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Travel Management on the Tonto National Forest

Final Environmental Impact Statement
Volume 1

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Travel Management on the Tonto National Forest
Final Environmental Impact Statement
Gila, Maricopa, Pinal, and Yavapai Counties, Arizona

Lead Agency:	**USDA Forest Service**
Cooperating Agencies:	**Arizona Game and Fish Department**
Responsible Official:	**Neil Bosworth, Forest Supervisor** **2324 E. McDowell Road, Phoenix, Arizona 85006**
For Information Contact:	**Anne Thomas, Interdisciplinary Team Leader** **2324 E. McDowell Road, Phoenix, Arizona 85006** **(602) 225-5213**

Abstract: The Tonto National Forest proposes changes to motorized use on roads, trails, and areas to meet requirements of Executive Order 11644, as amended by Executive Order 11989, and in the Travel Management Rule regulations (36 CFR 212, Subpart B). Routes and areas not designated for motorized use will be prohibited from motorized travel unless authorized under an exemption in the Travel Management Regulations. This action involves amending the Tonto National Forest Plan (Forest Plan) to restrict cross-country motorized travel in all nondesignated areas and amending other direction related to motorized use that does not comply with the Travel Management Rule. Three action alternatives (Alternatives B, C, and D) propose changes to the current system of National Forest System roads, trails, and areas for motorized use.

This final environmental impact statement (Final EIS) documents the analysis of the no action (Alternative A), a modified proposed action (Alternative C), and two alternatives to the proposed action (Alternatives B and D) to designate motorized use on the Tonto National Forest.

Alternative A proposes no change from the existing condition. Current management plans will continue to guide management of the project area. No changes will be made to the current National Forest transportation system. The Travel Management Rule will not be implemented and no Motor Vehicle Use Map (MVUM) will be produced. This action will not comply with the Travel Management Rule[1].

Alternative B proposes approximately 2,367 miles of roads for decommissioning, resulting in approximately 894 miles of designated roads and 1,666 miles of motorized trails open to public use. This alternative prohibits cross-country motorized travel except within 300 feet on both sides of designated roads and motorized trails for personal fuelwood gathering in permitted areas. The emphasis of Alternative B is limited motorized access across the Tonto National Forest and was developed in response to comments received during scoping.

Alternative C is a modified version of the proposed action that was made available during the comment period that ended September 17, 2014. It has been modified to respond to comments received on the draft EIS and to take into consideration route specific data that was submitted for consideration on the original proposed action in the notice of intent to prepare an environmental impact statement (Federal Register, Vol. 78, No. 2, p. 7391) that was not incorporated into the draft EIS. It proposes approximately 1,276 miles of roads for decommissioning, resulting in approximately 1,311 miles of designated roads and 2,341 miles of motorized trails open to public use, some of which will provide access for access to dispersed camping across the forest. This alternative prohibits cross-country motorized travel except in eight

[1] http://www.fs.fed.us/recreation/programs/ohv/final.pdf for more information.

proposed OHV areas totaling approximately 2,089 acres. It would also allow motorized access, up to one mile on both sides of designated roads and motorized trails, for retrieval of legally harvested elk and bear (totaling approximately 1,575,382 acres) and corridor 300 feet on both sides of designated roads and motorized trails for personal use fuelwood gathering in permitted areas. Alternative C is preferred by the responsible official.

Alternative D was developed in response to public comments received on the proposed action and provides the highest level of motorized recreation opportunities and access across the Forest. This alternative proposes approximately 194 miles of roads for decommissioning, resulting in approximately 3,347 miles of designated roads and 1,520 miles of motorized trails open to public use. This alternative prohibits cross-country motorized travel except in eight proposed OHV areas totaling approximately 6,791 acres. It would also allow motorized access, up to one mile on both sides of designated roads and motorized trails, for retrieval of legally harvested mule deer, white tail deer, elk, and bear (totaling approximately 2,068,208 acres), and a corridor of 300 feet on both sides of designated roads and motorized trails for dispersed camping and for personal use fuelwood gathering in permitted areas.

Summary

The Tonto National Forest proposes to designate a system of roads and motorized trails, in addition to prohibiting motorized cross-country travel, except in designated motorized areas and fixed-distance corridors solely for the purpose of motorized dispersed camping or motorized big game retrieval. The area affected by the proposal includes the entire Tonto National Forest. This action is needed because the increasing number of unmanaged motorized recreationists on the forest has been contributing to resource damage. The project area being analyzed in this document is the entire Tonto National Forest.

On November 2, 2005, the Forest Service announced the Final Travel Management Rule regulations governing off-highway vehicles (OHVs) and other motor vehicle use on national forests and grasslands. Under the new regulations, which reiterate direction given in previous Executive Orders (11644 and 11989), forests that do not already restrict OHV travel to designated roads and trails must do so. Motor vehicles, including OHVs, must remain on designated system roads and trails or in designated areas while on the national forest.

Currently, the Tonto National Forest does not have a forestwide designated road or trail system; cross-country motorized travel is permitted except in areas that are designated closed or restricted to seasonal use according to the 1985 Tonto National Forest Plan (Forest Plan). To date, four ranger districts (Cave Creek, Globe, Mesa, and Tonto Basin) are closed to cross-country travel by Closure Orders, direction in the Forest Plan, or other designation that restricts motor vehicle use.

On February 1, 2013, the Tonto National Forest published in the Federal Register a notice of intent to prepare an environmental impact statement to analyze the effects of designating motorized roads, trails, and areas as required by the Final Travel Management Rule. This original proposed action would have resulted in approximately 3,812 miles of designated National Forest System road and trails and 1,417 acres of designated areas open to motor vehicles on the National Forest, adding approximately 280 miles of unauthorized routes. On July 3, 2014, the Forest published a notice of availability of the draft environmental impact statement (EIS), which included an analysis of alternatives to the modified proposed action (Alternative C) including the no action (Alternative A), and Alternatives B and D. More information concerning the original proposed action and other alternatives considered but eliminated from detailed study is available in Chapter 2 of this Final EIS.

All three action alternatives (B, C, and D) would require amendments to the Forest Plan. Alternatives A and D would only allow one permit zone, Bulldog Canyon. Alternative B includes the addition of five motorized permit zones, while Alternative C includes the addition of four motorized permit zones. Motorized big game retrieval of elk and bear is allowed in Alternatives C and D—up to one mile on both sides of all designated motorized routes—but Alternative D also allows retrieval of white tail and mule deer, which nearly doubles the affected acreage. Alternative B does not allow for motorized retrieval off of designated roads or motorized trails. Motor vehicle access for dispersed camping is restricted to 65 acres in Alternative B and to designated routes in Alternative C. In contrast, Alternatives D would allow motor vehicle use for dispersed camping in designated corridors up to 300 feet on both sides of all designated motorized routes.

To clarify, the alternatives are summarized in alphabetical order:

- Alternative A proposes no change to existing conditions. This alternative would not comply with the Travel Management Rule.
- Alternative B, developed in response to public comments during scoping, has the fewest miles of roads and motorized trails open to the public and the most miles of roads proposed for decommissioning. It is the only alternative which does not allow motor vehicle use for big game retrieval, and motor vehicle use for dispersed camping is restricted to designated sites only. This alternative does allow for cross-country travel, up to 300 feet on both sides of all designated motorized routes, for fuelwood gathering within designated areas.
- Alternative C has the second lowest number of miles of roads designated to be open to the public, but also has the most miles of motorized trails.
- Alternative D has the most miles of motorized roads open to the public and the most acres of cross-country travel for the purposes of dispersed camping and big game retrieval.

Overall, the modified proposed action, Alternative C, will provide the most balance between protection of the natural and cultural resources, while still providing motorized access to the public for a variety of recreational opportunities. All of the action alternatives (one of which must be implemented per the final rule) increase the forest's ability to protect resources and manage the transportation system more effectively.

Based upon a review of public comments and the final environmental impact statement, the forest supervisor of the Tonto National Forest will select one of the analyzed alternatives or a combination of elements from these separate alternatives. A record of decision will document the forest supervisor's final designation of a motorized system for the Tonto National Forest as required by the Travel Management Rule.

List of Acronyms

ADEQ ~ Arizona Department of Environmental Quality

ADOT ~ Arizona Department of Transportation

AZGFD ~ Arizona Game and Fish Department

APE ~ Area of potential effect

ARPA ~ Archaeological Resources Protection Act

ATV ~ All-terrain vehicle

BA ~ Biological assessment

BE ~ Biological evaluation

BIA ~ Bureau of Indian Affairs

BLM ~ Bureau of Land Management

BMPs ~ Best management practices

BOR ~ Bureau of Reclamation

CAA ~ Clean Air Act

CEQ ~ Council on Environmental Quality

CFR ~ Code of Federal Regulations

CO_2 ~ Carbon dioxide

DEIS ~ Draft environmental impact statement

DO ~ Dissolved oxygen

EIS ~ Environmental impact statement

EPA ~ Environmental Protection Agency

FEIS ~ Final environmental impact statement

FR ~ Federal Register

FS ~ Forest Service

FSH ~ Forest Service Handbook

FSM ~ Forest Service Manual

FY ~ Fiscal year

HUC ~ Hydrologic unit code

GIS ~ Geographic information system

GMU ~ Game management unit

HDMS ~ Heritage data management system

ID ~ Interdisciplinary (as in ID Team)

IBA ~ Important bird area

IRA ~ Inventoried roadless area

LEI ~ Law enforcement and investigations

MBGR ~ Motorized big game retrieval

MIS ~ Management indicator species

MRS ~ Minimum road system

ML ~ Maintenance level

ML 1 ~ Maintenance level 1 (closed to public motorists)

ML 2 ~ Maintenance level 2

ML 3 ~ Maintenance level 3

ML 4 ~ Maintenance level 4

ML 5 ~ Maintenance level 5

MVUM ~ Motor vehicle use map

NAAQS ~ National Ambient Air Quality Standards

NEPA ~ National Environmental Policy Act

NF ~ National Forest

NFS ~ National Forest System

NFMA ~ National Forest Management Act

NHPA ~ National Historic Preservation Act

NOx ~ Nitrogen oxides

NVUM ~ National visitor use monitoring

NRIS ~ Natural resource information system

OHV ~ Off-highway vehicles

PA ~ Programmatic agreement

PAC ~ Protected activity center

PFA ~ Post fledgling area

PNVT ~ Potential Natural Vegetation Type

PM ~ Particulate matter

R3 ~ Region 3

RARE ~ Roadless area review and evaluation

RATM ~ Resource access-travelway management

RD ~ Ranger District

RFA ~ Recreation facility analysis

RNA ~ Research natural area

ROS ~ Recreation opportunity spectrum

SHPO ~ State Historic Preservation Officer

SIP ~ State implementation plan

SMS ~ Scenery management system
SPNM ~ Semiprimitive nonmotorized
SUV ~ Sports utility vehicle
TES ~ Terrestrial ecosystem survey
TEUI ~ Terrestrial Ecological unit inventory
TM ~ Travel Management
TMDL ~ Total maximum daily load
USC ~ United States Code
USDA ~ United States Department of Agriculture
USFS ~ United States Forest Service
USFWS ~ United States Fish and Wildlife Service
VMS ~ Visual management system
VMT ~ Vehicle miles traveled
VOC ~ Volatile organic compounds
VQO ~ Visual quality objective

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Chapter 1. Purpose of and Need for Action

Introduction

Motor vehicles are used for many activities on the Tonto National Forest, such as sightseeing, camping, hiking, hunting, fishing, recreational riding, and collecting fuelwood and other forest products, as well as permitted and administrative uses. Current regulations prohibit trail construction and operation of vehicles in a manner that is damaging to the land, wildlife, or vegetation (36 CFR 261—Prohibitions). However, these regulations have not proven sufficient to control the addition of user-created routes or environmental effects.

The project area being analyzed in this document is the entire Tonto National Forest. Of the six ranger districts that make up the Tonto National Forest, two currently permit cross-country motorized travel (Payson and Pleasant Valley), except in areas that are closed by forest order; restricted to seasonal use; or designated by Congress, such as wilderness areas. The other four ranger districts (Cave Creek, Globe, Mesa, and Tonto Basin) are closed to cross-country travel per the 1985 Tonto National Forest Land and Resources Management Plan (Forest Plan).

This final environmental impact statement (Final EIS) describes the proposed project to improve the management of motorized vehicle use on National Forest System lands on the Tonto National Forest in accordance with the Travel Management Rule (36 CFR 212, 251, and 261). The project will result in the publication of a motor vehicle use map (MVUM) showing those roads, trails and areas designated for motor vehicle use. After the MVUM has been released to the public, travel off the designated system will be prohibited unless authorized by permit or as allowed by the Travel Management Rule and the designated Responsible Official.

The Tonto National Forest has evaluated alternatives and is issuing this Final EIS to disclose the potential effects of changes to the existing system of National Forest System roads, prohibiting cross-country travel, and designating a system of roads, trails, and areas where motorized travel can occur on the forest in order to comply with the Final Travel Management Rule.

Document Structure

The Forest Service has prepared this Final EIS in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This draft environmental impact statement discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives.

The document is organized into four chapters:

Chapter 1. Purpose and Need for Action: The chapter includes information on the history of the project proposal, the purpose of and need for the project, and the Agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Chapter 2. Alternatives, including the Proposed Action: This chapter provides a more detailed description of the Agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

Chapter 3. Affected Environment and Environmental Consequences: This chapter describes the existing condition of the project area and the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area.

Chapter 4. Consultation and Coordination: This chapter provides a list of preparers and agencies consulted during development of the environmental impact statement.

Additional documentation, including detailed analyses of project area resources, may be found in the project record located at the Tonto National Forest Supervisor's Office, 2324 E. McDowell Road, Phoenix, Arizona and on the Forest website at: Tonto National Forest Travel Management Project Documents (http://data.ecosystem-management.org/nepaweb/fs-usda-pop.php?project=28967)

The Travel Management Rule

On November 9, 2005, the Forest Service published travel management regulations governing off-highway vehicles (OHVs) and other motor vehicles on national forests and grasslands. This is referred to as the Final Travel Management Rule. This final rule was developed in response to the substantial increase in use of OHVs on National Forest lands and related damage to forest resources caused by unmanaged OHV use over the past 20 to 30 years. The regulations implement Executive Order (EO) 11644 and EO 11989 regarding off-road use of motor vehicles on Federal lands.

The rule,

> provides for a system of National Forest System roads, National Forest System trails, and areas on National Forest System lands that are designated for motor vehicle use. After these roads, trails, and areas are designated, motor vehicle use, including the class of vehicle and time of year, not in accordance with these designations is prohibited by 36 CFR 261.13. Motor vehicle use off designated roads and trails and outside designated areas is prohibited by 36 CFR 261.13 (36 CFR 212.50(a)).

The rule goes on to stipulate that:

> Once roads, trails, and areas on the Tonto National Forest have been designated and identified on the MVUM, motor vehicle use off of the designated system is prohibited. The following vehicles and uses are exempted from this prohibition: (1) aircraft; (2) watercraft; (3) over-snow vehicles ; (4) limited administrative use by the Forest Service; (5) use of any fire, military, emergency, or law enforcement vehicle for emergency purposes; (6) authorized use of any combat or combat support vehicle for national defense purposes; (7) law enforcement response to violations of law, including pursuit; and (8) motor vehicle use that is specifically authorized under a written authorization issued under Federal law or regulations (36 CFR 212.51).

Forests that do not already restrict motorized travel to designated roads, trails, and areas must do so according to the rule. Designated roads, trails, and areas shall be identified on a motor vehicle use map (MVUM) and made available to the public.

The rule further states that,

> The responsible official may incorporate previous administrative decisions regarding travel management made under other authorities, including designations and prohibitions of motor

> vehicle use, in designating National Forest System roads, National Forest System trails, and areas on National Forest System lands for motor vehicle use" (36 CFR 212.50(b)).

It does not require reconsideration of any previous administrative decisions that allow, restrict, or prohibit vehicle use on National Forest System roads, trails, or areas and that were made under other authorities. This environmental analysis addresses changes to the system that are needed to meet the Final Travel Management Rule.

To comply with the Final Travel Management Rule, the Tonto National Forest conducted a forestwide travel analysis process in 2006, reviewing the entire road system that was in the forest database at the time. The intent of this process was to identify needed changes to the existing road and motorized trail system which would generate a proposed action to be analyzed through the NEPA process. While a proposed action was developed based on the 2006 travel analysis process, the environmental analysis was never completed on it, nor was a decision made.[2] In 2013, upon resumption of travel management planning, the interdisciplinary team, along with other Tonto National Forest employees, used a science based process to review and refine the preferred road and motorized trail system from the previous process. This was done with a focus on ensuring protection of resources, while providing for administration and utilization of National Forest System lands (36 CFR 212.5(b)).

For the purposes of this analysis, the term "road" or "trail" is defined as a National Forest System road or trail that is designated for motor vehicle use pursuant to 36 CFR 212.51. An unauthorized road or trail is, "a road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas" (36 CFR 212.1). Unauthorized routes have generally developed without agency authorization, environmental analysis, or public involvement and do not have the same status as National Forest System roads or trails included in the forest transportation system.

The travel management rule employs an iterative, ongoing process that begins with an analysis of the transportation system, which is then carried into a NEPA analysis for proposed changes to the system of roads, trails, and areas. This results in the designated transportation system, which can be adapted over time. The motor vehicle use map will show this system and will be valid until the forest issues a new map based on necessary system changes. The final rule states that this map will be reissued every year, which would be reflective of any changes made to the designated system.

Location of Proposed Travel Management

The Tonto National Forest covers approximately 2,964,308 acres in central Arizona and is the fifth largest national forest in the National Forest System. The Tonto National Forest spans a range of ecosystems from the Sonoran Desert through a variety of chaparral and pinyon pine/juniper up to the mixed conifer and ponderosa pine of the Mogollon Rim. The Tonto National Forest is divided into six ranger districts: Cave Creek, Globe, Mesa, Payson, Pleasant Valley, and Tonto Basin (Figure 1).

[2] For more information, see the Public Involvement section of this chapter.

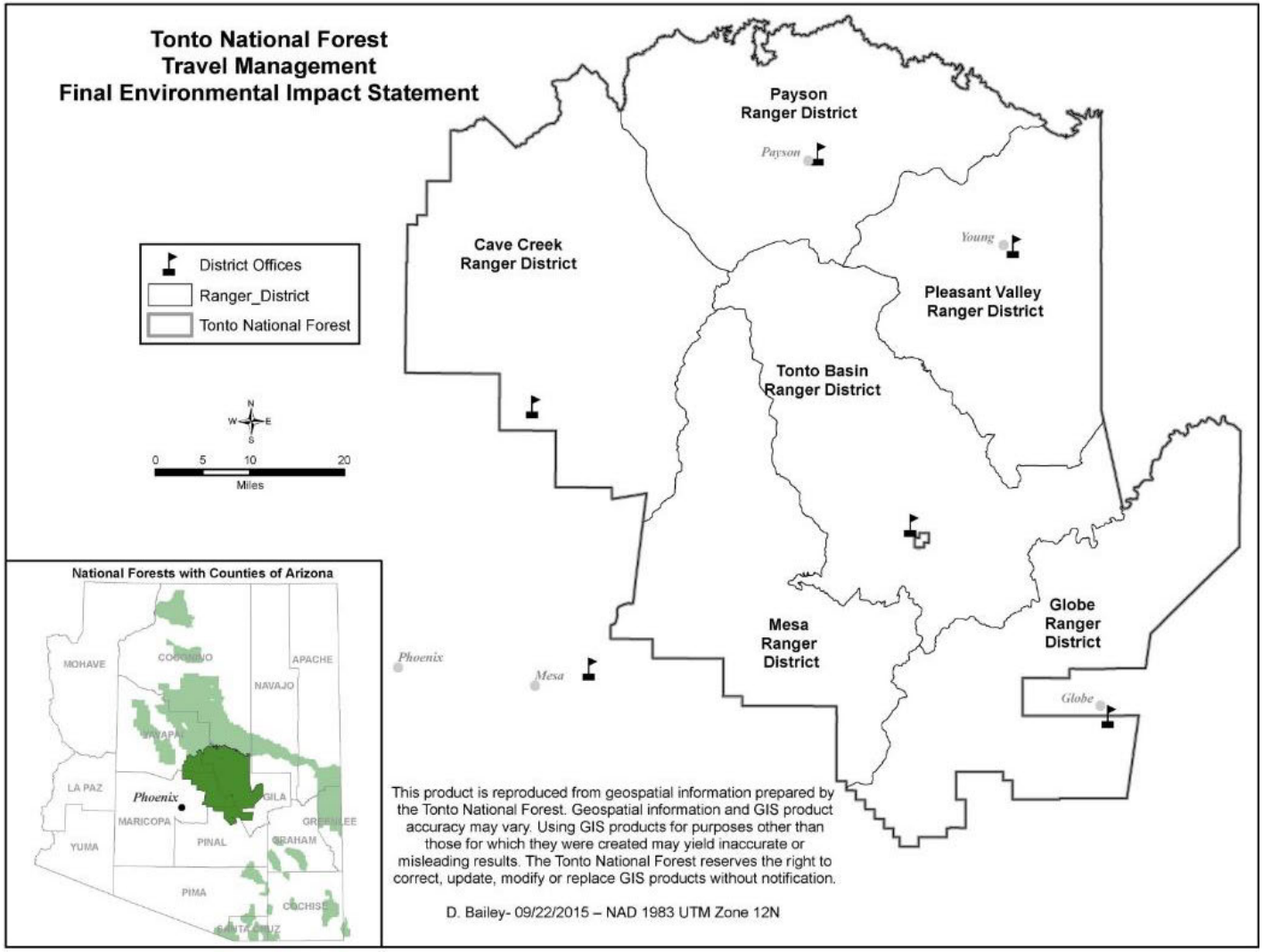

Figure 1. Map of the Tonto National Forest, including Ranger Districts

The Tonto National Forest abuts the northern edge of the Phoenix metropolitan area, which has a population of more than 4.5 million people.[3] The city of Phoenix itself has a population of approximately 1.5 million, making it the sixth largest city in the United States.[4] The Phoenix area is a popular destination for conferences, conventions, and tourism with its warm and sunny year-round climate, wide variety of business, cultural, and recreational offerings, serviced by many direct flights from most major U.S. cities. These factors combine to make the Tonto National Forest one of the most heavily visited national forests (U.S. Forest Service, 2005a), with nearly five million recreational visitors annually (U.S. Forest Service, 2012).

Many of these visitors drive through the Tonto National Forest for sightseeing the natural landscape or on their way to other destinations, such as the Grand Canyon or other northern, high-elevation locations to escape the Phoenix Valley's summer heat. Others come for the variety of water-based recreation such as fishing, boating, water skiing, swimming, rafting, or to picnic near picturesque desert lakes and rivers.

Background of Motor Vehicle Use and Management on the Tonto National Forest

Motor vehicles are used for many activities on the Tonto National Forest. These activities include sightseeing, camping, hiking, hunting, fishing, recreational riding, and collecting fuelwood and other forest products, as well as permitted and administrative uses. Motor vehicle use is both a form of access to nonmotorized activities on the Forest and a form of recreation in and of itself. On Arizona national forests and other public lands, off-highway vehicle (OHV) use varies depending on terrain and user preferences:

- Off-road motorcycles, including dirt bikes, have a narrow wheelbase width and can be ridden on single-track trails;
- All-terrain vehicles (ATVs) often have a wheelbase width of 50 inches or less and riders straddle the vehicle, with multiple riders sitting one in front of the other;
- Utility terrain vehicles (UTVs) allow riders to sit side-by-side and may have a wheelbase width greater than 50 inches; and
- Full-sized four-by-four vehicles, which have a high enough clearance and traction to drive off paved roads.

During the past ten years, OHV use has increased dramatically across the nation and on millions of acres of public land in the western U.S. In Arizona, sales of OHVs increased 623 percent, from 1995 to 2006 (Arizona State Parks, 2009). Prior to 2001, the majority of OHV sales in Arizona consisted of ATVs; however, by 2008 UTVs had surpassed the sales of ATVs in Maricopa County (Arizona State Parks, 2009). According to a survey conducted by Arizona State Parks (2009), 22 percent of adult Arizona residents have participated in motorized recreation, with nearly 11 percent indicating that motorized vehicle use accounts for the majority of their recreation.

[3] The Phoenix-Mesa-Scottsdale metropolitan statistical area (MSA) includes Maricopa and Pinal Counties and is the 12th largest among the U.S. metro areas (http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk accessed on September 19, 2015).

[4] According to the U. S. Census Bureau 2014 population estimates (http://quickfacts.census.gov/qfd/states/04/0455000.html accessed on September 19, 2015).

Riding a motorized vehicle off designated and maintained roads and trails can result in effects to resources, including increased soil erosion, decreased water quality, decreased air quality, damage to cultural resources, disruptions to wildlife, changes in natural vegetation, or conflicts with forest users seeking a nonmotorized experience. Managing motorized recreation is particularly challenging on the Tonto National Forest as the desert ecosystem does not provide many natural barriers to prevent users from riding anywhere their vehicle will take them. The Tonto National Forest is the most heavily-used national forest for motorized recreation, with OHV participation of nearly a million visitors from January 1, 2000 to September 30, 2003" (English et al. 2004).

The issue of increasing motorized use is not specific to the Tonto National Forest. Unmanaged recreation, including motor vehicle use, was listed as one of the four key threats to the health and sustainability of national forests by former Forest Service Chief Dale Bosworth. In November 2005, a Travel Management Rule was established as a regulation to improve management of motorized use by defining where motorized use is acceptable and where it is not. More specifically, this rule requires Forest Service staff at each national forest and grassland to designate motor vehicle use on roads, trails, and areas by vehicle class and time of year if appropriate. After designation, motor vehicle use not in accordance with the designation is prohibited, except for those exemptions listed in the Travel Management Rule, such as limited administrative use by the Forest Service or permitted activities (36 CFR 212.51). The Travel Management Rule only applies to motorized vehicle use and does not affect or prohibit any nonmotorized access.

Existing and Desired Conditions

Existing conditions describe the current management situation and environmental conditions within the project area. Desired Conditions describe the goals for travel management as defined by Forest Plan guidance, the Final Travel Management Rule, and other regulations, as well as the public's needs. The rule itself does not dictate a specific process for compliance; instead it outlines criteria for designation of roads, trails, and areas, which indicates that "The responsible official may incorporate previous administrative decisions regarding travel management made under other authorities, including designations and prohibitions of motor vehicle use, in designating National Forest System roads, National Forest System trails, and areas on National Forest System lands for motor vehicle use" (36 CFR 212.50(b)). Furthermore, the rule does not provide a strict definition for determining the current condition of a forest's motorized system, "Responsible officials may choose to reconsider past decisions, with public involvement, as necessary to achieve the purposes of the final rule (Federal Register, Volume 70, Number 216, 2005, p. 68268).

Existing Condition

Currently, motor vehicles may drive on any open road as well as access the forest interior by driving "cross-country" or off of forest roads, except where prohibited by existing off-road closure areas. These "motorized travel restricted" areas are closed to cross-country travel to protect sensitive soil and vegetation, wetlands, wilderness areas, and non-motorized recreational opportunities. These areas have been closed by the Forest Plan, previous official Forest Orders, or legislative actions, such as congressionally designated wilderness areas.

The Forest Service uses five maintenance levels (ML) to classify roads, ranging from ML 1 indicating intermittent service roads closed to vehicular use, to ML 5, indicating roads that provide a high degree of user comfort and convenience. ML 3, 4, and 5 roads are those suitable

for passenger cars. Some of these passenger vehicle roads are dirt, some are gravel, and some are paved. ML 3, 4, and 5 roads are subject to the Highway Safety Act. Therefore, these roads generally receive more maintenance than level 2 roads, which provide access for high clearance vehicles.

Historically, the Forest Service maintains an electronic "infrastructure" database that tracks, among other items, records of forest system roads. This database includes the assigned road number, mileage of roads, the current—also known as the operational—maintenance levels, and if appropriate, the objective or future maintenance levels. In this Final EIS, ML 3, 4, and 5 roads will be referred to as passenger car roads that a typical sedan could drive down and ML 2 roads as high clearance roads that are maintained to accommodate high clearance vehicles. According to the infrastructure database for roads on the Tonto National Forest, there are approximately 2,952 miles of roads open to the public: 645 miles for passenger vehicles and 2,308 miles for high clearance. This database also shows that there are 1,739 miles of ML 1 (closed to vehicular use) roads and 267 miles of decommissioned routes. However, after reviewing updated satellite imagery and gathering on-the-ground information from ranger district personnel, Forest Service Law Enforcement Officers, and Arizona Game and Fish Department employees,[5] it was determined that many roads in the database that were identified as ML 1 or decommissioned are being used currently by motor vehicles. Without a forestwide survey to determine the precise condition of a given road as it relates to maintenance levels—which would be cost prohibitive and would unnecessarily delay compliance with the Final Travel Management Rule—the existing condition for the road system on the Tonto National Forest, the baseline[6] for which the effects of the proposed changes to the road system for this project, results in approximately 5,000 miles of roads open to motor vehicle use.[7] Currently, there are no trails designated solely for motorized use on the Tonto National Forest.

In addition to the forest roads described above, the Tonto National Forest has seen the proliferation of unauthorized, or "user-created," routes,[8] In some cases, these routes appear as "two track" roads that access popular areas for dispersed recreation (camping, hunting, horseback riding, etc.) or as routes that provide for increased loop riding opportunities. These routes are not tracked in the Forest Service roads inventory, and do not receive maintenance to ensure environmental impacts are minimized. The number of unauthorized routes continues to grow as more and more visitors use the area and drive vehicles off road. Most of these routes include unauthorized travel for which the forest currently has no data[9] and routes that have been created by repeated off-road travel in areas where cross-country travel was permitted. Additionally, unauthorized routes have been created in areas where cross-country travel was not permitted but existing prohibitions or enforcement of such prohibitions were not adequate.

A more detailed description of the existing conditions, including specific mileage for roads, can be found in Chapter 2; the No Action Alternative (Alternative A).

[5] Arizona Game and Fish employees are often in the forest on a daily basis as part of their job and see first-hand motor vehicle use patterns.
[6] A more detailed discussion of the inconsistencies between what is in the Tonto National Forest infrastructure database for system roads and what is existing condition on the ground—the baseline for this analysis—can be found in the Alternatives Considered but Eliminated from Detailed Study section of Chapter 2 of this document.
[7] The total mileage for the existing condition includes all ML 2 through ML 5 roads from the infrastructure database.
[8] 36 CFR 212.1 Defines an unauthorized road or trail as: A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas.
[9] Per the Final Travel Management Rule, an exhaustive inventory of unauthorized routes was not conducted on the Tonto National Forest, nor is there any expectation that such an inventory will be conducted.

Desired Condition

The Tonto National Forest Land and Resource Management Plan (Forest Plan) is the guiding document for Forest Service management of natural resources and uses of the forest. Currently, the Tonto National Forest allows motorized cross-country travel throughout the Payson and Pleasant Valley ranger districts except in three types of areas: congressionally designated wilderness, areas closed to motorized use in the forest plan, or areas closed to motorized use in a forest closure order. The Final Travel Management Rule directs the Forest Service to provide for a system of National Forest System roads, system trails, and system areas on Forest Service lands that are designated for motor vehicle use and by class and time of year (if appropriate) (36 CFR 212.50). The desired condition is that the forest road system is the minimum system necessary to provide safe and efficient travel for the administration, utilization, and protection of NFS lands considering long-term funding expectations while ensuring that the identified system minimizes adverse environmental impacts (36 CFR 212.5 (b)). The desired condition is a designated system of roads, motorized trails, and OHV areas that are managed and sustainable, which accommodate motorized access needs consistent with the Forest Plan and the 2005 Travel Management Rule.

Purpose of and Need for Changes to Travel Management

The purpose of this project is to comply with the Travel Management Rule by providing a system of roads, trails, and areas designated for motor vehicle use by class of vehicle and time of year on the Tonto National Forest. In addition, the magnitude and intensity of motor vehicle use has increased to the point that the intent of EO 11644 and EO 11989, both pertaining to the use of motorized vehicles on public land, cannot be met while still allowing unrestricted cross-country travel. There is a need to determine which, if any, National Forest System roads currently open should be closed to motorized travel. In addition, there is a need to determine which, if any, National Forest System roads currently closed should be open to motorized travel. There is also a need to identify any restrictions on allowed uses, classes of vehicles, and/or seasons of use for specific routes. There is also a need to determine which, if any, unauthorized routes should be added to National Forest System as trails or roads open for motorized access. Furthermore, there is a need to determine if, when, where, and how far motor vehicles may be driven off designated roads for the sole purpose of motorized dispersed camping, motorized big game retrieval, and collection of forest products. Finally, there is a need to amend the Forest Plan[10] to prohibit motor vehicle use off designated National Forest System roads, trails, and areas except as shown on the motor vehicle use map and to revise wording for consistency regarding definition to comply with Travel Management Rule, 36 CFR 261.13.

Decision Framework

The Tonto National Forest Supervisor is the responsible official and will decide the following:

- Changes to the existing road system;
- Changes to existing motorized trails and areas open to cross-country motorized travel;
- The distance motor vehicles may travel off specific designated routes for the purpose of dispersed camping, big game retrieval, and collection of forest products; and

[10] A detailed account of plan amendments associated with the action alternatives can be found in Appendix A of this document.

- Language and content changes to the Tonto National Forest Plan via a forest plan amendment through use of the 1982 rule procedures as allowed by the transition language of the 2012 planning rule (36 CFR 219.17(b)(3)).

The decision will be based on a consideration of the environmental effects of implementing the proposed action or alternatives developed in response to significant issues. The Forest Supervisor may select the proposed action, an alternative analyzed in detail, or a modified proposed action or alternative within the project's range of alternatives. The Tonto National Forest Supervisor chose to focus this analysis and subsequent decision on meeting the primary purpose and intent of the Travel Management Rule to designate National Forest System roads, trails, and areas on Forest Service managed lands for motor vehicle use (36 CFR 212.51). Previous administrative decisions concerning development of existing National Forest System roads and trails, road construction, road reconstruction, motorized trail construction, and land suitability for motorized use on existing roads are outside of the scope of this analysis. This analysis does not preclude a planning effort that considers changes to the motorized route system at a later date. Any such future proposal would require an appropriate environmental analysis and documentation in a NEPA decision.

This environmental analysis process is focused on implementing 36 CFR 212 Subpart B of the Travel Management Rule. This decision will not affect the terms and conditions associated with special use authorization of National Forest System land, outlined in 36 CFR 251, including motorized access for grazing and livestock use and minerals. Those with a special use authorization permit, such as for grazing and mining access, will be required to follow motor vehicle use regulations as defined in the motor vehicle use map, unless they are given special authorization to drive off the designated system through a separate permitting system or environmental analysis process.

Additionally, over snow vehicle use on the Tonto National Forest is limited to occasional use during infrequent heavy snowfall in the northern ranger districts of Payson and Pleasant Valley, mostly for emergency ingress and egress to private land. Such use is minimal and will not be covered in this decision.

Public Involvement

In October 2009, the forest released a proposed action based on the 2006 travel analysis process. Seven public meetings were held throughout the communities within and proximate to the forest in November and December 2009 to gather input about the proposed action, including roads and trails proposed for motorized use. Comments to the proposed action were accepted through December 4, 2009. A draft version of an environmental assessment was released for public comment on January 6, 2012 for a 30-day comment period. Due to the length and complexity of the environmental assessment and requests from the public, an additional 30-day comment period began on February 5, 2012. Approximately 300 letters were received during these two comment periods.

Upon review of the comments received on the draft environmental assessment, the Tonto National Forest determined that preparation of an EIS was warranted. On February 1, 2013, a notice of intent to prepare an EIS was published in the Federal Register, initiating a 30-day scoping period that ended March 4, 2013. Approximately 1,800 postcards and 1,670 emails were

sent to interested and affected parties.[11] Approximately 120 replies were received, including 20 form letters from Rim County Riders ATV Club members.

Since this project is an activity implementing a land management plan, it is subject to the objection process described in 36 CFR 218 Subparts A and B. On July 3, 2014, the Forest published a notice of availability of the draft EIS in the Federal Register. Over 1,340 postcards and 1,680 emails were sent to interested and affected parties indicating the opportunity to provide timely and specific written comments (per 36 CFR 218) on the draft EIS. In conjunction with the publication of the Federal Register Notice, all of the supporting documents, including draft specialists reports, full-sized maps, and the draft implementation strategy for managing motorized trails, was made available electronically.[12] The initial 45-day comment period was extended to September 17, 2014 to respond to several requests for additional time to review the draft EIS. Approximately 2,500 response letters, emails, and faxes were received on the draft EIS. Of these, only 85 were unique submissions; the rest were form letters generated by environmental groups.

Consultation and Communication with Tribes

Communication with Tribes interested and affected by travel management on the Tonto National Forest has been ongoing since 2009. The following is a list of the Tribes and Tribal communities that have provided comments about travel management and a summary of their input:

- Fort McDowell Yavapai – supports closure of routes that access their adjacent reservation to protect tribal resources from vandalism.
- Gila River Indian Community and Salt River Pima-Maricopa Indian Community – wants the forest to maintain existing roads as they are now, without adding roads or unauthorized routes, and focus on enforcement to protect heritage sites.
- Hopi – supports the most restrictive action for travel management, limiting motorized access, decreasing motorized route mileage, and prohibiting cross-country travel.
- San Carlos Apache Tribe – wants the identification and protection of historic sites, while allowing for continued access for Tribal members to sacred, holy, traditional, cultural, and heritage resource sites. They also encourage the forest to decommission all unauthorized routes and as many roads as possible.
- White Mountain Apache Tribe – wants all cultural heritage resources to be protected by closing routes and limiting motorized access in areas on the forest that are adjacent to tribal land.
- Yavapai Apache Nation and Tonto Apache Tribe – supports an action that is most restrictive for motorized access and use.
- Yavapai Prescott Indian Community – also supports an action that is most restrictive for motorized access and use.
- Ak-Chin Indian Community – supports a plan that will protect the land and wildlife from damage associated with motor vehicle use.

[11] There was duplication in some instances with the postcards and emails where individuals and groups received both notifications.
[12] The website were all of this information can be found is at http://data.ecosystem-management.org/nepaweb/fs-usda-pop.php?project=28967

Issues Associated with Motor Vehicle Use

Issues serve to highlight effects or unintended consequences that may occur from the proposed action and alternatives, giving opportunities during the analysis to reduce adverse effects and compare trade-offs for the decision maker and public to understand. Issues help set the scope of the actions, alternatives, and effects to consider in our analysis (Forest Service Handbook 1909.15.12.4).

Comments from the tribes, public, and other agencies submitted during the scoping period were used to formulate issues concerning the Proposed Action. An issue is a point of dispute or disagreement with the Proposed Action based on some anticipated environmental effect. The interdisciplinary team separated the issues into two groups: significant and nonsignificant. Significant issues were defined as those directly or indirectly caused by implementing the Proposed Action. Nonsignificant issues were identified as those:

- Outside the scope of the proposed action;
- Already decided by law, regulation, policy, the forest land and resource management plan, or other higher level decision;
- Irrelevant to the decision to be made; or
- Conjectural and not supported by scientific or factual evidence.

The Council on Environmental Quality NEPA regulations explains this delineation in Sec. 1501.7. "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review…."

Issues Associated with Designation of Roads, Motorized Trails, and OHV Areas

1a. The amount of roads and motorized trails in the proposed action does not meet the current and future needs for motorized recreation and access throughout the Tonto National Forest.

Unit of measure: Miles of roads and trails designated open to motorized vehicles.

1b. The proposed action does not meet the needs for diverse motorized recreation opportunities.

Unit of measure: Miles of trails designated for the following motorized users: single track/motorcycle; ATV (less than 50 inches wide); UTV; or full-sized vehicles.

1c. Designation of roads and motorized trails would result in user conflict.

Unit of measure: Distance to nearest motorized road or trail and changes in recreation opportunities across the forest.

1d. Designation of roads, motorized trails, and OHV areas would result in impacts to water and soil resources.

Unit of measure: Miles, acres, and percentage of roads and areas related to watersheds and soil categories.

1e. Designation of roads, motorized trails, and OHV areas would result in impacts to wildlife habitat.

Unit of measure: Density of roads and motorized trails in all habitat types for threatened, endangered, and Forest Service sensitive species.

1f. Designation of roads, motorized trails, and OHV areas would result in impacts to cultural resources.

Unit of measure: Number of cultural resources impacted.

Issues Associated with Designation of Motor Vehicle Use for Big Game Retrieval

2. Authorizing motorized big game retrieval off designated routes could impact water and soil resources, wildlife habitat, cultural resources, and nonmotorized recreational experiences.

Unit of measure: Number of average off-road vehicular trips for motorized retrieval of big game by species, along with the potential acres allowed for motorized big game retrieval.

Issues Associated with Designation of Motor Vehicle Use for Dispersed Camping

3a. Limiting motor vehicle use to access dispersed camping to a specific distance from designated roads or motorized trails or on designated motorized access may reduce dispersed camping opportunities, cause user conflict, and concentrate resource impacts.

Unit of measure: Acres of designated camping corridors or mileage to access dispersed camping sites.

3b. Motorized dispersed camping corridors allow motorized use in areas that can cause impacts to water and soil resources, wildlife habitat, and cultural resources.

Unit of measure: Acres and intensity of designated motorized dispersed camping corridor use in sensitive wildlife habitat, riparian areas, and number of cultural resources impacted.

Chapter 2. Alternatives, Including the Proposed Action

Introduction

This chapter describes and compares the alternatives considered for the "Final Environmental Impact Statement for Travel Management on the Tonto National Forest" (Final EIS). It includes a description and maps of each alternative considered. Based on the issues and concerns identified in public comment on the proposed action, the Forest Service developed two alternative proposals that achieve the purpose and need differently than the Proposed Action. In addition, the Forest Service is required to analyze a No Action alternative. These four alternatives were described in detail and analyzed for their effects by resource in the draft EIS, released for public comment in July 2014. The No Action, a further modified proposed action replacing Alternative C from the draft EIS, and the two other action alternatives are described in detail in this chapter. In addition, alternatives considered but eliminated from detailed study are described.

This chapter also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Information used to compare the alternatives is based upon the design of the alternative and the environmental, social, and economic effects of implementing each alternative. These effects are discussed in detail in Chapter 3, by resource area.

Development of Alternatives

The development of the four alternatives, in particular Alternative C, has been a multi-year, iterative process as outlined in 36 CFR 220.5(e)(1). Initially, the Tonto National Forest engineering staff reviewed the existing road system being managed by the forest and developed a system for classifying roads to develop a desired road network from the engineering staff perspective (Appendix B). Once nearly every road had been analyzed, the information was further reviewed on a ranger district level, involving district rangers, Forest Service personnel familiar with the existing road and resource conditions, and Arizona Game and Fish Department Wildlife Managers whose wildlife management responsibilities overlapped with the corresponding district boundaries. This review involved comprehensive discussions related to public use patterns, permitted user access, and resource protection needs and is the basis for much of the road and motorized trail system in Alternative C. This entire process took nearly four months, and allowed for the correction of some route alignment issues using aerial imagery gathered in 2012. The No Action Alternative, along with all the action alternatives, uses this corrected data.

Alternatives Considered in Detail

The description of the four alternatives being analyzed, including the No Action, in this Final EIS are organized by six elements to help the reader understand the differences and similarities among them. These elements are:

Roads and Trails Designated for Motor Vehicle Use: According to the Travel Management Rule, a National Forest System road is defined as a "forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county, or other local public

road authority" (36 CFR 212.1). In addition, a road is defined as "a motor vehicle route over 50 inches wide, unless identified and managed as a trail" (36 CFR 212.1).

Areas Designated for Motor Vehicle Use (open to travel off designated motor vehicle use routes): According to the Travel Management Rule, an area is defined as "a discrete, specifically delineated space that is smaller, and in most cases much smaller, than a Ranger District" (36 CFR 212.1).

Permit Zones: Are unique to the Tonto National Forest and are a discrete area where effects from OHV use are negatively impacting resources, but complete exclusion to the area by OHV use is not desirable. Currently there is one permit zone on the Tonto National Forest (Bulldog Canyon). In a permit zone, cross-country travel is not allowed. Instead, motorized vehicle users are required to get a permit to access the area, which would have locked gates and barriers restricting nonpermitted access.

Currently, there is no limit to the number of permits available. To obtain a permit, users would either obtain one in person at a designated Forest Service office or via the Internet. Interested users are required to provide personally identifiable information to acquire a permit and the combination to the locked access gates. Once the user is granted a permit, additional instructions and a map would be provided detailing specific routes open for motorized use and a description of the penalties associated with driving off of the designated routes or providing access to users without a valid permit. Permits are valid for 6 months, but users can reapply for a permit for an additional 6 months of permitted use.

Permits are not required for nonmotorized users such as equestrians and hikers. They may enter the zone through equestrian/ pedestrian gates. The number of permits issued for the Bulldog Canyon Permit Zone is estimated on average at 750 per month over the course of a year or 9,000 annually. During periods of high use (winter), up to 30-50 permits are issued per day.

While there is research into the effectiveness of face-to-face communication in increasing compliance in federal land users (such as Marion and Reid, 2007; Park et al., 2008; Roggenbuck, 1992), there is only anecdotal information regarding the improvement of resource conditions and their relationship to user compliance within the existing permit zone. Because of the lack of relevant quantitative or peer-reviewed qualitative analysis, roads and motorized trails within existing and proposed permit zones would not be treated differently than roads and motorized trails outside of these permit zones. This assumption will be used in the analysis for Chapter 3 of this document unless stipulations can be included in the permit as a form of mitigation (i.e., requiring vehicles to be washed clean of mud and plant debris that may result in the spread of noxious weeds).

Motor Vehicle Use for Big Game Retrieval: The Responsible Official may include in the designation the limited use of motor vehicles within a specified distance of designated routes, and if appropriate, within specified time periods solely for purposes of "…retrieval of a downed big game animal by an individual who has legally taken that animal" (36 CFR 212.51 (b)). Motorized off-road travel for other hunting activities, such as scouting or accessing hunting sites, would be prohibited.

Motor Vehicle Use for Dispersed Camping: Similar to big game retrieval using motor vehicles, the Responsible Official "may include in the designation the limited use of motor vehicles within a specified distance of certain designated routes, and if appropriate, within specified time periods, solely for the purposes of dispersed camping…" (36 CFR 212.51 (b)).

Additional Information Pertaining to Motor Vehicle Use Designation: This section includes information about personal use fuelwood gathering. Currently, if a forest user receives a permit for personal use fuelwood, they are permitted to gather wood in specific areas during specified times (indicated by a packet with maps and regulations for gathering). The use of motorized vehicles to aid in the gathering of wood is not distance limited so long as the user is within the permitted area and not causing resources damage. Since most of the fuelwood gathering areas are within parts of the forest that are currently open to cross-country travel, designation of motor vehicle use for gathering will be analyzed in this Final EIS.

Alternative A – No Action

National Environmental Policy Act (NEPA) regulations require the no action alternative be included as a baseline for comparison to all action alternatives. This alternative demonstrates what is currently permitted motor vehicle use on the forest along with what currently exists on the ground. This alternative illustrates motor vehicle use on the Tonto National Forest in the absence of compliance with the Final Travel Management Rule.

Roads and Trails Designated for Motor Vehicle Use

For the Tonto National Forest, the current system consists of approximately 2,950 miles of ML 2-5 roads; however, we know that approximately 2,000 additional miles of ML 1 and decommissioned roads are currently being used.[13] Table 1 shows the type of use associated with the motorized system on the Tonto National Forest.[14] (Map A in the map packet shows the route system for this alternative.)

Since 2007, the Tonto National Forest has collected or received geographic information about unauthorized routes that are either obvious on the ground or are being used for motorized travel, totaling approximately 736 miles to date.[15] There are also numerous unauthorized routes existing on the Forest not accounted for in this document. Most of these routes include unauthorized travel for which the forest currently has no data and routes that have been created by repeated off-road travel in areas where cross-country travel was permitted or areas where cross-country travel was not permitted but existing prohibitions or enforcement of such prohibitions were not adequate. Without site-specific information about these routes, a quantitative analysis of their effects cannot be conducted in this Final EIS.

[13] A more detailed discussion of the inconsistencies between what is in the Tonto National Forest Infrastructure database for roads and trails and what is the existing condition can be found in this chapter in Alternatives Considered but Eliminated from Detailed study.
[14] A detailed account of each route for the Tonto National Forest for the existing condition can be found in the project record.
[15] When the draft EIS was released in July 2014, there were 672 miles of inventoried unauthorized routes. However, it was brought to the attention of the Forest that route specific comments, including GIS data, had been omitted that was submitted by the deadline of scoping period, which ended March 4, 2013. This data has been added to the project record and was taken into consideration in the modification of the motor vehicle use system for Alternative C and has not been adjusted for the other two action alternatives. The routes have not been surveyed for cultural resources. Specific information pertaining to the additional unauthorized routes can be found in the project record.

Table 1. Current Roads and Trails (No Action)

Type of Road/Trail	Miles
Roads Open to Passenger Vehicles (ML 3-5)	644.72
Roads Open to High Clearance Vehicles (ML 2)	2,307.67
Motorized Trails (Single Track)	0.00
Motorized Trails (General)	0.00
Administrative Use Only Road (ML 2 – ML 5)	0.00
Administrative Use Only Motorized Trail	0.00
FS Roads Likely Open to Public, ML Unknown[16]	2,006.20
Unauthorized (User Created)	736..22
Total Motorized Routes Open to Public	4,958.58
Total Motorized System	4,958.58

In addition to the mileage in Table 1, there are approximately 414 miles of roads that are within the Forest boundaries that the Forest Service does not manage, such as state highways and roads within private property. This data is not exhaustive, and as such, without site-specific information about these routes, a complete quantitative analysis of their effects cannot be conducted in this draft EIS.

Areas Designated for Motor Vehicle Use

Cross-country travel was restricted on the Cave Creek, Globe, Mesa, and Tonto Basin ranger districts per the Forest Plan, unless posted open. Other restricted areas across all ranger districts are closed to cross-country travel. These areas have been closed by the Forest Plan, previous Forest Closure Orders, and legislative actions, such as congressionally-designated wilderness. Approximately 703,618 acres of land are currently open for unrestricted motorized cross-country travel on the Payson and Pleasant Valley Ranger Districts. Hunters that qualify for the Arizona Game and Fish Department CHAMP permit [17] are restricted to the same acreage as is currently open to cross-country travel.

Permit Zones

There is currently one permit zone on the Tonto National Forest, the Bulldog Canyon OHV Area on the Mesa Ranger District, which is approximately 34,720 acres in size (Figure 2). Although the Bulldog Canyon OHV Area has “area” in the name, cross-country travel is not allowed. Instead, motorized vehicle users are required to get a permit to access the Bulldog Canyon OHV Area, which has locked gates and barriers restricting nonpermitted access. Motorized cross-country travel in the existing Bulldog Canyon OHV Area was restricted by Forest Order No. 12-152, due to considerable environmental damage occurring from uncontrolled vehicle use. The Order was signed by the Forest Supervisor on March 19, 1997, after completion of an environmental assessment. Findings of the analysis showed that uncontrolled vehicle use in Bulldog Canyon was contributing to significant soil and vegetation resource damage, but total closure was undesirable due to its proximity to the Phoenix metropolitan area.

[16] These are routes identified as decommissioned or ML 1 (closed to vehicle use) as listed in the current database that are likely being used by the public. An explanation of these routes can be found in the Existing and Desired Conditions section of Chapter 1 of this document.

[17] For more information about the CHAMP program with Arizona Game and Fish Department, go to http://www.azgfd.gov/eservices/special_licenses/champ.shtml

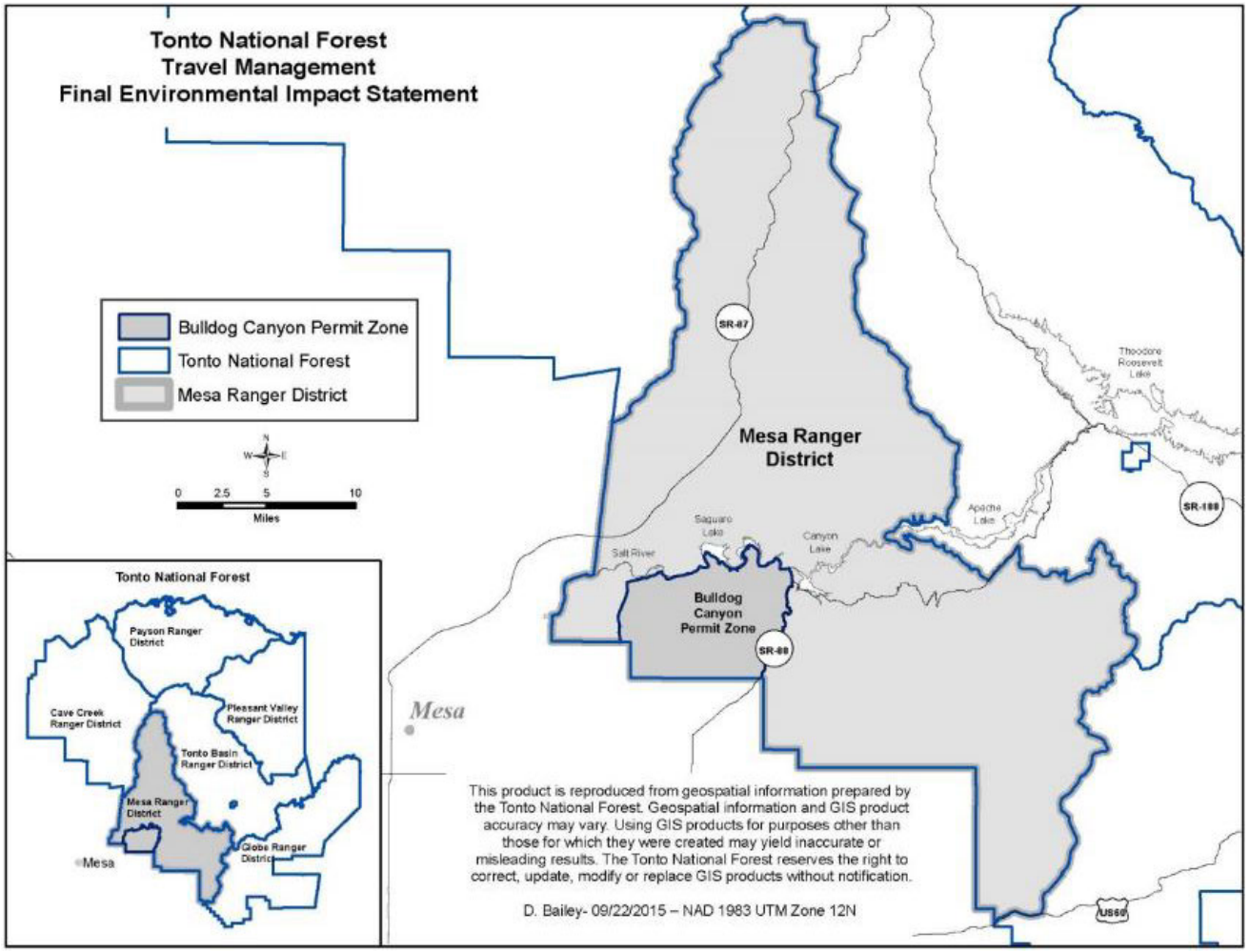

Figure 2. Map of Permit Zones for Alternative A

Motor Vehicle Use for Big Game Retrieval

The Arizona Game and Fish Department is the state agency responsible for managing game and nongame species in Arizona. The Tonto National Forest is divided into game management units, each of which has a different set of species and seasons that hunting can take place (Figure 3). Arizona Game and Fish Department manages the hunting and fishing license program along with providing programs targeted at conserving Arizona's diverse wildlife resources and managing for safe, compatible outdoor recreation opportunities.

Currently, within the Payson and Pleasant Valley ranger districts, unless otherwise posted, motorized vehicles are allowed to travel cross-country for any number of activities, including retrieval of game (Figure 4). Hunters that qualify for the Arizona Game and Fish Department CHAMP permit,[18] which may be issued to persons who have a permanent disability or combination of disabilities, are restricted to the same acreage as is currently open to cross-country travel.

In the remaining ranger districts, cross-country motorized travel is prohibited, unless posted open, and the current Forest Plan does not address a need for motorized big game retrieval. As a result, motorized vehicles are not allowed to travel cross-country for the purpose of retrieving downed game animals in most of the Cave Creek, Mesa, Globe, or Tonto Basin ranger districts. However, hunters may still unknowingly travel on unauthorized routes to retrieve game because of the current lack of signs on the ground or unintentionally taking a well-defined unauthorized route thinking it was a designated road on the current forest visitor map.

Motor Vehicle Use for Dispersed Camping

Use of motor vehicles off National Forest System roads to access campsites is a popular activity on the Tonto National Forest. In some instances, Forest visitors park their vehicles at trailheads or roadside locations and hike to their camping spots. Others will drive cross-country to their desired camping spot, often with a recreational vehicle or camping trailer. Frequently-used dispersed campsites, where evidence of past use exists, are located along both National Forest System roads and unauthorized routes throughout the Forest. Currently, the distance traveled from existing roads to frequently-used dispersed campsites can vary depending on the terrain and proximity to water and shade trees. Based on knowledge from Forest Service law enforcement officers and Arizona Game and Fish Wildlife Managers, most of these dispersed campsites are within 300 feet of an existing road, including sites on the four districts where cross-country travel is currently prohibited. On the northern two ranger districts (Payson and Pleasant Valley), driving cross-country has been permitted regardless of the distance from an existing road (Figure 5). On the four southern ranger districts, driving off road is prohibited unless posted open and campers have been cited for driving off roads illegally.

Within the last 15 years, Forest Service employees and contractors have mapped 999 dispersed campsites within the Tonto National Forest.[19] From June 2014 through March 2015, Arizona Game and Fish Department conducted a comprehensive collection of dispersed campsite data across the Tonto National Forest.[20] This data was collected for dispersed campsites that could be accessed via existing on-the-ground motorized routes, either unauthorized trails or existing

[18] Ibid
[19] None of these inventoried dispersed camping sites were located within the Globe and Mesa Ranger Districts.
[20] For a more detailed description of the inventory of motorized dispersed campsite process used by Arizona Game and Fish Department, see the Arizona Game and Fish Department Report for Inventory of Motorized Dispersed Campsites on the Tonto National Forest in the project record.

system roads. As a result of all dispersed camping inventories on the Tonto National Forest, 2,864 sites were identified and mapped.[21]

Additional Information Pertaining to Motor Vehicle Use Designation

Personal use fuelwood gathering and other forest products: Currently, permits for personal use fuelwood gathering are limited to the Globe, Payson, Pleasant Valley, and Tonto Basin ranger districts, encompassing approximately 1,345,998 acres (Figure 6).

Each year approximately 1,500 permits are issued and are for the Tonto National Forest only.[22] It does not allow cutting on other public land or on private land. Rules for permit holders include the prohibition of cutting or removing wood from wilderness and experimental areas, campgrounds and picnic areas, restricted areas, administrative sites, ongoing commercial fuelwood or timber sales, special personal use areas, or nonharvest areas identified on the attached maps; and no fuelwood cutting is allowed on Mesa or Cave Creek ranger districts.

According to a Tonto National Forest silviculturist, the 2012 fuelwood gathering season ran from March 1 to December 31 (which is a standard season). During that time period, approximately 1,120 paid fuelwood permits for oak and juniper were issued, for a total volume of 4,484 hundred cubic feet. In addition, 296 free fuelwood permits for pinyon pine and ponderosa were issued, for a total volume of 1,184 hundred cubic feet.

Where fuelwood cutting is permitted, the following stipulations currently apply:

- Locate fuelwood before moving vehicle off route; take the most direct route to the product.
- Do not damage other vegetation in route to product location.
- Return to the designated road on the same direct path used; cover your route with slash or other available debris.
- If there is no good route; do not attempt to collect that fuelwood.
- Do not go off road when soils are wet or rutting may occur.

Additional forest products, such as seeds, cones, branches of shrubs, and driftwood, also need a permit to be gathered on the Tonto National Forest. The permits for most of these products are within existing permitted fuelwood gathering areas. Outside of these permitted areas, additional forest products would only be allowed using a motor vehicle on designated roads and in areas where motorized cross-country travel is permitted.

[21] Dispersed campsites within designated wilderness and inventoried roadless areas are not part of this total, as designating motorized routes within these areas is not permitted.
[22] There is currently not a limit to the number of permits issued.

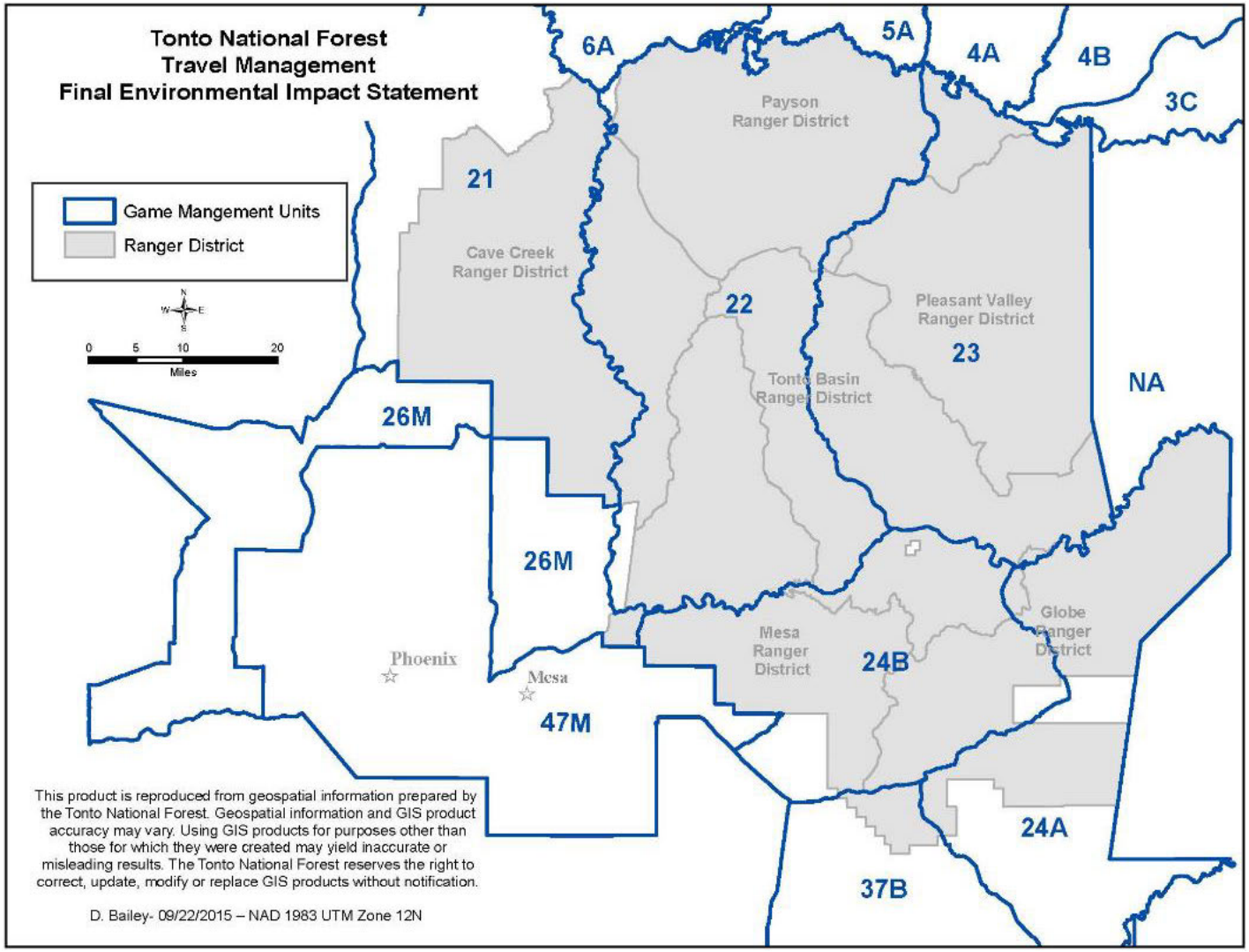

Figure 3. Map of Game Management Units Overlapping the Tonto National Forest

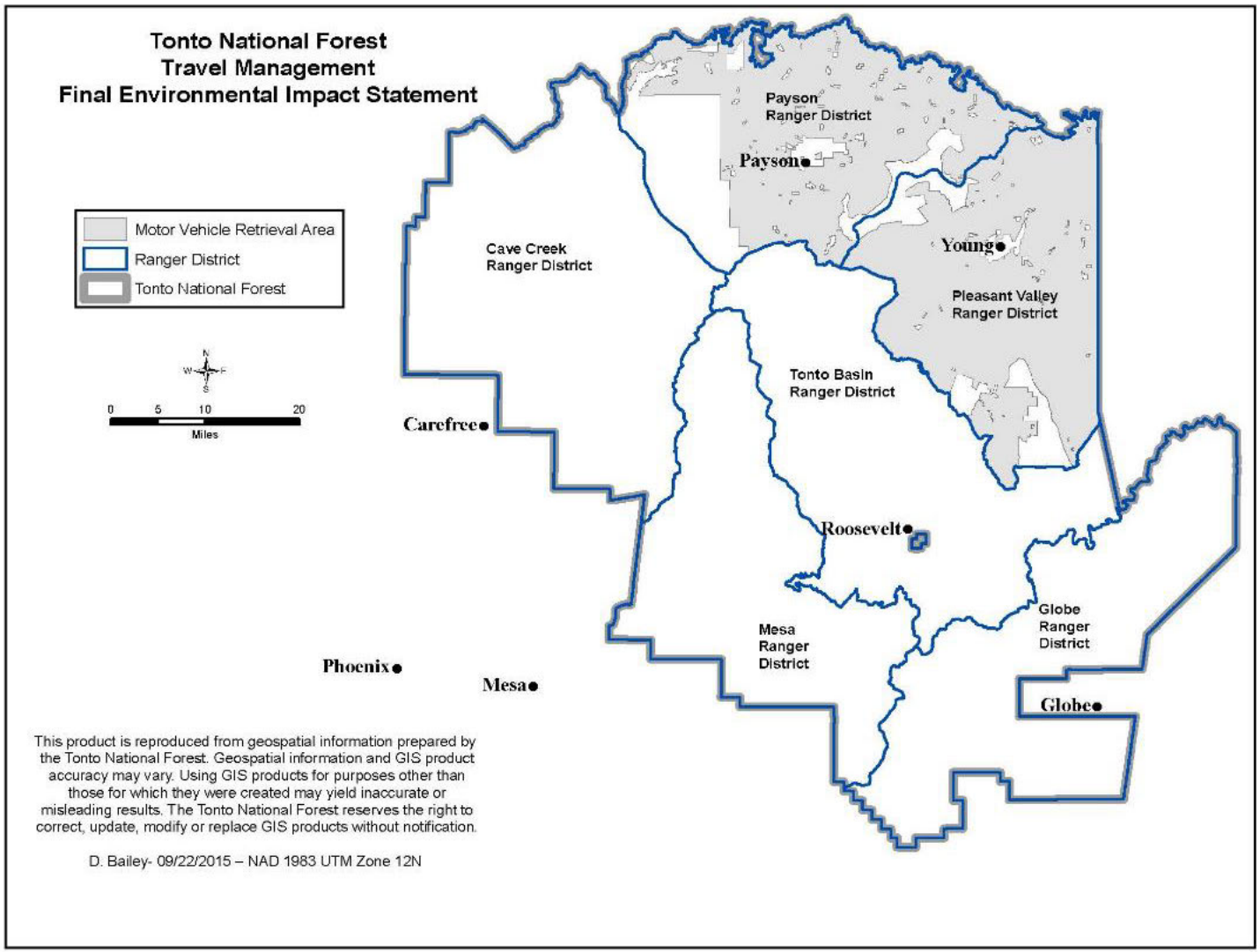

Figure 4. Map of Motor Vehicle Use for Big Game Retrieval for Alternative A

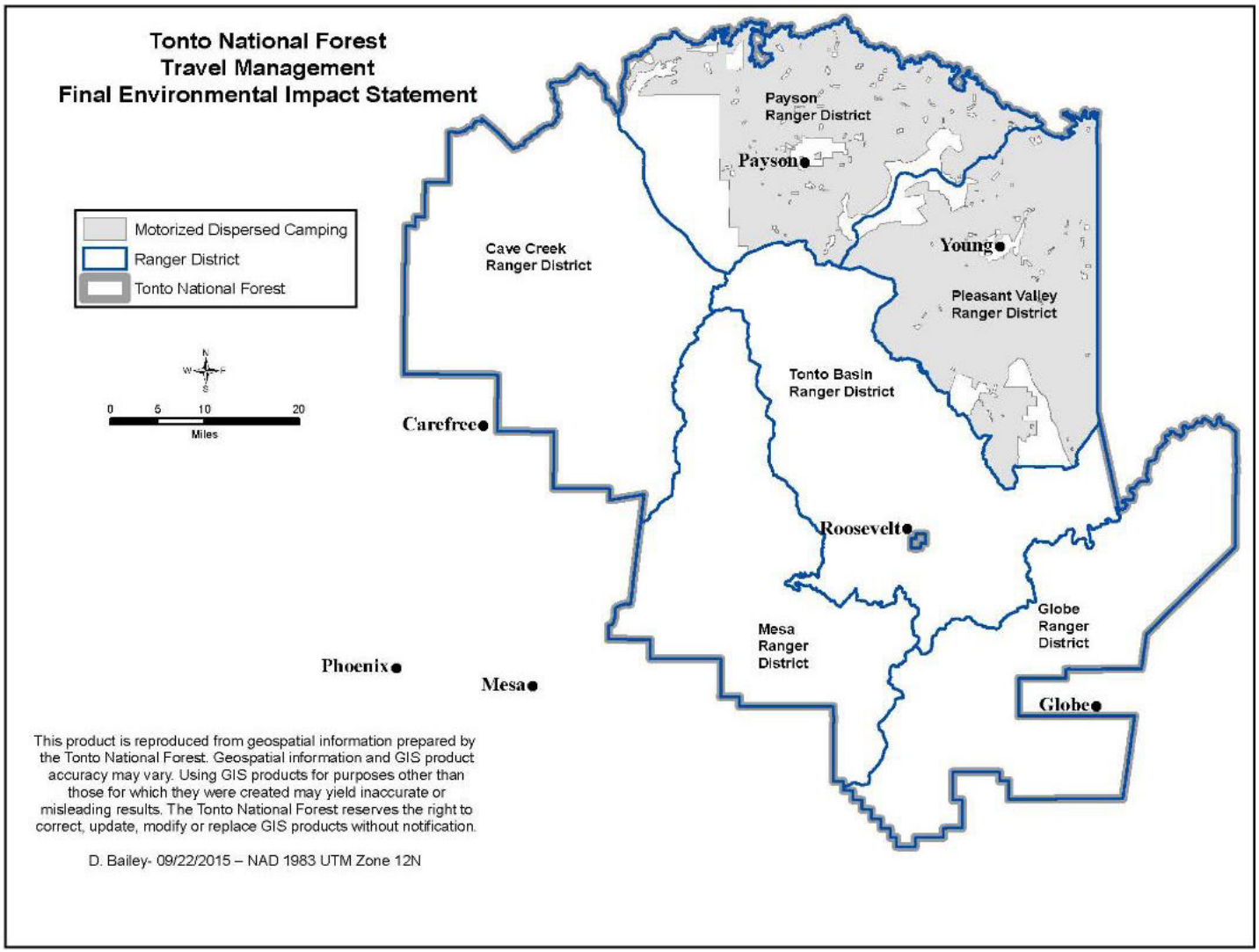

Figure 5. Map of Motor Vehicle Use for Dispersed Camping for Alternative A

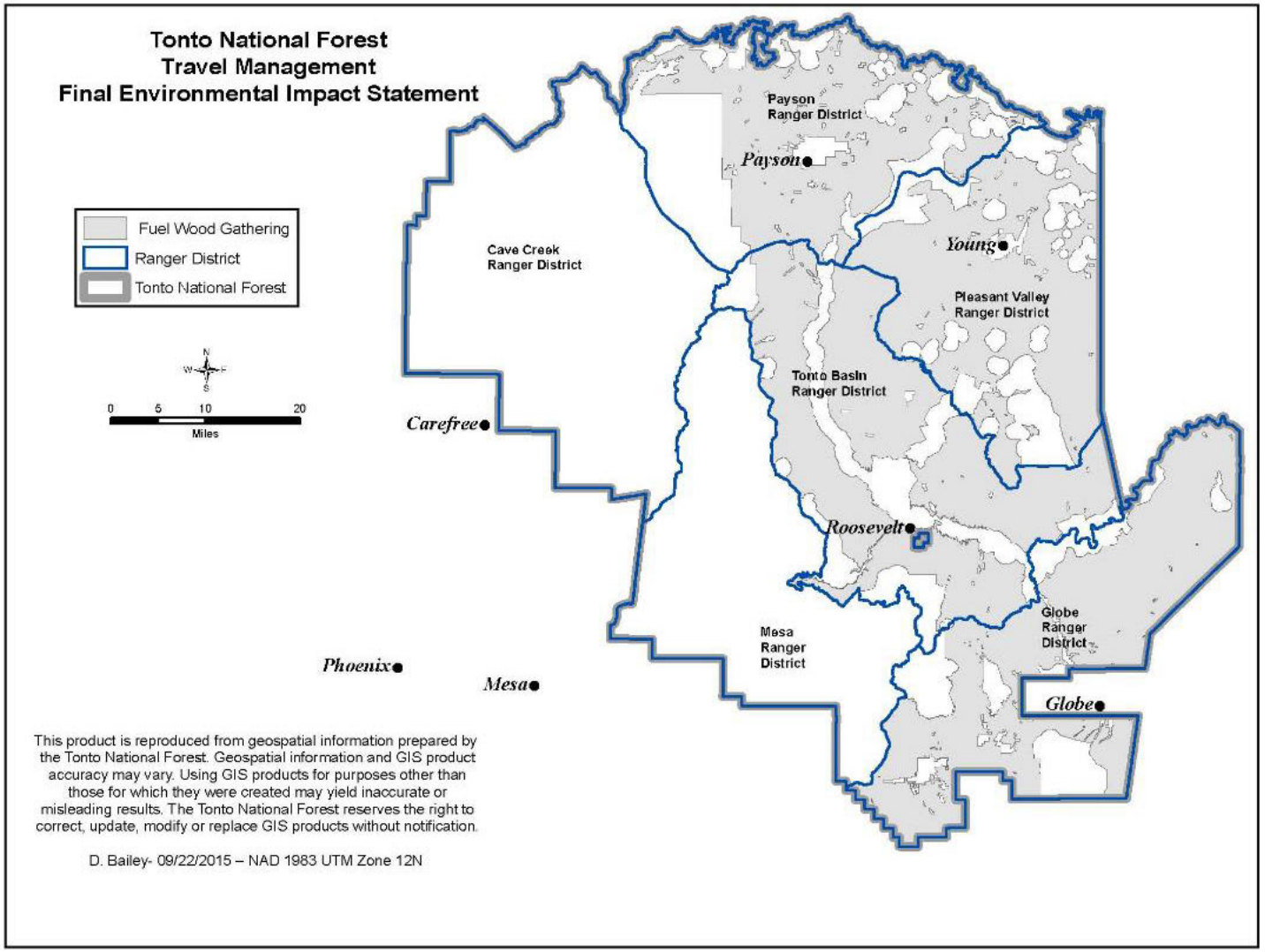

Figure 6. Map of Fuelwood Areas for Alternative A

Collection of forest resources by tribal members: Currently, the policy (in compliance with the American Indian Religious Freedom Act and the U.S. Forest Service Policy toward American Indians and Alaska Natives (FSM 1563)) for the Tonto National Forest requires a permit for timber products to be used for religious purposes. No Forest Service permit is required for the collecting of minor quantities of medicinal and ceremonial plants, acorns, pinyon nuts, agave, tree boughs, water, plants, quartz crystals, other minerals, soil, invertebrate fossil remains, rocks, trees less than six feet in height, and other food plants or other resources for personal (noncommercial) use in traditional cultural or religious activities, provided those activities are in accordance with Executive Order 13007, applicable laws and regulations, and Forest Service policies regarding special forest products and botanical products. For tribal members only, no artifacts or other cultural items or remains may be collected from archaeological sites without a permit. Motorized use for the gathering of forest resources is only allowed on designated roads. A permit does not allow cross-country vehicle travel.

Need to amend the Forest Plan to include language from the decision: Motorized travel currently follows the Forest Plan, forest order closures, and Congressional designations, such as wilderness areas. This alternative would result in no amendments to the Forest Plan.

Alternative B

This alternative provides less motorized access than the existing condition and the proposed action and was developed to address the following issues identified during the scoping of the proposed action:

- Designation of roads and motorized trails would result in user conflict;
- Designation of roads, motorized trails, and OHV areas would result in impacts to water and soil resources;
- Designation of roads and motorized trails would result in impacts to wildlife habitat;
- Designation of roads and motorized trails would result in impacts to cultural resources;
- Authorizing motorized big game retrieval off designated routes could impact water and soil resources, wildlife habitat, cultural resources, and nonmotorized recreational experiences; and
- Motorized dispersed camping corridors allow motorized use in areas that can cause impacts to water and soil resources, wildlife habitat, and cultural resources.

Roads and Trails Designated for Motor Vehicle Use

Alternative B would result in 2,367 miles of roads proposed for decommissioning [23] (Table 2); some of these roads may already be effectively obliterated on the ground from lack of use or due to previous road closure efforts. For public access, approximately 894 miles of designated roads and 1,666 miles of motorized trails would be open; leaving approximately 144 miles of roads and 355 miles of motorized trails restricted to public motorized use but authorized for administrative use[24] by the Forest Service or permitted activities. (Map B in the map packet

[23] The on-the-ground actions associated with decommissioning a road, along with the effects, are not part of this analysis. All activities associated with decommissioning will be covered by additional environmental analysis in compliance with the National Environmental Policy Act.

[24] Administrative use only means that motorized access is restricted, often with a locked gate, to Forest Service personnel or those that hold an authorized use permit to access the road or trail. These routes would not show up on the motor vehicle use map. Motorized users not authorized to be on these routes would be cited for being in violation

shows the route system for this alternative.) Designated National Forest System roads within existing seasonal closure areas would be seasonally designated for motor vehicle use.[25]

Table 2. Roads and Trails for Alternative B

Type of Road/Trail	Miles
Roads Open to Passenger Vehicles	353.38
Roads Open to High Clearance Vehicles	540.13
Motorized Trails (Single Track)	1.12
Motorized Trails (General)	1,664.95
Administrative Use Only Road	144.30
Administrative Use Only Motorized Trail	355.04
Closed	0.00
Decommissioned Routes	2,367.03
Total Motorized Routes Open to Public	2,559.57
Total Motorized System	3,058.90

Of the unauthorized roads to be included in the road and motorized trail system (Table 2) for this alternative, Table 3 shows just the mileage and designation of these routes.

Table 3. Unauthorized Routes Proposed for Inclusion for Alternative B

Type of Road/Trail	Miles
Roads Open to Passenger Vehicles	4.12
Roads Open to High Clearance Vehicles	6.45
Motorized Trails (Single Track)	0.00
Motorized Trails (General)	0.00
Administrative Use Only Road	10.34
Administrative Use Only Motorized Trail	29.53
Total Motorized Open to Public	10.58
Total Miles Proposed for Inclusion	50.44

Areas Designated for Motor Vehicle Use

In this alternative, there would be no designation of OHV areas.

Permit Zones

For this alternative, there would be five permit zones where motorized vehicles have to stay on designated routes and cannot travel cross-country: Bulldog Canyon, Desert Vista, The Rolls, St. Clair, and Sycamore (Table 4 and Figure 7).

of the MVUM. All activities associated with physically restricting use will be covered by additional environmental analysis in compliance with the National Environmental Policy Act.

[25] A detailed account of each route for the Tonto National Forest for Alternative B can be found in the project record.

Table 4. Permit Zones for Alternative B

Name of Permit Zone	Ranger District	Acres
Bulldog Canyon	Mesa	34,720.0
Desert Vista	Cave Creek	33,479.3
The Rolls	Mesa	24,143.7
St. Clair	Cave Creek	24,454.9
Sycamore	Mesa	34,127.0
	Total	150,924.9

Motor Vehicle Use for Big Game Retrieval

No motorized cross-county travel would be allowed for the retrieval of any game species in this alternative.

Motor Vehicle Use for Dispersed Camping

Motorized access for dispersed camping in this alternative would be limited to certain sites that are easily accessible by a designated road or motorized trail. As indicated in the No Action Alternative (Alternative A), Forest Service employees and contractors have mapped 999 sites within the Tonto National Forest. Using a mapping exercise to draw a 50 foot buffer around these 999 sites, those that intersected designated routes for this alternative and were not within wilderness or private property will have designated motorized access to these sites (Figure 8). Using this mapping exercise, 414 sites, totaling approximately 65 acres, will be designated for this alternative.

Additional Information Pertaining to Motor Vehicle Use Designation

Personal use fuelwood gathering: For some members of the public, especially those in remote towns located within the forest, fuelwood gathering on public lands is necessary to provide heat and a means for preparing food. As such, the use of a motorized vehicle for the purpose of collecting fuelwood would be permitted within 300 feet of a designated road or motorized trail within a woodcutting permit area, resulting in approximately 132,568 acres [26] (Figure 9).

Each year approximately 1,500 permits are issued and are for the Tonto National Forest only. Under this alternative, there is no quantitative information available that would indicate that the number of permits issued would change, either increasing or decreasing.

Collection of forest resources by tribal members: For Alternative B, there would be no change from the existing condition.

Need to amend the Forest Plan to include language from the decision: Alternative B would require the Forest Plan to be amended. A table summarizing the proposed changes to the forest plan is in Appendix A.

[26] For the purpose of this analysis, all currently foreseeable fuelwood gathering permit areas are represented. However, in practice, these areas are not all open for use every year; this is dependent on existing vegetation conditions and the need to decrease dead and down material.

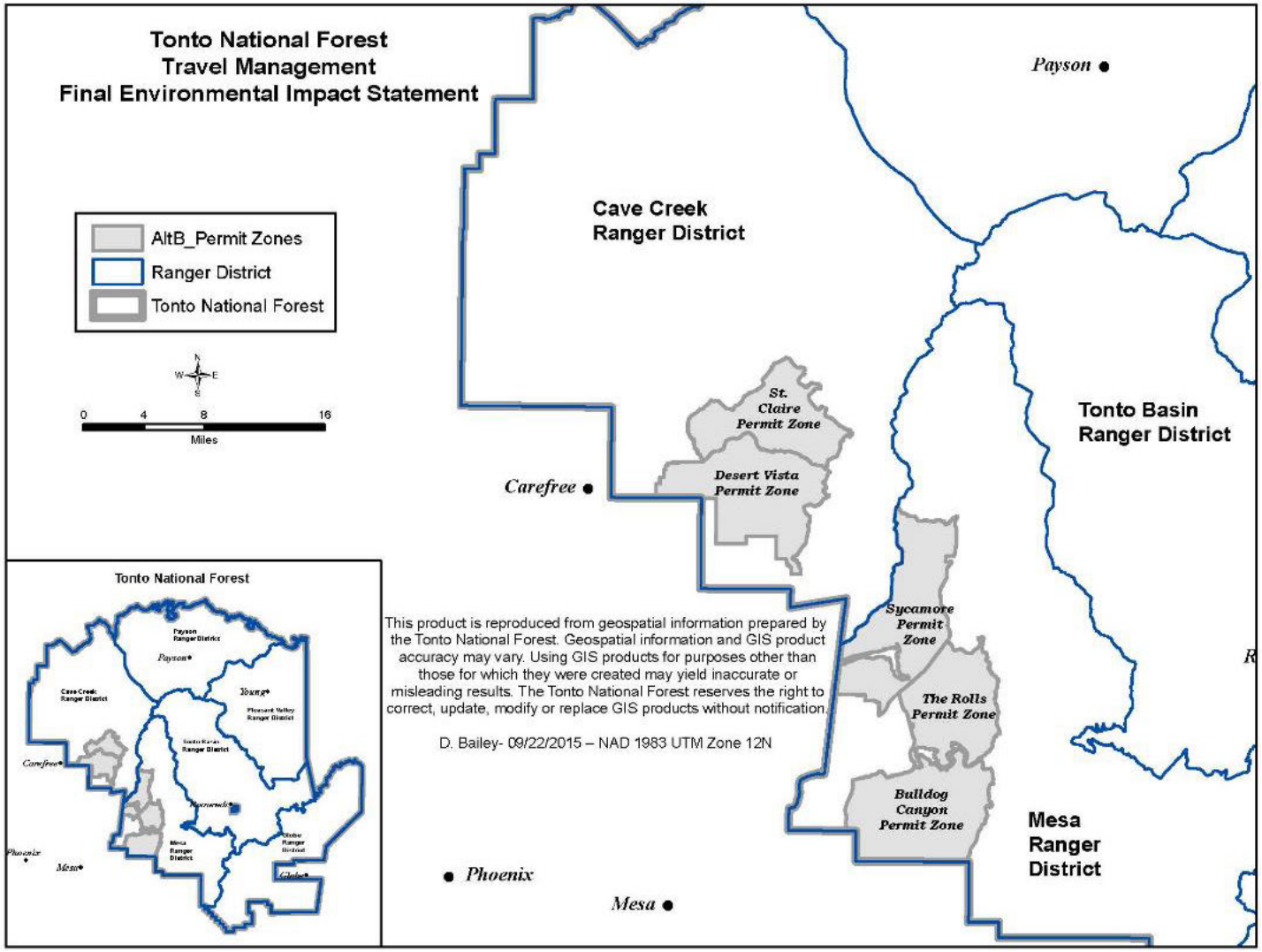

Figure 7. Map of Permit Zones for Alternative B

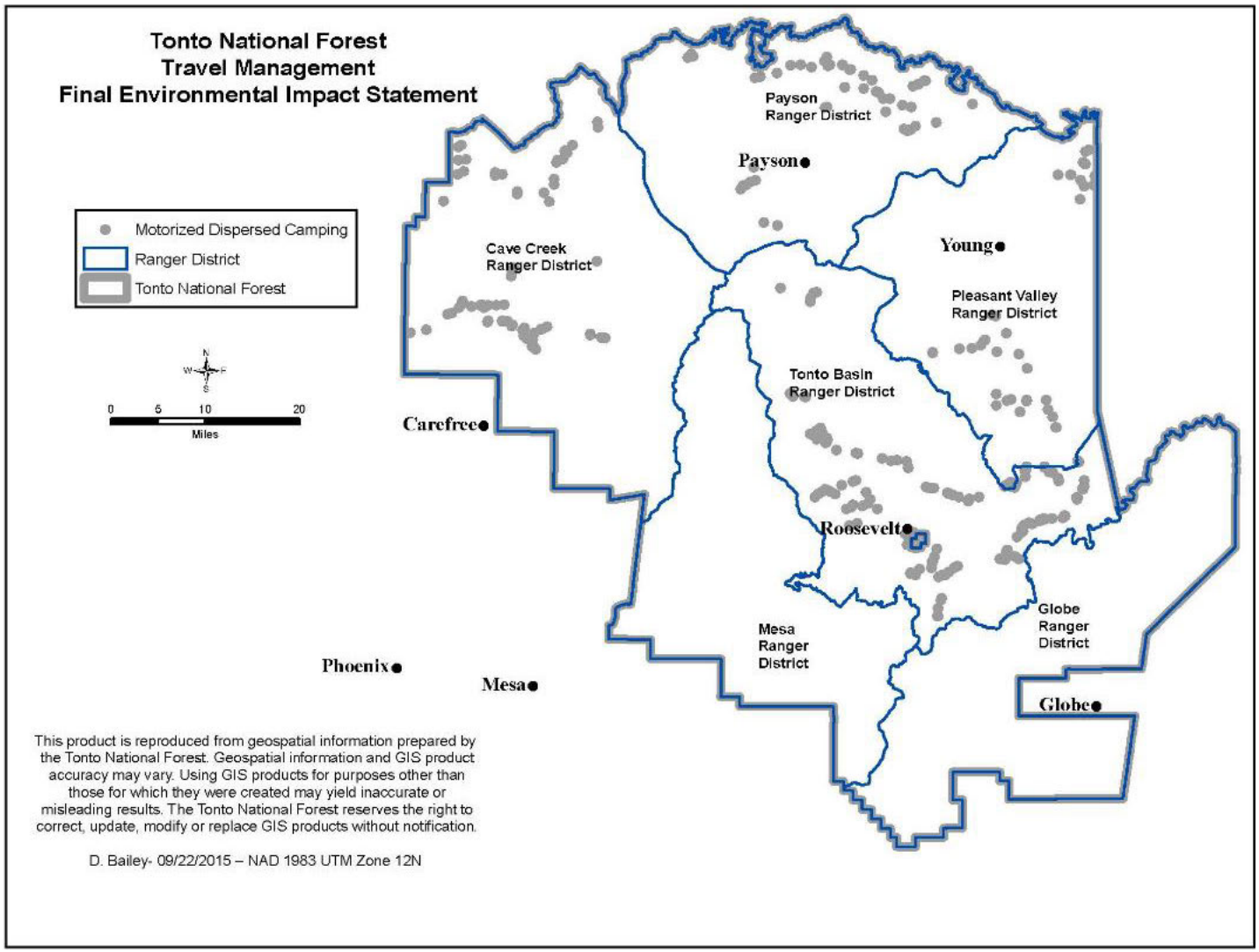

Figure 8. Map of Motor Vehicle Use for Dispersed Camping for Alternative B

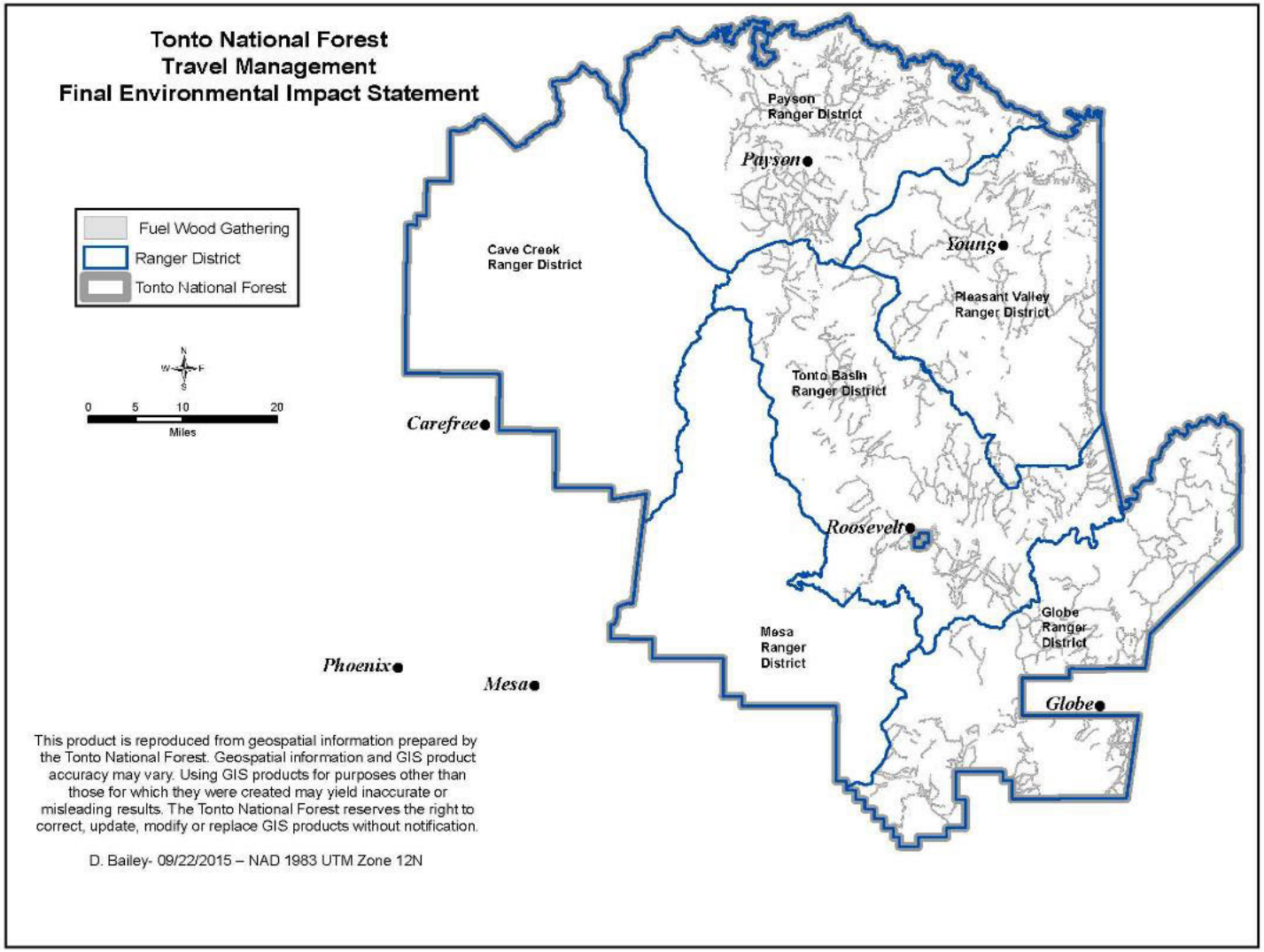

Figure 9. Map of Fuelwood Areas for Alternative B

Alternative C

This alternative is a modified version of the proposed action that was made available during the comment period that ended September 17, 2014. It has been modified to respond to comments received on the draft EIS and to take into consideration route specific data that was submitted for consideration on the original proposed action in the notice of intent to prepare an environmental impact statement (Federal Register, Vol. 78, No. 2, p. 7391) that was not incorporated into the draft EIS. The changes to this alternative are in three of the elements: Roads and Trails Designated for Motor Vehicle Use; Areas Designated for Motor Vehicle Use; and Motor Vehicle Use for Dispersed Camping. Details regarding these changes for Alternative C can be found in these three sections. Additionally, the total acreage for Motor Vehicle Use for Big Game Retrieval and personal fuelwood gathering changed between draft EIS and final, as they are based on the designated route system open to the public. However, the distance for travel for either of these elements did not change.

Roads and Trails Designated for Motor Vehicle Use

Alternative C would result in 1,276 miles of roads proposed for decommissioning[27]; some of these roads may already be effectively obliterated on the ground from lack of use or due to previous road closure efforts (Table 5). For public access, approximately 1,311 miles of designated roads and 2,341 miles of motorized trails [28] will be open. Approximately 167 miles of roads and 411 miles of motorized trails will be restricted to authorized use only for administrative use[29] by the Forest Service or permitted activities. (Map C in the map packet shows the route system for this alternative.) Designated National Forest System roads and motorized trails within existing seasonal closure areas will be seasonally designated for motor vehicle use[30].

[27] The on-the-ground actions associated with decommissioning a road, along with the effects, are not part of this analysis. All activities associated with decommissioning will be covered by additional environmental analysis in compliance with the *National Environmental Policy Act*.

[28] This total includes approximately 94 miles of full-sized motor vehicle trails that would be designated to allow for access for dispersed camping. For more information, see the Motor Vehicle Use for Dispersed Camping section below.

[29] Administrative use only means that motorized access is restricted, often with a locked gate, to Forest Service personnel or those that hold an authorized use permit to access the road or trail. These routes would not show up on the motor vehicle use map. Motorized users not authorized to be on these routes would be cited for being in violation of the MVUM. All activities associated with physically restricting use will be covered by additional environmental analysis in compliance with the *National Environmental Policy Act*.

[30] A detailed account of each route for the Tonto National Forest Alternative C can be found in the project record.

Table 5. Roads and Trails for Alternative C

Type of Road/Trail	Miles
Roads Open to Passenger Vehicles	544.59
Roads Open to High Clearance Vehicles	766.36
Motorized Trails (Single Track)	109.64
Motorized Trails (Less than 60")	20.80
Motorized Trails (Full-sized Vehicles)	2,210.23
Administrative Use Only Road	166.69
Administrative Use Only Motorized Trail	410.53
Closed (ML 1)	0.00
Decommissioned Routes	1,276.08
Total Motorized Open to Public	3651.62
Total Motorized System	4,228.84

Of the unauthorized roads to be included in the road and motorized trail system (Table 5) for this alternative, Table 6 shows just the mileage and designation of these routes.

Table 6. Unauthorized Routes Proposed for Inclusion for Alternative C

Type of Road/Trail	Miles
Roads Open to Passenger Vehicles	4.12
Roads Open to High Clearance Vehicles	6.61
Motorized Trails (Single Track)	108.66
Motorized Trails (General)	192.59
Administrative Use Only Road	10.46
Administrative Use Only Motorized Trail	30.78
Total Motorized Open to Public	311.97
Total Miles Proposed for Inclusion	353.20

Changes to Designation between Draft EIS and Final EIS

In the draft EIS, motorized trails greater than 50 inches that could accommodate full-sized high clearance vehicles were identified based on public input that indicated the need for motorized routes that provide a challenge and a range of opportunity greater than what ML 2 roads traditionally do. The ability to "rock crawl" and experience the opportunity to "conquer rough terrain" are potential elements that are not usually present on ML 2 roads that could be provided by the designation of motorized trails. Commenters also indicated that they would be inclined to volunteer with maintenance needs on motorized trails if they met their recreation needs through a Forest Service program called "Adopt a Trail." There was also a public identified need to provide motorized trails for motorcycle and dirt bike use, referred to as single track.

Comments on the draft EIS made it clear that motorized users of the Tonto National Forest seek a variety of experiences using a range of equipment, from an off-road motorcycle to a side-by-

side utility vehicle (UTV) to a four-by-four drive truck or sport utility vehicle (SUV). In response to these comments, three categories of motorized trails were identified and will be designated: single track; less than 60 inches[31]; and full-sized vehicles[32].

In response to comments on the draft EIS received from federally recognized tribes, local and state governments, stakeholder groups, and the public, designation of routes were again examined at the ranger district level. This process included input from district biologists, silviculturalists, para-archeologists, and range and recreation staff, along with Forest Service Law Enforcement Officers, Arizona Game and Fish Department Game Enforcement Officers, and district rangers, many of whom had participated in trips to the field to assess current conditions on the ground. These routes were reviewed based on use—either for public or permitted use access with an emphasis on assessing potential user conflicts—and resource protection—including effects to watersheds, vegetation, wildlife habitat, and water resources as required in the Final Travel Management Rule (*36 CFR 212.55*)[33]. These meetings were conducted in late January and early February of 2015, and involved site specific knowledge and the use of the most recent areal imagery. Responses to route specific comments were also addressed at these meetings[34].

As a result of the comments received and the ranger district meetings, some routes were proposed for decommissioning and others were added to the system for motor vehicle use.

Areas Designated for Motor Vehicle Use

In this alternative, motorized travel off designated routes would be limited to four areas (Table 7 and Figure 10): Specific locations around Bartlett Lake (Cave Creek Ranger District) between the variable water level and the high water mark (Figure 11); Golf Course (Globe Ranger District); specific locations around Roosevelt Lake (Tonto Basin Ranger District) between the variable water level and the high water mark (Figure 12); and Sycamore (Mesa Ranger District) totaling approximately 2,077 acres. In addition, commenters indicated the need to provide an opportunity for youth riders just learning OHV use and safety. To address this need, there are four proposed “tot lots” totaling approximately 12 acres. These areas would be limited to children and would allow them to learn to ride without the presence of other motorized users.

[31] Although the Final Travel Management Rule identifies 50 inches for most motorized trails, with the changes in technology, many OHVs, including side-by-side utility vehicles that have a wheel base greater than 50 inches, have become prevalent since the rule was issued. In order to meet the needs of the Tonto National Forest users who desire to recreate using an OHV away from full-sized vehicles, it was necessary to identify motorized trails that would meet their needs.
[32] More detail about how these motorized trails will be managed, see Appendix D of the Draft Tonto National Forest Travel Management Implementation Strategy in the project record.
[33] See Appendix C of this document for more detailed information about this process.
[34] Appendix D of this document contains all response to comments, including those related to specific routes.

Table 7. OHV Areas for Alternative C

Name of OHV Areas	Ranger District	Acres
Bartlett Lake	Cave Creek	177.1
Golf Course	Globe	17.3
Roosevelt Lake	Tonto Basin	554.1
Sycamore	Mesa	1,328.9
Tot Lot Areas		
532	Cave Creek	0.8
Sycamore	Mesa	3.0
The Rolls	Mesa	6.0
Wildcat	Cave Creek	1.6
	Total	2,088.8

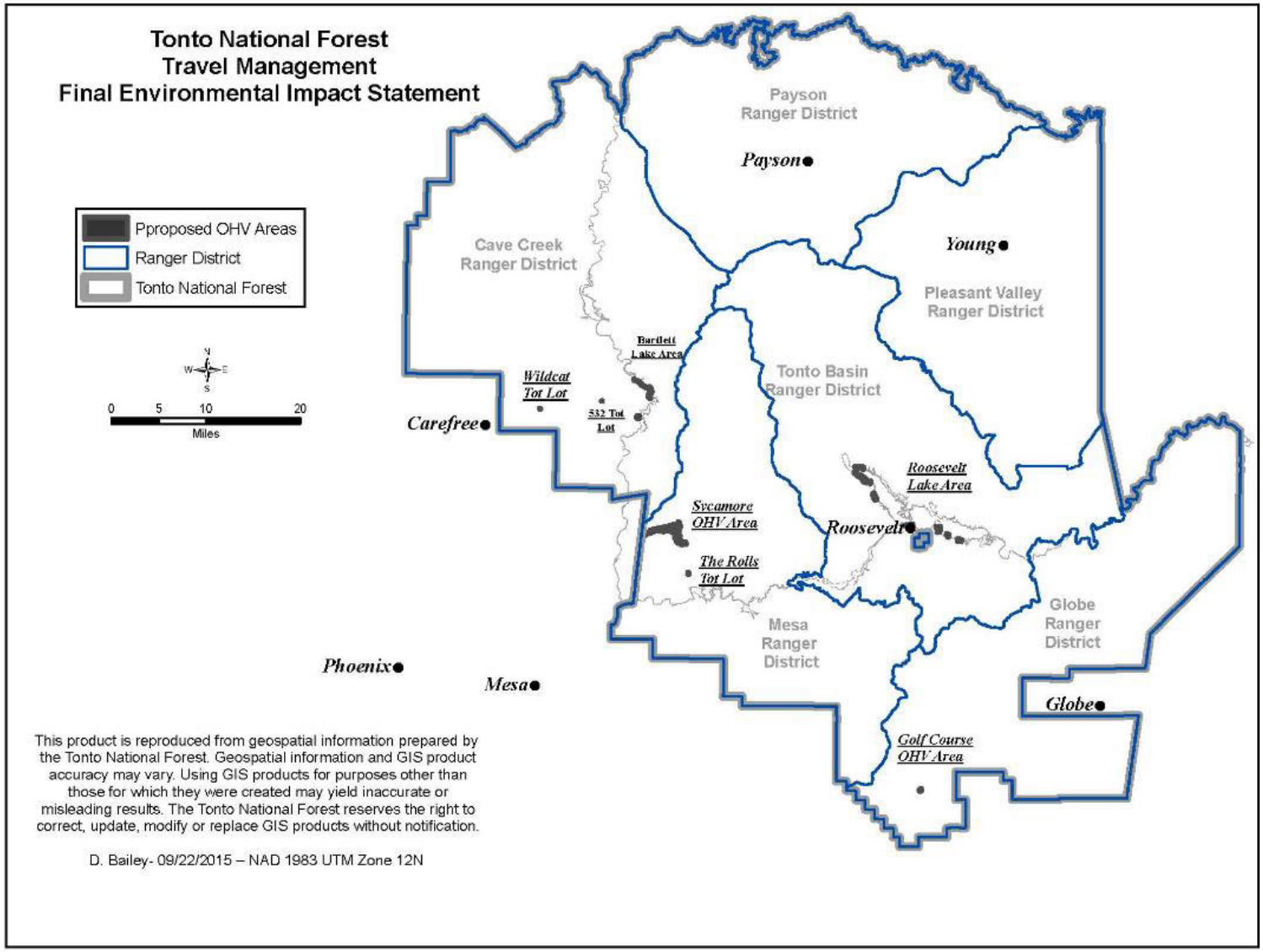

Figure 10. Map of OHV Areas for Alternative C

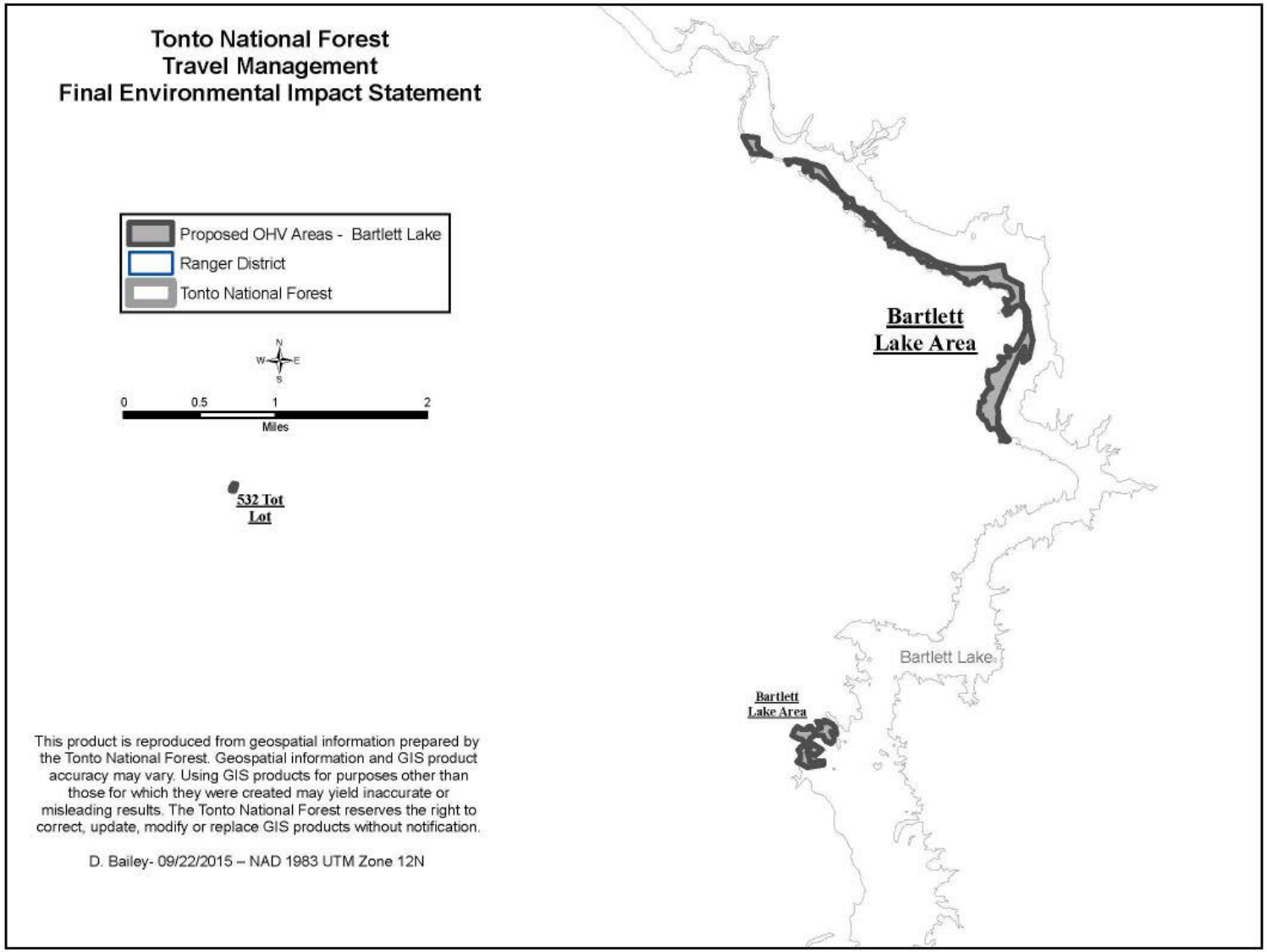

Figure 11. Map of OHV Areas Associated with Bartlett Lake for Alternative C

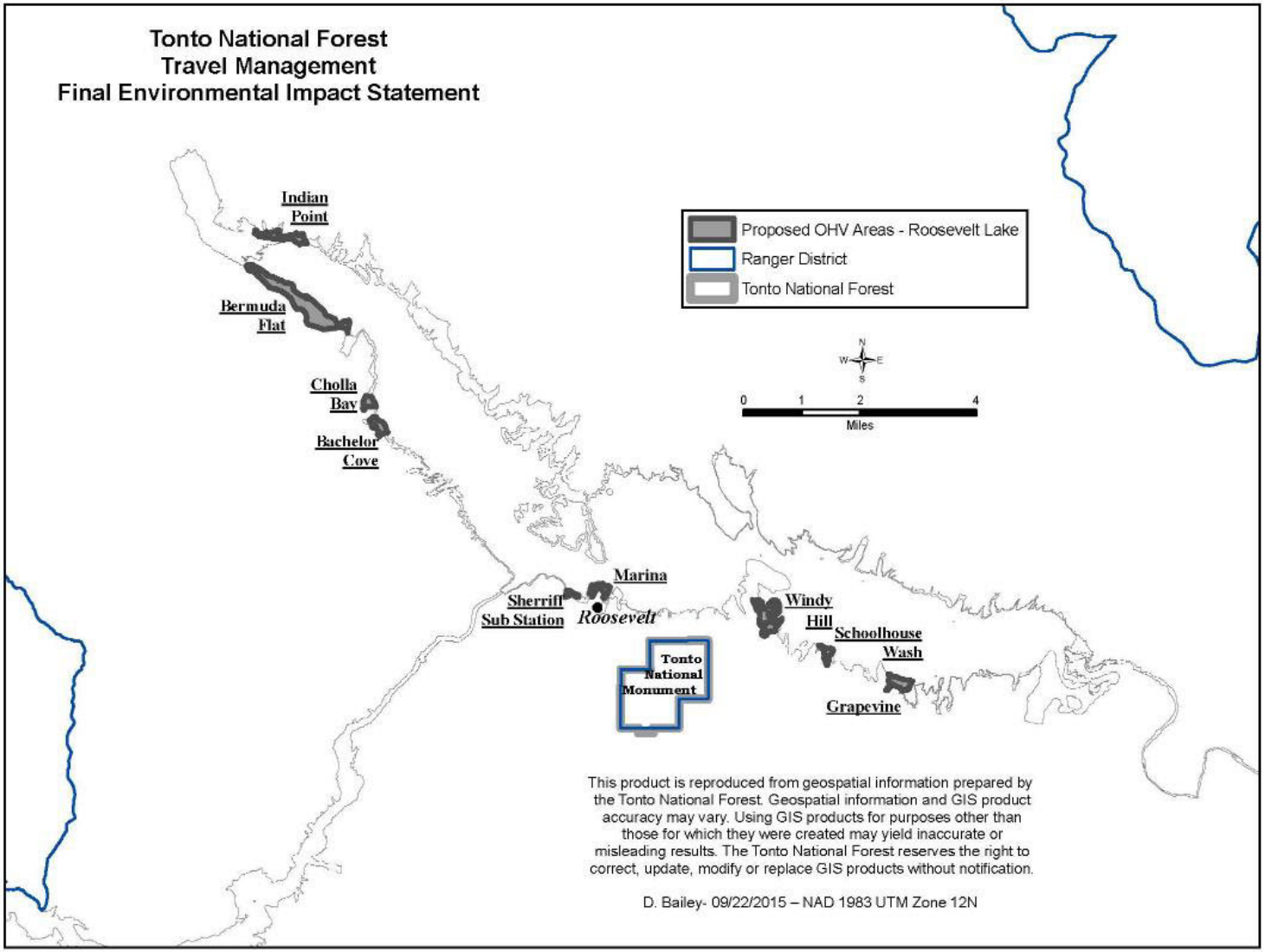

Figure 12. Map of OHV Areas Associated with Roosevelt Lake for Alternative C

Changes to Designation between Draft EIS and Final EIS

Several comments on the draft EIS were received pertaining to the designation of OHV areas. Most expressed concern over allowing OHVs unfettered use within the high and low water marks of both Roosevelt and Bartlett Lakes and the potential impacts to natural resources and conflicts between forest visitors to these areas. During the ranger district meetings, previously mentioned, these proposed OHV areas were reexamined with a focus on the minimization criteria detailed in the Final Travel Management Rule (*36 CFR 212.55*). For the OHV area associated with Bartlett Lake, acreage was reduced from 922 acres to an approximate total of 177 acres, a 421 percent decrease. For Roosevelt Lake, which is home to several threatened and endangered species, including southwestern willow flycatcher, the designated OHV area changed from 4,508 acres to an approximate total of 554 acres, a 713 percent decrease.

Permit Zones

For this alternative, there would be four permit zones[35] where motorized vehicles have to stay on designated routes and cannot travel cross-country: Bulldog Canyon (Mesa Ranger District); Desert Vista (Cave Creek Ranger District); The Rolls (Mesa Ranger District); and St. Clair (Cave Creek Ranger District) (Table 8 and Figure 13).

Table 8. Permit Zones for Alternative C

Name of Permit Zone	Ranger District	Acres
Bulldog Canyon	Mesa	34,720.0
Desert Vista	Cave Creek	33,479.3
The Rolls	Mesa	24,143.7
St. Clair	Cave Creek	24,454.9
	Total	116,798

Motor Vehicle Use for Big Game Retrieval

Alternative C would allow motor vehicle use, up to one mile on both sides of all designated roads and motorized trails, solely for retrieving legally harvested elk and bear for all hunts[36] (Figure 14). Limitations to this corridor would be within congressionally designated areas where motorized travel is not permitted and other areas that would remain closed from existing closure orders. This results in approximately 1,575,382 acres where motorized retrieval would be permitted.

[35] The Sycamore OHV Permit Zone was removed from this alternative in response to input questioning the ability to effectively implement controlled access for this area.

[36] Within this corridor, Arizona Game and Fish Department CHAMP holders would be permitted to hunt and retrieve per Arizona Game and Fish Department Special Licenses accessed May 16, 2013. Based on 2012 data provided by the Arizona Game and Fish Department (manager of the program), approximately 81 CHAMP permits were issued for game management units on the Tonto National Forest.

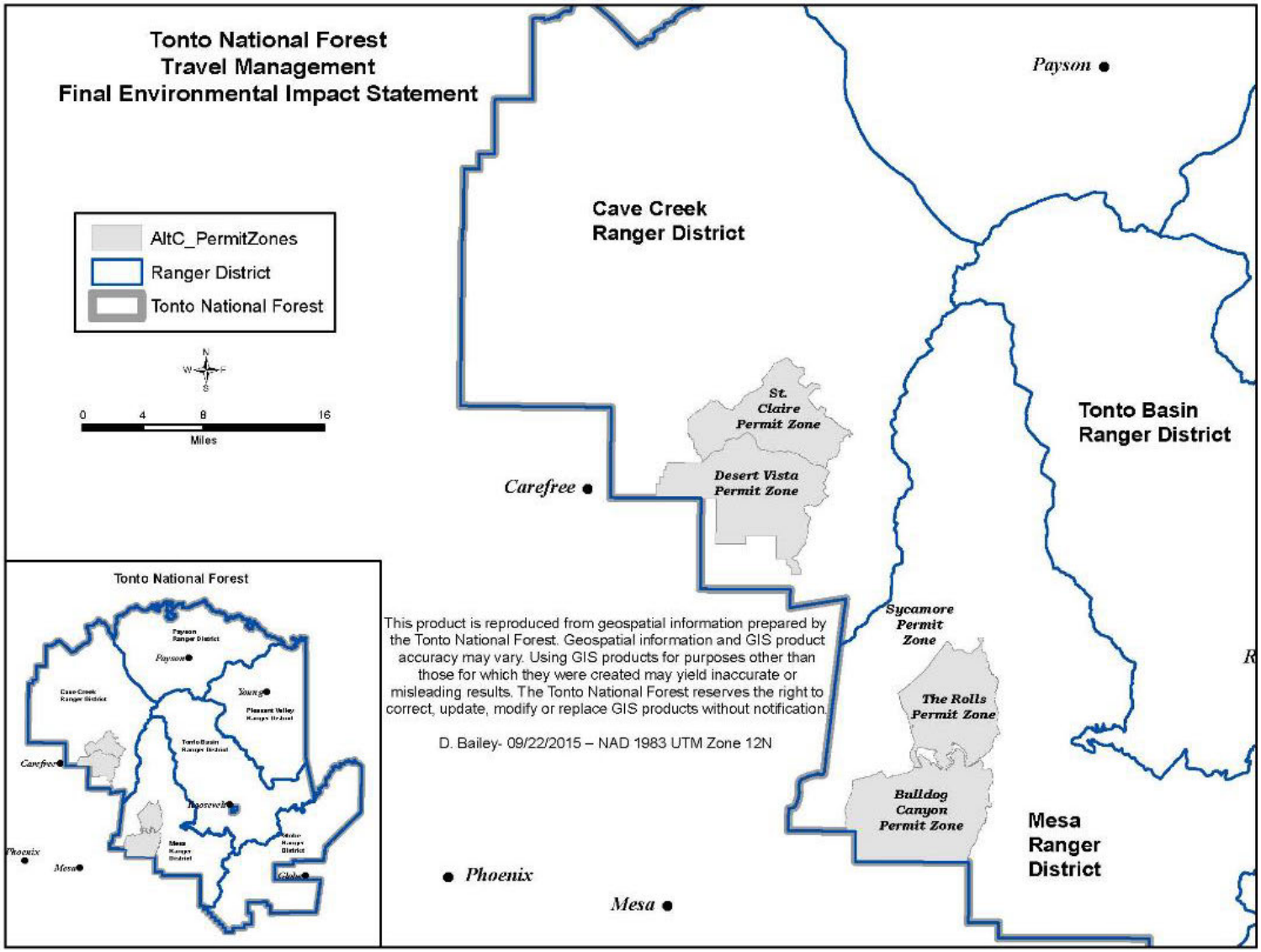

Figure 13. Map of Permit Zones for Alternative C

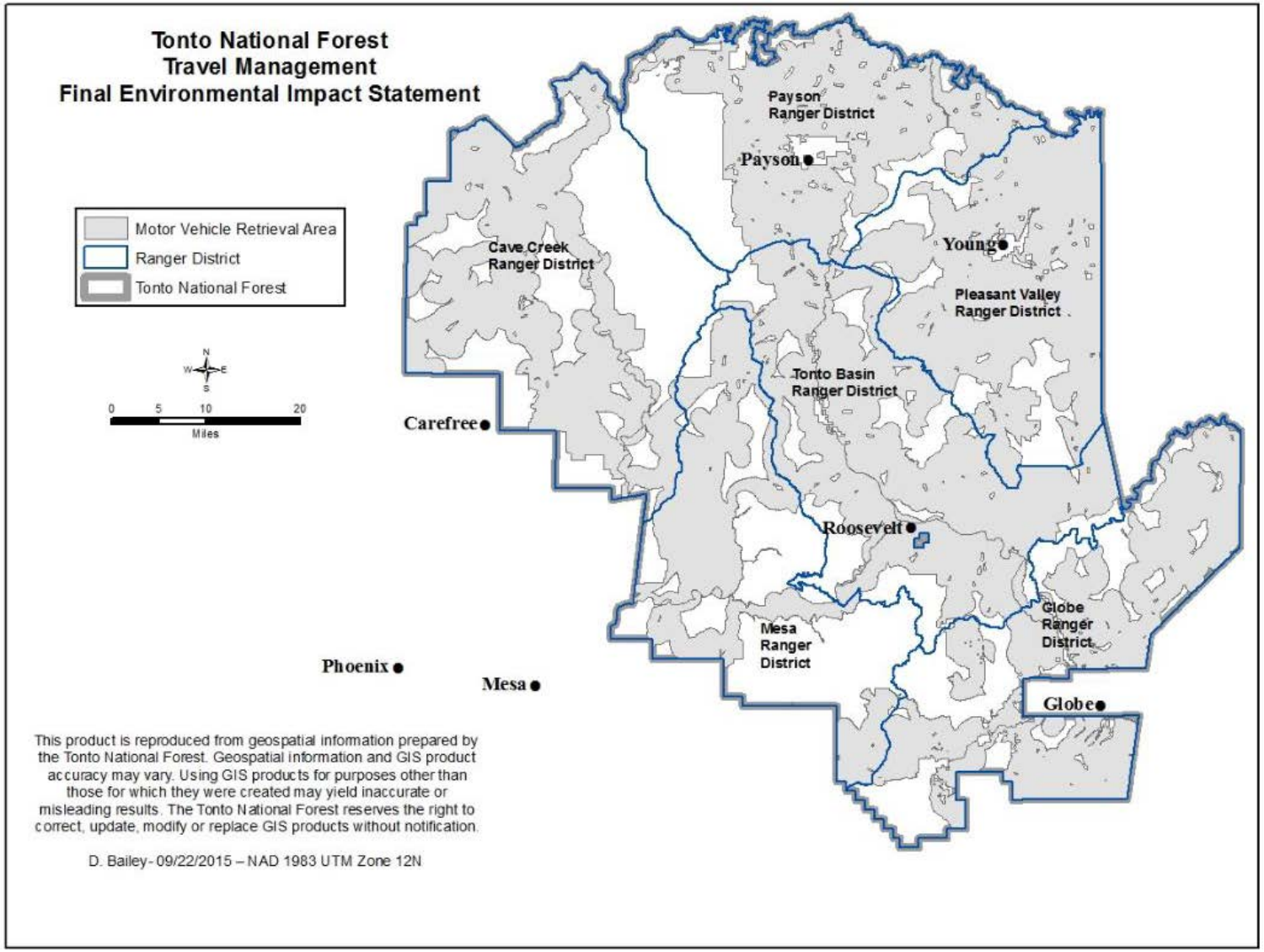

Figure 14. Map of Motor Vehicle Use for Big Game Retrieval for Alternative C

The Arizona Game and Fish Department conducted an analysis to approximate the number of individuals that may use motorized big game retrieval on the Tonto National Forest for elk and bear[37] to assist in the understanding of the intensity of retrieval using a motorized vehicle off designated roads and motorized trails for this alternative. Table 9 shows the approximate number of motorized trips that would be taken yearly, based on game management unit[38] and species. In game management units 21, 24A, 24B, and 37B, permits for hunting elk are not issued or elk harvested on the Tonto National Forest portions of the units and subsequent motorized big game retrieval is negligible.

Table 9. Retrieval of Elk and Bear Data for Alternative C

Game Management Unit	Elk	Bear
21	*	0.90
22	103.02	2.74
23	90.58	9.16
24A	*	2.37
24B	*	0.40
37B	*	0.00
Total	193.60	15.57

Motor Vehicle Use for Dispersed Camping

Alternative C will designate approximately 94 miles of motorized trails for full-sized vehicle use that access 2,864 inventoried existing dispersed camping sites on the Tonto National Forest[39]. These routes currently exist on the ground and are likely unauthorized routes that have been used for dispersed camping. Before these routes will be shown on the motor vehicle use map and made available for public use, they will need to be surveyed for cultural resources and to make sure they are not within congressionally designated areas, inventoried roadless areas, or special management areas that restrict the use of a vehicles to system roads. Routes that pose a threat to resources, including cultural and wildlife, may not be designated or may need to be rerouted to protect cultural and prehistoric sites and certain wildlife habitat.

For the ranger districts closest to the Phoenix metropolitan area, Mesa and Cave Creek, less than 20 miles of motorized trails will be designated (Table 10). The average length of these spur routes for accessing dispersed camping is 137 feet.

[37] For a more detailed description of this process, see the Final Arizona Game and Fish Department Report in the project record.
[38] A map showing the game management units within the Tonto National Forest can be found in the description of Alternative A in this chapter.
[39] For more information about how these sites were inventoried and how the mileage to them was calculated, see the Arizona Game and Fish Department Report for Inventory of Motorized Dispersed Campsites on the Tonto National Forest in the project record.

Table 10. Number and Miles of Spur Routes to Access Dispersed Camping Forestwide

Ranger District	Total Spur Routes Necessary	Total Miles for Dispersed Camping Access
Cave Creek	236	6.1
Globe	467	27.0
Mesa	237	10.6
Payson	611	15.1
Pleasant Valley	538	15.2
Tonto Basin	775	19.8
Total	2,864	93.8

Changes to Designation between Draft EIS and Final EIS

Many comments were submitted regarding motor vehicle access for dispersed camping and fell into two categories:

A buffer that allowed travel up to 100 feet from both sides of designated routes would not provide adequate access to existing and future dispersed camping sites; and

This buffer would encourage damage to natural resources that have not been impacted by accessing dispersed camping historically and it would be difficult to enforce[40].

In working with employees of Arizona Game and Fish Department—the cooperating agency for this project—there was no existing information to determine if the first assertion above was correct or not. To address this, Arizona Game and Fish Department engaged in an effort to get GIS data (latitude and longitude) for all known existing dispersed camping sites that can be accessed on an existing route[41]. As data collection took place, the interdisciplinary (ID) team for this project met to discuss comments received on the draft EIS. One of the issues discussed was dispersed camping corridors and their relationship to inventoried roadless areas. During the discussion, the Tonto National Forest Patrol Captain and the Arizona Game and Fish Department Wildlife Manager Supervisor (both part of the ID team) indicated that it would be much easier to implement designated "spur" routes to known, inventoried dispersed camping sites instead of corridors of a certain width (either 100 feet or 300 feet). Based on this information, the alternative was modified to reflect this change.

These routes will not appear on the MVUM until site-specific GIS data for the actual existing routes that lead to these sites is collected, they have been surveyed for cultural resources, and it is verified that they are not within designated Wilderness areas, inventoried roadless areas, or on private property.

[40] For more information, see the Law Enforcement section in Chapter 3 of this document.
[41] Nearly all of these "existing routes" are unauthorized routes that motor vehicle users have used to access dispersed camping. Additionally, for more specific information about this process, see the Arizona Game and Fish Department Report for Inventory of Motorized Dispersed Campsites on the Tonto National Forest in the project record.

Additional Information Pertaining to Motor Vehicle Use Designation

Personal use fuelwood gathering: Alternative C would limit the motorized vehicle use for the purpose of collecting fuelwood to within 300 feet of a designated road or motorized trail within a woodcutting permit area, resulting in approximately 165,138 acres[42] (Figure 15).

Each year approximately 1,500 permits are issued and are for the Tonto National Forest only. Under this alternative, there is no quantitative information available that would indicate that the number of permits issued would change, either increasing or decreasing.

Additional forest products, such as seeds, cones, branches of shrubs, and driftwood, also need a permit to be gathered on the Tonto National Forest. In this alternative, collection of these products using a motor vehicle would only be permitted on designated roads and motorized trails.

Collection of forest resources by tribal members: For Alternative C, there would be no change from the existing condition.

Need to amend the Forest Plan to include language from the decision: Alternative C would require the Forest Plan to be amended. A table summarizing the proposed changes to the forest plan is in Appendix A.

[42] For the purpose of this analysis, all currently foreseeable fuelwood gathering permit areas are represented. However, in practice, these areas are not all open for use every year; it is dependent on existing vegetation conditions and the need to decrease dead and down material.

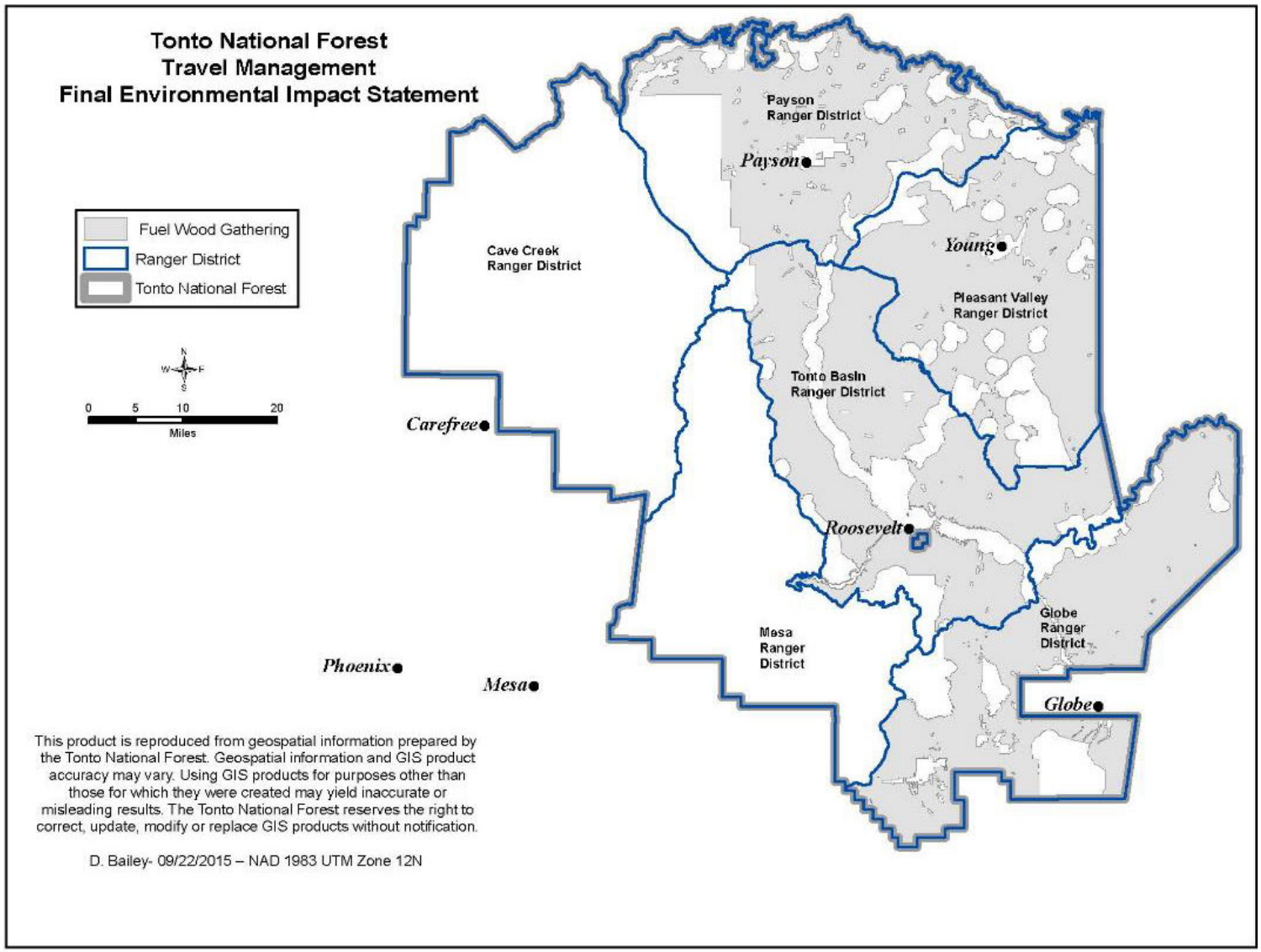

Figure 15. Map of Fuelwood Areas for Alternative C

Alternative D

This alternative provides more motorized access than the existing condition and the proposed action and was developed to address the following issues:

- The amount of roads and motorized trails in the proposed action does not meet the current and future needs for motorized recreation and access throughout the Tonto National Forest;
- The proposed action does not meet the needs for diverse motorized recreation opportunities; and
- Limiting motorized access for dispersed camping to 30 feet from designated roads may reduce motor vehicle use for dispersed camping access, cause user conflict, and concentrate resource impacts.

Roads and Trails Designated for Motor Vehicle Use

Alternative D would result in approximately 200 miles of roads proposed for decommissioning[43]; some of these roads may already be effectively obliterated on the ground from lack of use or due to previous road closure efforts (Table 11). For public access, approximately 3,350 miles of designated roads and approximately 1,520 miles of motorized trails would be open; leaving approximately 50 miles of roads and 300 miles of motorized trails restricted to public motorized use but authorized for administrative use[44] by the Forest Service or permitted activities. (Map D in the map packet shows the route system for this alternative.) Designated National Forest System roads within existing seasonal closure areas would be seasonally designated for motor vehicle use[45].

Table 11. Roads and Trails for Alternative D

Type of Road/Trail	Miles
Roads Open to Passenger Vehicles	546.97
Roads Open to High Clearance Vehicles	2,798.91
Motorized Trails (Single Track)	102.74
Motorized Trails (General)	1,410.72
Administrative Use Only Road	49.27
Administrative Use Only Motorized Trail	296.54
Closed	0.00
Decommissioned Routes	201.22
Total Motorized Open to Public	4,859.34
Total Motorized System	5,205.15

[43] The on-the-ground actions associated with decommissioning a road, along with the effects, are not part of this analysis. All activities associated with decommissioning will be covered by additional environmental analysis in compliance with the *National Environmental Policy Act*.

[44] Administrative use only means that motorized access is restricted, often with a locked gate, to Forest Service personnel or those that hold an authorized use permit to access the road or trail. These routes would not show up on the motor vehicle use map. Motorized users not authorized to be on these routes would be cited for being in violation of the MVUM. All activities associated with physically restricting use will be covered by additional environmental analysis in compliance with the *National Environmental Policy Act.*

[45] A detailed account of each route for the Tonto National Forest for the Alternative D can be found in the project record.

Of the unauthorized roads to be included in the road and motorized trail system (Table 11) for this alternative, Table 12 shows just the mileage and designation of these routes.

Table 12. Unauthorized Routes Proposed for Inclusion for Alternative D

Type of Road/Trail	Miles
Roads Open to Passenger Vehicles	4.77
Roads Open to High Clearance Vehicles	131.20
Motorized Trails (Single Track)	96.22
Motorized Trails (General)	320.26
Administrative Use Only Road	0.11
Administrative Use Only Motorized Trail	30.97
Total Motorized Open to Public	552.45
Total Miles Proposed for Inclusion	583.52

Areas Designated for Motor Vehicle Use

In this alternative, motorized access off of designated routes would be limited to four areas (Table 7 and Figure 16): The area around Bartlett Lake (Cave Creek Ranger District) between the variable water level and the high water mark; Golf Course (Globe Ranger District); the area around Roosevelt Lake (Tonto Basin Ranger District) between the variable water level and the high water mark; and Sycamore (Mesa Ranger District) totaling approximately 6,779 acres. In addition, commenters indicated the need to provide an opportunity for youth riders just learning OHV use and safety. Just like with Alternative C, there are four proposed “tot lots” totaling approximately 12 acres. These areas would be limited to children and would allow them to learn to ride without the presence of other motorized users.

Table 13. OHV Areas for Alternative C

Name of OHV Areas	Ranger District	Acres
Bartlett Lake	Cave Creek	922.2
Golf Course	Globe	17.3
Roosevelt Lake	Tonto Basin	4,507.6
Sycamore	Mesa	1,331.9
Tot Lot Areas		
532	Cave Creek	0.8
Sycamore	Mesa	3.0
The Rolls	Mesa	6.0
Wildcat	Cave Creek	1.6
	Total	6,790.4

Permit Zones

For this alternative, there would be one permit zone, the currently existing Bulldog Canyon Permit Zone on the Mesa Ranger District, totaling approximately 34,720 acres (Figure 17).

Motor Vehicle Use for Big Game Retrieval

Alternative D would allow motor vehicle use, up to one mile on both sides of all designated roads and motorized trails, solely for retrieving legally harvested mule deer, white tail deer, elk, and bear for all hunts[46]. Limitations to this corridor would be within congressionally designated areas where motorized travel is not permitted and other areas that would remain closed from existing closure orders. This results in approximately 2,068,208 acres where motorized retrieval would be permitted (Figure 18).

Table 14 shows the approximate number of motorized trips that would be taken yearly[47], based on game management unit[48] and species. Permits for hunting elk are not issued for game management units 21, 24A, 24B, and 37B or elk harvested on the Tonto National Forest portions of these units and subsequent motorized big game retrieval is negligible.

Table 14. Retrieval of Mule Deer, Whitetail Deer, Elk, and Bear Data for Alternative D

Game Management Unit	Mule Deer	Whitetail Deer	Elk	Bear
21	25.86	20.08	*	0.90
22	22.36	44.39	103.02	2.74
23	52.41	65.93	90.58	9.16
24A	14.57	43.29	*	2.37
24B	18.61	32.32	*	0.40
37B	1.39	0.06	*	0.00
Total	135.26	206.07	193.60	15.57

Motor Vehicle Use for Dispersed Camping

Alternative D would allow motor vehicle use, up to 300 feet on both sides of designated roads and motorized trails, for accessing dispersed camping sites. Limitations to this corridor would be in congressionally designated areas where motorized travel is not permitted and other areas that would remain closed from existing closure orders. For this alternative, an area of approximately 336,038 acres will be analyzed for the effects of motorized travel in relationship to dispersed camping (Figure 19).

Additional Information Pertaining to Motor Vehicle Use Designation

Personal use fuelwood gathering: Alternative D would not limit the use of a motorized vehicle for the purpose of collecting fuelwood to those that have a personal use fuelwood cutting permit so long as they are within a woodcutting permit area. Just like the No Action Alternative, this area is approximately 1,345,998 acres [49] (Figure 20).

[46] Within this corridor, Arizona Game and Fish Department CHAMP holders would be permitted to hunt and retrieve per http://www.azgfd.gov/eservices/special_licenses/champ.shtml accessed May 16, 2013.
[47] For a more detailed description of this analysis, see the Arizona Game and Fish Department Specialist Report in the project record.
[48] A map showing the game management units within the Tonto National Forest can be found in the description of Alternative A in this chapter
[49] For the purpose of this analysis, all currently foreseeable fuelwood gathering permit areas are represented. However, in practice, these areas are not all open for use every year; it is dependent on existing vegetation conditions and the need to decrease dead and down material.

Collection of forest resources by tribal members: For Alternative D, there would be no change from the existing condition.

Need to amend the Forest Plan to include language from the decision: Alternative D would require the Forest Plan to be amended. A table summarizing the proposed changes to the forest plan is in Appendix A.

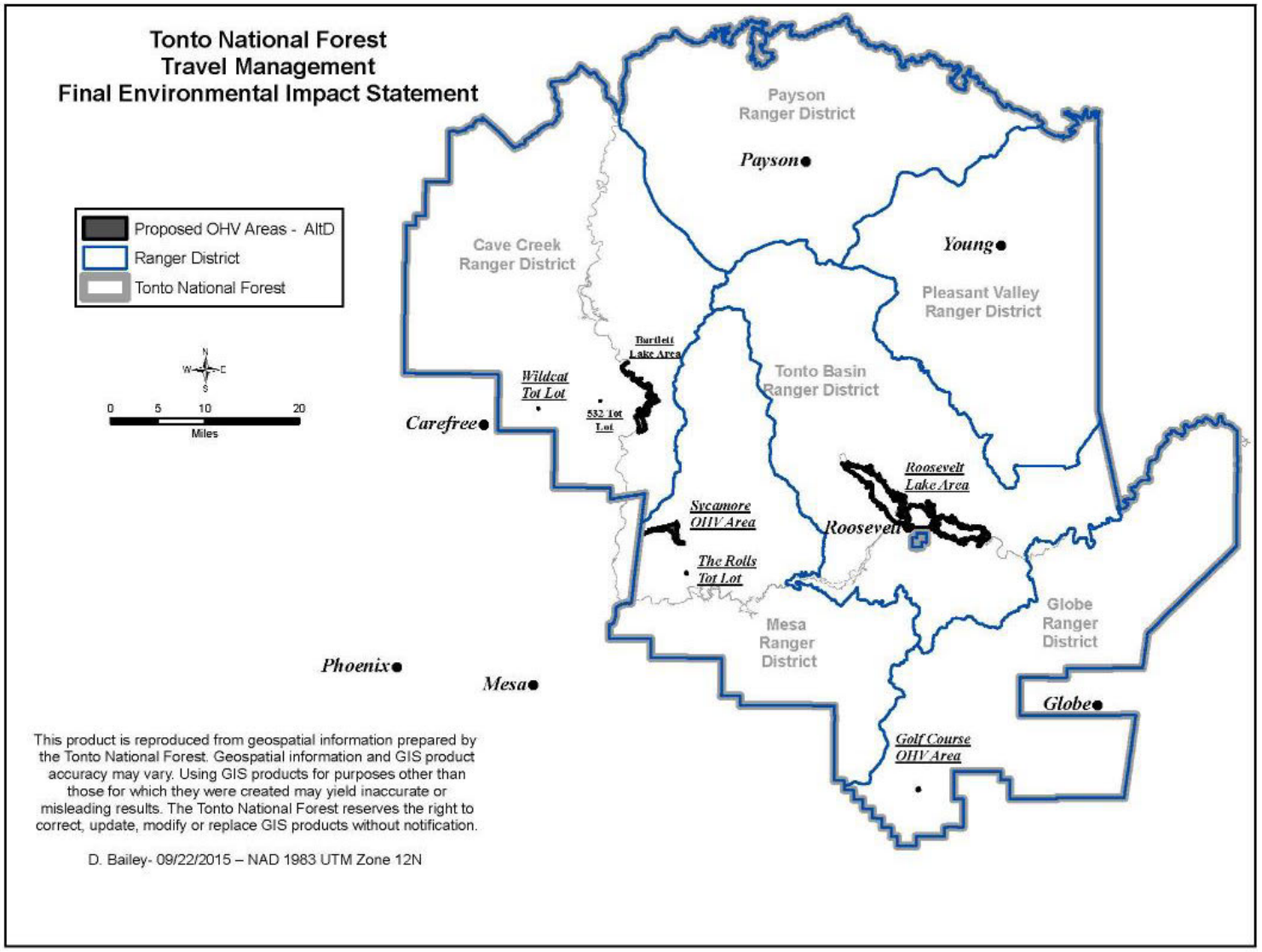

Figure 16. Map of OHV Areas for Alternative D

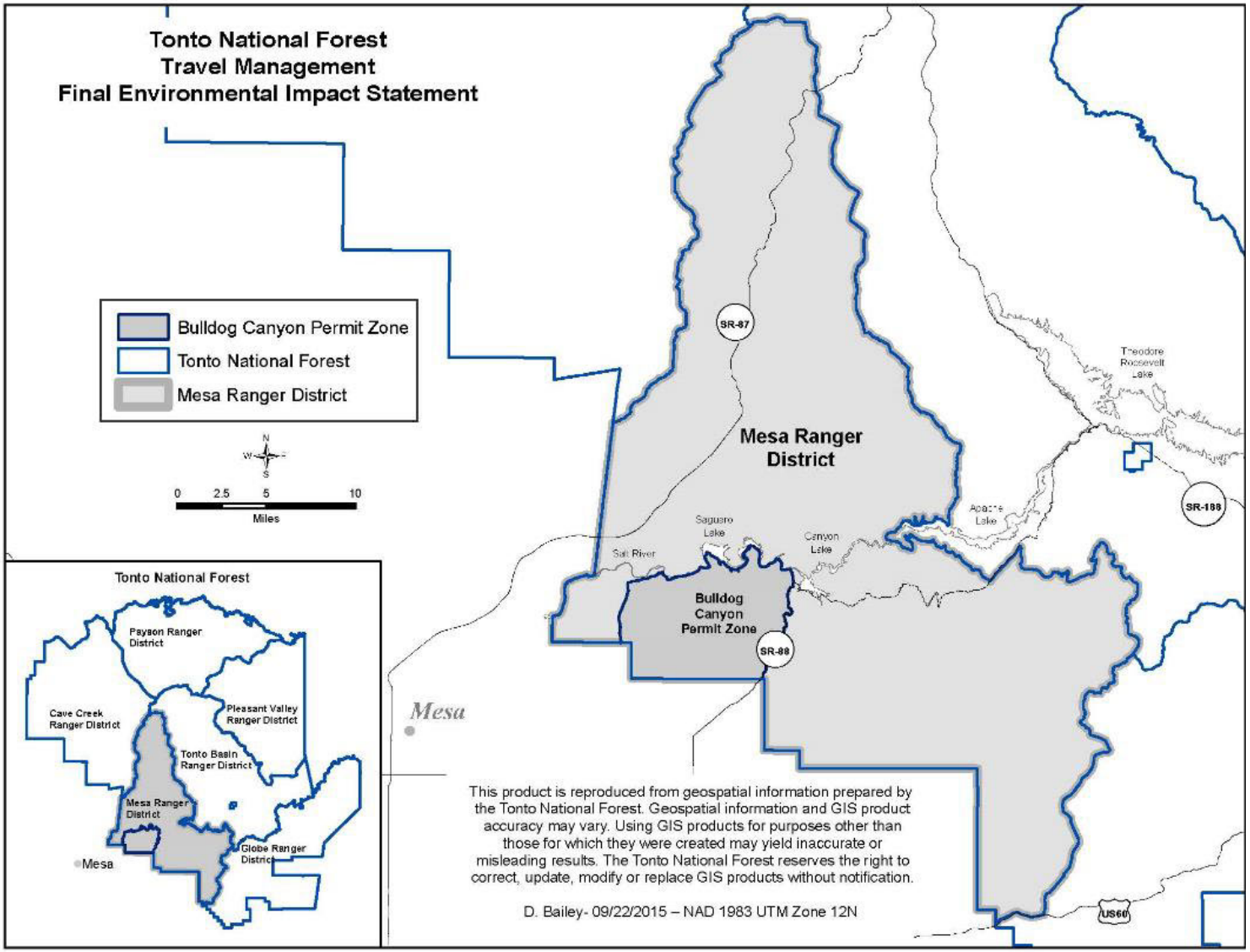

Figure 17. Map of Permit Zones for Alternative D

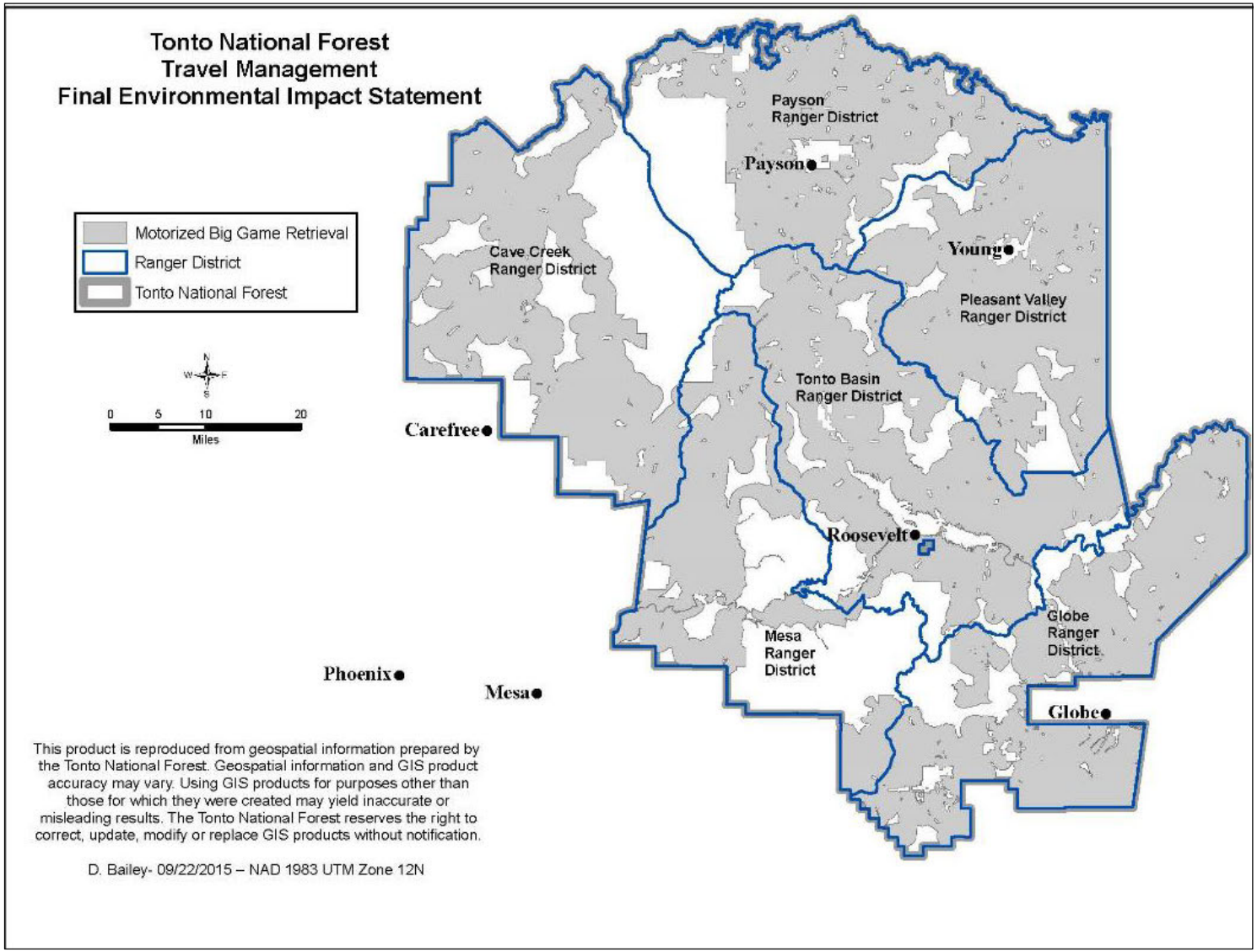

Figure 18. Map of Motor Vehicle Use for Big Game Retrieval for Alternative D

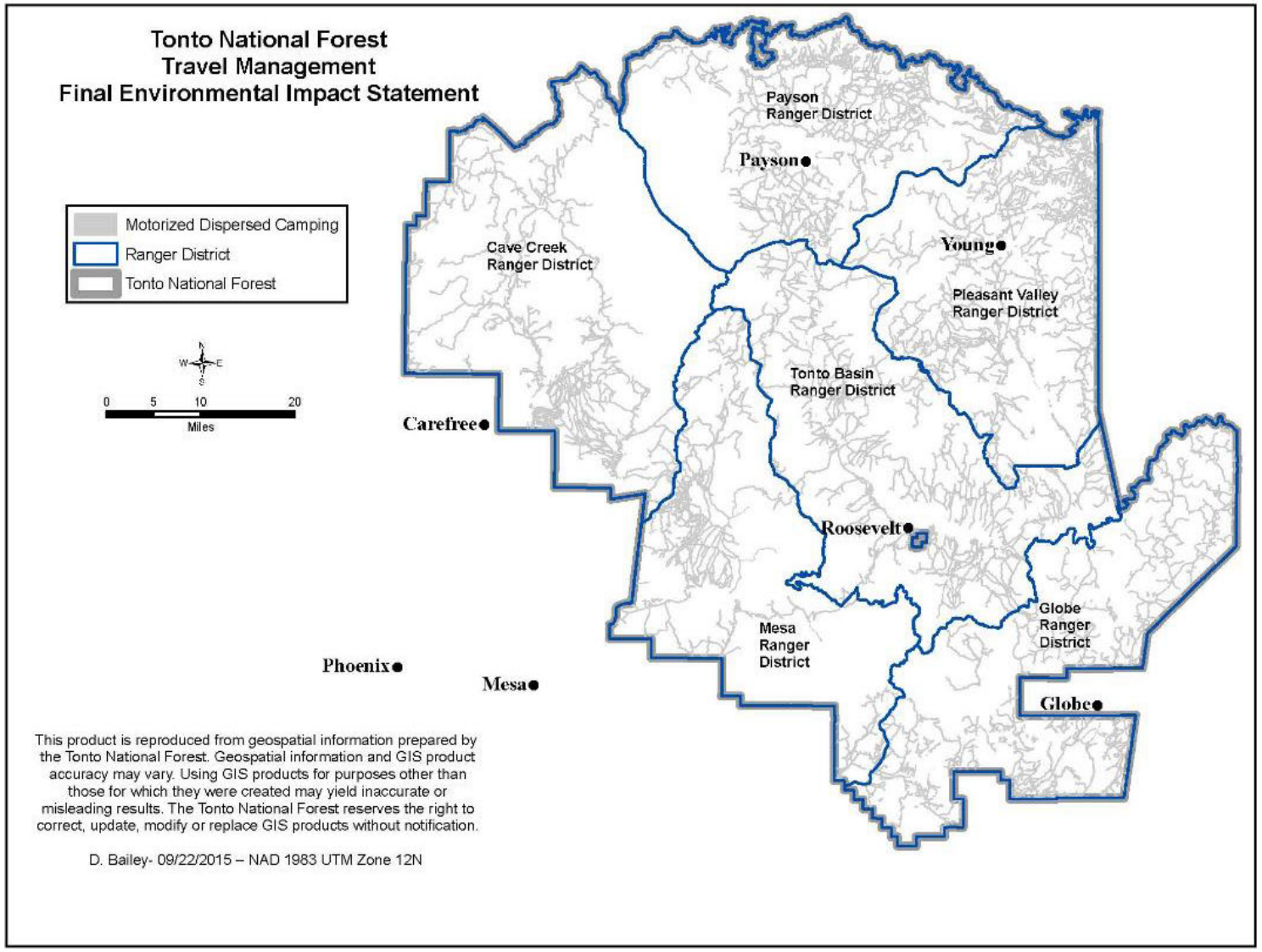

Figure 19. Map of Motor Vehicle Use for Dispersed Camping Corridors for Alternative D

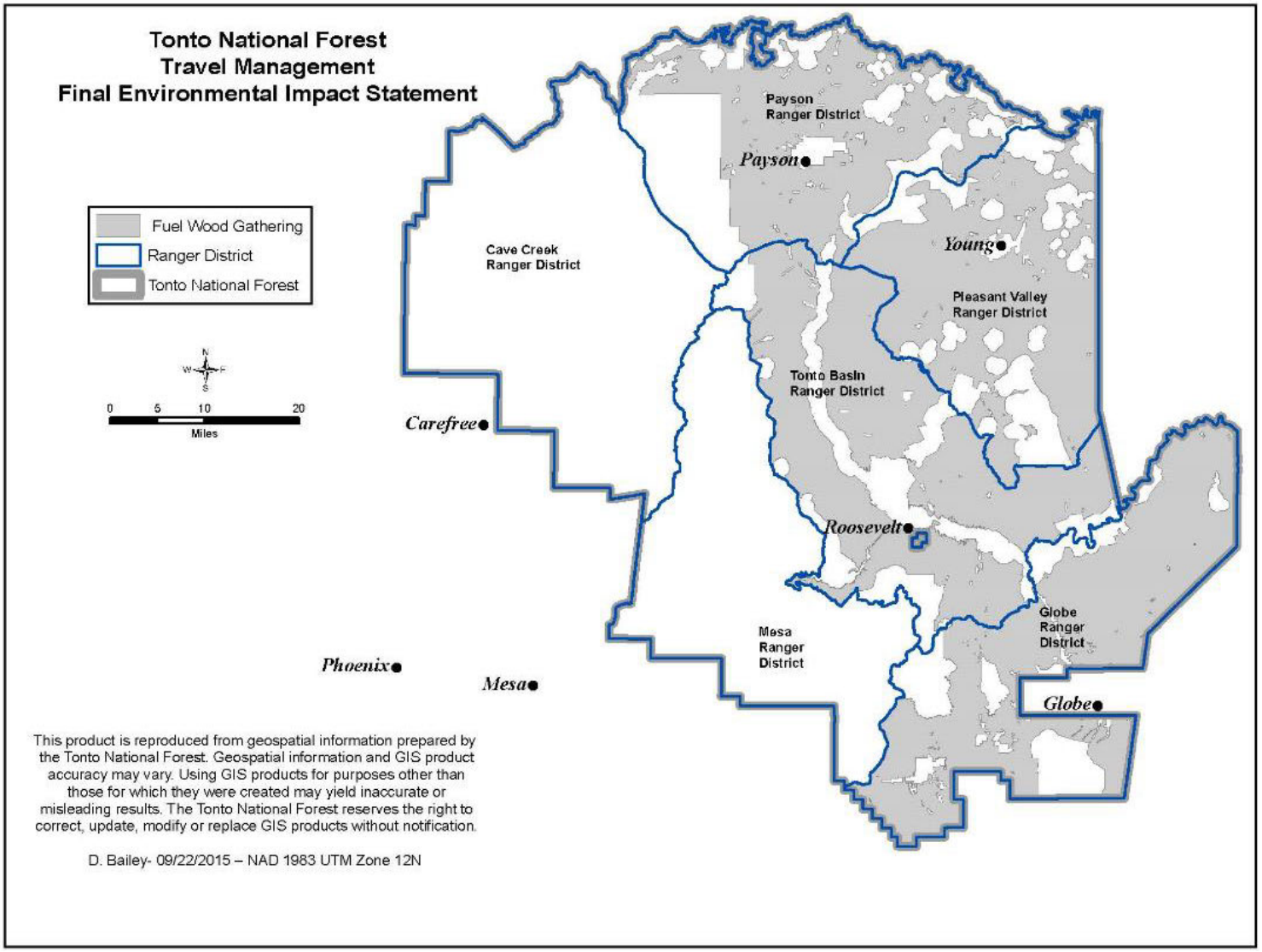

Figure 20. Map of Fuelwood Areas for Alternative D

Alternatives Considered but Eliminated from Detailed Study

The National Environmental Policy Act requires Federal agencies to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the proposed action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of the designation of roads, trails, and areas for motorized travel and the prohibition of cross-country travel on the Tonto National Forest, duplicative of the alternatives considered in detail, or determined to be components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered but dismissed from detailed consideration for reasons summarized below.

Original Proposed Action Published in the Federal Register

On February 1, 2013, a notice of intent to prepare an environmental impact statement was published in the *Federal Register*. The original proposed action would result in approximately 3,812 miles of designated NFS roads and trails and 1,411 acres of designated OHV areas open to motor vehicles use on the Tonto National Forest, with approximately 280 miles of user-created routes added to the forest transportation system. Specifically, approximately 2,567 miles of roads would be open to high clearance vehicles and approximately 967 miles would be open to passenger vehicles and approximately 1,187 miles of roads would be designated for administrative use only. Approximately 251 miles would be open to off-highway vehicle (OHV) travel only.

Motorized retrieval of big game species would be limited to one mile on both sides of designated roads to retrieve a downed elk or bear by an individual who has legally taken the animal. Motorized travel for the purpose of dispersed camping would not be allowed off designated roads and trails. Vehicles would be allowed to park one vehicle length, or up to 30 feet, from the edge of the designated road or trail.

Rationale for Elimination

This alternative was eliminated and replaced with Alternative C, described in detail in this chapter, after considering all comments received thus far and a review of the existing road system using updated aerial imagery. The original proposed action scoped in 2013 was eliminated for the following reasons:

Technical errors were found in the data within this alternative. Errors included such things as: missing Forest Service constructed routes, incorrect alignment, length errors, maintenance level identification, and incorrect jurisdiction identification. Technical errors have been corrected in the other action alternatives.

Errors were found in the proposal (e.g., the proposed action originally proposed to close routes that were identified as a need by the public or forest staff for administrative uses or to access private inholdings).

Distinctions between the original proposed action and Alternative C are not clear enough to show a major difference.

All of the elements of the original proposed action can be found in the other action alternatives.

Use of Decommissioned and Closed Roads in the Existing Condition

As already explained in the Existing Condition section of Chapter 1 of this document, the Forest Service maintains an electronic infrastructure (also referred to as Infra) database that tracks, among other items, records of forest system roads. This data includes the mileage of roads, the current—also known as the operational—maintenance levels, and if appropriate, the objective or future maintenance levels[50]. This database was established to track and report on road management and maintenance level costs for Forest access and recreation. Though this database is updated regularly, it was never previously used to manage motor vehicle access across the entire Forest. The database had previously been used to identify a maintenance level for each road. Thus roads not receiving maintenance by the Forest Service were often not updated in the database. On many forests, the infrastructure database was used as a template to identify the known road system, but was strongly supplemented with route information from public and agency input and site visits. As will be demonstrated by the following rational, using roads in the infrastructure database that were identified as decommissioned or ML 1, either as operational or objective, was eliminated from detailed study as part of the baseline or existing condition. All routes from the infrastructure database that are ML 2 through ML 5 are part of the baseline and represented in Alternative A.

Rationale for Elimination

On the Tonto National Forest, use of the entire Infra database as the current, existing condition will not provide a representative baseline of current use from which to compare alternatives because of actions that were taken, or often not taken, in tracking the current road system, as described below:

The 1985 Tonto National Forest Land and Resource Management Plan (Forest Plan): The Forest Plan indicated that the road and trail system at the time was “substandard” and that road maintenance needed to be at a level that provided for user safety and protection of investments (the road itself), soil, and water resources. Substandard roads would be closed. The plan also listed road system miles by road maintenance levels; defining maintenance levels as follows (pp. 10-11):

- Level 1 (242 miles): “Roads are not open to traffic; they are maintained to protect the road investment and its surrounding resources. These roads may be opened for a specific activity and returned to Level 1 upon completion of the project.”

[50] Guidelines for Road Maintenance Levels (Forest Service Handbook 7709.58): Direction for road maintenance and its existing condition perceived to be applied from a management and maintenance standpoint is referred to as the operational maintenance level. Future desired condition of the management and maintenance of a road is referred to as the objective maintenance level. Specifically, roads “may be currently maintained at one level and planned to be maintained at a different level at some future date. The operational maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns; in other words, it defines the level to which the road is currently being maintained. The objective maintenance level is the maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns. The objective maintenance level may be the same as, or higher or lower than, the operational maintenance level. The transition from operational maintenance level to objective maintenance level may depend on reconstruction or disinvestment” (Forest Service Handbook 7709.58.12.3.1).

- Level 2 (2246 miles): “Roads are maintained open for limited passage of traffic. Roads in this maintenance level are primitive type facilities intended for high clearance vehicles. Passenger car traffic is not a consideration.”
- Level 3 (480 miles): “Roads are maintained open and safe for travel by a prudent driver in a passenger car. However, user comfort and convenience is not considered a priority.”
- Level 4 (140 miles): “Roads are maintained to provide a moderate degree of user comfort and convenience at moderate travel speeds.”
- Level 5 (95 miles): “Roads are maintained to provide a high degree of user comfort and convenience. These roads are normally two lanes with aggregate or paved surface.”

Resource Access-Travelway Management: After the decision on the Forest Plan, Tonto National Forest personnel conducted an intensive analysis of all inventoried roads on the forest, called the Resource Access-Travelway Management (RATM) process. A decision memo to implement the process was signed by the Forest Supervisor in 1990. The decision included miles of road system by road maintenance levels, including miles of roads to be obliterated: Level 1—1,906 miles; Level 2—2,198 miles; Level 3—399 miles; Level 4—83 miles; Level 5—77 miles; and Obliterated—13 miles. Once the RATM decision was signed, the information was documented in the Transportation Information Systems Database.

The information from the Transportation Information Systems Database was then exported into the Infra database concurrent with the development and implementation of the I-Web computerized tracking program and geographic information system (GIS) currently used. The management decisions recorded in Transportation Information Systems Database and transferred to I-Web program are assumed to be a direct relation to the decisions of the RATM process. Changes which were recorded in the I-Web modules post transition from Transportation Information Systems Database also occurred and are assumed to have been based on District and Line Officer decisions as well as refinement of the datasets in GIS.

The decisions of the 1990 RATM process that were carried to I-Web form the basis for the GIS information and all other data related to the current condition of the Tonto National Forest road system. However, implementation of road management objectives previously assigned to roads from the RATM process was never fully implemented due to various factors, including lack of funding and changes in ranger district personnel. In many instances, roads that were listed with an operational maintenance level of 2 or higher were identified with an objective maintenance level of 1 (closed to vehicular traffic), resulting in approximately 90 percent or more of the roads which were identified to be managed and maintained as maintenance level 1 (intermittent/closed) never received a prescriptive treatment or maintenance to implement a custodial closure and remain currently open to motorized use. In similar fashion, a small percentage of roads which are recorded in the I-Web data and GIS as objectively being decommissioned[51] were generally never implemented. In addition, many roads which were identified as operational maintenance level 1 and objective level 1 in I-Web were seemingly incorrectly identified as “intermittent/closed” operationally to begin with. The result of the RATM process and how it was carried through several databases, along with the lack of implementation of proposed closed or decommissioned roads, results in a current situation on the Tonto National Forest where what is in the database for

[51] Decommissioned is defined as the demolition, dismantling, removal, obliteration and /or disposal of a deteriorated or otherwise unneeded asset or component, including necessary cleanup work. This action eliminates the deferred maintenance needs for the fixed asset. Portions of an asset or component may remain if they do not cause problems or require maintenance.

a road may not match what is currently on the ground. Since these roads remain physically open to current motorized use, they will be evaluated in this analysis as part of the current road baseline. To fail to consider them as currently being used by motor vehicles would also fail to accurately assess the real, on-the-ground existing conditions of the Tonto National Forest road system, and also make analyzing the environmental effects of this existing condition nearly impossible. Even though these routes were reclassified as closed for management purposes in the RATM process, we believe the spirit of the Final Travel Management Rule and the NEPA process is better served by accurately assessing the conditions that are physically on-the-ground today as verified by aerial imagery, knowledge from Forest Service and Arizona Game and Fish Department employees, and site visits, instead of using the potentially outdated and unimplemented descriptions of road conditions currently in the infrastructure database that resulted from the RATM analysis and decision.

A Travel Analysis Process (TAP) was completed for the Tonto National Forest with the intent to identify opportunities for the national forest transportation system to meet current and future management objectives, and provide information that allows integration of ecological, social, and economic concerns into recommendations, which can be used to assist with future decisions. This process recommended a minimum road system that included some unauthorized routes. These recommendations were presented to the public as the proposed action during scoping for the environmental assessment in 2009. While Tonto National Forest resource specialists were assembled to evaluate routes through the TAP based upon localized, site-specific resource risks (i.e., potential impacts to cultural resources and wildlife/habitat, etc.) and benefits (administrative needs, access to commercial facilities, recreational opportunities, etc.), the data collected is incomplete and what exists in the current project record for each specific route for the entire forest lacks detailed information about the potential effects of each route on resources in terms of context and intensity. Since “The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences…” (40 CFR 1500.1(c)) and federal agencies are required to make conclusions that are not arbitrary or capricious as required by the Administrative Procedures Act of 1946, the existing information related to the TAP was found to be lacking these statutory requirements and it was determined that the existing information in the TAP would not provide a solid rationale for the decision to designate a motorized route system on the Tonto National Forest. As such, the recommendations that came from the TAP were not used to generate any of the action alternatives being considered in this analysis. Again, we feel using the updated and more complete analysis of current road conditions provided by aerial imagery, knowledge from Forest Service and Arizona Game and Fish Department employees, and site visits better serves the integrity of this NEPA process for complying with the Final Travel Management Rule in evaluating the existing conditions as opposed to using the incomplete TAP data.

As part of this travel management process, the Tonto National Forest reviewed the existing road system from the infrastructure database. It was during this process, which included speaking with district personnel familiar with the roads, that the disparity between the current data for the forest’s road system and what exists on the ground was revealed. As just one example of the inconsistencies, there are approximately 267 miles of roads in RATM that had an objective level of decommissioned. After completing the review for these roads, approximately 75 miles were included as potential motorized trails and approximately 3 miles were identified as part of the desired road network for inclusion in Alternative C. Similarly, there are approximately 1,739 miles of roads in RATM that had an objective level of ML 1 (closed to all motorized travel). After completing the review, approximately 936 miles were included as potential motorized

trails and approximately 98 miles of roads were identified as part of the desired road network for inclusion in Alternative C.

In summary, the direction from the 1985 Forest Plan is outdated, the RATM decision was never fully realized or implemented, the TAP does not have the sufficient information to inform travel management decisions, and a recent review of the current road system exposed errors. Thus, the entire current Infra database is not an adequate baseline for this NEPA analysis and routes identified as decommissioned or ML 1 in the database will be eliminated from detailed study as the baseline.

Alternative Submitted by the Center for Biological Diversity

An alternative was submitted by the Center for Biological Diversity (Center), accompanied by route-specific lists detailing where motor vehicle use should be prohibited. In general, the Center's proposal would limit motorized use:

- In critical wildlife habitat and water resources (such as streams, lakes, and riparian areas) to decrease potential effects. This includes prohibiting motorized use within 300 feet of streams and lakes and in areas that provide critical habitat for sensitive, threatened, and endangered wildlife species;
- In areas of primitive and semiprimitive nonmotorized recreation opportunity spectrum classes from the 1985 Tonto National Forest Plan. This includes prohibiting motorized use for dispersed camping and big game retrieval in these areas;
- In areas with high cultural resource site densities or sensitive cultural resource areas. This includes prohibiting motorized use for dispersed camping and big game retrieval in these areas; and
- In proximity to designated wilderness areas and inventoried roadless areas to decrease potential effects associated with noise pollution and possible illegal intrusions by motorized vehicles. This includes prohibiting motorized use within a quarter of a mile of the wilderness boundary and within all inventoried roadless areas.

Rationale for Elimination

In order to spatially understand the Center's proposal of the above recommendations, these elements were mapped using GIS. The suggested motor vehicle prohibitions associated with wildlife habitat and water resources were the most restrictive of the above list for OHV use across the forest. If all roads that met this criteria were proposed for closure or decommissioning (and those that would no longer be accessible as they would not connect to remaining designated roads), several large sections of the forest would be inaccessible except by non-motorized means. Three notable areas that would not be accessible by motorized means are:

Nearly the entire area of the Cave Creek Ranger District, including access to Bartlett Reservoir, Horseshoe Reservoir, much of the Verde River, and access to the western side of the Mazatzal Wilderness;

Nearly the entire area between State Routes 188 and 288, including very limited access to Salome and Hells Gate Wilderness Areas, and access to the northern side of Roosevelt Lake; and

The area between the northern boundary of the Tonto National Forest along the Mogollon Rim and the town of Payson, which includes Forest Service Road 64, also known as the Control

Road, developed and named because of its strategic location in controlling and preventing wildland fires.

While the Final Travel Management Rule instructed consideration of effects on, "Damage to soil, watershed, vegetation, and other forest resources" and "Harassment of wildlife and significant disruption of wildlife habitats" (36 CFR 212.55 (b)(1) and 36 CFR 212.55 (b)(2)), it also stipulates consideration of effects on "…public safety, provision of recreational opportunities, access needs, conflicts among uses of National Forest System lands, the need for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration are designated" (36 CFR 212.55 (a)). The motor vehicle use restrictions proposed by the Center would result in limiting access to areas on the Tonto National Forest that provide for opportunities for non-developed to low developed recreation sites. The potential result would be relocating those recreation users seeking a more primitive experience into areas already highly developed and lacking a primitive experience, such as the southern side of Roosevelt Lake, and the Superstition and Salt River Canyon Wilderness Areas. Much of the areas that would not permit motor vehicle access have steep terrain, resulting in limiting non-motorized access for some forest visitors.

Restricting access along the Control Road presents different concerns. There are many private property inholdings north of Payson along the Control Road, including Bonita Creek Estates and Tonto Village. Many of these inholdings have subdivisions, where multiple property owners live. While access to private property within the National Forest is permitted "…in order to reach their homes and to utilize their property" (36 CFR 212.6 (b)), visitors and services, such as mail delivery and utility service, would not be permitted under this provision in the rule even if designated as administrative use only.

Because of the limitations that potentially conflict with the Final Travel Management Rule, Forest Plan direction which provides for a range of recreational opportunities and the administration of the Forest Transportation System, the broad alternative proposal submitted by the Center is being dismissed from further study. However, many of the components of this submitted alternative, especially where specific routes were mentioned, were included in Alternative B, which adds very limited unauthorized routes for access connectivity, limits the use of motorized vehicles off designated roads and trails, and proposes to close many of the suggested routes to motorized use.

Comparison of Alternatives

This section provides a summary of the alternatives and the potential effects of implementing each alternative considered in detail. Table 15 provides a side-by-side comparison of the alternatives by the six elements provided in the alternative descriptions earlier in this chapter.

Table 15. Side-by-Side Comparison of Alternatives

Items being compared	Alternative A	Alternative B	Alternative C	Alternative D
Roads and Trails Designated for Motor Vehicle Use (Miles)				
Roads Open to Passenger Vehicles (ML 3-5)	644.72	353.38	544.59	546.97
Roads Open to High Clearance Vehicles (ML 2)	2,307.67	540.13	766.36	2,798.91
Motorized Trails (Single Track)	0.00	1.12	109.64	102.74
Motorized Trails (Less than 60")	0.00	0.00	20.80	0.00
Motorized Trails (Full-sized Vehicles)	0.00	1,664.95	2,210.23	1,410.72
Administrative Use Only Road (ML 2 – ML 5)	0.00	144.30	166.69	49.27
Administrative Use Only Motorized Trail	0.00	355.04	410.53	296.54
Closed (ML 1)	n/a	0.00	0.00	0.00
Decommissioned Routes	n/a	2,367.03	1,276.08	201.22
Forest System Roads Likely Open to Public Use (ML Unknown)[52]	2,006.20	n/a	n/a	n/a
Total Motorized Open to Public	4,958.58	2,559.57	3,651.62	4,859.34
Total Motorized System	4,958.58	3,058.90	4,228.84	5,205.15
Inventoried Unauthorized Routes[53] Proposed for Inclusion (Miles)				
Roads Open to Passenger Vehicles	n/a	4.12	4.12	4.77
Roads Open to High Clearance Vehicles	n/a	6.45	6.61	131.20
Motorized Trails (Single Track)	n/a	0.00	108.66	96.22
Motorized Trails (General)	n/a	0.00	192.59	320.26
Administrative Use Only Road	n/a	10.34	10.46	0.11
Administrative Use Only Motorized Trail	n/a	29.53	30.78	30.97

[52] A detailed explanation of these routes can be found in the Existing and Desired Conditions section of Chapter 1 of this document.

[53] Since 2007, the Tonto National Forest has collected or received geographic information about unauthorized routes that are either obvious on the ground or are being used for motorized travel, totaling approximately 736 miles to date.

Items being compared	Alternative A	Alternative B	Alternative C	Alternative D
Total Motorized Open to Public	n/a	10.58	311.97	552.45
Total Miles Proposed for Inclusion	n/a	50.44	353.20	583.52
Areas Designated for Motor Vehicle Use (Acres)				
Name of Area (Total Acres)	Payson and Pleasant Valley Ranger Districts (703,618 total)	300 feet both sides of all designated roads and trails within fuelwood cutting permit areas (132,568 total)	Bartlett Lake (177); Golf Course (17); Roosevelt Lake (554); Sycamore (1,329); 4 Tot Lots (11) (2,089 total)	Bartlett Lake (922); Golf Course (17); Roosevelt Lake (4,508); Sycamore (1,333); 4 Tot Lots (11) (6,790 total)
Permit Zones (Acres)				
Name of Permit Zone (Total Acres)	Bulldog Canyon (34,720 total)	Bulldog Canyon (34,720); Desert Vista (33,479); The Rolls (24,144); St. Clair (24,455); Sycamore (34,127) (150,925 total)	Bulldog Canyon (34,720); Desert Vista (33,479); The Rolls (24,144); St. Clair (24,455) (116,798 total)	Same as Alternative A (34,720 total)
Motor Vehicle Use for Big Game Retrieval (Acres)				
Total Acres Available (including Width of Corridor) (Species Allowed)	703,618 (elk, bear, mule deer, whitetail deer)	No motorized big game retrieval would be allowed	1,575,382 (1 mile both sides of all designated routes) (elk, bear)	2,068,208 (1 mile both sides of all designated routes) (elk, bear, mule deer, whitetail deer)
Motor Vehicle Use for Dispersed Camping (Acres)				
Distance from Designated Routes (Total Acres)	Driving off-road has been permitted in northern districts, prohibited in southern districts unless posted open (703,618 total)	414 Designated Sites (Buffered 50 feet from center point) (65 total)	94[54] miles of motorized trails for full-sized vehicle use that access inventoried existing dispersed camping sites	300 feet both sides of all designated routes (336,038 total)

[54]The 94 miles are included in the total mileage for Alternative C as mentioned previously in the table.

Items being compared	Alternative A	Alternative B	Alternative C	Alternative D
Additional Information Pertaining to Motor Vehicle Use				
Personal Use Fuelwood Gathering (Total Acres)	Permitted to gather wood in designated woodcutting permit areas (1,345,998 total)	Within 300 feet of all designated routes within a designated woodcutting permit areas (132,568 total)	Within 300 feet of all designated routes within designated a woodcutting permit areas (165,138 total)	Same as Alternative A (1,345,998 total)
Collection of Forest Resources by Tribal Members	Only allowed on designated routes.	Same as Alternative A	Same as Alternative A.	Same as Alternative A
Need to Amend Forest Plan	Not necessary	Would Require Forest Plan Amendment[55]	Would Require Forest Plan Amendment[56]	Would Require Forest Plan Amendment[57]

Information below is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives. Table 16 shows the comparison based on the resource areas from Chapter 3 of this document.

[55] The amendment would include striking language allowing cross-country travel on the entire Payson and Pleasant Valley Ranger Districts and modifying the current Recreation Opportunity Spectrum. A detailed summary of these amendments can be found in Appendix A.
[56] Ibid.
[57] Ibid.

Table 16. Comparison of Effects for Alternatives by Resource

Effects	Alternative A	Alternative B	Alternative C	Alternative D
Transportation Facilities				
Effects to Maintenance cycle of designated roads (year cycle)	ML 2 = 5.9 ML 3-5 = 2.1	ML 2 = 1.4 ML 3-5 = 1.2	ML 2 = 1.8 ML 3-5 = 2.0	ML 2 = 1.8 ML 3-5 = 7.2
Recreation Resources				
Effects of Roads and Trails Recreation Opportunity Motorized Trail Maintenance	Few opportunities to recreate away from roads, except in designated wilderness areas No change from current ROS There are currently no designated motorized trails ($0 total)	Greatest ability to recreate away from motorized routes outside of designated Wilderness Greatest increase in nonmotorized opportunities; Greatest decrease in motorized opportunities $999,000 total	Ability to recreate away from motorized routes would be greater than Alternatives A and D, but less than Alternative B Increase of semiprimitive non-motorized from Alternative A $1,338,000 total	Nearly identical to Alternative A Greatest increase in motorized opportunities; Greatest decrease in nonmotorized opportunities $912,000 total
Effects of Motor Vehicle Use for Big Game Retrieval	Has the potential to shift opportunities for nonmotorized recreation forestwide	Greatest increase in nonmotorized opportunities forestwide	Has the potential to shift opportunities for nonmotorized recreation forestwide	Same as Alternative C
Effects of Motor Vehicle Use for Dispersed Camping	Least potential for competition for sites, but only in northern districts; no opportunity for southern districts	Greatest potential for competition for sites, concentration of use, and user conflict	Less potential for competition for sites, concentration of use, and user conflict than Alternative B	Least potential for competition for sites, concentration of use, and user conflict
Roadless, Wilderness, and Special Areas				
Effects to Wilderness	No change from current conditions	Greatest improvement to all four Wilderness characters	Improves all four Wilderness characters	Least improvement to all four Wilderness characters

Effects	Alternative A	Alternative B	Alternative C	Alternative D
Effects to Wild and Scenic Rivers	Greatest increase for motorized access; Greatest decrease for solitude	Greatest decrease for motorized access; Greatest opportunity for solitude	Decrease in motorized access from current conditions; Increase in solitude	Greatest increase for motorized access; Greatest decrease for solitude
Effects to Inventoried Roadless Areas	56 miles of roads in IRAs; no improvement to IRA characteristics	2.7 miles of roads IRAs; greatest improvement to IRA characteristics	39.03 miles of roads in IRAs; moderate improvement to IRA characteristics	63 miles of roads in IRAs; least improvement to IRA characteristics
Visual Resources				
Change in natural appearance	No potential for existing landscape character to become more natural	Greatest potential for existing landscape character to become more natural	Second least potential for existing landscape character to become more natural	Least potential for existing landscape character to become more natural
Socioeconomics				
Effects to Social and Economic Trends of The Four-County Area	Negligible	Negligible	Negligible	Negligible
Environmental Justice: Motorized access for fuelwood gathering, big game retrieval, dispersed camping for populations of concern	Access would continue	Substantial decrease in all could disproportionately affect	Decrease for fuelwood could negatively affect, increase for retrieval and dispersed camping could benefit	Increase in all could benefit
Heritage Resources				
Effects of Motorized Access	Continue direct and indirect effects on northern districts; No change in access for monitoring and patrolling of sites	Significantly reduce direct and indirect effects; Decreases access for monitoring and patrolling of sites	Significantly reduce direct and indirect effects; Maintain access for monitoring and patrolling of sites	Same as Alternative C
Contemporary Indian Uses				
Effects of Motorized Access on traditional use areas, sacred sites, and traditional activities;	Increase in the cumulative effect and may inhibit or limit	Reduces effects to sacred sites and traditional use areas; May restrict access for	Reduces effects to sacred sites and traditional use areas; Provides more access	Same as Alternative C

Effects	Alternative A	Alternative B	Alternative C	Alternative D
and Access to traditional resources and places of significance to Tribes	the use of such areas; Access remains the same	the practice of known contemporary Indian uses	opportunities for known contemporary Indian uses	
Game and Nongame Species				
Estimated direction of game and nongame habitat for desired future conditions	Away from	Towards	Same as Alternative C	Same as Alternative A
Effects to satisfaction of wildlife related recreationists for motorized dispersed camping restrictions	Satisfied	Dissatisfied	Same as Alternative A	Same as Alternative A
Law Enforcement				
Effects to General Enforcement	Difficult because of inconsistent rules and laws; Proliferation of unauthorized roads will continue increase	Highest violation rates most likely due to decreased motorized access; Increased patrol frequency because of decreased miles to patrol	Increased motorized access will likely garner public support/more voluntary compliance; Increase in the administrative use only routes will likely cause enforcement complications	Increased motorized access will likely garner public support/more voluntary compliance; Reduced patrol frequency of patrol because of increased miles to patrol
Effects of Cross-country Travel/OHV Areas	Damage and route creation currently takes place in areas both open and closed to cross-country travel	No access for off designated routes simplifies enforcement	Designated areas may result in fewer attempts to travel off designated routes	Same as Alternative C
Wildlife and Plant Habitat Resources				
Effects to Mexican Spotted Owl	Continued localized disturbance to species and designated critical habitat	Overall, greatest benefit from reduced access to and activity near occupied sites, reduced disturbances to individuals and their habitat	Overall, second greatest benefit from reduced access to and activity near occupied sites, reduced disturbances to individuals and their habitat	Overall, least benefit from reduced access to and activity near occupied sites, reduced disturbances to individuals and their habitat

Effects	Alternative A	Alternative B	Alternative C	Alternative D
Effects to Southwestern Willow Flycatcher	Continued localized disturbance to species and designated critical habitat	Overall, greatest benefit from reduced access to and activity near nesting and forging sites, reducing disturbances to individuals and their habitat.	Same as Alternative B	Overall, no benefit from reduced access to and activity near nesting and forging sites, reducing disturbances to individuals and their habitat.
Effects to Western Yellow-billed Cuckoo	Continued localized disturbance to species and potential habitat	Overall, greatest benefit from reduced access to and activity near nesting and forging sites, reducing disturbances to individuals and their habitat.	Overall, second greatest benefit from reduced access to and activity near occupied sites, reduced disturbances to individuals and their habitat	Overall, no benefit from reduced access to and activity near nesting and forging sites, reducing disturbances to individuals and their habitat.
Effects to Yuma Clapper Rail	Continued minimal localized disturbance to species and potential habitat	Same as Alternative A	Same as Alternative A	Greatest effect to localized disturbance to species and potential habitat
Effects to Narrow-headed Gartersnake	Continued minimal localized disturbance to species and potential habitat	Overall, second greatest benefit by reducing access to and activity near basking and forging sites, and reducing disturbances to individuals and their habitat	Overall, greatest benefit by reducing access to and activity near basking and forging sites, and reducing disturbances to individuals and their habitat	Overall, least benefit by reducing access to and activity near basking and forging sites, and reducing disturbances to individuals and their habitat
Effects to Northern Mexican Gartersnake	Continued minimal localized disturbance to species and potential habitat	Overall, greatest benefit by reducing access to and activity near basking and forging sites, and reducing disturbances to individuals and their habitat	Overall, second greatest benefit by reducing access to and activity near basking and forging sites, and reducing disturbances to individuals and their habitat	Overall, least benefit by reducing access to and activity near basking and forging sites, and reducing disturbances to individuals and their habitat
Effects to Sonoran Desert Tortoise	Continued effects to potential habitat which influences behavior, survival, reproduction, and distribution; Continued habitat alteration	Overall, greatest benefit by reducing access to and activity near burrows and forging sites and reducing disturbances to individuals and their habitat	Overall, second greatest benefit by reducing access to and activity near burrows and forging sites and reducing disturbances to individuals and their habitat	Overall, negative impacts by increasing access to and activity near burrows and forging sites and increasing disturbances to individuals and their habitat

Effects	Alternative A	Alternative B	Alternative C	Alternative D
Effects to Chiricahua Leopard Frog	Continued minimal localized disturbance to species and potential habitat	Overall, greatest benefit by reducing access to and activity near dispersal and occupied sites and reducing disturbances to individuals and their habitat	Same as Alternative B	Overall, next greatest benefit by reducing access to and activity near dispersal and occupied sites and reducing disturbances to individuals and their habitat
Effects to Colorado Pikeminnow	Continued effects to species and habitat alteration	Overall, minimal benefit to species and potential watersheds	Same as Alternative B	Overall, minimal impacts to species and potential watersheds
Effects to Desert Pupfish	Continued effects to species and its habitat	Overall, benefit to species and potential watersheds	Same as Alternative B	Overall, negative impacts to species and potential watersheds
Effects to Gila Chub, Gila topminnow, Loach Minnow, Razorback Sucker, and Spikedace	Continued effects to species and habitat alteration	Overall, benefit to species and potential watersheds	Same as Alternative B	Overall, negative impacts to species and potential watersheds
Effects to Headwater Chub	Continued effects to species and habitat alteration	Overall, greatest benefit to species and potential watersheds	Same as Alternative B	Overall, next greatest benefit to species and potential watersheds
Effects to Roundtail Chub	Continued effects to species and habitat alteration	Overall, benefit to species and potential watersheds	Same as Alternative B	Overall, minimal impacts to species and potential watersheds
Effects to Lesser Long-nosed Bat	Continued effects to species and habitat alteration	Overall, benefit to species and potential foraging habitat	Same as Alternative B	Overall, minimal impacts to species and potential foraging habitat
Effects to Mexican Gray Wolf	Continued effects to potential primary and secondary habitats	Overall, benefit to potential primary and secondary habitats	Same as Alternative B	Overall, negatively impact potential primary and secondary habitats
Effects to Ocelot	Continued effects to species and habitat alteration	Overall, benefit to species and potential habitat	Same as Alternative B	Overall, negative impacts to species and potential habitat

Effects	Alternative A	Alternative B	Alternative C	Alternative D
Effects to Arizona Cliffrose	Continued effects to species and habitat alteration	Overall, benefit to species and potential habitat	Same as Alternative B	Overall, negative impacts to species and potential habitat
Effects to Arizona Hedgehog Cactus	Continued effects to species and habitat alteration	Overall, minimal benefit to species and potential habitat	Same as Alternative B	Overall, negative impacts to species and potential habitat
Effects to Indicator Species of Ponderosa Pine Forest Mild and Mixed Conifer with Aspen	Continued localized disturbance to species and habitat	Overall, second greatest benefit to species populations by reduced noise disturbance	Overall, greatest benefit to species populations by reduced noise and human disturbance	Overall, greatest impacts to species populations by increasing noise disturbance
Effects to Indicator Species of Pinyon-Juniper Chaparral, Pinyon-Juniper Grassland, Madrean Encinal Woodland, and Interior Chaparral	Continued effects to species and habitat alteration	Overall, greatest improvement to habitat quality by reduced noise disturbance	Overall, second greatest improvement to habitat quality by reduced noise disturbance	Overall, greatest impacts to habitat structural stages and increasing noise disturbance
Effects to Indicator Species of Semidesert Grassland	Continued localized disturbance to species and habitat	Overall, greatest decrease to disturbance to species and habitat	Overall, moderate decrease to disturbance to species and habitat	Similar to Alternative A
Effects to Indicator Species of Desert Communities	Continued effects to species and habitat alteration	Overall, greatest benefit to habitat structural stages and decreasing noise disturbance	Overall, negative impact to habitat structural stages; Decreasing noise disturbance	Overall, greatest impacts to habitat structural stages and increasing noise disturbance
Effects to Indicator Species of Cottonwood Willow Riparian Forest	Continued effects to species and habitat alteration	Overall, benefit to habitat quality and decreasing noise disturbance	Similar to Alternative B	Overall, negative impacts to habitat quality and increasing noise disturbance
Effects to Indicator Species of Mixed Broadleaf Deciduous Riparian Forest	Continued effects to species and habitat alteration	Overall, second greatest benefit to habitat quality and decreasing noise disturbance	Overall, greatest benefit to habitat quality and decreasing noise disturbance	Similar to Alternative A
Effects to Indicator Species of Water – Macro-invertebrates	No effect	Same as Alternative A	Same as Alternative A	Same as Alternative A

Effects	Alternative A	Alternative B	Alternative C	Alternative D
Effects to Migratory Birds	Continued localized disturbance to species and habitat	Overall, benefit to species and habitat quality	Overall, benefit to species and habitat quality	Overall, negative impacts to species and habitat quality
Effects to Allen's Lappet- Browed Bat and Pale Townsend Big-eared Bat	Continued localized disturbance to species and habitat	Overall, benefit to species and habitat	Same as Alternative B	Same as Alternative A
Effects to Spotted Bat	No effect	Same as Alternative A	Same as Alternative A	Same as Alternative A
Effects to Western Red Bat	Continued localized disturbance to species and habitat	Overall, reduced disturbance to individuals	Same as Alternative B	Same as Alternative B
Effects to American Peregrine Falcon	Continued localized disturbance to species and habitat	Overall, greatest benefit to habitat and reduced disturbance to individuals	Same as Alternative B	Overall, next greatest benefit to habitat and reduced disturbance to individuals
Effects to Sulphur-bellied Flycatcher and Yellow-eyed Junco	Continued localized disturbance to species and habitat	Overall, reduced disturbance to individuals	Same as Alternative B	Similar to Alternative B
Effects to Bezy's Night Lizard	No effect	Same as Alternative A	Same as Alternative A	Same as Alternative A
Effects to Lowland Leopard Frog and Western Barking Frog	Continued localized disturbance to species and habitat	Overall, benefit to species and habitat	Same as Alternative B	Similar to Alternative A
Effects to Desert Sucker and Sonoran Sucker	Continued localized disturbance to species and habitat	Overall, benefit to species and habitat	Same as Alternative B	Similar to Alternative B
Effects to Parker's Cylloepus Riffle Beetle, A Caddisfly, and Netwing Midge	Continued localized disturbance to species and habitat	Overall, benefit to species and habitat	Same as Alternative B	Same as Alternative B
Effects to A Mayfly	No effect	Same as Alternative A	Same as Alternative A	Same as Alternative A

Effects	Alternative A	Alternative B	Alternative C	Alternative D
Effects to Fossil Springsnail	Continued effects to species habitat	Overall, benefit to species habitat	Same as Alternative B	Same as Alternative B
Effects to Pima Indian Mallow	Continued effects to species habitat; decrease habitat effectiveness	Overall, greatest benefit to habitat; increased habitat effectiveness	Overall, benefit to habitat; increased habitat effectiveness	Overall, negative impacts to habitat; decrease habitat effectiveness
Effects to Tonto Basin Agave	Continued effects to species habitat; decrease habitat effectiveness	Similar to Alternative A	Similar to Alternative A	Overall, negative impacts to habitat; decrease habitat effectiveness
Effects to Hohokam Agave and Mt. Dellenbaugh Sandwort	Continued effects to species habitat; decrease habitat effectiveness	Overall benefit to habitat; increased habitat effectiveness	Same as Alternative B	Overall, negative impacts to habitat; decrease habitat effectiveness
Effects to Ripley's Wild Buckwheat	Continued effects to species habitat; decrease habitat effectiveness	Overall benefit to habitat; increased habitat effectiveness	Similar to Alternative A	Similar to Alternative A
Effects to Horseshoe Deer Vetch	Continued effects to species habitat; decrease habitat effectiveness	Overall benefit to habitat; increased habitat effectiveness	Same as Alternative B	Similar to Alternative A
Effects to Toumey's Groundsel	Continued effects to individuals and species habitat; decrease habitat effectiveness	Overall benefit to individuals and habitat; increased habitat effectiveness	Same as Alternative B	Similar to Alternative A
Effects to Hualapai Milkwort	Continued effects to species habitat; decrease habitat effectiveness	Overall benefit to individuals and habitat; increased habitat effectiveness	Same as Alternative A	Similar to Alternative A
Potential Spread of Noxious and Invasive Weeds (risk of introduction and spread of weeds)	Continued moderate	Lowest	Second lowest	Low to moderate
Hydrological Resources				

Effects	Alternative A	Alternative B	Alternative C	Alternative D
Effects to Water Quality	Continued small localized impacts (sediment and turbidity) from motorized routes and vehicle crossings	Small reduction to localized impacts (sediment and turbidity) from motorized routes and vehicle crossings	Less reduction than Alternative B to localized impacts (sediment and turbidity) from motorized routes and vehicle crossings	Same as Alternative A
Effects to Riparian Areas (route density in miles per square mile)	Continued effects from road density of 3.6; poor rating	Greatest decrease in road density to 2.1; fair rating	Decrease in road density to 2.7; poor rating	Slight decrease in route density to 3.4; poor rating
Effects to Watershed Conditions (HUC 12 rating for road density attribute)	No improvement; Forestwide rating: Good = 67 Fair = 92 Poor = 19	Greatest overall improvement; Forestwide rating: Good = 113 Fair = 62 Poor = 3	Overall moderate improvement; Forestwide rating: Good = 82 Fair = 91 Poor = 5	Overall slight improvement; Forestwide rating: Good = 70 Fair = 91 Poor = 17
Soil Resources				
Effects of Motorized Access	Continued effects to soil conditions	Least overall effects to soil conditions	Less overall effect to soil conditions	Greatest overall effects to soil conditions; similar to existing condition
Air Quality				
Effects to Air Quality	Highest emission density; Continued contribution to exceedances of Maricopa County air quality standards	Greatest reduction in emission density; least contribution to exceedances of Maricopa County air quality standards	Second greatest reduction in emission density; Second least contribution to exceedances of Maricopa County air quality standards	Slight reduction in emission density; Greatest contribution to exceedances of Maricopa County air quality standards
Climate Change				
Effects to Climate Change	No direct effects; No measurable indirect effects	Same as Alternative A	Same as Alternative A	Same as Alternative A

Chapter 3. Affected Environment and Environmental Consequences

Introduction

This chapter summarizes the physical, biological, social, and economic environments on the Tonto National Forest and the effects of implementing each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in the chapter 2. It is organized by individual environment or resource topic.

The Affected Environment section for each resource topic describes the existing or baseline condition against which environmental effects are evaluated and from which progress toward the desired condition can be measured. The Environmental Consequences section for each resource topic discusses direct, indirect, and cumulative effects, and applicable mitigation measures. Effects can be neutral, beneficial, or adverse. Environmental consequences form the scientific and analytical basis for comparison of the alternatives, through compliance with standards set forth in the 1985 Tonto National Forest Land and Resource Management Plan (Forest Plan), as amended, with the 1969 National Environmental Policy Act (NEPA), and the 1976 National Forest Management Act. The Irreversible and Irretrievable Commitments of Resources section is at the end of this chapter.

Analysis Process

The environmental consequences presented here address the impacts of the actions proposed in each alternative for the Tonto National Forest Travel Management Project. Each motorized route and designated OHV area proposed in the alternatives has been reviewed by resource specialists.

Environmental effects are disclosed for the following types of actions common to all action alternatives:

- **Prohibition of Cross-country Motor Vehicle Travel.** The direct and indirect effects of prohibiting motorized cross-country travel forestwide are described generally in each alternative, considering both current conditions and projected trends. Both short-term and long-term effects are presented.
- **Determination for Motor Vehicles Driven Off Designated Routes.** Effects resulting from permitting motorized access for the sole purpose of motorized dispersed camping, big game retrieval, or collection of forest products are described generally by alternative.
- **Additions to the National Forest Transportation System of New Roads and Motorized Trails.** The effects of adding new routes by incorporating inventoried unauthorized routes are analyzed by alternative in this chapter. For most resources, one or more resource indicators or analysis measures are used to measure the direct and indirect effects of each alternative. Both short- and long-term effects are presented.
- **Changes to the Existing National Forest Transportation System**. Effects caused by changes to vehicle class, season of use, and proposed decommissioning are described generally by alternative.

Additionally, effects are disclosed in this chapter for actions that are unique to an alternative.

Cumulative Effects

According to the Council on Environmental Quality (CEQ) NEPA regulations, "cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR 1508.7).

In order to understand the contribution of past actions to the effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions reflect innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions and what exactly that contribution was. Additionally, focusing on the impacts of past human actions would risk ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. Looking at current conditions captures all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. Third, public scoping for this project has yet to identify any public interest or need for detailed information on individual past actions. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." For these reasons, the analysis of past actions in this section is based on current environmental conditions.

In terms of reasonably foreseeable future actions, this analysis has attempted to include, specific to each resource area, projects for which upcoming actions are known and can be meaningfully analyzed. What will not be analyzed in the cumulative effects for this chapter are projects that are inevitable and known, but which have not yet developed proposed actions, such as future Four Forest Restoration Initiative (4FRI) projects or Forest Plan Revision.

General Assumptions and Limitations

The following assumptions and limitations apply to the project and the decision that will be forthcoming:

- No NEPA decision is necessary to continue use of the National Forest Transportation System (i.e. OHV and transportation) as currently designated and managed under the No Action alternative. These decisions were made previously.
- Unauthorized or user-created roads, trails, and areas are not National Forest Transportation System facilities. They are unauthorized. The agency never took action to

create, manage, or construct them for public use. They were created by the public as a result of cross-country travel.

- Temporary roads, trails, and areas built to support emergency operations or temporarily authorized in association with contracts, permits, or leases are not intended for public use. They are not part of the National Forest Transportation System. Any proposal to add these temporary roads to the National Forest Transportation System will require a NEPA decision.
- Any unauthorized routes not included in the action alternatives are not precluded from consideration for addition to the National Forest Transportation System in future travel management actions.
- "Designation" is an administrative act which does not trigger NEPA analysis. Designation technically occurs with printing of the Motor Vehicle Use Map (MVUM) and does not require additional analysis.

Resource Reports

Each section in this chapter provides a summary of the project-specific reports, assessments, and input prepared by Forest Service resource specialists that are incorporated by reference in this Final EIS. The following final reports are incorporated by reference:

- Transportation Facilities Report;
- Recreation Report;
- Wilderness, Wild and Scenic Rivers, Inventoried Roadless Areas, and Special Management Areas Report;
- Visual Resources Report;
- Socioeconomic Report;
- Heritage Resources Report;
- Contemporary Indian Uses Report;
- Law Enforcement Report;
- Arizona Game and Fish Department Report (Game and Nongame Species);
- Threatened, Endangered, and Candidate Species Report;
- Sensitive Wildlife Species, Management Indicator Species and Migratory Bird Report;
- Sensitive Plant Report;
- Noxious Weed Risk Assessment (Invasive Weeds Report);
- Water Resources Report (Hydrology and Watershed);
- Soils Report;
- Air Quality Report; and
- Climate Change Report.

These reports are part of the project record on file at the Forest Supervisor's Office in Phoenix, Arizona. Copies of these reports are available upon request by contacting Anne Thomas, Project Leader, at (602) 225-5213 or by email at mariannethomas@fs.fed.us.

Legal and Regulatory Compliance

NEPA at 40 CFR 1502.25(a) directs "to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with …other environmental review laws and executive orders." Each resource section includes a list of applicable laws, regulations, policies, and executive orders that are relevant to that resource. Surveys, analyses, and findings required by those laws may also be addressed in each of those sections.

Transportation Facilities

This section discusses the effects of the alternatives on management and maintenance of National Forest System (NFS) roads and trails (i.e., transportation facilities). It addresses the extent to which the alternatives respond to the direction related to transportation facilities in the Tonto National Forest Plan (Forest Plan) and considers whether changes to these facilities provide for adequate public safety and result in a sustainable route system.

Affected Environment

National Forest System roads are used for multiple purposes by various user groups. One example of a multiple-use road is Forest Road 24 on the Cave Creek Ranger District, also known as Seven Springs Road. The road accesses private property, range improvements, administrative sites, mining resources, and recreation sites; and is used by recreationists, hunters, Forest Service staff, private landowners, and OHV users among others. This road is categorized as a principal feeder/trunk route serving as a connector road with minor system roads feeding into it. Forest Roads 41, 562, and 468 are examples of roads that feed into Forest Road 24.

The Forest Service currently classifies maintenance of National Forest System roads by five maintenance levels (ML)[58]. This analysis refers to ML 3-5 roads that are maintained for prudent drivers in a standard passenger car, ML 2 roads that are maintained for high-clearance vehicles, and ML 1 roads that are placed in storage for intermittent use. Utilization of roads identified as "administrative use only" is restricted to Forest Service personnel and emergency response personnel. Other authorized users of these routes can include special use and grazing permittees; mining companies; county, state, and Federal agencies; private land owners; and utility companies. According to the current database for roads on the Tonto National Forest, there are approximately 2,952 miles of roads open to the public: 645 miles for passenger vehicles and 2,308 miles for high clearance.

The average annual road maintenance budget is $2,326,900 (based on fiscal year 2008 to fiscal year 2012). Though not every mile of NFS road requires yearly maintenance, the annual maintenance budget is insufficient for supporting the Forest's annual maintenance needs. Only a percentage of the total roads on the forest are maintained each year, as opposed to the entire 2,952 miles of ML 2 through ML 5 roads. Maintenance that goes unperformed each year is considered deferred maintenance. Over the years, the Tonto National Forest road system has accrued a substantial amount of deferred maintenance. The Tonto does have cooperative maintenance agreements with Gila and Maricopa counties to help address combined road maintenance needs. Approximately 514 miles of NFS roads (264 miles of ML 2 roads, 193 miles

[58] For more information, see t the Existing Condition section in Chapter 1 of this document.

of ML 3 roads, 44 miles of ML 4 roads, and 13 miles of ML 5 roads) are included in cooperative maintenance agreements with these counties[59].

Environmental Consequences

The Forest Service does not receive sufficient funding to match the calculated estimates in the Infrastructure database (often referred to as Infra) where road maintenance is tracked. Annualized items are funded on a project-by-project basis and are competed for regionally and nationally. Therefore, annual maintenance costs do not reflect the way the Forest actually maintains its road system. Every mile of road does not need to be maintained every year. Rather, roads are maintained on a cyclic basis and in response to safety hazards and situations where resource damage may occur. There are some high-use roads that receive maintenance every year to repair winter and storm run-off damage and damage due to heavy traffic loads. Other roads do not require more than periodic inspection and occasional maintenance to repair damage to the road surface and road structures, eliminate traffic hazards, and prevent resource damage. This is true of most of the existing roads maintained for high clearance vehicles (ML 2) and the roads and motorized trails proposed for addition to the system under the action alternatives.

Table 17 shows how many miles of road received annual maintenance from fiscal year[60] (FY) 2009 to FY 2012.

Table 17. Summary of Road Receiving Annual Maintenance by Maintenance Level (in Miles)

Maintenance Level	FY 2009	FY 2010	FY 2011	FY 2012	Average
2	470	477	341	276	391
3	279	298	255	173	252
4	38	31	38	66	44
5	13	10	2	3	7
Total	800	816	636	518	

The consideration of tracking the true cost of maintaining each mile of road is problematic. The costs and metrics that are currently available do not effectively convey how the annual road maintenance budget is being managed with respect to the roads that need maintenance. The Infra costs available would show that the needed budget to maintain our roads will exceed our available budget by five times. Although there is always a need for additional funds to maintain our roads, there has never been a time that the Forest has had the Infra-based funding available on an annual basis. The cost comparison will be included in the analysis; however the analysis will focus on the relative difference in cost between alternatives, not the discrepancy of available funding.

The methodology compares the amount of roads that we have historically maintained with our budget as a percentage of the overall roads system to those of each alternative. This will effectively show how far our historical maintenance efforts would go toward maintaining the

[59] Forest Road Agreement between U.S. Forest Service and Gila County (2009) and Forest Road Agreement between U.S. Forest Service and Maricopa County (2011).
[60] Federal government fiscal years run from October 1 through September 30.

road system for each of the alternatives. The motorized trails would not be considered as a road as they would be analyzed through the recreation specialist report.

Direct and Indirect Effects

The four alternatives vary greatly in the mileage of roads needing maintenance. The mileage noted in this table represents the road system the Tonto National Forest Service is required to periodically maintain. A portion of the road system is open to the public, while a portion of the road system is open for administrative purposes only. The mileage noted below reflects the total road miles for each maintenance level category inclusive of the administrative use only roads, and will be used for the analysis.

Table 18. Road Needing Maintenance by Maintenance Level (in Miles) for Each Alternative

Maintenance Level	Alternative A	Alternative B	Alternative C	Alternative D
3-5	645	376	545	548
2	2,308	663	766	2,849
Total	2,953	1,039	1,311	3,397

Cycle-Time Analysis

The metric used for comparison between the alternatives is the “cycle” time between regular forest road maintenance as a measure of years. The cycle time is the ratio of the total number of miles to the average miles maintained per year. The result will be a measure of how many years it would take to maintain every mile of road once before we start over. The lower the cycle time, the more often we maintain a forest road.

As an example, ML 2 roads designated in Alternative A equates to 2,308 miles (Table 18). The Tonto National Forest has maintained on average 391 miles of ML 2 roads per year. Dividing Alternative A ML 2 mileage (2,308) by the average number of miles of ML 2 roads maintained per year (391) results in a value of 5.9, indicating with the number of ML 2 roads in Alternative A, it would take 5.9 years to maintain each road one time. Similarly, if the total number of miles of ML 3-5 for Alternative A (645), is divided by the average number of miles of ML 3-5 roads maintained per year for Alternative A (303), derived from adding averages for ML 3, 4 and 5, the result is 2.1. This indicates with the number of ML 3-5 roads in Alternative A, it would take 2.1 years to maintain each road one time.

Alternative A

This alternative would not add any new facilities to the existing transportation system. Maintenance, signing, and improvements of unauthorized routes would not occur, because appropriated road and trail maintenance funds are restricted to expenditure for system roads and trails. Initially this alternative requires the least expenditure of funds (Table 19). However, it has the potential to increase the need for resource funding to repair damage and degradation caused by continued motorized use of existing unauthorized routes and the creation of new unauthorized routes through continued cross-country travel. Maintenance of the ML 2 roads would be a 5.9 year cycle (once every 5.9 years the road would be maintained).

Table 19. Road Miles Needing Maintenance by Maintenance Level for Alternative A

Maintenance Level	Alternative A (miles)	Average Maintenance* (miles)	# of Years to Cycle all Roads
3-5	645	303	2.1
2	2,308	391	5.9

* From data in Table 18.

Alternative B

This alternative provides the least amount of motorized access of all alternatives. This alternative would result in the decommissioning of all roads not designated for motorized use. Administrative roads would remain open. Some of these roads may already be effectively closed on the ground from lack of use or due to previous road closure efforts. Maintenance of the ML 2 roads would be a 1.7 year cycle (once every 1.7 years the road would be maintained) (Table 20).

Table 20. Road Miles Needing Maintenance by Maintenance Level for Alternative B

Maintenance Level	Alternative A (miles)	Average Maintenance* (miles)	# of Years to Cycle all Roads
3-5	376	303	1.2
2	663	391	1.7

* From data in Table 18.

Alternative C

This alternative is a modified version of the proposed action scoped in February 2013. It reflects the changes that resulted from a review of the desired road network that was discussed earlier in this chapter. This information was further reviewed on a district level, involving district rangers, Forest Service personnel familiar with the existing road and resource conditions, and Arizona Game and Fish Department enforcement officers whose game retrieval units overlapped with the corresponding district boundaries. This process allowed for the correction of alignment issues of roads using aerial imagery gathered in 2012, as reflected in this alternative. This alternative would result in the closure of all motorized routes (roads and trails) not designated for motorized use that are not located within an area already closed to motorized use or entry. Some of the roads may already be effectively closed on the ground from lack of use or due to previous road closure efforts. Maintenance of the ML 2 roads would be a 1.8 year cycle (once every 1.8 years the road would be maintained) (Table 21).

Table 21. Road Miles Needing Maintenance by Maintenance Level for Alternative C

Maintenance Level	Alternative A (miles)	Average Maintenance* (miles)	# of Years to Cycle all Roads
3-5	572	303	1.8
2	766	391	2.0

* From data in Table 18.

Alternative D

This alternative provides the most motorized access of all alternatives. This alternative would result in the closure of all motorized routes (roads and trails) not designated for motorized use

that are not located within an area already closed to motorized use or entry. Some of these roads may already be effectively closed on the ground from lack of use or due to previous road closure efforts. Maintenance of the ML 2 roads would be a 1.8 year cycle (once every 1.8 years the road would be maintained) (Table 22).

Table 22. Road Miles Needing Maintenance by Maintenance Level for Alternative D

Maintenance Level	Alternative A (miles)	Average Maintenance* (miles)	# of Years to Cycle all Roads
3-5	548	303	1.8
2	2,849	391	7.3

* From data in Table 18.

Maintenance Cost Analysis

The cost of National Forest System road maintenance occurs on an annual basis and varies by maintenance level[61]. The following table shows the funding requirements to perform routine and periodic maintenance for all existing system roads on an annual basis (Table 23). It does not show actual funding. The annual cost shown below would maintain the roads in their current condition and begin to address the backlog of deferred maintenance. Shortfalls in road maintenance funding have resulted in a large backlog of deferred maintenance needs. Deferred maintenance can be generally defined as annual or routine maintenance that was not completed when scheduled.

Table 23. Routine and Deferred Maintenance Cost Estimates for Existing NFS Roads (RATM) By Maintenance Level

Maintenance Level	# of Miles	Annual Maintenance Needs per mile	Annual Cost
3-5	559	$8,230	$4,600,570
2	2,198	$1,949	$4,283,902
Totals	2,757	------	$8,884,472

The ability to perform road maintenance is limited by the availability of time, personnel, equipment, materials, and funding. The amount of road maintenance accomplished per day or per season is dependent on the road maintenance level and condition of the road being maintained. The condition of the road is affected by both the environment and the volume of traffic over the road between maintenance cycles. Environmental factors include soil moisture, tree and brush growth, storm and spring run-off, and other natural events such as floods.

The average annual road maintenance budget is $2,326,900 (based on fiscal year 2008 to fiscal year 2012). It is important to note that while the annual maintenance budget is insufficient for supporting the Forest's annual maintenance needs, not every mile of NFS road or trail requires yearly maintenance. Only a percentage of the total roads on the Forest are maintained each year, as opposed to all 2,757 miles of ML 2 through 5 roads. Therefore, the difference between the annual maintenance budget and the annual needs is not as drastic as it appears. For example, in 2003, the estimated annual cost to maintain all NFS roads to standard was about $4.8 million.

[61] For information related to the costs of designated motorized trail maintenance, see the Recreation section of this chapter.

While this amount still exceeds the annual budget of approximately $2.3 million, this is a significantly smaller annual difference.

Alternative A

This alternative reflects the No Action and would not add any new facilities to the existing transportation system. Initially this alternative requires the least expenditure of funds. However, it has the potential to increase the need for resource funding to repair damage and degradation caused by continued motorized use of existing unauthorized routes and the creation of new unauthorized routes through continued cross-country travel (Table 24). The cost to maintain the ML 2 -5 routes within this alternative would be $9,718,195 which is 417 percent of our annual maintenance budget.

Table 24. Maintenance Cost Estimates for Alternative A (Based on 2006 figures)

Maintenance Level	# of Miles	Annual Maintenance Needs per mile	Annual Cost
3-5	645	$8,230	$5,308,350
2	2,308	$1,949	$4,498,292
Totals	2,953		$9,718,195

Alternative B

This alternative provides the least amount of motorized access of all alternatives. It would result in the decommissioning of all roads not designated for motorized use that are not located within an area already closed to motorized use or entry. The cost to maintain the ML 2 -5 routes within this alternative would be $4,386,667 which is 189 percent of our annual maintenance budget (Table 25).

Table 25. Maintenance Cost Estimates for Alternative B (Based on 2006 figures)

Maintenance Level	# of Miles	Annual Maintenance Needs per mile	Annual Cost
3-5	376	$8,230	$3,094,480
2	663	$1,949	$1,292,187
Totals	1,039		$4,386,667

Alternative C

This alternative is a modified version of the proposed action scoped in February 2013. The cost to maintain the ML 2 -5 routes within this alternative would be $5,978,284 which is 257 percent of our annual maintenance budget (Table 26).

Table 26. Maintenance Cost Estimates for Alternative B (Based on 2006 figures)

Maintenance Level	# of Miles	Annual Maintenance Needs per mile	Annual Cost
3-5	545	$8,230	$4,485,350
2	766	$1,949	$1,492,934
Totals	1,311		$5,978,284

Alternative D

This alternative provides the most motorized access of all alternatives. The cost to maintain the ML 2 -5 routes within this alternative would be $10,062,741 which is 432 percent of our annual maintenance budget (Table 27).

Table 27. Maintenance Cost Estimates for Alternative B (Based on 2006 figures)

Maintenance Level	# of Miles	Annual Maintenance Needs per mile	Annual Cost
3-5	548	$8,230	$4,510,040
2	2849	$1,949	$5,552,701
Totals	3,397		$10,062,741

Summary of Direct and Indirect Effects

The cost of NFS road maintenance would vary by alternative. Alternative D increases maintenance costs more than any alternative. Alternative B would reduce the annual maintenance needs by approximately $5.3 million per year compared to Alternative A, resulting in the lowest annual road maintenance cost. Alternative C would reduce the maintenance need by $3.7 million per year compared to Alternative A. These costs would offset some of the savings mentioned above. Based on this analysis, Alternative B is the preferred alternative.

To support the existing transportation system with current and projected appropriated and non-appropriated maintenance funding, routine maintenance is being reduced, maintenance cycles are extended, and selective repairs are made to ensure public safety and prevent resource damage. Major repairs such as resurfacing or new bridges are funded by special appropriations outside of the Forest's annual budget. Current and projected funding levels do not cover deferred maintenance, which means that the deferred maintenance backlog grows annually.

All action alternatives will create maintenance funding shortfalls to a greater degree than Alternative A, mostly because of adding motorized trails to the transportation system. Not performing routine annual maintenance on time may increase the amount of deferred maintenance. If annual maintenance was fully funded, it would still leave a large amount of deferred maintenance that will be prioritized for completion upon identification of danger to the public or the potential for severe resource damage.

Cumulative Effects – All Alternatives

In addition to funding, the Forest achieves yearly road maintenance goals by working in conjunction with county and state governments. Fluctuation of budgets within other governmental agencies could impact the total number of miles of maintenance achieved.

Potential effects on the road system from activities such as urban development, increased visitation, mineral exploration and other construction activities could include temporary increases in the amount of traffic and road use by OHV vehicles and larger vehicles, primarily construction trucks. Much of the cost of any additional road maintenance needed as a result of commercial activities proposed with these future projects would be borne by the purchaser of the commercial product, and any temporary road needed to access the product would be constructed and then decommissioned by the purchaser when no longer needed.

The effects of cumulative activities, when added to the effects of the activities proposed with this project, would result in additional current maintenance needs. There is also the potential for increased conflict between commercial and noncommercial road users. Some roads and trails being designated as open for motor vehicle use could have an increased concentration of traffic, while other roads and trails could have a decreased concentration of traffic. Potential for conflict would be mitigated by the appropriate use of signing and traffic control during implementation of activities.

Recreation Resources

The Forest supports a wide range of recreational opportunities, including day hiking, backpacking, mountain biking, horseback riding, watching and photographing wildlife and scenery, hunting, cold and warm water fishing, visiting archaeological and historical sites, camping, and picnicking. Although some of these activities may include motorized travel to access them, the motorized travel is not the main point of the activity.

Background

A recreation opportunity is an opportunity to participate in a specific recreation activity in a particular recreation setting to enjoy desired recreation experiences and other benefits that accrue (36 CFR 219.19). Recreation opportunities include nonmotorized, motorized, developed, and dispersed on land, water, and in the air. The opportunities may be provided by the Forest Service or through concessionaire under a special use permit.

A variety of developed and dispersed recreational activities take place on the Tonto National Forest year round. Recreationists tend to flock to the lower Sonoran Desert in the winter and in the summer head to the high country south of the Mogollon Rim.

Special features on the forest that contribute to its recreational resource diversity include portions of a national scenic trail, national millennium trail, and two national recreation trails. In addition, there is one national forest scenic byway along with a state designated historic road and scenic road. Other prominent features on the Forest include Canyon, Saguaro, Apache, Roosevelt and Bartlett Lakes, stretches of the Verde and Fossil Creek Wild and Scenic Rivers, and the Lower Salt River Recreation Area, which are popular for recreationists.

The scenery of the Tonto National Forest can be experienced traveling along two National Forest Scenic Byways along with historic and scenic roads meandering through the Forest. The state-designated Apache Trail Historic Road (State Route 88) was placed in the National Forest Scenic Byway Program in 1986. The road extends 38 miles from Apache Junction to Roosevelt Dam on the Tonto Basin Ranger District. The U.S. Reclamation Service built it as a wagon road to bring supplies from the Phoenix area to the Roosevelt Dam construction site in Tonto Basin. Road construction, begun in 1903, had to cross some of the most complicated topography in the State. The road was officially opened for use on April 24, 1905.

Desert to Tall Pines Scenic Road (State Route 288), established July 13, 2001, runs along the eastern side of the Forest, from the north near the Mogollon Rim. This National Forest Scenic Byway runs south through the Pleasant Valley Ranger District and passes between the Salome and Sierra Ancha wilderness areas and into the Tonto Basin Ranger District where it passes to the east of Roosevelt Lake and continues south to intersect with State Route 188. This 67-mile backcountry route passes through rolling grasslands, ponderosa pines and the rugged Sierra Ancha.

The Gila – Pinal Scenic Road (US 60) was established on June 20, 1986, and is located in the southern portion of the Forest traversing the southern Globe Ranger District. This 26-mile route, skirts the Superstition Mountains and their fabled lost mine, and passes the Boyce Thompson Southwest Arboretum and into the Old West mining towns of Globe and Miami where prospectors found and lost fortunes.

Copper Corridor Scenic Roads East and West (State Route 77) were established on October 17, 2008. They are located in the southern portion of the Forest on the Globe Ranger District, from the towns of Superior and Globe south to the forest boundary. The Copper Corridors offer spectacular scenery for the high desert areas of the state, including winding roadway curves, panoramic views, gigantic open mining activities, and diversity of desert ecology.

Travel Management Rule

The travel management rule provides criteria for recreation considerations in 36 CFR 212.55. The responsible official shall consider effects on the following:

- Provision of recreational opportunities
- Conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands
- Conflicts among different classes of motor vehicle uses of National Forest System lands or neighboring Federal lands

Providing outdoor recreation opportunities with minimized impacts to natural resources is also a primary goal in the Forest Service strategic plan (Forest Service, 2007). Two objectives of the strategic plan are to emphasize (1) improving public access and (2) improving the management of OHVs to protect natural resources, promote safety, and minimize conflicts among users.

Forest Accessibility

It is necessary to clarify how the Final Travel Management Rule affects access to National Forests for people with disabilities. Under section 504 of the Rehabilitation Act of 1973, no person with a disability can be denied participation in a federal program that is available to all other people solely because of his or her disability. In conformance with section 504, wheelchairs are welcome on all National Forest System (NFS) lands that are open to foot travel and are specifically exempted from the definition of motor vehicle in 36 CFR 212.1 of the final rule, even if they are battery powered. However, there is no legal requirement to allow people with disabilities to use OHVs (off-highway vehicles) or other motor vehicles on roads, trails, or areas closed to motor vehicle use because such an exemption could fundamentally alter the nature of the Forest Service's travel management program (7 CFR 15e.103).

OHV Management Challenges

Unmanaged recreation has been identified by the Forest Service as one of four key threats to the nation's forests and grasslands. The use of OHVs is seen as a major component of unmanaged use (U.S. Forest Service, 2006). As states, counties, BLM, and Forest Service restrict OHV use of their lands in Arizona, demand for OHV access to National Forest lands and the importance of the availability of motorized access (amount and location) would increase in importance (National Visitor Use Monitoring data from 2008[62]).

[62] Since the 2013 NVUM is being redone, data for this analysis is from 2008 surveys (U.S. Forest Service, 2009).

Arizona Motorized Outdoor Recreation Trends

The 2013 Arizona Statewide Comprehensive Outdoor Recreation Plan (SCORP) reports that based on the Arizona Trails 2010 Plan, OHV users represent almost 22 percent of the Arizona population which includes residents who use motorized vehicles on trails for multiple purposes. Of that, 11 percent of Arizona residents reported that motorized trail use accounted for the majority of their use and are considered "core users." With Phoenix and surrounding communities being among the fastest growing populations in the State, adjacent forest areas can expect a large increase in visitation.

Arizona Nonmotorized Outdoor Recreation Trends

The 2008 Arizona Statewide Comprehensive Outdoor Recreation Plan (SCORP) provides an indication of anticipated increases in recreation use. In every instance, residents expected to increase the amount of time they spend in the future recreating.

As recreation use increases, the types of recreation activities visitors engage in are likewise increasing and diversifying as the State's population grows and demographics shift. District personnel have observed that recreational activities on the Forest occur in both developed and dispersed settings, and occur in all seasons.

National Visitor Use Monitoring Data

The National Visitor Use Monitoring (NVUM) survey process was designed to better understand recreation use of the NFS lands. The NVUM program provides science-based estimates of the volume and characteristics of recreation visitation to the National Forest System. The information gleaned from NVUM is valid and applicable at forest, regional, and national levels, but was not designed to be accurate at the district or site specific level.

The eight most frequently selected main activities reported by those surveyed on the Tonto National Forest are: hiking/walking (26.3 percent); viewing natural features (23.4 percent), relaxing (23.3 percent), motorized trail activity (17.7 percent), fishing (15 percent), viewing wildlife (14.8 percent), driving for pleasure (14.5 percent), and OHV use (11 percent). These use figures could likely underestimate recreationists since they represent what users indicated as the primary purpose of their visit. Recreationists may not have indicated their mode of travel as the primary purpose of their visit.

Currently, there are no designated motorized trails on the Tonto National Forest. Although some visitors to the Forest indicated they had used motorized trails, more than likely they were actually using forest system roads that have not been maintained or an unauthorized route. Without a dedicated motorized trail system, it may be assumed that the needs of those seeking a motorized trail experience are not being met.

Arizona National Scenic Trail and Great Western Trail Opportunities

The 800 plus mile Arizona National Scenic Trail travels from Mexico to Utah connecting mountain ranges, canyons, deserts, forests, wilderness areas, historic sites, points of interest, communities, and people. The Arizona Trail Association divides the trail into passages, 192.8 miles of which are located on the Tonto National Forest.

In Arizona, the Great Western Trail (GWT) is a system of existing backcountry roads that run north and south from Mexico to Utah. The first segment of the Arizona section of the trail was established in 1996, eight miles located on the Bull Dog Canyon Trail on the Mesa Ranger

District. Another portion, the 71 mile Cave Creek segment was established in 1998. A total of 79 miles of the trail are located on the Tonto National Forest.

Developed Recreation

The Forest Plan defines developed recreation as recreation that requires facilities that result in concentrated use of an area. Developed recreation opportunities on the Tonto National Forest include 113 developed sites with facilities that typically include roads, parking areas/parking spurs, picnic tables, grills, toilet buildings, and possibly shower buildings. The Forest currently has 59 developed camping sites, 26 picnic sites, 18 boating sites, ten fishing sites, three organization camps, 52 trailheads, 8 commercial public service sites (e.g., resorts, marinas), and ten interpretive sites.

No change to developed recreation from existing conditions is anticipated in any alternatives because access to the Tonto National Forest's developed sites will be maintained. As a result, these activities will not be analyzed.

Affected Environment

The Tonto National Forest is the most heavily used forest in the Southwest Region for motorized OHV recreation, including four-wheel drive vehicles, four-wheelers, and motorcycles. An analysis of NVUM data indicates that visitation estimates for the Tonto National Forest make up 67.5 percent of the regional total of primary OHV visits and 54.2 percent of primary and secondary OHV visits for the entire region (English et al., 2004). OHV riding is a popular activity and is also important to the State economically. OHV riding in Arizona contributes over 3 billion dollars to the economy according to the Arizona State Parks (2003)

Recreation Opportunity Spectrum

National Forest visitors are diverse in their preferences for recreational settings, experiences, and activities. The Forest Service uses the Recreation Opportunity Spectrum (ROS) to provide a variety of recreation opportunities that can be enjoyed in diverse settings. The social, managerial, and physical attributes of a place, when combined, provide a distinct set of recreation opportunities.

The ROS provides a framework for defining the types of outdoor recreation opportunities the public might desire, and identifies that portion of the spectrum a given national forest might be able to provide (U.S. Forest Service, 1982). ROS defines recreation and arranges them into a continuum of six distinct classes including primitive, semi-primitive nonmotorized, semi-primitive motorized, roaded natural, rural, and urban. These objectives are general goals, not standards and guidelines, and do not strictly govern future development.

These settings represent a range from a very high probability of solitude, self-reliance, challenge, and risk to a very social experience where self-reliance, challenge, and risk are less important (U.S. Forest Service, 1982). The physical setting is defined by the absence or presence of human sights and sounds, size, and the amount of environmental modification caused by human activity. The social setting reflects the amount and type of contact between individuals or groups. The managerial setting reflects the amount and kind of restrictions placed on people's actions by the respective administering agency or private landowner (U.S. Forest Service, 1986).

Conflicts Associated with Motor Vehicle Use

Members of the public, Arizona Game and Fish Department, and Arizona Parks and Recreation Department have shared their concerns about unrestricted OHV travel on public lands. Complaints focus on noise, litter, lack of environmental ethics, and safety concerns. The Nonmotorized Arizona Trails 2000 (AZSP, 1999) showed that 82 percent of motorized and 81 percent of nonmotorized trail users expressed concern over behavior of other users. These concerns often lead to conflict. Conflicts exist on the Tonto National Forest between motorized recreationists and nonmotorized recreationists, classes of motor vehicle use, and adjacent land owners mainly due to the lack of designated motorized trails.

Studies have shown that managerial actions can have a very strong impact on managing perceived and actual conflict between users and thus enhance visitors' recreational experiences (Reichart and Arnberger, 2010). By designating routes and areas for motorized use, impacts from noise, dust, and potential safety concerns are more predictable and thus result in less actual and perceived conflict between motorized and nonmotorized users (Hunt *et al*., 2009; Koontz, 2005; Frost and McCool, 1988; Fillmore and Bury, 1978; Bury and Fillmore, 1974).

The large majority of research on the social impacts of OHV use shows that the impacts between motorized users and other recreationists (including other motorized uses) are asymmetric; meaning that motorized users affect other recreationists more than they are affected by other recreationists and often this leads to displacement of nonmotorized recreationists (Adams and McCool, 2009; Stokowski and LaPointe, 2000; McCay and Moeller, 1976; Lynn and Brown 2003). This impact is not only a result of the direct effects of motorized use such as noise and dust, but also from the indirect impacts of reduced vegetation, clearly altered natural areas from human activities, and the reduction in opportunities to view wildlife.

Comments were submitted regarding the Final Travel Management Rule relating to the noise of motor vehicles and what should be done to abate or eliminate the problem. In response, the Department of Agriculture indicated that, "Noise is a particularly important issue affecting OHV use nationally. The Forest Service anticipates developing a national standard for OHV noise levels in a future rulemaking" (Federal Register, Volume 70, Number 216, 2005). Until such time, noise will continue to be an issue surrounding motor vehicle use on NSF lands.

Motorized and Nonmotorized Recreationists

Because of the trend of increasing OHV use, there is a greater chance for conflicts between users that favor motorized recreation and those that do not. The earliest approach to recreational conflict was to view it as competition for resources among user groups (Devall and Harry, 1981; Owens, 1985). Two more theoretically grounded and somewhat overlapping conceptualizations today are categorized as follows: conflict as goal interference and conflict based on differences in social values (MacLennan and Moore, 2011). Jacob and Schreyer (1980) conceptualized that goal interference can arise between recreationists on the basis of four distinct factors: activity style – the various personal meanings attached to an activity, resource specificity – the significance attached to using a specific recreation resource for a given recreation experience, mode of experience – the varying expectation of how a natural environment is perceived, and tolerance for lifestyle diversity – the tendency to accept or reject lifestyles different from one's

own. Use conflict often can be “asymmetrical” in that one user group is generally more impacted by conflict than the other[63].

Often motorized and nonmotorized users share the same or similar goals, but those seeking quiet and solitude through nonmotorized means are more likely to be disturbed by engine noise from an OHV than are those traveling by motor vehicle. The rise in motorized activity over the past two decades represents a rapid change in one factor affecting forest recreation settings; the prevalence of motorized activities and the evidence of such activities that threaten to diminish user expectations for, and enjoyment of, more primitive setting attributes in some areas of the forest. The continued rise in motorized activity in the more primitive settings threatens to disrupt and displace, or at least to diminish, the experiences sought by many forest recreationists.

Many nonmotorized recreationists seek opportunities for solitude, challenge, and risk on the Tonto National Forest. The same often applies to motorized users. Presently there are opportunities forestwide for such recreation settings and for all recreationists; however, on Mesa and Cave Creek Ranger Districts there are popular areas that nonmotorized recreationists, such as equestrians, utilize that have a proliferation of motorized use. These highly-concentrated motorized use areas tend to diminish solitude opportunities for nonmotorized recreationists. Conflicts occur when nonmotorized visitors, such as hikers, mountain bikers, and equestrian, travel within these districts expecting a quiet recreation experience, instead are faced with motor vehicle users that may present safety concerns. This is particularly evident when equestrians encounter fast moving, loud motor vehicles.

Since there are no motorized trails on the Forest, motorized users may use nonmotorized trail system, which also creates conflicts between nonmotorized and motorized recreationists including disturbance by OHV engine noise. Hikers and mountain bikers have been known to complain of unwanted vehicle intrusions on the designated nonmotorized trail system, such as Arizona National Scenic Trail, and in areas they are not anticipating encounters with motorized vehicles, such as forest lands with a primitive ROS setting.

On the other hand, due to there being no designated motorized trails, the Forest does not provide a diverse range of safe motorized recreational opportunities and does not meet expectations or desires of motorized recreationists looking specifically for motorized trails. This is most evident when motorized users are in areas popular with motor vehicle use, such as The Rolls (Mesa Ranger District). Conflict occurs when these users encounter a slower moving nonmotorized recreationist, including hikers, mountain bikers, or equestrians, on the same route. This can be especially dangerous for everyone involved on blind curves.

Classes of Motor Vehicle Use

The lack of designated motorized trails on the forest also creates conflicts between classes of motor vehicle use due to preferences of drivers/riders for width of routes, distance traveled, and speed. Drivers of four-by-four full-sized vehicles prefer wide routes and traveling long distances, since they drive in comfort with their supplies, along with means to cool or warm themselves. Riders of side-by-sides (UTVs), ATVs, and off-road motorcycles/dirt bikes look for narrower, shorter routes, since they cannot carry as much supplies and exert more energy riding. In addition, four-by-four full-sized vehicles take corners more slowly because they are larger, heavier, and more difficult to maneuver than the lighter weight UTVs, ATVs, and off-road

[63] GAO report June 2009 report to subcommittee on National Parks, Forests, and Public lands, Committee on Natural Resources, House of Representatives; Enhanced Planning Could Assist Agencies in Managing Increase Use of Off-Highway Vehicles.

motorcycles/dirt bikes that travel fast around corners. Dangerous conditions arise when different classes of motor vehicle use meet at blind corners or narrow passages where there is poor visibility. This type of conflict is almost exclusively related to the designation of motorized trails more so than dispersed camping access or big game retrieval.

Adjacent Land Owners

Within the Tonto National Forest, there are several towns—like Payson and Young—and other private inholdings. In addition, several towns and cities—like Mesa and Scottsdale—are adjacent to the Tonto National Forest. While these lands are not under the jurisdiction of the Forest Service, land management actions may still affect these land owners. The designation of motor vehicle use within close proximity to land owners has the potential to affect them by increasing noise, dust, and even illegal trespass on to their land. The effects from noise can be exacerbate by users of motor vehicles not complying with regulations, such as not having a spark arrester on their vehicle, which reduces the sound emitted from a vehicle.

Roads and Trails Designated for Motorized Use

Access to and within the Forest will likely define the location, experience, and opportunities for those who visit the Forest. Almost all activities one could pursue on a national forest involve driving on forest roads. Whether it is to access a trailhead or dispersed camping area, collect firewood, or driving for pleasure, motor vehicle use generally has a major influence on where and how the public uses public land.

Different uses vary in their dependence on forest roads and differ in the type of route being used. For example, OHV use depends not only on major roads to access trailheads, but also can include the use of many unmaintained routes, trails, and often open country where there is no established route. In fact, studies show that common OHV user preferences include less-populated routes with challenging terrain (Albritton and Stein, 2007; Snyder *et al*., 2008), which also means that these routes are the less maintained level 2 and level 1 roads or unauthorized trails and off-road use.

The existing road system does not include trails specifically dedicated to ATVs or off-road motorcycles.

Motorized Cross-Country Travel

Today, many individuals and families come to the Forest with their trailers and trucks loaded with OHVs for the sole purpose of riding in the forest, enjoying the challenge of riding rough trails and country, seeing new areas, and relaxing in the forest. Cross-country travel is currently open on over 700,000 acres on Payson and Pleasant Valley Ranger Districts by recreationists for: retrieving game; testing technical skills and exciting off-route travel; traveling between two existing routes or to points of interest; accessing dispersed campsites by a motorized mode of travel; or gathering forest products (i.e., seeds, cones, driftwood and firewood gathering for dead and down) outside of designated areas. Cross-country travel was restricted on the southern ranger districts (Cave Creek, Globe, Mesa, and Tonto Basin Ranger Districts) per forest plan, unless posted open, however, illegal cross-country travel is known to occur. Currently, the Forest lacks areas specifically designated for off-road motorized use.

When motorized users travel cross-country, they tend to create unauthorized routes when done repeatedly. As a result, increase in the use and creation of unauthorized routes is likely to continue and increase, along with degradation to the natural landscape. As the number of users

continue to increase, the demand for additional motorized routes for recreation activities is likely to increase, which in turn could increase the conflicts between motorized and nonmotorized, class of motor vehicles, and between motorized recreationists and adjacent land owners.

There are many locations where highly-concentrated motorized use occurs on ranger districts within the urban interface. OHV use is concentrated in Sycamore and The Rolls on Mesa Ranger District and Desert Vista on Cave Creek Ranger District. The public has found motorized recreational use most enjoyable in these locations due to their proximity to the Metropolitan Phoenix Area and the open, varied desert terrain. Families with young OHV users and beginners, OHV clubs, and small groups of motorized recreation enthusiasts frequent these intensively-used areas.

The mostly flat areas around Bartlett and Roosevelt Lakes, often devoid of vegetation, are also areas where illegal cross-country travel is known to occur resulting in route proliferation and conflicts between motorized users and nonmotorized recreationists.

Sycamore Creek is indicative of the heavy use occurring in these concentrated use areas. Users of this site refer to it as “Sycamore OHV area” but the Tonto National Forest has not designated any areas as OHV areas per the Final Travel Management Rule. The bare ground and scarred landforms from an extensive network of unauthorized routes along with hill climbs found in Sycamore Wash have contributed to severe degradation of the natural desert. Often, these routes are created by users trying to exit the wash by driving up the incline or using these inclines to enhance the difficulty or vary the terrain in their motorized experience.

In a 2008 study data was collected for the desert ecoregion on the Mesa Ranger District of the Tonto National Forest, “Because of the close proximity of Phoenix, Arizona, this ranger district receives an estimated 5,000 ATV users per week” (Meadows *et al.*, 2008, p. 35). The study found that properly designed and maintained motorized routes decreased the negative effects on natural resources, including scenery (Meadows *et al*., 2008).

Permit Zones

A popular area for motorized recreationists is the 34,720-acre Bulldog Canyon OHV Area (not considered an OHV area per the Final Travel Management Rule) on Mesa Ranger District. In Bulldog Canyon, uncontrolled vehicles use was contributing to considerable environmental damage. However, total closure was undesirable due to its proximity to the Phoenix-metropolitan area. Fencing and gates were installed in 1997 to designate zone boundaries. Motorized vehicle use in the permit zone is prohibited with exception of persons who have written authorization. Visitors receive a free permit and gate code from the Mesa Ranger District to access the permit zone along with a map and regulations. Guided Jeep Tours also provide access to this area. Motorized vehicles are required to stay on the 30 miles of system roads within. Permits are not required for nonmotorized recreationists such as equestrians and hikers who may enter the zone through equestrian/pedestrian gates. The number of permits issued for the Bulldog Canyon Permit Zone is estimated on average of 750 per month over the course of a year, or 9,000 annually. During periods of high use (winter), permits issued can be up to 30 to 50 permits per day.

There are two main differences between the proposed designated OHV areas and the proposed permit zones. In OHV areas, permits will not be required and travel will not be restricted within the area. Although most of the proposed OHV areas are in locations where motorized cross-

county travel has been restricted, they are extremely popular locations with OHV enthusiasts due to their proximity to major metropolitan areas and varied desert terrain.

Motor Vehicle Use for Big Game Retrieval

Big game hunting is a popular activity on the Tonto National Forest that brings many high-clearance and four-wheel drive vehicles to the Forest for both official hunting seasons and scouting for game before the seasons begin[64].

Motorized vehicles are currently not allowed to travel off road for retrieving big game on Cave Creek, Globe, and Mesa, and Tonto Basin ranger districts. However, illegal cross-country travel is known to occur and likely will continue. Conflicts often occur and likely will continue when hunters traveling by foot or horseback on these southern districts are disrupted by the arrival of hunters and others using motor vehicles. These accounts are supported by a study from the Arizona Game and Fish Department which found that 54 percent of survey participants identified "OHV disruption" as a barrier to participation in hunting (2005). Conflicts also occur and will likely continue when nonmotorized recreationists, such as hikers, mountain bikers, and equestrians, expect a quiet recreation experience and instead motor vehicle use where they are prohibited by those engaging in hunting activities.

Motor Vehicle Use for Dispersed Camping

Forests in the Southwestern Region receive some of the highest dispersed use in the nation (English, 2009), likely due to the open vegetation and year-round sun. Dispersed recreation consists of those activities that take place after the motor vehicle stops. Dispersed recreation occurs throughout the Tonto National Forest where there are few or no facilities in undeveloped or general forest areas. Dispersed recreation includes the full suite of outdoor nonmotorized and motorized recreation opportunities available throughout the year.

Motorized dispersed camping describes the practice of driving vehicles to a campsite and camping with the vehicle(s) in the vicinity in locations chosen by forest visitors. (This is in contrast to camping at a developed campground where amenities such as restrooms, water, and defined camping spurs are provided). Dispersed camping is an important use of the Forest, and for many people is an inherent part of their recreation expectation and experience. Based on Forest Service employee observation and expertise in the field, the majority of dispersed camping access on the Tonto is by motorized vehicles. From simple car-camping with tents, to overnight camping with larger vehicles such as motor homes, or RVs, camping outside of developed campgrounds in areas without amenities is desirable for many people. This type of camping experience is sought in many places, including along roads in remote locations, near lakes, creeks and rivers, or in quiet and secluded parts of the forest.

Driving off-road for accessing dispersed camping is permitted in the northern districts (Payson and Pleasant Valley) while it is prohibited in the southern districts (Cave Creek, Globe, Mesa, and Tonto Basin) unless posted open; however, campers have been cited for driving off roads illegally in these lower elevation districts. Generally, dispersed camping is more popular at higher elevations on Payson and Pleasant Valley Ranger Districts from May through September, where cross-country travel is permitted. The Cave Creek, Globe, Mesa, and Tonto Basin Ranger Districts are generally more popular during colder seasons. Most frequently used dispersed campsites, where evidence of past use exists, on the northern districts are located some distance from the edge of National Forest System roads. This results in a short (100 to 300 feet)

[64] For more information on hunter satisfaction, see the Game and Nongame Species section of this chapter.

unauthorized route leading to them. Typically, these campsites include an open, cleared area from vehicles parking and turning around. On the southern districts, dispersed campsites tend to be user created pullouts along NFS roads and unauthorized routes or in desert washes.

Much like with the conflicts from motorized big game retrieval, hunters that disperse camp without the aid of a motor vehicle in remote forest areas find that “OHV disruption” is a barrier to their hunting experience. In addition, conflicts will occur when nonmotorized recreationists, such as hikers, mountain bikers, and equestrians, expect a quiet recreation experience and are instead presented with a motor vehicle user engaged in dispersed camping.

Environmental Consequences

CEQ regulations for implementing NEPA state that when an agency is evaluating reasonable foreseeable significant adverse effects on the human environment, in an EIS, and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking (40 CFR 1502.22).

Recreation Opportunity Spectrum

For the current Forest Plan the ROS Users Guide (U.S. Forest Service, 1982) was followed to designate Recreation Opportunity Spectrum (ROS) classes for all areas of the forest, creating the ROS inventory. Congressionally-designated wilderness areas are often associated with a primitive type of recreation opportunity, but the primitive ROS class is not synonymous with designated wilderness. The following was noted by the forest landscape architects designating ROS classes:

> It must be remembered that Wilderness areas are zoned in the same fashion as the rest of the forest. So the wildernesses do have areas zoned SPM [semi-primitive motorized] or RN [roaded natural]. All areas zoned SPNM [semi-primitive nonmotorized] or P [primitive] were examined through air photos to ascertain the actual existence or non-existence of roads. Approximately 50% of these areas were changed to SPM because of the existence of roads. Any roads in a designated wilderness area were assumed to be closed unless specific mention of their being used was made by district representatives.

When the ROS inventory was completed for the Forest Plan, GIS systems did not exist so the inventory was completed manually and consisted of overlays of Mylar. In 2006, hard copies of the original ROS inventory were digitized and integrated into the GIS system, creating the current dataset for 1985. Since then numerous changes in the software used to manage geographic data have occurred resulting in spatial differences, including wilderness boundaries and discrepancies in the current dataset. These discrepancies resulted in one half a percentage of unknown ROS class as shown in Table 28, which displays the 1985 ROS classifications (current dataset) when the Forest Plan was signed and Figure 21 which shows a map of the forest by ROS class. In 1985, approximately 34 percent of Tonto National Forest lands offered recreation opportunities in the semi-primitive nonmotorized setting, over 33 percent in the semi-primitive motorized setting, and over 20 percent in the roaded natural setting. Over one percent of forest lands offered recreation opportunities in the rural setting and about one percent in the urban setting. Almost nine percent of Forest land offered recreation opportunities in the primitive setting.

Table 28. Recreation Opportunity Spectrum Classes - 1985 (Current Dataset)

ROS Class	Current Dataset (1985) Acres	Current Dataset (1985) Percent of Forest
Urban	31,373	1.1
Rural	41,859	1.4
Roaded Natural	613,448	20.7
Semi-Primitive Motorized	994,373	33.5
Semi-Primitive Nonmotorized	1,007,967	34.0
Primitive	260,506	8.8
Unknown	16,143	0.5
Total Acres	2,965,669	100

In addition to the discrepancies, the Forest's ROS classes have not been updated since the Forest Plan to reflect site-specific projects effecting ROS designations. Thus, the existing inventory does not identify which areas are currently providing what kinds of settings and opportunities.

Part of the importance of ROS is to ensure the Tonto is providing a diversity of recreation settings and opportunities that respond to publics' desires and expectations. Also, the ROS helps managers ensure that activities people want to pursue are consistent with the desired recreation setting. However, types of recreation activities change over time (i.e., introduction of new activities), as does the popularity of recreation activities (i.e., some activities are more popular now than they were in the past). The Forest recognizes there is a need to re-inventory the recreation supply opportunities, so has partnered with TEAMS, a Forest Service Enterprise group, to formally re-designate the Forest's ROS classes, creating a new ROS inventory. Although, since the ROS re-designation hinges on the final travel management decision, it was determined that more accurate representation of the existing settings and opportunities the Forest provides was necessary for this analysis. Re-designation was done in 2013 by assigning all wilderness areas as primitive class and buffering the road system using the same process that was used to create the original ROS inventory for the Forest Plan. This process generated the current condition for the ROS classes for analysis in this report (Table 29).

Table 29. Recreation Opportunity Spectrum Classes - Current Condition (2013)

ROS Class	Updated Current Condition (2013) Acres	Updated Current Condition (2013) Percent of Forest
Primitive	588,937	20
Semi-Primitive Nonmotorized	519,259	18
Semi-Primitive Motorized	1,212,083	41
Roaded Natural	571,379	19
Rural	41,691	1
Urban	30,939	1
Total Acres	2,964,287	100

Table 29 clearly shows that the current GIS dataset associated with the Forest Plan underrepresented the approximately 20 percent of land currently offering recreation opportunities in a Primitive setting, which is approximately 11 percent more than the Forest Plan. The GIS dataset overrepresented the amount of forest lands providing a Semi-Primitive Non-Motorized setting with approximately 18 percent, 16 percent higher than the current condition. Currently approximately 41 percent of the forest offers recreation opportunities in the semi-primitive motorized setting, which is over seven percent more than the dataset and 19 percent in the roaded natural setting, almost two percent less than the dataset. One percent of forest lands currently offer recreation opportunities in the rural and urban settings, similar to the This updated existing condition better articulates the current on-the-ground condition and allows for a more meaningful understanding of the effects associated with the action alternatives (Figure 22) and is the best available data,

Conflicts Associated with Motor Vehicle Use

Overall, user conflicts on motorized routes is expected to be minimized by implementing the Final Travel Management Rule, because the locations of motorized routes, motorized dispersed camping and big game retrieval corridors, designated OHV Areas, and permit zones would all be defined and published on the Motor Vehicle Use Map (MVUM). When a user's expectations of what they will experience are aligned with the opportunities provided that user's satisfaction is increased and conflict between users had the potential to be reduced. Researchers have found that such a system reduces direct conflicts (Filmore and Bury, 1978; Frost and McCool, 1988; Albritton and Stein 2007; Snyder *et al.*, 2008). There is no site-specific data available regarding user conflicts on the Tonto National Forest.

Alternative A (No Action) – Direct and Indirect Effects

Under this alternative, there would be no changes from the current condition.

Roads and Trails Designated for Motor Vehicle Use

In Alternative A, management of motorized recreation on the Tonto National Forest would not change from the existing condition. The existing 2,952 miles of roads open to passenger and high clearance vehicles on the Forest and 2,006 miles of open routes where the maintenance level is unknown would remain open. There are no trails specifically managed for motorized use on the Tonto and the Forest will continue not providing this opportunity in this alternative. Since there are no designated motorized trails, the Forest will continue not providing a diverse range of safe, motorized-specific recreational opportunities and not meeting expectations or desires of OHV users looking specifically for this recreation endeavor.

Currently there are few opportunities to recreate in the Forest without being near a road, except in designated wilderness areas (Figure 23). Approximately 59 percent of the forest is within 0.5 miles of an open motorized route, with no areas outside of designated wilderness located greater than four miles away from a road. Of the non-wilderness, 7.6 percent of the forest is located within two to four miles from an open motorized route. Currently designated wilderness provides the only opportunity for those forest visitors seeking solitude where they can recreate in a setting greater than four miles from an open road and this would likely continue.

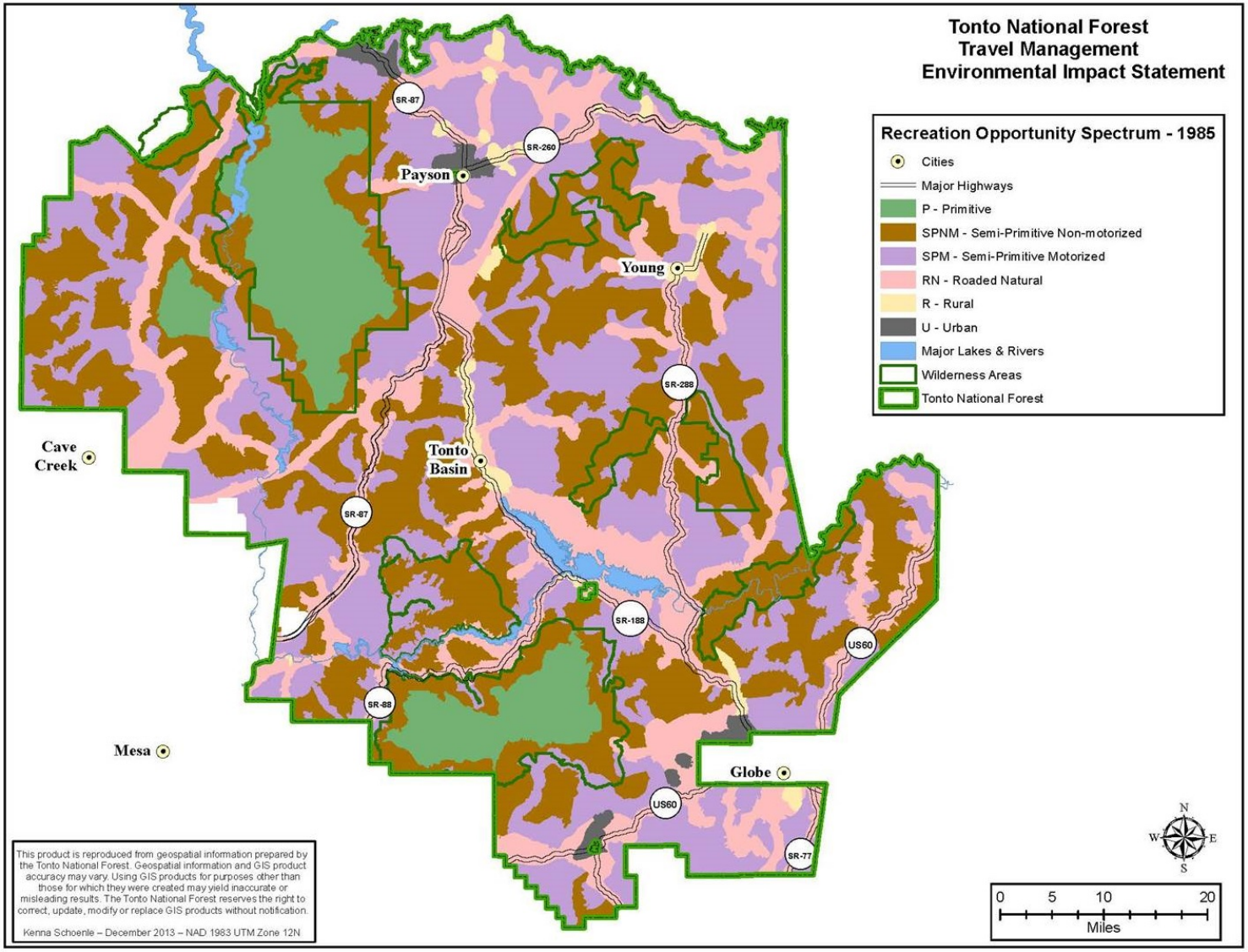

Figure 21. Map of Recreation Opportunity Spectrum Classes - 1985 (Current Dataset)

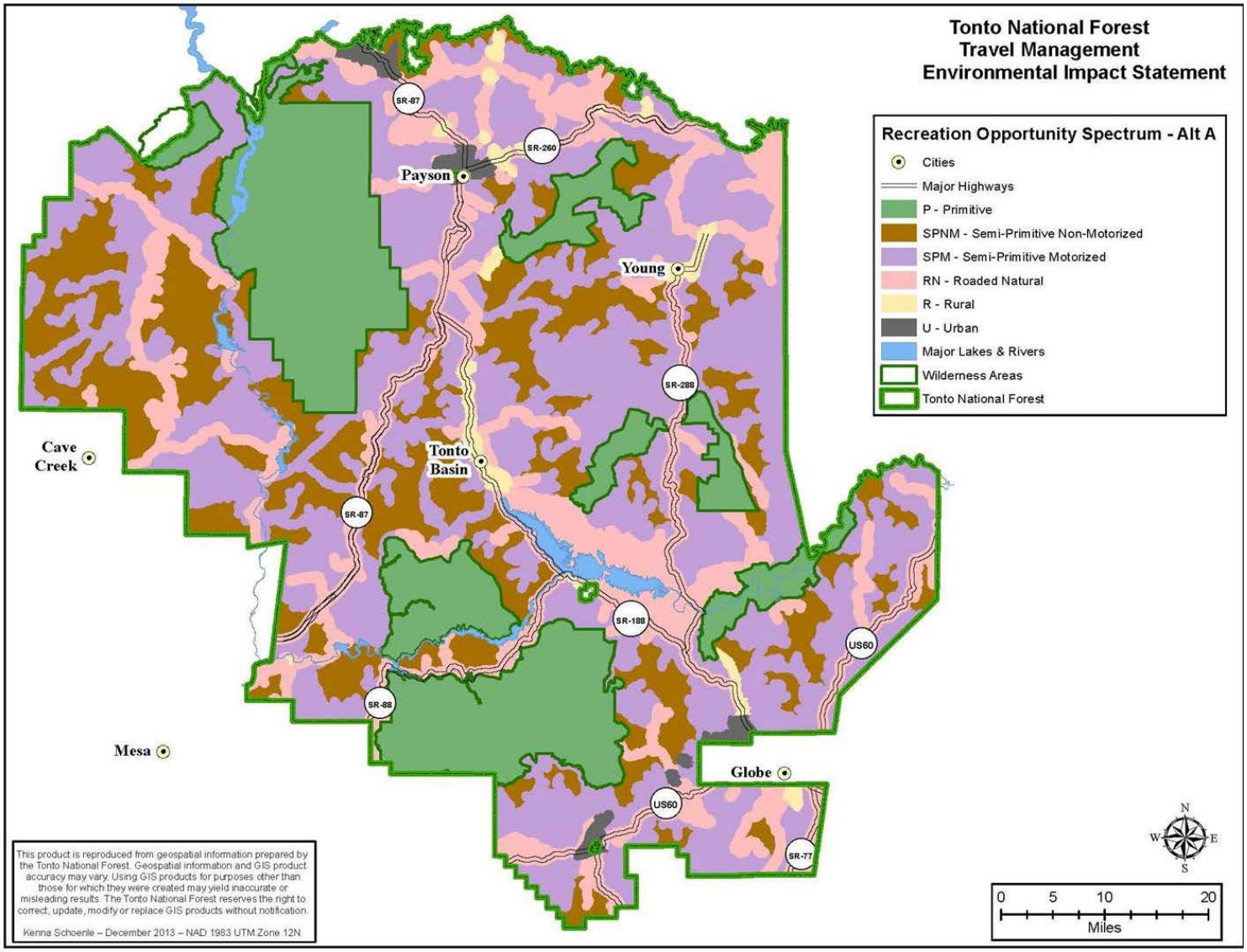

Figure 22. Map of Recreation Opportunity Spectrum Classes - Current Conditions (2013)

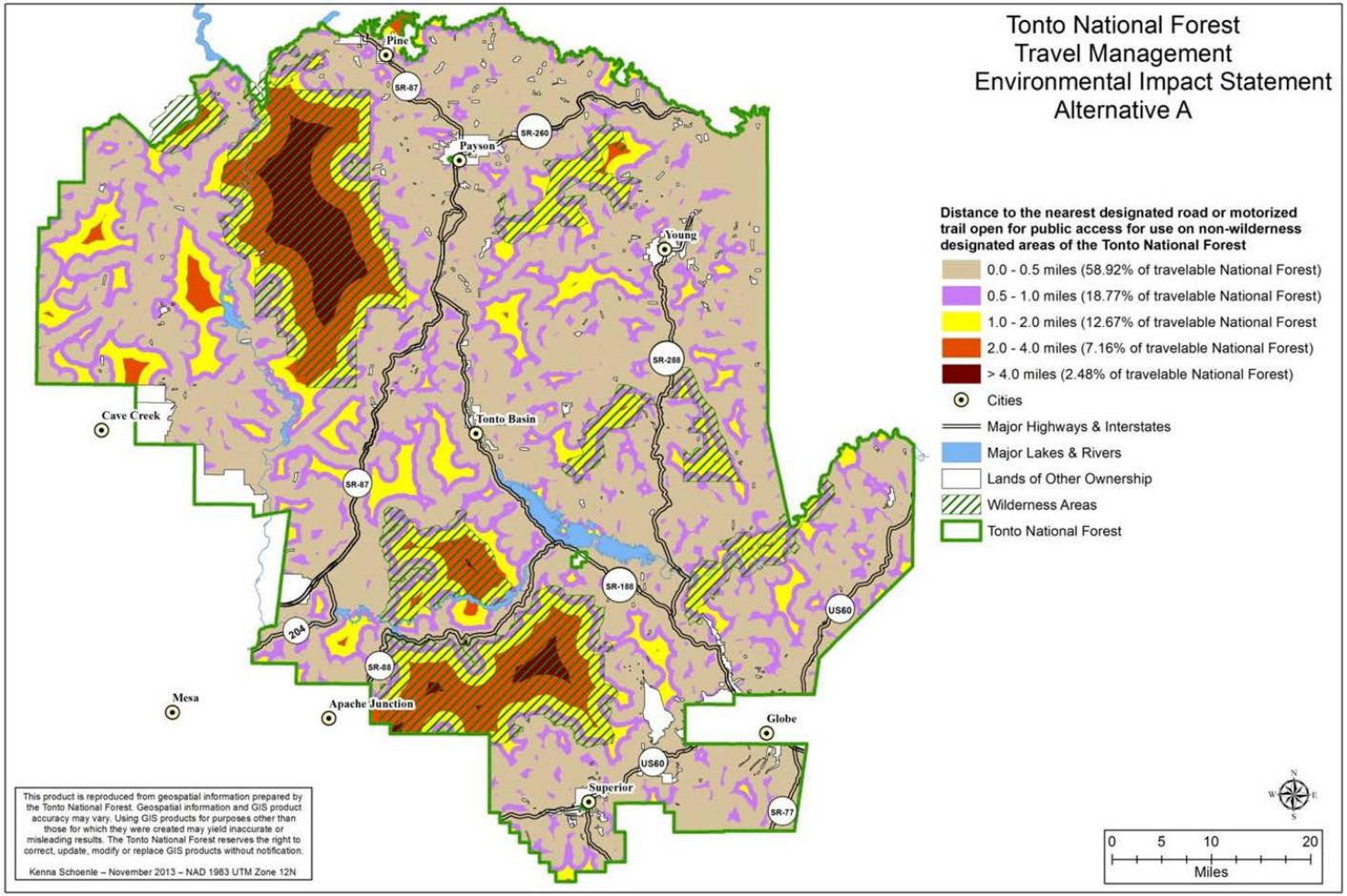

Figure 23. Map of Distance to Nearest Designated Road or Motorized Trail – Alternative A

Effects to Conflicts Associated with Motor Vehicle Use

The current lack of trails and OHV areas specifically managed for motorized use on the Forest will continue to create conflicts between motorized recreationists and nonmotorized recreationists, classes of motor vehicle use, and adjacent land owners and they will likely continue. Due to the popularity of OHV use and/or restrictions placed on state and local government land, motored use on the Forest is likely to increase, which will increase these conflicts.

Motorized and Nonmotorized Recreationists

Since there are no trails specifically managed for motorized use on the Forest, motorized users tend to travel cross-country and utilize the nonmotorized trail system. Nonmotorized recreationists will likely continue to complain of unwanted vehicle intrusions on the designated non-motorized trail system, such as Arizona National Scenic Trail, and in areas that they are anticipating the vehicle use is not permitted, such as areas with a Primitive ROS setting.

Classes of Motor Vehicle Use

The current lack of designated motorized trails also creates conflicts between classes of motor vehicle use due to preferences of drivers/riders for width of routes, distance traveled, and speed. Since there are no clear guidelines for each class these conflicts along with safety issues will likely continue and increase.

Adjacent Land Owners

The conflicts associated with private land owners and motor vehicle use will continue as described in the affected environment section of this report.

Effects to Recreation Opportunity Spectrum

There are currently roads in areas desired for semi-primitive nonmotorized recreation opportunities and the road density is often greater than desired in semi-primitive motorized areas. The existing road system has negative effects on the semi-primitive nonmotorized ROS settings since these are locations where recreationists expect to find nonmotorized settings and opportunities.

There would be no change in the current conditions (2013 ROS class dataset) for ROS classes for the Forest.

Effects to Arizona National Scenic and Great Western Trails

Currently nonmotorized recreationists utilizing the Arizona National Scenic Trail encounter motorized recreationists. This is due to 4.2 miles of the trail being located on system roads and the trail crossing motorized routes 50 times (Table 30) over the course of the 186 miles within the Forest. These encounters with motorized recreationists on a nonmotorized trail intended to provide a nonmotorized experience does not meet the intent nor provide the experience many hikers, mountain bikers, trail runners, and equestrian riders who utilize the trail expect.

Table 30. Occurrences of Motor Vehicle Routes Crossing, Arizona National Scenic Trail – Alternative A

Passage Name (Trail Mileage)	Number of Motorized Crossings
Alamo Canyon (10.9)	3
Reavis Canyon (17.8)	12
Superstition Wilderness (28.6)	5
Four Peaks (18.4)	5
Pine Mountain (18.9)	9
Saddle Mountain (15.2)	3
Mazatzal Divide (20.9)	0
Red Hills (13.6)	1
Whiterock Mesa (10.9)	1
Hardscrabble Mesa (11.5)	8
Highline (18.6)	3
Gila River Canyons (0.3)	0
Total (185.6)	50

The Great Western Trail is located on 71 miles of passenger vehicle (ML 3-5) and eight miles of high clearance (ML 2) roads. This currently provides a semiprimitive motorized setting and experience for visitors on the Great Western Trail.

Effects of Motorized Trail Maintenance[65]

Currently, there are no designated motorized trails on the Tonto National Forest. The budget allocated to maintain trails is currently, and has been historically, used to maintain nonmotorized trails. However, as indicated in the NVUM survey results, many visitors to the Tonto National Forest believe they are recreating on motorized trails; likely ML 2 roads that have overgrown vegetation and challenging terrain.

Future budget funding projections are currently unknown. Since the Tonto National Forest currently does not have a designated motorized trail system, the emphasis of the trail program is on maintenance, reconstruction, and signing of the forest nonmotorized trail system. Funding is limited for the signing and restoration of unauthorized routes. The partnership and volunteer program on the Tonto National Forest greatly attributes to visitor contacts, trail maintenance, reconstruction, and restoration of unauthorized routes.

Using the 2005 to 2010 Average National Trail Cost Figures, the estimated five year averages of the current Tonto National Forest nonmotorized trail needs are: total operations $160,863, deferred maintenance $2,229,440, annual trail maintenance $529,440 and trail capital improvement (trail reconstruction) $2,948,985. The total (2005 to 2010 average allocation numbers) for funding the Tonto National Forest's trails program including operations, maintenance, and trails capital investment is $1,677,237, which currently goes to maintain the nonmotorized trail system.

[65] For information related to the costs of designated road maintenance, see the Transportation Facilities section of this chapter.

Motorized Cross-Country Travel

In Alternative A, the forest will continue not having formally designated areas for cross-country travel. Cross-country motorized travel will continue being allowed on the Payson and Pleasant Valley Ranger Districts (703,618 acres total). In spite of restrictions on cross-country travel, illegal use will continue on the Cave Creek, Globe, Mesa, and Tonto Basin Ranger Districts. Other forestwide closures in the Forest Plan, previous Forest Closure Orders, and legislative actions such as congressionally-designated wilderness areas will continue not allowing cross-country motorized travel.

As the number of motorized recreationists continues to increase, demand for cross-country travel will likely increase. Although cross-country travel in the lower elevation, desert areas is not permitted, illegal use will likely continue, expanding areas where cross-country travel currently exists.

Under this alternative, there will be no change to ROS classes and effects from cross-country travel will be similar to those related to roads.

Conflicts between motorized recreationists and nonmotorized recreationists, different classes of motorized user, and adjacent land owners will likely continue to occur and potentially increase in these locations as use is expected to increase.

Motor Vehicle Use for Big Game Retrieval

The Payson and Pleasant Valley ranger districts (703,618 acres) currently permit hunters to travel off-road with a motorized vehicle to retrieve any downed game animal. Motor vehicles are not permitted to travel off-road for the purpose of game retrieval on the Cave Creek, Mesa, Globe, or Tonto Basin Ranger Districts; however, it is known to currently occur since the prohibition on cross-country travel is difficult to enforce.

Under this alternative, there will be no change to ROS classes and effects from motor vehicle use for big game retrieval will be similar to those related to roads.

Conflicts are known to occur, and likely will continue, when hunters traveling by foot or horseback on the southern ranger districts are disrupted by the arrival of hunters and others using motor vehicles where they are prohibited. Conflicts also occur and will likely continue when nonmotorized visitors such as hikers, mountain bikers, and equestrians expect a quiet recreation experience and instead find motor shooting and vehicle use where they are prohibited.

Motor Vehicle Use for Dispersed Camping

As with big game retrieval, using a motor vehicle to access dispersed campsites is permitted on the Payson and Pleasant Valley ranger districts and not permitted on the southern districts. It is likely this motorized use will continue on both the northern and southern ranger districts. The effects and conflicts associated with motor vehicle use for dispersed camping are expected to be similar to those associated with big game retrieval and cross-country travel and will likely continue. In addition, there will be no change to ROS classes and effects from motor vehicle use for big game retrieval will be similar to those related to roads.

Alternative B – Direct and Indirect Effects

This alternative provides less motorized access than the existing condition.

Roads and Trails Designated for Motor Vehicle Use

Alternative B proposes the least miles of roads open to the public with 893 miles (1,293 total miles available to the public, including highways and country and state roads). There will be approximately 1,666 miles of motorized trails, which includes one mile of single-track trail. And there are 11 miles of unauthorized routes proposed to be included in the road system that will be open to the public, while none of the inventoried unauthorized routes are proposed to be included in the motorized trail system. Overall, Alternative B proposes almost 2,400 miles less motorized routes open to the public than currently exists.

Under Alternative B, the ability to recreate away from motorized routes outside of designated wilderness will be greater than the current condition (Figure 24). Approximately 43 percent of the Forest will be located within 0.5 miles from an open motorized route outside of wilderness, with less than five percent located outside of wilderness providing an opportunity greater than four miles from an open motorized route. For those seeking recreation away from motor vehicle use, this alternative provides the greatest opportunity. However, for those seeking a motorized opportunity, this alternative substantially decreases the opportunity.

Effects to Conflicts Associated with Motor Vehicle Use

This alternative decreases the miles that are available for motor vehicle use, which in turn may increase conflict in a more asymmetrical manner. This change will likely increase opportunities for those seeking quiet and solitude, away from the noise generated by motor vehicles.

Motorized and Nonmotorized Recreationists

Motorized users will likely have greater conflict with nonmotorized recreationists on routes designated for motor vehicle use as this mileage will be substantially less. Just like with the current situation, if motorized users venture onto nonmotorized trails where motor vehicle use is prohibited, conflicts will continue. However, with the decrease in mileage and cross-country travel being prohibited, the ability to access these nonmotorized trails will likely decrease.

Classes of Motor Vehicle Use

This alternative, with the exception of one mile of single-track, does not provide opportunities for different motor vehicle classes as nearly all the designated motorized trails are for four-by-four full-sized vehicles. This will result in greater conflict between different classes of motor vehicle use.

Adjacent Land Owners

For adjacent land owners, this alternative will provide the least amount of conflict with motor vehicle users, as it designates the least amount of mileage near their property.

Effects to Recreation Opportunity Spectrum

In Alternative B, there would be 461,459 acres more semiprimitive nonmotorized ROS setting, nearly double, than Alternative A (Table 31 and Figure 25). Recreationists seeking motorized recreation opportunity in the Forest would have fewer opportunities, while those seeking nonmotorized recreation would have more opportunities than the current condition. A conflict could arise with those that are familiar with the current setting and opportunities in areas that will change. In addition, this alternative will require a Forest Plan amendment, because it will not comply with the current Forest Plan ROS.

Table 31. Recreation Opportunity Spectrum Classes - Alternative B, Change from Current Condition (2013)

ROS Class	Alternative B Acres	Current Condition (2013) Acres	Difference Acres
Primitive	621,683	588,937	+ 32,746
Semi-Primitive Nonmotorized	980,718	519,259	+ 461,459
Semi-Primitive Motorized	843,000	1,212,083	- 369,083
Roaded Natural	445,909	571,379	- 125,470
Rural	41,774	41,691	+ 83
Urban	31,204	30,939	+ 265

Effects to the Arizona National Scenic and Great Western Trails

This alternative proposes the largest reduction in encounters of nonmotorized recreationists utilizing the Arizona National Scenic Trail. The mileage of this trail located on designated motorized routes, including roads or motorized trails, will be reduced from 4.2 to 0.6 miles and the number of times a motor vehicle route crosses the trail is reduced from 50 to 29 times over the course of the 186 miles within the Forest. While the encounters with motorized recreationists in this alternative is almost half of the current condition, these interactions on a trail intended to provide a nonmotorized experience still does not meet the intent nor provide the experience many hikers, mountain bikers, trail runners, and equestrians who utilize the trail expect. However, of the action alternatives, this alternative proposes the least interaction of nonmotorized recreationists with motorized users, which is the closest to the meeting the intent of the Arizona National Scenic Trail.

Effects of Motorized Trail Maintenance

This alternative proposes 1,666 miles of motorized trail at a cost of $600/mile for maintenance (a total of $999,000). Trail maintenance for this alternative will need to be funded, either out of the Tonto's operating funding, or the work would need to be accomplished by volunteers.

Areas Designated for Motor Vehicle Use

No OHV areas are proposed for designation in this alternative. OHV users will be dissatisfied at the lack of opportunity to travel off of designated routes, especially on the Cave Creek and Mesa Ranger Districts, as this type of OHV activity is highly desired by some motor vehicle users. These motorized users will have nowhere on the Tonto National Forest to legally engage in this type of activity. With the elimination of cross-country travel, the opportunity for solitude, challenge, and risk without the use of a motor vehicle will increase.

Motor Vehicle Use for Big Game Retrieval

This proposal eliminates motor vehicle use for big game retrieval on the Payson and Pleasant Valley Ranger Districts where cross-country travel is currently permitted, which will increase hunter dissatisfaction. Conflicts associated with motor vehicle use for retrieval will decrease and may be eliminated between those seeking an opportunity for solitude, challenge, and risk and those using a motor vehicle.

Motor Vehicle Use for Dispersed Camping

In Alternative B, motor vehicle access for dispersed camping is limited to routes accessing a total of 414 campsites, which results in approximately 65 acres total forestwide.

This proposal will substantially decrease the acreage currently available to visitors that travel off of system roads to camp on the Payson and Pleasant Valley Ranger Districts. Since this alternative is the most restrictive for motor vehicle use for dispersed camping, it poses the most potential for competition for sites, concentration of use, and user conflict.

Alternative C – Direct and Indirect Effects

This alternative provides less motorized access than the existing condition.

Roads and Trails Designated for Motor Vehicle Use

Alternative C proposes 1,311 miles of roads open to the public (1,711 total miles available to the public, including highways and country and state roads). This alternative proposes the greatest miles of motorized trails, with 2,341 miles. Motorized trails will include 2,210 miles open to four-by-four full-sized vehicles, 20 miles open to less than 60 inches vehicles, and 109 miles open to off road motorcycles/dirt bikes. Also, this alternative proposes the addition of 330 miles of unauthorized routes designated open to motorized use including ten miles designated as roads; and motorized trails including 206 miles designated for four-by-four full-sized vehicles; and 72 miles for off road motorcycles/dirt bikes. Overall, Alternative C proposes almost 1,306 miles less motorized routes open to the public than currently exists.

Under Alternative C, the ability to recreate away from motorized routes outside of designated wilderness will be greater than the current condition (Figure 26). Approximately 55 percent of the Forest will be located within 0.5 miles from an open motorized route outside of wilderness, with approximately three percent located outside of wilderness providing an opportunity greater than four miles from an open motorized route. This alternative provides an opportunity for those seeking solitude to recreate four miles from an open road outside of designated wilderness. Outside of wilderness, 14 percent of the Forest will be located two to four miles from an open motorized route. This alternative does not provide as much opportunity for those seeking recreation away from motor vehicle use as Alternative B, but will provide more than the current condition and Alternative D. However, for those seeking a motorized opportunity, this alternative decreases the opportunity.

Effects to Conflicts Associated with Motor Vehicle Use

This alternative decreases the miles that are available for motor vehicle use, which in turn may increase conflict in a more asymmetrical manner. This change will likely increase opportunities for those seeking quiet and solitude, away from the noise generated by motor vehicles. However, this alternative proposes the greatest miles of motorized trails, reducing conflicts between classes of motor vehicle uses.

Motorized and Nonmotorized Recreationists

Motorized users will likely have greater conflict with nonmotorized recreationists on roads designated for motor vehicle use as this mileage will be less than current condition. However, there is the potential to reduce conflicts between motorized and nonmotorized recreationists on nonmotorized trails. This is due to motorized users being less likely to venture onto nonmotorized trails where motor vehicle use is prohibited since this alternative proposes the

greatest miles of motorized trails. In addition, the decrease in road mileage and cross-country travel being prohibited, the ability to access these nonmotorized trails will likely decrease.

Classes of Motor Vehicle Use

This alternative provides the greatest opportunities for different motor vehicle classes since it proposes the most miles of motorized trails open for four-by-four full-sized vehicles and off road motorcycles/dirt bikes. In addition, this is the only alternative proposing motorized trails open specifically for vehicles less than 60 inches. These changes will result in the least conflict between different classes of motor vehicle use for all alternatives. Although this alternative will have the greatest miles of motorized trails, in proportion to the Forest's size and the increasing popularity of OHV use, the mileage does not accommodate the demand.

Adjacent Land Owners

For adjacent land owners, this alternative will provide more conflict with motor vehicle users than Alternative B and less than Alternative D, as it designates the second least amount of mileage near their property.

Effects to Recreation Opportunity Spectrum

In Alternative C, there would be 174,662 acres more semi-primitive nonmotorized ROS setting (Table 32 and Figure 27) than the updated current condition (Alternative A). Recreationists seeking motorized recreation opportunity in the Forest would have fewer opportunities, while those seeking nonmotorized recreation would have more opportunities than the updated current condition. A conflict could arise with those that are familiar with the current setting and opportunities in areas that will change. In addition, this alternative will require a Forest Plan amendment, because it will not comply with the current Forest Plan.

Table 32. Recreation Opportunity Spectrum Classes - Alternative C, Change from Current Condition (2013)

ROS Class	Alternative C Acres	Current Condition (2013) Acres	Difference Acres
Primitive	599,271	588,937	+ 10,334
Semi-Primitive Nonmotorized	693,921	519,259	+ 174,662
Semi-Primitive Motorized	1,071,701	1,212,083	- 140,382
Roaded Natural	529,150	571,379	- 42,229
Rural	39,264	41,691	- 2,427
Urban	30,980	30,939	+ 41

Effects to the Arizona National Scenic and Great Western Trails

This alternative proposes a reduction in encounters of nonmotorized recreationists utilizing the Arizona National Scenic Trail. The mileage of this trail located on designated routes, including roads or motorized trails, will be reduced from 4.2 to approximately two miles and the number of times a motor vehicle route crosses the trail is reduced from 50 to 35 times over the course of the 186 miles within the Forest. While the encounters with motorized recreationists in this alternative is less than the current condition, these interactions on a trail intended to provide a nonmotorized experience still does not meet the intent nor provide the experience many hikers,

mountain bikers, trail runners, and equestrians who utilize the trail expect nor will it meet the intent of the Arizona National Scenic Trail.

The 71 miles of Great Western Trail route located on passenger vehicle (ML 3-5) roads remains the same as the current condition. This alternative reduces the miles of high clearance (ML 2) roads on the trail from eight to almost one mile and designates approximately seven miles as motorized trail. There is the potential for user dissatisfaction from the loss of motorized opportunities due to decommissioning. Visitors who prefer a more primitive experience would benefit from the routes maintained as motorized trail. Visitors on the Great Western Trail will continue having a semi-primitive motorized experience.

Effects of Motorized Trail Maintenance

This alternative proposes 2,339 miles of motorized trail at a cost of $600/mile for maintenance (a total of $1,403,400). Trail maintenance for this alternative will need to be funded, either out of the Tonto's operating funding, or the work will need to be accomplished by volunteers. Of the action alternatives, this alternative will be the greatest burden in terms of budget needs.

Areas Designated for Motor Vehicle Use

The prohibition on cross-country travel will be implemented forestwide in Alternative C except in the proposed four OHV areas. This will reduce opportunities for motorized users who currently travel cross-country on Payson and Pleasant Valley Ranger Districts, where this use is currently allowed. However, visitors seeking an opportunity for solitude, challenge, and risk without the use of a motor vehicle will have more opportunities on these two ranger districts. This does not pose a change for the Cave Creek, Mesa, Globe, or Tonto Basin Ranger Districts where travel is currently not allowed off motorized routes. However, illegal cross-country travel is known to occur with many locations where highly-concentrated motorized use occurs.

There are four OHV areas proposed in this alternative: including Bartlett Lake, Golf Course, Roosevelt Lake, and Sycamore totaling approximately 2,097. In addition, four tot lots are proposed (Sycamore, The Rolls, Wildcat, and 532) totaling approximately 11 acres.

The areas that are proposed to be designated OHV areas currently receive heavy OHV use and many are within the urban interface of Scottsdale and Mesa. In some instances, these locations are not as desirable to nonmotorized recreationists so it is less likely there would be conflict between motorized and nonmotorized recreationists in these areas. However, conflict may increase in OHV areas around Bartlett and Roosevelt Lakes.

By limiting cross-country travel to these OHV areas; there will likely be reduced conflicts between motorized and nonmotorized recreationists. There could be a reduction in the conflict such as the illegal motorized access occurring onto the nonmotorized Arizona Trail from Golf Course on the Globe Ranger District. In addition, conflicts between OHV types would also likely be reduced, since all recreationists have the same goal, to drive cross-country.

The creation of the four tot lots: Sycamore; The Rolls; Wildcat and 532; would likely reduce young OHV riders conflict with four-by-four full-sized vehicles, increase user safety, proving a safe environment where children could develop their OHV riding skills.

With the elimination of cross-country travel, except in designated OHV areas, the opportunity for solitude, challenge, and risk without the use of a motor vehicle will increase.

Conflicts between motorized users and nonmotorized recreationists, different classes of motorized user, and adjacent land owners may occur with the designation of OHV areas in locations that were not identified as open for motor vehicle use by the Forest Plan, such as around Bartlett and Roosevelt Lake.

Motor Vehicle Use for Big Game Retrieval

Alternative C will limit motor vehicle use for big game retrieval solely for the retrieval of elk and bear up to one mile on both sides of the 1,310 miles of designated road system and 2,339 miles of designated motorized trail system forestwide. This will reduce opportunities for hunters on the Pleasant Valley and Payson Ranger Districts and increase opportunities on the southern ranger districts (Cave Creek, Mesa, Globe, and Tonto Basin). This could affect Forest recreationists that have become accustomed to a nonmotorized hunting opportunity in areas that currently limit cross-country travel on the southern ranger districts. Forestwide there will be an increase in motorized big game retrieval opportunities for hunters with a total of 1,575,382 acres, which is 872,160 acres more than currently allows for cross-country travel for retrieval. Limitations to this corridor will be in congressionally designated wilderness where motorized travel is not permitted and other areas that will remain closed from existing closure orders.

This poses a reduction in opportunity on the Payson and Pleasant Valley Ranger Districts and possible dissatisfaction by hunters who are currently accustomed to retrieving game with a motorized vehicle greater than one mile from a road. This poses an increase in opportunity for hunters who prefer to retrieve game with a motorized vehicle on the Cave Creek, Globe, Mesa, and Tonto Basin Ranger Districts. With this proposed change on the southern districts of the Forest, conflicts could occur initially when hunters who prefer nonmotorized travel are not aware of the change in designation, meet hunters using motorized vehicles to retrieve game.

Motor Vehicle Use for Dispersed Camping

Alternative C will designate approximately 94 miles of motorized trails for four-by-four full-sized vehicle use to access 2,864 inventoried existing dispersed camping sites on the Tonto National Forest. The average length of these spur routes is 137 feet.

This proposal will decrease the opportunities currently available to visitors that travel off of system roads to camp on the Pleasant Valley and Payson ranger districts. This alternative restricts motor vehicle use for dispersed camping and poses the potential for competition for sites, concentration of use, and user conflict more than Alternative B and less than Alternative D.

Alternative D – Direct and Indirect Effects

This alternative provides more motorized access than the existing condition.

Roads and Trails Designated for Motor Vehicle Use

Alternative D proposes the most miles of roads open to the public with approximately 4,867 miles (5,267 total miles available to the public, including highways and country and state roads). However, this alternative is still a decrease in miles of motorized routes open to the public from the current condition. This alternative proposes approximately 2,230 miles of designated motorized trail miles, with nearly 80 miles for single track vehicles only. Approximately 330 miles of unauthorized routes are proposed to be designated for motor vehicle use. This would provide an opportunity for these routes currently being utilized by forest visitors without resource impacts to be available to the public.

The ability to recreate away from motorized routes outside of designated Wilderness would be nearly identical to the current condition (Figure 28).

Emphasis would focus on OHV opportunities in the front country and driving for pleasure and motorized long distance trail use.

Effects to Conflicts Associated with Motor Vehicle Use

This alternative increases the miles that are available for motor vehicle use, which in turn may increase conflict in a more asymmetrical manner. This change will likely decrease opportunities for those seeking quiet and solitude, away from the noise generated by motor vehicles. In addition, this alternative proposes the least miles of motorized trails, increasing conflicts between classes of motor vehicle uses.

Motorized and Nonmotorized Recreationists

In Alternative D, motorized users will likely have less conflict with nonmotorized recreationists on roads designated for motor vehicle use as this mileage will be greater than current condition. Although this alternative proposes the least miles of motorized trails, there is the potential to reduce conflicts between motorized and nonmotorized recreationists on nonmotorized trails. This is due to motorized users being less likely to venture onto nonmotorized trails where motor vehicle use is prohibited. In addition, due to cross-country travel being prohibited, the ability to access these nonmotorized trails will likely decrease.

Classes of Motor Vehicle Use

This alternative provides the least opportunities for different motor vehicle classes since it proposes the least miles of motorized trails open for four-by-four full-sized vehicles and off road motorcycles/dirt bikes. These changes will result in the most conflict between different classes of motor vehicle use for all alternatives.

Adjacent Land Owners

For adjacent land owners, this alternative will provide the greatest conflict with motor vehicle users for all alternatives.

Effects to Recreation Opportunity Spectrum

In Alternative D, there would be 50,519 acres more semiprimitive motorized ROS setting and nearly equal less roaded natural ROS setting (Table 33 and Figure 29) than Alternative A (updated current condition). The effect for recreationists in Alternative D is those seeking motorized recreation in the Forest would have more opportunities while those seeking nonmotorized recreation would have less opportunities than the updated current conditions (2013 ROS dataset). This alternative would require a Forest Plan amendment, because it would not comply with the current Forest Plan ROS.

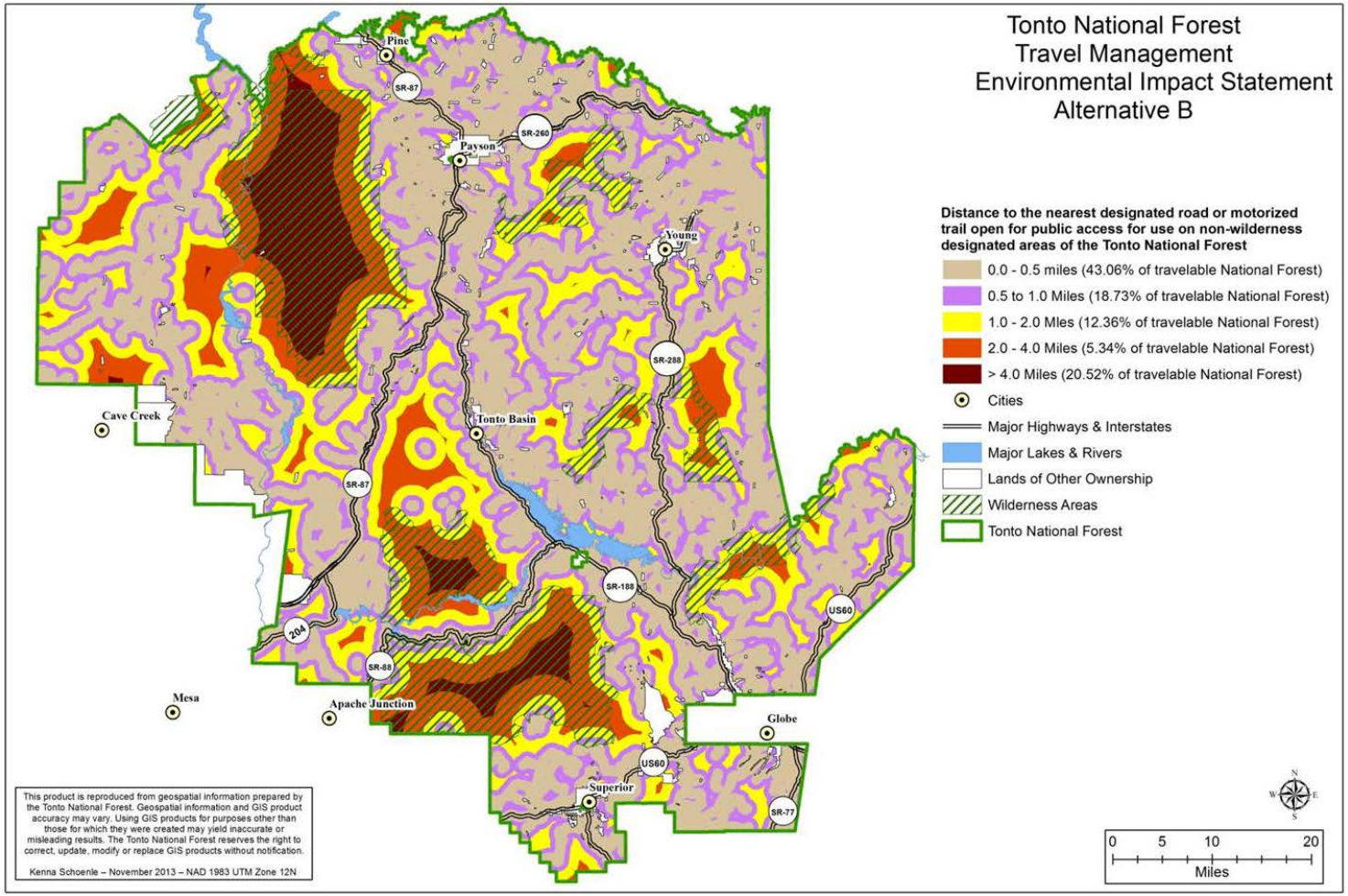

Figure 24. Map of Distance to Nearest Designated Road or Motorized Trail – Alternative B

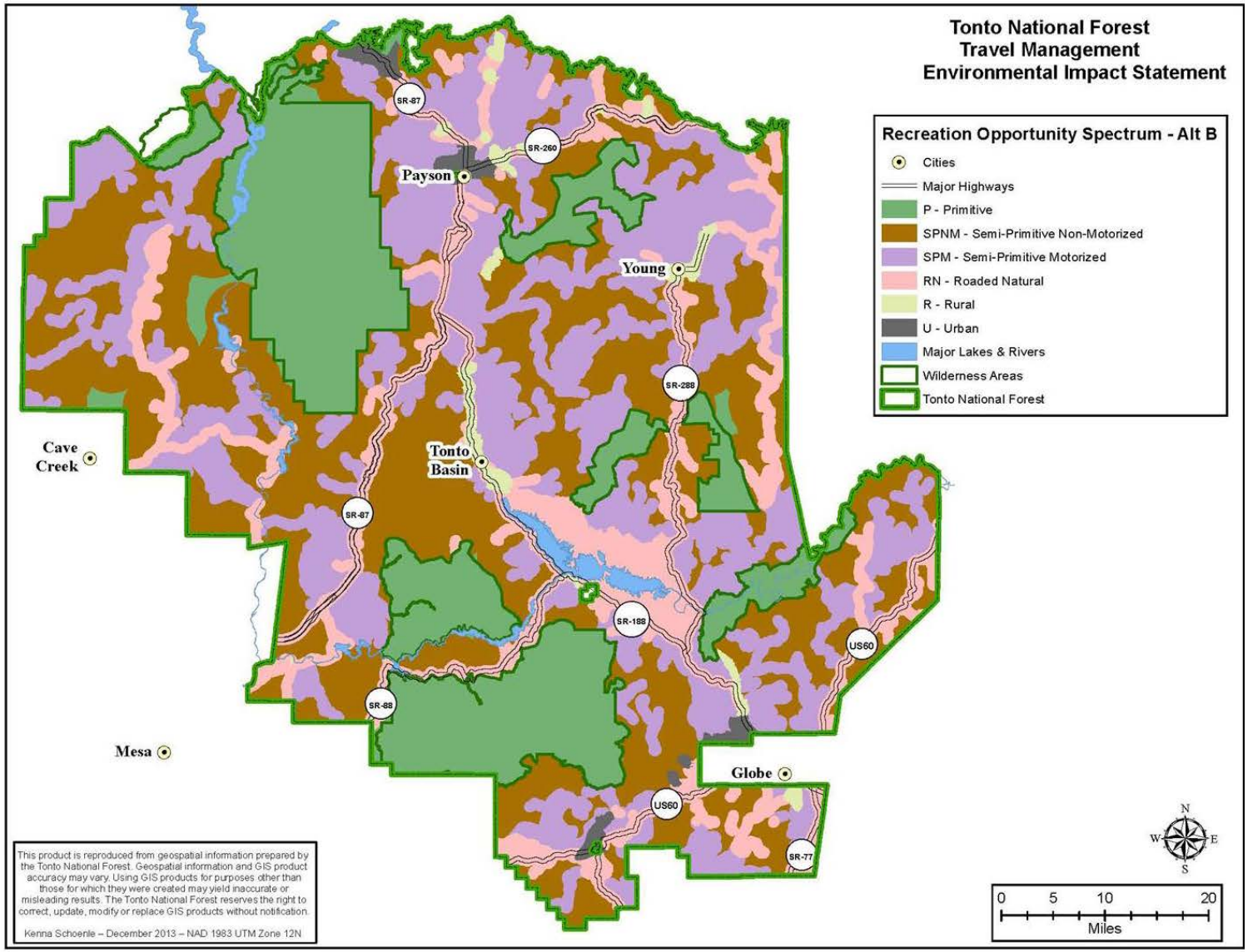

Figure 25. Map of Recreation Opportunity Spectrum Classes - Alternative B

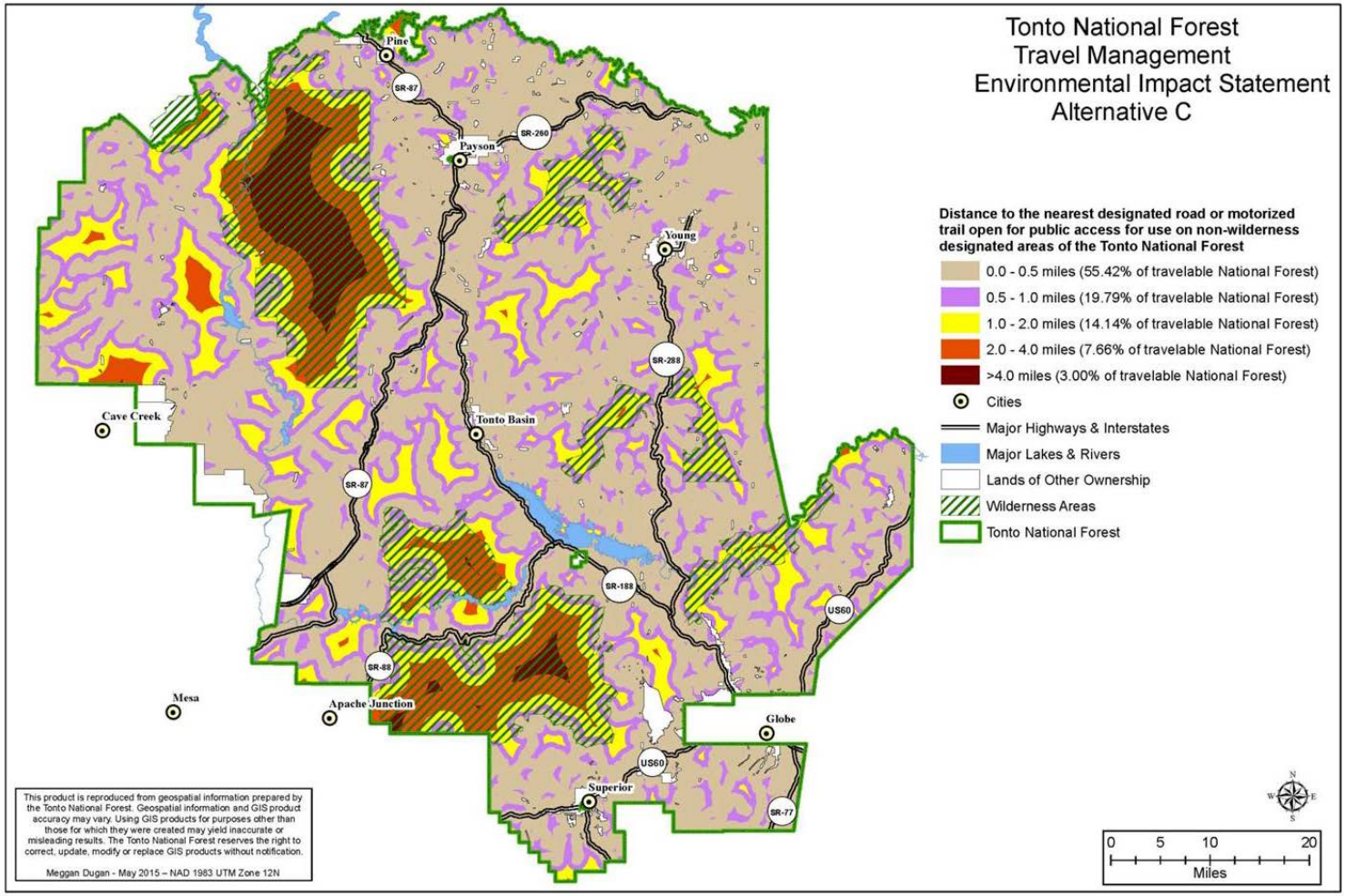

Figure 26. Map of Distance to Nearest Designated Road or Motorized Trail – Alternative C

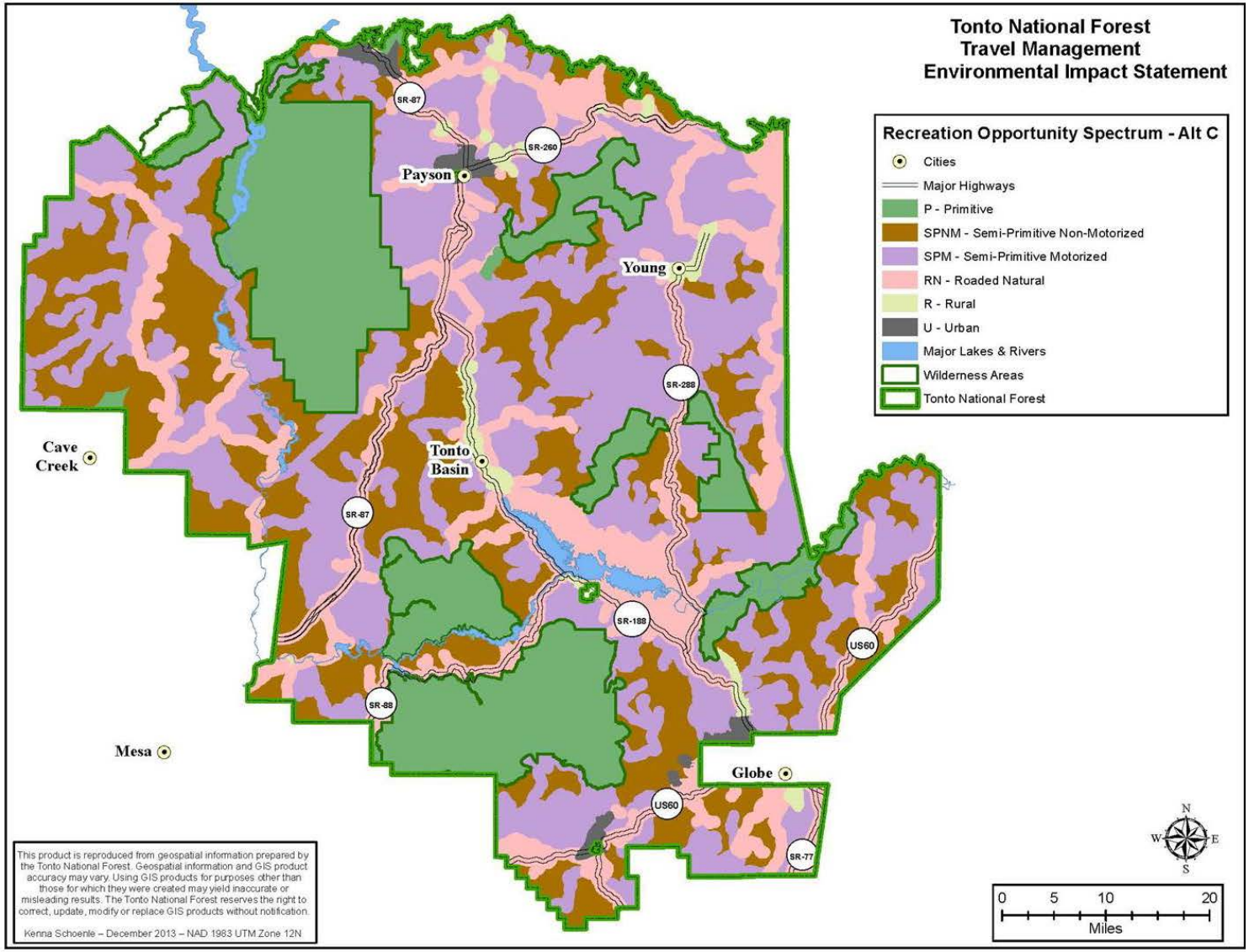

Figure 27. Recreation Opportunity Spectrum Classes - Alternative C

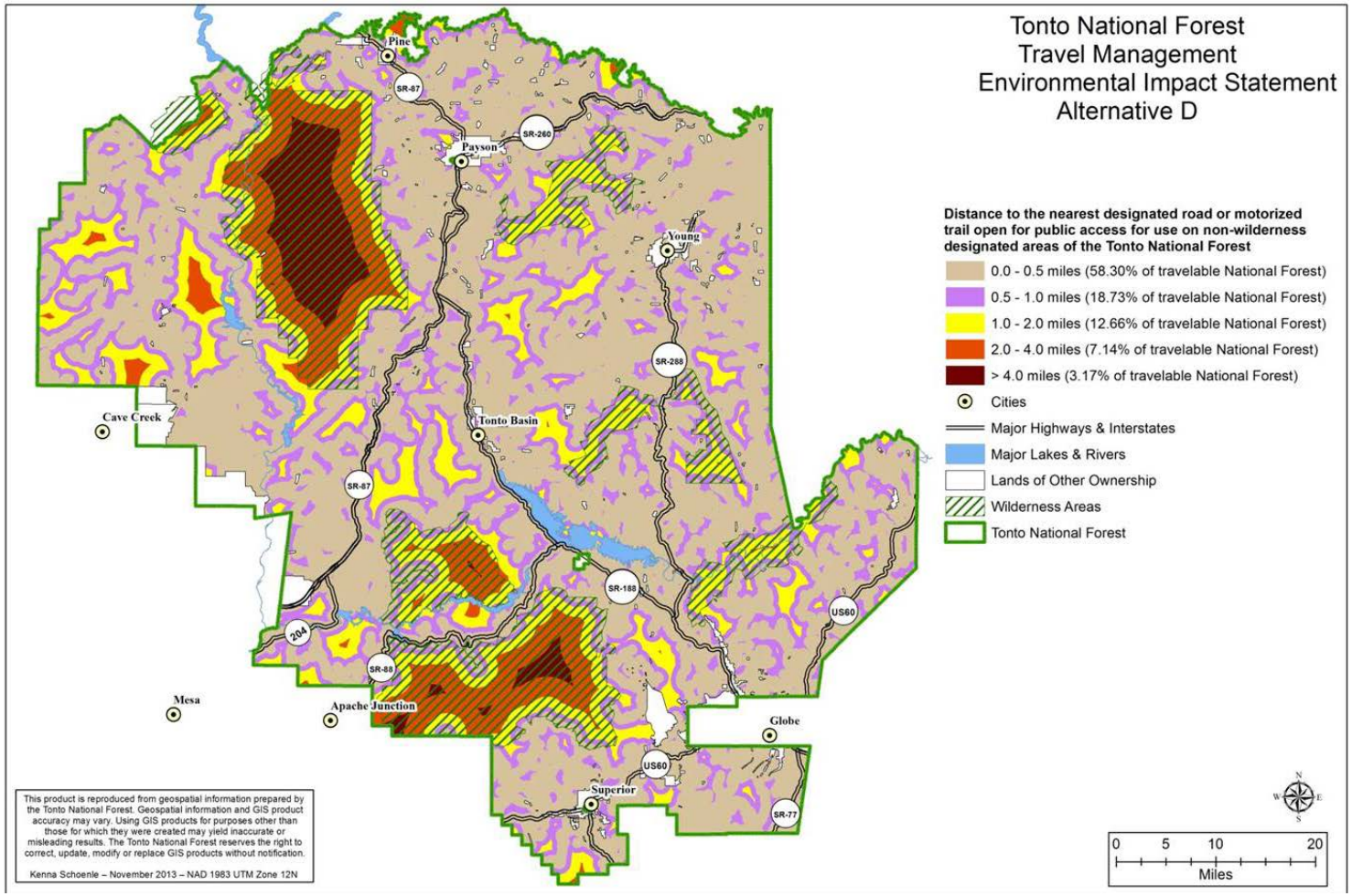

Figure 28. Map Distance to Nearest Designated Road or Motorized Trail – Alternative D

Table 33. Recreation Opportunity Spectrum Classes - Alternative D, Change from Current Condition (2013)

ROS Class	Alternative D Acres	Current Condition (2013) Acres	Difference Acres
Primitive	590,244	588,937	+ 1,307
Semi-Primitive Nonmotorized	510,012	519,259	- 9,247
Semi-Primitive Motorized	1,262,602	1,212,083	+ 50,519
Roaded Natural	528,588	571,379	- 42,791
Rural	41,902	41,691	+ 211
Urban	30,939	30,939	0

Effects to the Arizona National Scenic and Great Western Trails

This alternative proposes a reduction in encounters of nonmotorized recreationists with motorized recreationists utilizing the Arizona National Scenic Trail. The mileage of this trail located on designated routes, including roads or trails, will be reduced and the number of times a motor vehicle route crosses the trail is reduced from 50 to 46 times over the course of the 186 miles within the forest. While the encounters with motorized recreationists in this alternative is less than current condition, these interactions on a trail intended to provide a nonmotorized experience still does not meet the intent nor provide the experience many hikers, mountain bikers, trail runners, and equestrians utilizing the trail expect. However, of the action alternatives, this alternative proposes the most interaction of nonmotorized recreationists with motorized users, which does not meet the intent of the Arizona National Scenic Trail.

Alternative D proposes no change from the current condition to the motorized routes that comprise the Great Western Trail. The effects would be the same as those for Alternative A.

Effects of Motorized Trail Maintenance

This alternative proposes 1,520 miles of motorized trails at a cost of $600/mile for maintenance (a total of $912,000). Trail maintenance for this alternative would need to be funded, either out of the Tonto's operating funding, or the work would need to be accomplished by volunteers. This alternative has slightly less costs for trail maintenance than Alternative B.

Areas Designated for Motor Vehicle Use

The prohibition on cross-country travel would be implemented forestwide in Alternative D. This does not pose a change for the Cave Creek, Mesa, Globe, or Tonto Basin Ranger Districts where travel is currently not allowed off motorized routes however, illegal cross-country travel is known to be occurring. With the designation of routes and more emphasis on enforcement with the implementation of the Final Travel Management Rule and MVUM, visitors may perceive that travel is more restricted on these districts. There is the potential for user dissatisfaction by Forest visitors who currently travel cross-country on Payson and Pleasant Valley Ranger Districts. Visitors who prefer more solitude will benefit from the prohibition on cross-country travel on these two ranger districts.

In this alternative, motorized cross-county travel would be limited to four areas: Around Bartlett Lake (Cave Creek Ranger District) between the variable water level and the high water mark; Golf Course (Globe Ranger District); Around Roosevelt Lake (Tonto Basin Ranger District) between the variable water level and the high water mark; and Sycamore (Mesa Ranger District) totaling approximately 6,779 acres. In addition, commenters indicated the need to provide an opportunity for youth riders just learning OHV use and safety. To address this need, there are four proposed “tot lots” totaling approximately 12 acres. These areas would be limited to children and would allow them to learn to ride without the presence of other motorized users. This alternative has the same proposed designated OHV areas as Alternative C. The effects would be the same as those in Alternative C, including those for user conflicts.

The effects from the OHV areas for this alternative will be similar to Alternative C, except for the size of the areas around Bartlett and Roosevelt Lakes. Conflicts between motorized users and nonmotorized recreationists, different classes of motorized user, and adjacent land owners is expected to have a higher occurrence with the designation of OHV areas in locations that were not identified by the Forest Plan, such as around Bartlett and Roosevelt Lake.

Motor Vehicle Use for Big Game Retrieval

Alternative D would limit motor vehicle use for big game retrieval solely for the retrieval of elk, bear, white tailed deer, and mule deer up to one mile on both sides of the 3,347 miles of designated road system and 1,520 miles of designated motorized trail system forestwide. This would reduce opportunities for hunters on the Pleasant Valley and Payson Ranger Districts who currently retrieve big game using a motorized vehicle at distances over a mile. Although this would increase opportunities on the southern ranger districts (Cave Creek, Mesa, Globe, and Tonto Basin) where motorized big game retrieval is not currently authorized. This could affect those forest recreationists that have become accustomed to a nonmotorized hunting opportunity in areas that currently limit cross-country travel on the southern ranger districts. Forestwide there would be an increase in motorized big game retrieval opportunities for hunters with a total of 2,248,279 acres, which is 1,544,661 acres more than currently allows for cross-country travel for retrieval (the greatest increase of the action alternatives).

With this proposed change on the southern districts of the Forest, conflicts could occur initially when hunters who prefer nonmotorized travel are not aware of the change in designation, meet hunters using motorized vehicles to retrieve game. These conflicts will be greater in this alternative, as it has a greater acreage where retrieval is permitted.

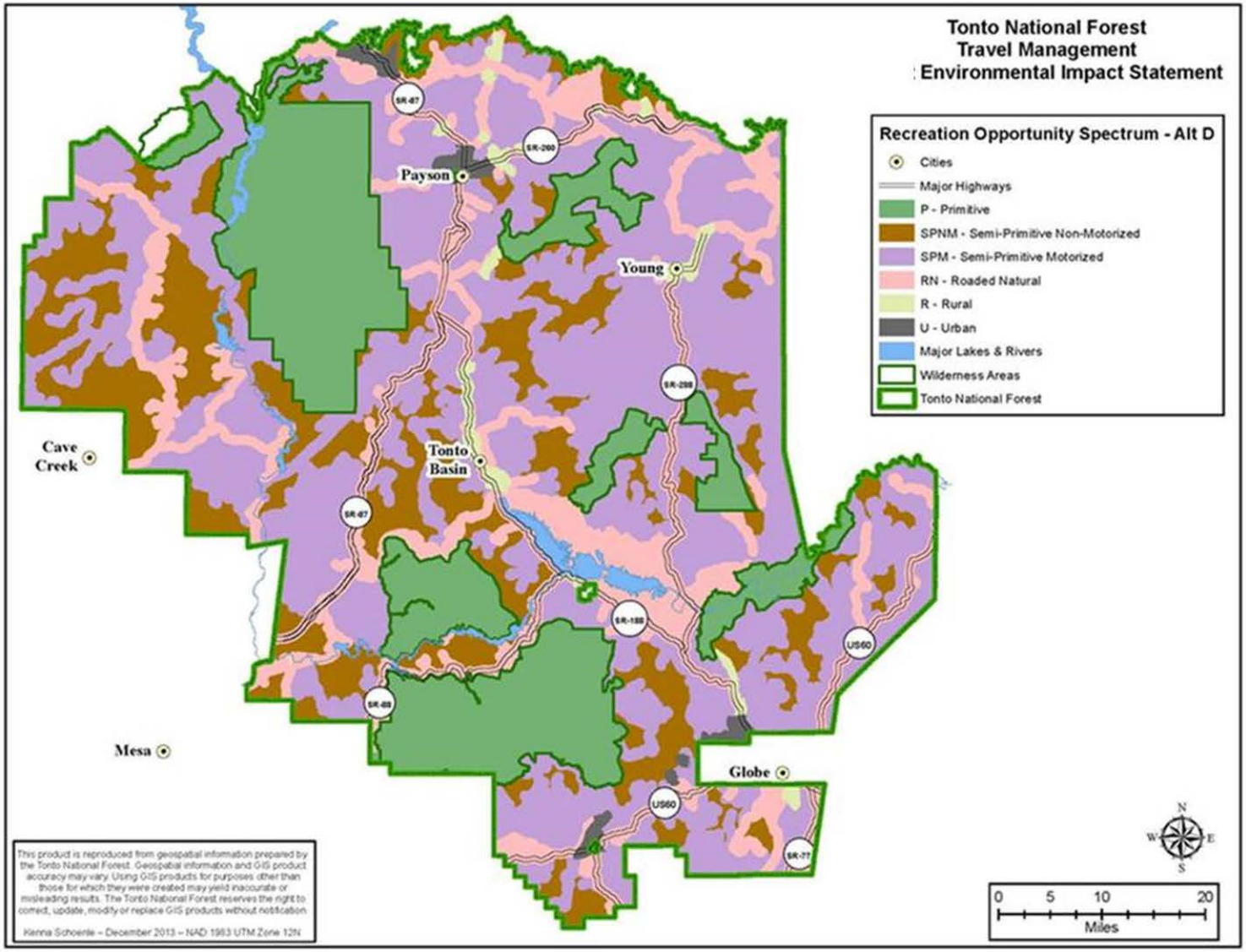

Figure 29. Map of Recreation Opportunity Spectrum Classes - Alternative D

Motor Vehicle Use for Dispersed Camping

Alternative D would allow motor vehicle access up to 300 feet on both sides of the 3,347 miles of designated road system and 1,519 miles of designated motorized trail system. This represents the most acres of corridors proposed for motor vehicle access for dispersed camping opportunities, a total of 336,038 acres. Limitations to this corridor would be in congressionally designated Wilderness areas where motorized travel is not permitted and other areas that would remain closed from existing orders.

This will affect campers on the Pleasant Valley and Payson Ranger Districts who access campsite sites greater than 300 feet of open roads. This alternative provides additional dispersed opportunities on the Cave Creek, Mesa, Globe, and Tonto Basin ranger districts where cross-country travel from open roads is currently prohibited.

Cumulative Effects

The cumulative effects analysis for this analysis considers past, present, and reasonably foreseeable actions in terms recreation activities, opportunities and user conflicts on the Tonto National Forest, forests in the Southwestern Region, and adjacent public lands for the next 20 years. Twenty years was selected because it is the anticipated length of time for natural rehabilitation of unauthorized routes (where achievable) and other non-permitted activities that would affect recreation opportunities and the natural resources. Studies related to soil and vegetation disturbance indicated that the rehabilitation of these routes will take many years, especially those in arid climate zones (Cole *et al.*, 1986). Some may never recover without assistance.

Past Action

In the January 2013, decision for The Issuance of Priority Outfitter – Guide Permits and Forest Plan Amendment to Adjust Outfitter-Guide Service Day Allocations mentioned in the Affected Environment, Priority Use requests that involve construction of new roads or trails would be subject to site-specific environmental analysis. If a public or agency need for new priority use is identified (through a needs assessment), additional priority permits may be issued within the Total Service Day allocation by activity type and management area. A prospectus to solicit bids in response to public or agency need for new outfitter-guide uses may be issued when competitive interest exits.

The Recreation Facility Analysis 5 Year Program of Work and Programmatic Results of Implementation Document completed November of 2007 contains a 5 Year Program of Work which provides a framework from which the Forest prioritizes investments and pursues changes in operation or maintenance of recreation sites. Options considered for the management of trailheads include: reducing the length of season available; begin charging a fee, and utilization of volunteers for maintenance of the site.

With the implementation of the Bulldog Permit Zone and associated designation of routes within the Permit Zone in 1997, there may have been a reduction in conflict, since this zone has been specifically managed to reduce conflicts between recreationists, safety issues, and damage to the natural landscape.

Ongoing and Future Foreseeable Actions

Projects on the Forest's Schedule of Proposed Action (SOPA) were considered for the cumulative effects analysis as reasonably foreseeable actions.

The Cave Creek Complex Fire burned in June 2005. A closure order was implemented for the area to allow the ecosystem to recover from the intense burn. This fire is located within the proposed St. Claire Permit Zone. If the proposed St Claire Permit Zone is implemented as part of the Tonto Travel Management decision, the closure order for this fire area would be lifted with the area restricted to motorized travel on designated routes and the requirement of obtaining a permit.

All national forests in the Southwestern Region are either in the process of travel management planning or implementing existing Travel Management Plan decisions. Several forests or ranger districts within the Southwestern Region have completed Travel Planning and have designated routes for motorized travel, published Motor Vehicle Use Maps and are currently implementing their decisions, including the Coconino, the Coronado, Kaibab, and Prescott National Forests. Of these forests, only the Coronado has not designated OHV areas where cross-country travel within is permitted. The Apache-Sitgreaves National Forest is currently working on the analysis for their travel management decision.

Urban development and interface growth would likely continue on private lands. These will not directly affect National Forest land, but may increase the number of motorized and nonmotorized recreationists.

The creation of unauthorized routes is not limited to motorized travel, in some areas of the Forest due to the number of recreationists and frequency of use, unauthorized routes are being created by nonmotorized travel including equestrians and mountain bikers. In these areas, designation of nonmotorized routes may need to be considered in the future.

A number of major road construction projects are planned by other government entities well into the future. Road construction can have short-term impacts on recreationists due to delays. Road construction can also have short-term impacts on the Forest's natural landscapes, but impacts are minimized through implementation of best management practices (BMPs). Over the long term, additional paved surfaces can increase recreation opportunities. Construction of the Tonto Creek Bridge may also result in increased recreation opportunities for local residents.

Roads and Trails Designated for Motor Vehicle Use

If the population in the Southwest and its preference for using off-highway vehicles continues to increase, a potential exists for an increase in conflicts between motorized and nonmotorized recreationists in Alternative A. People wishing to avoid vehicles altogether could potentially be pushed to using wilderness areas exclusively. With a designated system in place, as proposed in all action alternatives, there would be no cumulative change since people would know where to go to avoid vehicles and where motorized activities are emphasized.

All action alternatives have the potential for the following cumulative effects upon motorized recreational opportunities:

- Change the array of recreational opportunities across the Forest and would restrict motorized cross-country travel and reduce the amount of motorized access on the Tonto National Forest.

- The possibility of user dissatisfaction over the loss of cross-country motorized access on the Payson and Pleasant Valley Ranger Districts.
- The possibility of user dissatisfaction with the loss of motorized recreational opportunities throughout the forest lands in the Southwestern Region 3, particularly in Arizona.

For all alternatives, volunteers who maintain trails help stretch the trail maintenance budget. Volunteers have enabled the Tonto National Forest to accomplish much needed trail maintenance, signing, fence construction, and visitor contacts with fewer dollars. Grants and other sources of funding would continue to be a viable option for increasing the Forest's ability to maintain the motorized and nonmotorized trail system. Having a designated motorized trail system has the potential to improve the Forest's chances to be competitive to obtain grants. While grants and volunteers cumulatively increase the amount of trails the Tonto National Forest could maintain, it is not expected to be enough to maintain every trail on the system on an annual basis with the potential for some trails to eventually pose a safety hazard.

Designated OHV Areas, including Corridors for Motorized Big Game Retrieval and Dispersed Camping

All Action Alternatives prohibit cross-country travel per Travel Management Rule direction. Selection of any of the action alternative would contribute to a statewide reduction in places to drive and camp on public land across the state of Arizona, especially as forests complete the analysis for travel management and implement a decision.

Wilderness, Wild and Scenic Rivers, Inventoried Roadless Areas, and Special Management Areas

Designated Wilderness Areas

The concept of wilderness in the National Forest System was first implemented in 1924 with the administrative designation of the Gila Wilderness in New Mexico. In 1964 Congress passed the Wilderness Act designating a National Wilderness Preservation System. Congress passed the Arizona Wilderness Act of 1984 designating additional lands to the National Wilderness Preservation System in Arizona.

Affected Environment

There are seven congressionally designated Wilderness Areas totaling over 615,855 acres located on the Tonto National Forest (21 percent of the total forest acres) including the following (Figure 30): Superstition; Hellsgate; Mazatzal; Salome; Salt River Canyon; Four Peaks; and Sierra Ancha. The Superstition, Mazatzal, and Sierra Ancha were designated under the 1964 Wilderness Act with the remaining Wilderness Areas designated under the 1984 Arizona Wilderness Act. The 1984 Arizona Wilderness Act also designated additions to the Mazatzal and Superstition Wilderness Areas.

The Wilderness Act prohibits permanent roads and the use of vehicles and any other forms of motorized or mechanized transport within wilderness areas, with little exception. There is no law or policy that prohibits motorized use up to the boundary of designated Wilderness. Current system roads do exist within or adjacent to Wilderness boundaries. Many of these existed prior to wilderness designation of the Wilderness Act in 1964 or the Arizona Wilderness Act of 1984;

however, none are specifically recognized in the federal register language designating these areas.

Superstition Wilderness

There is a well-developed trail system and the western end of the wilderness receives heavy use during the cooler times of the year. Two trailheads, First Water and Peralta receive about 80 percent of the annual use, and the U.S. Forest Service calls the 6.3-mile Peralta Trail one of the most heavily used trails in Arizona. Other trails within the Wilderness are virtually untrodden. There are about 180 miles of trails, ranging from excellent to poor, as well as other unmaintained tracks. Several trails are unsuitable for horses.

Forest Service Road (FSR) 213 is outside the wilderness boundary, as it is buffered 33 feet from centerline on both sides of the road as defined within the legal description of the enabling legislation for the Superstition Wilderness.

Mazatzal Wilderness

The Arizona Wilderness Act of 1984 added some 46,000 acres expanding the wilderness area to its present configuration. The Act contains a special provision: “provided, that within the lands added to the Mazatzal Wilderness by this Act, the provisions of the Wilderness Act shall not be construed to prevent the installation and maintenance of hydrologic, meteorologic, or telecommunications facilities, or any combination of the foregoing, or limited motorized access to such facilities when non-motorized access means are not reasonably available or when time is of the essence, subject to such conditions as the Secretary deems desirable, where such facilities or access are essential to flood warning, flood control, and water reservoir operation purposes.”

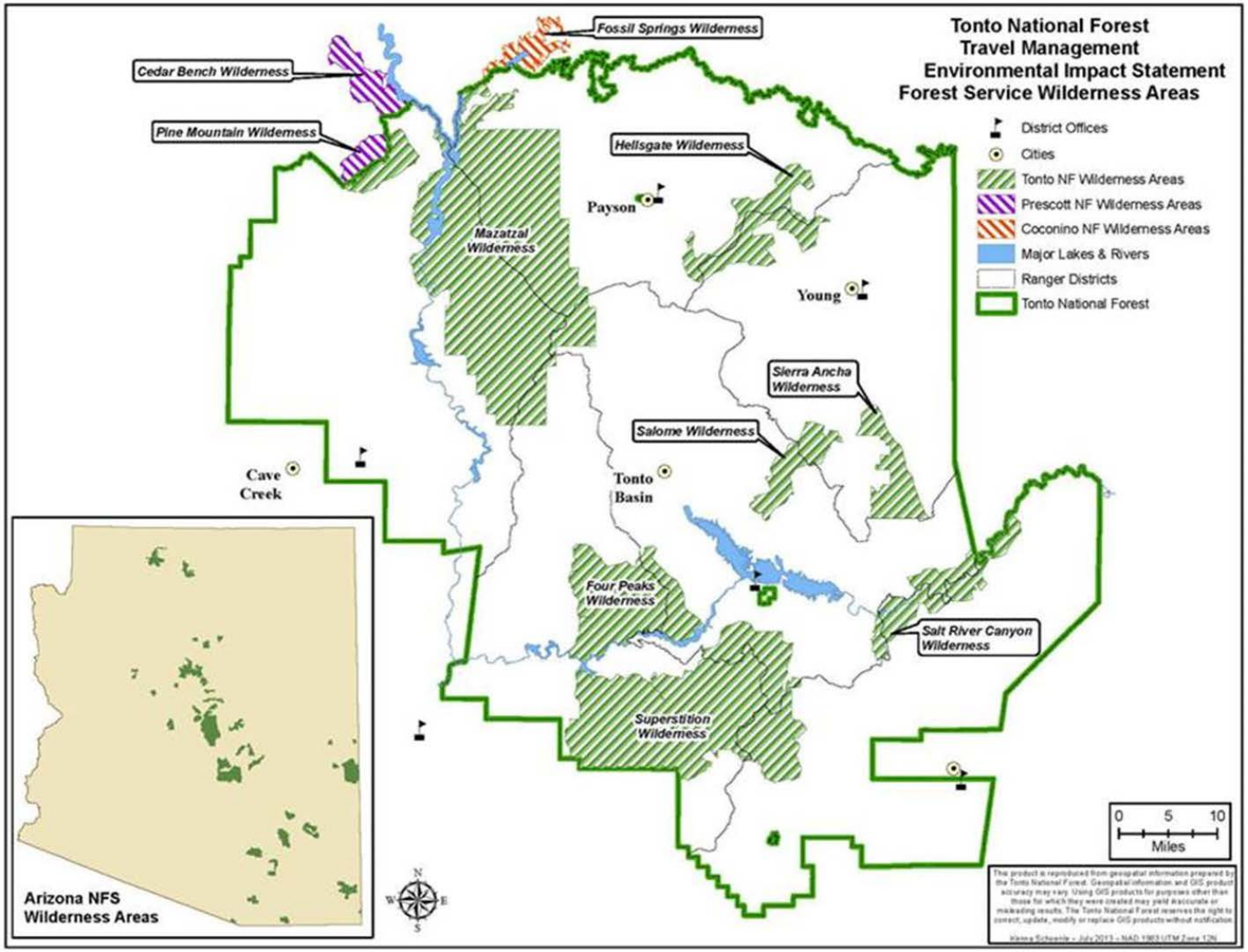

Figure 30. Map of Wilderness within and Adjacent to Tonto National Forest

FSR 406B (3.65 miles) is within the Wilderness and provides access to a private land inholding on the east side of the Wilderness. FSR 567B (3.38 miles) is within the Wilderness and provides access to a private inholding located on the west side of the wilderness. Both roads currently show as open on the forest database; however, both are gated with Special Use Permits issued to the private land holders. Written authorization for access in wilderness may be granted to provide access to inholdings totally surrounded by National Forest Wilderness and is detailed in Subpart D, 36 CFR 251.114g. Additional factors that must be considered when granting access within a Wilderness area are listed in Forest Service Manual 2700-2730.3.

FSR 393 travels along the southern boundary of the Wilderness, with 0.64 miles of this road located within the Wilderness boundary. This road provides access to the powerline operated under special use permit issued to Arizona Public Service that is located outside of the Mazatzal Wilderness. This road currently provides a through route to access the powerline for routine maintenance. The road and powerline predate the 1984 Arizona Wilderness Act.

Sierra Ancha Wilderness

The extremely rough topography limits (and often prohibits) cross-country travel; however, there is an extensive system of trails with conditions ranging from good to poor. Thirteen trailheads give access to a well-maintained network of foot and horse trails.

FSRs 203B, 2886, and 2814 run in and out of the northeast wilderness boundaries in the Cherry Creek drainage, totaling 10.83 miles within the Wilderness. An additional 1.01 miles of FSR 487/487A are located along and within the wilderness boundary in the southwestern corner. This road provides access to a private land inholding within the Tonto National Forest. The private property within the forest and access road predate the Wilderness Act. FSR 487B connects to FSR 487/487A and is also within the wilderness. This road provides access to Aztec Peak fire lookout and communication equipment.

Hellsgate Wilderness

A segment of FSR 1625A (0.28 miles) is located on the northern boundary of the Wilderness. Another road segment, an inventoried unauthorized route (0.24 miles), is located within the Wilderness boundary on the southeastern side of the Wilderness Area.

Salome Wilderness

A homestead patent was issued for 57 acres in 1926. This property was acquired by the government in 1991 and is now a part of the wilderness. There are four grazing allotments under permit which have acreages in and adjacent to this wilderness. The objective for range management in this area is for the “utilization of the forage resources while maintaining wilderness values.”

There is a segment of Forest Road 1765 (0.06 miles) that is located within the southern boundary of the Wilderness Area.

Salt River Canyon Wilderness

The Salt River and its spectacular canyon, also designated in 1984, bisect the Wilderness for its entire length. Mandatory permits for private floating parties are required between March 1 and May 15. The application period for these permits is from November 15 through January 15 each year.

Four Peaks Wilderness

Visits to some parts of the Wilderness can be made throughout the year, using a rather extensive trail system.

There is user conflict occurring between motorized and non-motorized users within The Rolls, a highly-concentrated use area located on the Mesa Ranger District. This area is located adjacent to the Four Peaks Wilderness and shares a north south boundary. Motorized users recreating in The Rolls have trespassed into the Four Peaks Wilderness creating disruptions to non-motorized recreationists and creating unauthorized routes.

Designated in 1984, there are two roads (FSRs 401 and 1521) that are outside the designated wilderness and buffered 33 feet from centerline on both sides of the road as defined within the legal description of the enabling legislation for the Four Peaks Wilderness. Additionally, there are two roads located within the boundary: FSR 3741 (0.35 miles) and 3742 (0.29 miles) located within the northwestern corner of the Wilderness. Additional roads are located along the Wilderness boundary, but are outside of the Wilderness itself.

Wilderness Areas Adjacent to the Tonto National Forest

A portion of the Pine Mountain Wilderness is located on the Tonto National Forest; however, it is administered by the Prescott National Forest. Roads accessing trailheads as well as designated trail access is gained from the Prescott National Forest. The Cedar Bench Wilderness located on the Prescott National Forest southern boundary runs along the boundary between the Prescott and Tonto national forests.

The Fossil Springs Wilderness located on the Coconino National Forest shares its southern boundary with the Tonto National Forest. The White Canyon Wilderness located on BLM land shares its northern boundary with the Tonto National Forest.

Environmental Consequences

The *Wilderness Act* describes wilderness using these four qualities of wilderness character which will be used for this analysis:

- Untrammeled – wilderness is essentially unhindered and free from modern human control or manipulation.
- Natural –wilderness ecological systems are substantially free from the effects of modern civilization.
- Undeveloped –wilderness is essentially without permanent improvements or modern human occupation.
- Outstanding opportunities for solitude or a primitive and unconfined type of recreation, such as hiking and fishing.

Direct and Indirect Effects

Roads within designated Wilderness often affect wilderness characteristics. As Table 34 shows, there is currently 22.40 miles of known motorized routes within the Wilderness Areas on the Tonto National Forest.

Table 34. Motorized Routes in Wilderness Areas by Alternative

Route Number	Miles	Alternative A	Alternative B	Alternative C	Alternative D
Superstition Wilderness					
28	0.09	Open to public-Unknown ML	Decommissioned	Decommissioned	Decommissioned
Mazatzal Wilderness					
393	0.64	ML 2 Road	Decommissioned	Admin Use Only	ML 2 Road
406B	3.65	Road Permit Use Only	Use by Permit Only for Private Land Owners	Use by Permit Only for Private Land Owners	Use by Permit Only for Private Land Owners
567B	3.38	Road Permit Use Only	Decommissioned	Use by Permit Only for Private Land Owners	Use by Permit Only for Private Land Owners
Sierra Ancha					
203B	10.05	ML2/3 Road	Decommissioned	Decommissioned	ML 2 Road
487/ 487A	0.14	ML 2 Road	Decommissioned	Use by Permit Only for Private Land Owners	ML 2 Road
487B	0.87	ML 2 Road	Decommissioned	Decommissioned	ML 2 Road
2814	0.19	Open to public-Unknown ML	Decommissioned	Decommissioned	Decommissioned
2886	0.59	Open to public-Unknown ML	Decommissioned	Decommissioned	Decommissioned
Hellsgate Wilderness					
1625A	0.28	ML 2 Road	Decommissioned	Decommissioned	ML 2 Road
Unauth-orized Route	0.24	Unauthorized	Decommissioned	Decommissioned	Decommissioned
Salome Wilderness					
1765	0.06	Open to public-Unknown ML	Decommissioned	Decommissioned	Decommissioned
Salt River Canyon					

Route Number	Miles	Alternative A	Alternative B	Alternative C	Alternative D
368A	0.26	Open to public-Unknown ML	Decommissioned	Decommissioned	Decommissioned
644A	0.80	Open to public-Unknown ML	Decommissioned	Decommissioned	ML 2
1790	0.52	Open to public-Unknown ML	Decommissioned	Decommissioned	ML 2
Four Peaks Wilderness					
3741	0.35	Open to public-Unknown ML	Decommissioned	Decommissioned	Decommissioned
3742	0.29	Open to public-Unknown ML	Decommissioned	Decommissioned	Decommissioned
Total Miles Open		22.40	3.65	7.81	20.33

Table 35 displays the effects on wilderness character that will result from the proposed changes to motorized access and recreation opportunities on the wilderness areas located on the Tonto National Forest.

Cumulative Effects

The spatial boundary for the cumulative effects analysis for wilderness areas includes the boundaries of the Superstition, Hellsgate, Mazatzal, Salome, Salt River Canyon, Four Peaks, and Sierra Ancha Wilderness areas. This analysis considers past, present, and reasonably foreseeable actions upon the wilderness character of wilderness areas located on the Tonto National Forest. The natural effects of monsoons and fires will impact both wildlife and wilderness character. Wilderness projects for range, trail work, and cleanups for areas like “The Jug,” a well-known climbing area in the Salome Wilderness will, over time, enhance the wilderness character especially the solitude and absence of man. Although there has been documented illegal trespass by motor vehicles into wilderness areas, especially those closest to the Phoenix metropolitan area, enforcement of travel management regulations and designation will continue to curtail these activities. As with “The Jug,” partnerships with users groups focused on rehabilitation, these illegal trespasses will continue to improve the characteristics of the wilderness. Some of these illegal trespasses will, over time, be reclaimed and rehabilitated by natural processes where the plant life will allow. Additionally, livestock grazing and certain mining practices are permitted in designated Wilderness areas and can also affect a user’s expectation and enjoyment of these areas. These activities are currently ongoing in the Tonto National Forest and may, cumulatively, decrease user satisfaction with wilderness areas across the Forest.

Any sign of man can and may affect the characteristic of a wilderness area and can decrease the enjoyment of a designated wilderness. In following the Wilderness Act, the Tonto National Forest strives to prohibit or decrease man-made intrusions whenever possible to increase the overall characteristics of wilderness areas on the Forest.

Wilderness character including the untrammeled attribute of wilderness may be compromised regardless of alternative from the general population increase particularly within the Phoenix metropolitan area and associated increase in recreational use within and adjacent to wilderness areas. These affects are attributed to an increase in noise, in light and air pollution, and the potential for more users within the wilderness itself.

Cumulatively, all action alternatives will improve the wilderness characteristics when compared to the current condition because all action alternatives propose a reduction in the number of motorized routes located within wilderness boundaries on the Tonto National Forest.

Table 35. Effects on Wilderness Characteristics by Alternative

Wilderness Character	Effects of Alternative A (No Action)	Effects of Alternative B	Effects of Alternative C	Effects of Alternative D
Natural: Wilderness ecological systems are substantially free from the effects of modern civilization.	Currently, there are 22.40 miles of known motorized routes within wilderness areas. The western boundary of the Mazatzal, all of the boundary of the Hellsgate and Sierra Ancha and northeastern boundary of the Salome Wilderness will continue to be vulnerable to motorized use and the potential for the addition of unauthorized routes and associated impacts to soil and vegetation due to the Payson and Pleasant Valley ranger districts being open to motorized cross-country travel. Currently illegal motorized trespass is also known to occur into the Mazatzal and Salt River Wilderness Areas with the creation of additional unauthorized routes and the associated impacts to soil and vegetation, including the potential for introduction of non-native species and the presence of pollutants. This illegal trespass is likely to continue to occur, along with the spread of invasive species. This will decrease the opportunity for natural characteristic.	3.65 miles of motorized routes will be open to authorized permitted uses only. This alternative will have the greatest potential to reduce effects on soils and vegetation associated with motorized travel because it proposes to decommission nearly 20 miles of roads currently in wilderness areas. The remaining 3.65 miles of roads in the Mazatzal will be under Special Use Permits and regulated to decrease effects. This will substantially decrease the potential for introduction of non-native species and the presence of pollutants. This alternative has greatest opportunity for improving the natural characteristics.	7.81 miles of motorized routes will be open authorized permitted uses only. This has the potential to reduce the effects on soils and vegetation associated with motorized travel because it proposes to decommission nearly 14 miles of roads currently in the wilderness areas. 7.81 miles of roads to remain open will be under Special Use Permits and regulated to decrease effects. This alternative will improve the natural characteristic compared to the current condition by decreasing the potential for introduction of non-native species and the presence of pollutants.	20.33 miles of motorized routes will be open in this alternative. This has the potential to reduce the effects on soils and vegetation associated with motorized travel because it proposes to decommission about 2 miles of roads currently in the wilderness areas. 7.03 miles of roads to remain open will be under Special Use Permits and regulated to decrease effects. This alternative will improve the natural characteristic compared to the current condition, but provides the least opportunity, among the action alternatives, for improving the natural characteristic.

Wilderness Character	Effects of Alternative A (No Action)	Effects of Alternative B	Effects of Alternative C	Effects of Alternative D
Untrammeled: Wilderness is essentially unhindered and free from modern human control or manipulation.	Currently, there are 22.40 miles of known motorized routes within wilderness areas, along with many unauthorized routes that have not been inventoried. Without the prohibition of cross-country travel on the two northern ranger districts, four of the wilderness areas will continue to be effected by motorized users unknowingly (or possibly illegally) driving into a wilderness area. In addition, if known roads have not been physically decommissioned within wilderness areas, there is an expectation that these roads will be maintained to standard. This alternative will not improve the untrammeled characteristic.	3.65 miles of motorized routes will be open to authorized permitted uses only. Additionally, motorized big game retrieval and motorized dispersed camping will not be permitted, decreasing the chances of motor vehicle users unknowingly driving into these areas. With the exception of the Mazatzal Wilderness, existing motorized routes within the other wilderness areas will be decommissioned. The road in the Mazatzal Wilderness will be the only road that will be maintained and controlled within a wilderness area. This alternative has greatest opportunity for improving the untrammeled characteristic.	7.81 miles of motorized routes will be open to authorized permitted uses only. Additionally, a corridor up to one mile on both sides of all designated motorized routes will be permitted for motorized big game retrieval. Currently cross-country travel is not permitted on the four southern districts. By allowing the corridor for motorized big game retrieval, motorized users could unknowingly drive into a wilderness area. This alternative will improve the untrammeled characteristic compared to the current condition, and with education and enforcement, motorized incursions could decrease over time.	20.33 miles of motorized routes will be open in this alternative. Additionally, a corridor up to one mile on both sides of all designated motorized routes will be permitted for motorized big game retrieval and a corridor up to 300 feet on both sides of designated motorized routes will be permitted. Currently cross-country travel is not permitted on the four southern districts. By allowing the corridors for motorized big game retrieval and motorized dispersed camping, motorized users could unknowingly drive into a wilderness area. This alternative has the least opportunity to improve the untrammeled characteristic compared to the current condition as it has the most motorized routes to be maintained within wilderness areas.
Undeveloped: Wilderness is essentially without permanent improvements or modern human occupation.	Currently, there are 22.40 miles of known motorized routes within wilderness areas. There are also less than ten privately owned parcels of land surrounded by wilderness (inholdings). In many of the wilderness areas livestock grazing is permitted. Additionally, many of the	3.65 miles of motorized routes will be open to authorized permitted uses only. With the exception of the Mazatzal Wilderness, existing motorized routes within the other wilderness areas will be decommissioned. The road in the Mazatzal Wilderness will be	7.81 miles of motorized routes will be open to authorized permitted uses only. These roads will likely require some level of permanent improvement to maintain safe use and decrease effects associated with unmaintained roads.	20.33 miles of motorized routes will be open in this alternative. These roads will likely require some level of permanent improvement to maintain safe use and decrease effects associated with unmaintained roads. This alternative will improve the undeveloped characteristic

Wilderness Character	Effects of Alternative A (No Action)	Effects of Alternative B	Effects of Alternative C	Effects of Alternative D
	wilderness areas have been mined over the last 150 years. There are currently signs of both of these activities. Additionally, there is an expectation that the current roads in the wilderness areas will be maintained to standard. This alternative will not improve the undeveloped characteristic.	the only road that will require permanent improvements. This alternative has greatest opportunity for improving the undeveloped characteristic.	This alternative will improve the undeveloped characteristic compared to the current condition by decreasing the miles of roads that will need maintenance.	compared to the current condition by decreasing the miles of roads that will need maintenance, but will have the least opportunity for improving the undeveloped characteristic among the action alternatives.
Outstanding opportunities for solitude or a primitive and unconfined type of recreation: Wilderness provides outstanding opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenge.	The Superstition and Mazatzal wilderness areas are the largest in size with extensive NFS non-motorized trail systems providing opportunities for primitive and unconfined recreation. The Mazatzal Wilderness Area is the largest in the Southwest. The smaller wilderness areas have a less extensive NFS trail system providing opportunities for solitude. The Salt River Canyon Wilderness is unique in that it does not have a designated trail system. Most use occurs during the river floating season from March 1 through May 15. This alternative will not improve the opportunities for solitude or a primitive and unconfined type of recreation for users.	With the reduction in motorized routes described above, Alternative B provides the most opportunities for visitors to experience solitude or a primitive type of recreation experience. There is the potential for user dissatisfaction by those who are accustomed to traveling on routes currently open with a motorized vehicle that are proposed for closure. This alternative favors those users seeking solitude and unconfined type of recreation experiences in wilderness.	Alternative C provides less motorized opportunities than Alternative A, No Action and alternative D and more than proposed in alternative B. There is the potential for user dissatisfaction from users who are accustomed to traveling on routes currently open proposed for closure with a motorized vehicle. This alternative provides additional opportunities than the current condition for those users who seek solitude and unconfined type of recreation experiences in wilderness.	Alternative D will designate the most miles of motorized routes within wilderness; however, fewer motorized routes are proposed compared to current condition, and will provide the least opportunities for visitors to experience solitude or a primitive type of recreation experience.

Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. There are three classifications of Wild and Scenic Rivers: “wild,” “scenic,” and “recreational.” For a river to be eligible for Wild and Scenic River designation it must be free flowing and, with its adjacent land area, must possess one or more outstandingly remarkable values. Outstandingly remarkable values are specific to each river segment and may include scenic, recreation, fish, historic, and cultural values. Nothing in the Act precludes accesses associated with motor vehicle use. Section 2(b) of the Act even stipulates the inclusion of roads and trails for access within certain types of potential river segments. Furthermore, “motorized travel on land or water is generally permitted in wild, scenic, and recreational river areas, but will be restricted or prohibited where necessary to protect the values for which the river area was designated” (Federal Register Vol. 47, No. 173, 1982, p. 39459).

Affected Environment

Currently, there are two designated Wild and Scenic Rivers corridors on the Tonto National Forest: Fossil Creek and Verde River (Figure 31). Management of the Fossil Creek area, including the designated corridor, has been delegated to the Coconino National Forest and they will administer the Fossil Creek Wild and Scenic River corridor within the boundaries of the Tonto National Forest. As such, designation of motor vehicle use will be decided in a separate environmental analysis by a line officer from the Coconino National Forest[66] . The Verde Wild and Scenic River Area is approximately 5,692 acres in size. The Scenic River segment is 50 percent located within the Coconino National Forest, 28 percent located within the Prescott National Forest and 12 percent located on the Tonto National Forest. The scenic classification is a total of 18.3 miles. The wild segment is predominantly located on the Tonto National Forest (93 percent) and seven percent located on the Coconino National Forest. Virtually the entire Wild River Area is within the Mazatzal Wilderness and was established as a result of the Arizona Wilderness Act of 1984 that designated this segment of the Verde River as a Wild River under the Wild and Scenic River Act (Public Law 90-542). The Act requires that this segment be administered in such a manner as to protect and enhance its designated outstandingly remarkable scenic, fish and wildlife, and historical/cultural values, while protecting the river’s free flowing character and water quality. According to the Verde Wild and Scenic River (VWSR) Comprehensive River Management Plan (2004), “Motor vehicle use shall occur only on roads and locations designated for this use. No new roads shall be built in the VWSR” (p. 19).

[66] Forest Service Road (FSR) 708, west of the locked gate identified in closure Order Number 12-15-256 and all routes stemming from the closed portion of this road will be designated administrative use only until such time as the Coconino National Forest makes a decision for the Fossil Creek corridor. Analysis in relationship to Fossil Creek is in the recreation section, as part of the cumulative effects.

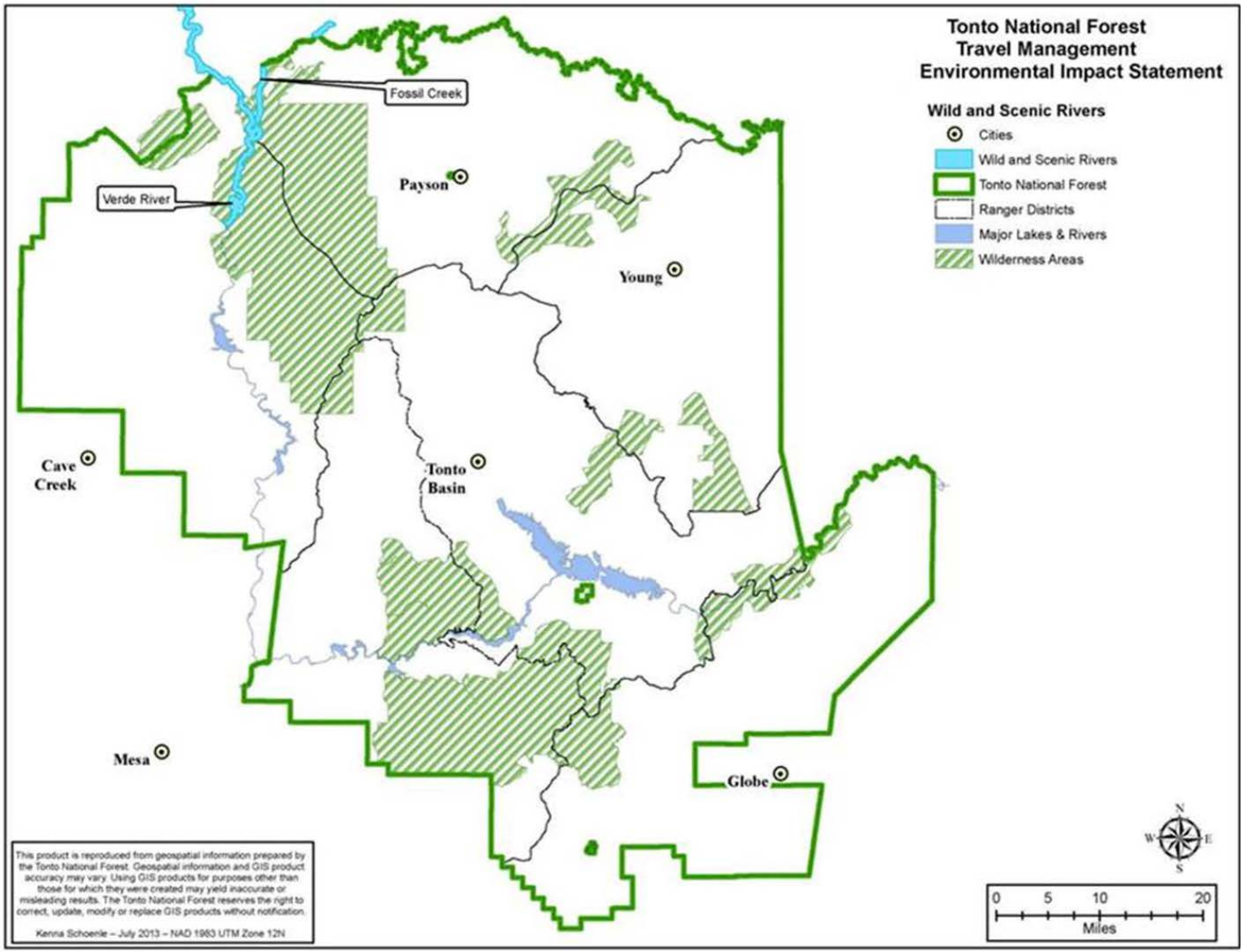

Figure 31. Map of Wild and Scenic Rivers on Tonto National Forest

Environmental Consequences

Currently, there are approximately 2.0 miles of ML 2 road located within the Verde Wild and Scenic River corridor: Forest Service Roads (FSR) 16, 16B, and 57B. All action alternatives propose to maintain these routes within the Verde Wild and Scenic River corridor. Unauthorized motor vehicle use within this corridor has been limited, mostly due to terrain and road conditions. In addition, no cross-country travel within the corridor is permitted per the Act, resulting in no effects associated with motor vehicle access for big game retrieval or fuelwood gathering.

Currently, there are two instances of motor vehicles crossing of the Verde Wild and Scenic River. None of the action alternatives propose any changes to the number of crossings. Since there will be no changes to the river crossings, the river's free flowing character and fish should not be impacted by this project. No historical/cultural values have been identified within the route corridors that will be impacted.

Alternative A – Direct and Indirect

The Cave Creek Ranger District, where the Verde River Wild and Scenic River corridor is located, does not allow motorized cross country travel[67]. For the designated scenic portion of the Verde River that is outside of wilderness, motorized dispersed camping is limited to roadside and end of road locations where topography allows. While this has provided attractive dispersed camping locations for those seeking access to water, these sites may decrease the scenic value of the corridor by permitting users to camp within the line of sight of the river. Furthermore, presence of wildlife, an outstandingly remarkable value, could be decreased by campers potentially causing wildlife to avoid these locations.

Alternatives B – Direct and Indirect

Alternatives B proposes to designate motorized access to one dispersed campsite. Travel to this one campsite will likely not increase or decrease the effects to the values of the river corridor and effects are expected to be identical to the current condition.

Alternative C – Direct and Indirect

Alternative C will designate four full-sized motor vehicle routes, totaling less than 1/10 of a mile, to facilitate recreational opportunities within the corridor, such as dispersed camping access. While this is an increase over the current condition and Alternative B, the effects are likely to be similar to both of these alternatives.

Alternative D – Direct and Indirect

Alternative D also proposes two miles of corridors with an associated 136.6 acres, the most opportunity for those recreationists who prefer to access their dispersed campsite with a motorized vehicle within the Verde Wild and Scenic River Corridor. This alternative provides the least opportunities for those who seek solitude, while dispersed camping. The larger increase in camping space will decrease the scenic values and increase the potential for wildlife to avoid the corridor.

[67] In the Draft EIS, the Verde Wild and Scenic River corridor was incorrectly identified as being within the Payson Ranger District instead of the Cave Creek Ranger District.

Cumulative Effects

The cumulative effects analysis for motorized routes and motorized crossings for Verde River Wild and Scenic River considers the past, present and reasonably foreseeable actions. In addition to the direct and indirect effects analyzed, other activities could affect this river. These activities include range allotment management and recreation activities that take place within and adjacent to the corridor. However, if other proposed projects within this corridor follow law, regulation, and policy, no cumulative effects are anticipated.

Potential Wild and Scenic Rivers Outside of Wilderness

The Nationwide Rivers Inventory (NRI) is a listing of more than 3,400 free-flowing river segments in the United States that are believed to possess one or more outstandingly remarkable values judged to be of more than local or regional significance. Under a 1979 Presidential Directive, and related Council on Environmental Quality procedures, all federal agencies must seek to avoid or mitigate actions that will adversely affect one or more NRI segments.

Affected Environment

There are thirteen[68] rivers and creeks which contain sections that have been identified as potential wild, scenic, and recreational river segments on the Tonto National Forest[69] (Figure 32). For this analysis, river and creek segments that are inside designated wilderness areas will not be analyzed as motor vehicle use in these areas is prohibited[70]. Each segment contains outstandingly remarkable values (ORVs) that qualify it to be considered a potential wild and scenic river.

Environmental Consequences

The analysis for the effects to Wild and Scenic Rivers on the Tonto National Forest will be assessed based on motorized routes within the corridor and motorized creek crossings.

Alternative A – Direct and Indirect

Currently, there are approximately 48 miles of roads located within potential Wild and Scenic River segments on the Tonto National Forest as follows: 27 miles of recreational; 14 miles of scenic; and seven miles of wild. Additionally, this alternative allows for 140 motorized crossings.

Motorized dispersed camping is limited to roadside and end of road locations where topography allows on the four southern districts (Cave Creek, Globe, Mesa, and Tonto Basin) and anywhere on the two open districts (Payson and Pleasant Valley). This allowed for approximately 41 miles of river corridor open to motorized camping (20,833 acres). In addition, motor vehicle use for big game retrieval is currently permitted on the two northern districts, the same acreage as dispersed camping. For users desiring a more natural river experience in potential corridors, the four southern districts will provide this. And for those wishing to access and recreate in the corridors using a motor vehicle, the two northern districts will provide this opportunity.

[68] The Fossil Creek segment originally identified in the draft EIS was officially designated in 2009. Management of that segment, along with the entire Fossil Creek river corridor, has been delegated to the Coconino National Forest.
[69] These river and creek sections are listed on the National River Inventory, which is administered by the National Park System.
[70] Segments of the following are all within designated wilderness areas and will not be evaluated in this report: Tonto Creek, Cherry Creek, Workman Creek, East Verde River, Upper Salt River, Upper Verde River, Salome River, and Spring Creek.

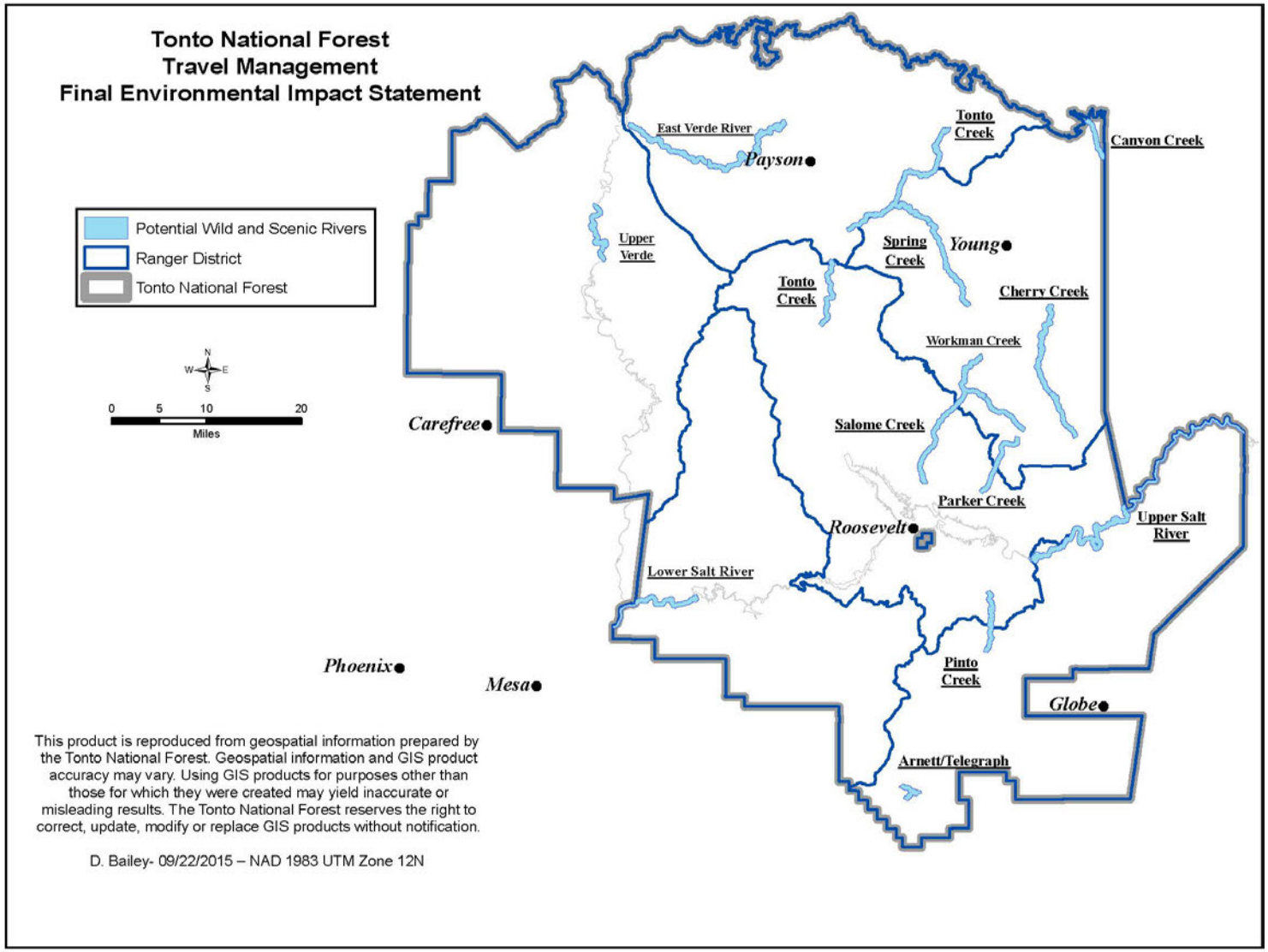

Figure 32. Map of Potential Wild and Scenic Rivers

Alternative B – Direct and Indirect

Overall, Alternative B proposes approximately 48 miles within potential Wild and Scenic River corridors, nearly identical to the current condition. Additionally, it proposes to decrease the number of crossings to 67. This alternative does not permit big game retrieval using a motor vehicle. These changes will provide more opportunities for users seeking a more primitive experience within the potential wild segments.

Under this alternative, 414 dispersed sites that are accessible by a designated road or motorized trail will be designated for camping on the entire forest. By placing a 50 foot buffer around each of those 414 sites, only 0.2 acres of these sites fall within the Potential Wild and Scenic River Corridors. This alternative significantly decreases the opportunity for using a motor vehicle to disperse camp, nearly eradicating this type of recreation opportunity in the corridors of the potential Wild and Scenic River segments. The effect from this proposal will limit motorized use for dispersed camping, causing those users to potentially look for this type of opportunity elsewhere. Those seeking a non-motorized experience in the corridors will become nearly exclusive to this type of recreation opportunity.

Alternative C – Direct and Indirect

Alternative C proposes 60 miles of routes within potential Wild and Scenic River corridors, an increase of approximately 12 miles when compared to the current condition. The change is an increase in miles in recreational and scenic segments, and a decrease in wild segments. Additionally, it proposes to decrease the number of motorized crossings in the corridor to 48. While the decrease in crossings will appeal to those seeking a more natural experience, the increase in miles of roads within the corridors will appeal to those that seek a motorized recreation experience.

In terms of using a motor vehicle for dispersed camping, this alternative decreases the overall acres where motorized travel may occur, but increases the mileage where the camping corridor is within the potential Wild and Scenic River corridor. Overall, this alternative will decrease the motorized dispersed camping opportunity for Forest users. This alternative provides 43 locations that may, in the future, be used for dispersed camping that average 0.034 miles (179 feet) from a designated route.

In terms of big game retrieval using a motor vehicle, this alternative permits retrieval up to one mile on both sides of designated routes for elk and bear, totaling nearly 200 trips across the Forest. While there could be an effect if legally taken game was within a potential corridor, the effects are likely to be negligible.

Alternative D – Direct and Indirect

While this alternative decreases the number of motorized crossings by 15 percent from Alternative A, it nearly doubles the miles of motorized routes within the potential Wild and Scenic River Corridors when compared to the current condition.

For motor vehicle use for dispersed camping, this alternative substantially decreases the overall acres within the corridor due to the 300 foot buffer on both sides of designated routes in all six ranger districts. This gives the users the most mileage for motorized dispersed camping, 61.61 miles, with fewer acres (approximately 4,000). Overall, this alternative, when compared to the other action alternatives, provides the greatest opportunity for those users that prefer a motorized experience.

In terms of big game retrieval using a motor vehicle, this alternative permits retrieval up to one mile on both sides of designated routes for deer, elk, and bear, totaling nearly 400 trips across the Forest. While there could be an effect if legally taken game was within a potential corridor, the effects are likely to be negligible.

Cumulative Effects

The cumulative effects analysis for motorized routes and motorized creek crossings for Potential Wild and Scenic Rivers outside of wilderness considers the past, present and reasonably foreseeable actions. In terms of future designation of these segments for designated Wild and Scenic Rivers, nothing in the Act precludes accesses associated with motor vehicle use. Section 2(b) of the Act even stipulates the inclusion of roads and trails for access within certain types of potential river segments. Furthermore, “motorized travel on land or water is generally permitted in wild, scenic, and recreational river areas, but will be restricted or prohibited where necessary to protect the values for which the river area was designated” (Federal Register Vol. 47, No. 173, 1982, p. 39459). We manage these segments to preserve the outstandingly remarkable values associated with each river and creek.

In addition to the direct and indirect effects analyzed, other activities could affect potential river and creek segments on the Tonto National Forest. These activities include range allotment management and recreation activities that take place within and adjacent to the corridors. However, if other proposed projects within these corridors follow law, regulation, and policy, no cumulative effects are anticipated.

Inventoried Roadless Areas

Inventoried Roadless Areas (IRAs) were authorized by the 2001 Special Areas; Roadless Area Conservation Final Rule, 36 CFR Part 294. The “inventoried” part of the name comes from the Roadless Area Review and Evaluation (RARE) forests conducted in the 1970s and 1980s.

The Roadless Area Conservation Final Rule states that, “This final rule will not close or otherwise block access to any of those roads; the final rule merely prohibits the construction of new roads and the reconstruction of existing roads in inventoried roadless areas. Under this final rule, management actions that do not require the construction of new roads will still be allowed, including activities such as timber harvesting for clearly defined, limited purposes, development of valid claims of locatable minerals, grazing of livestock, and off-highway vehicle use where specifically permitted. Existing classified roads in inventoried roadless areas may be maintained and used for these and other activities as well" (Federal Register, Vol. 66, No. 9, 1/12/2001, p. 3249).

Affected Environment

Approximately 209,762 acres (0.07 percent) of the Tonto National Forest is located within 13 individual Inventoried Roadless Areas (Figure 33).

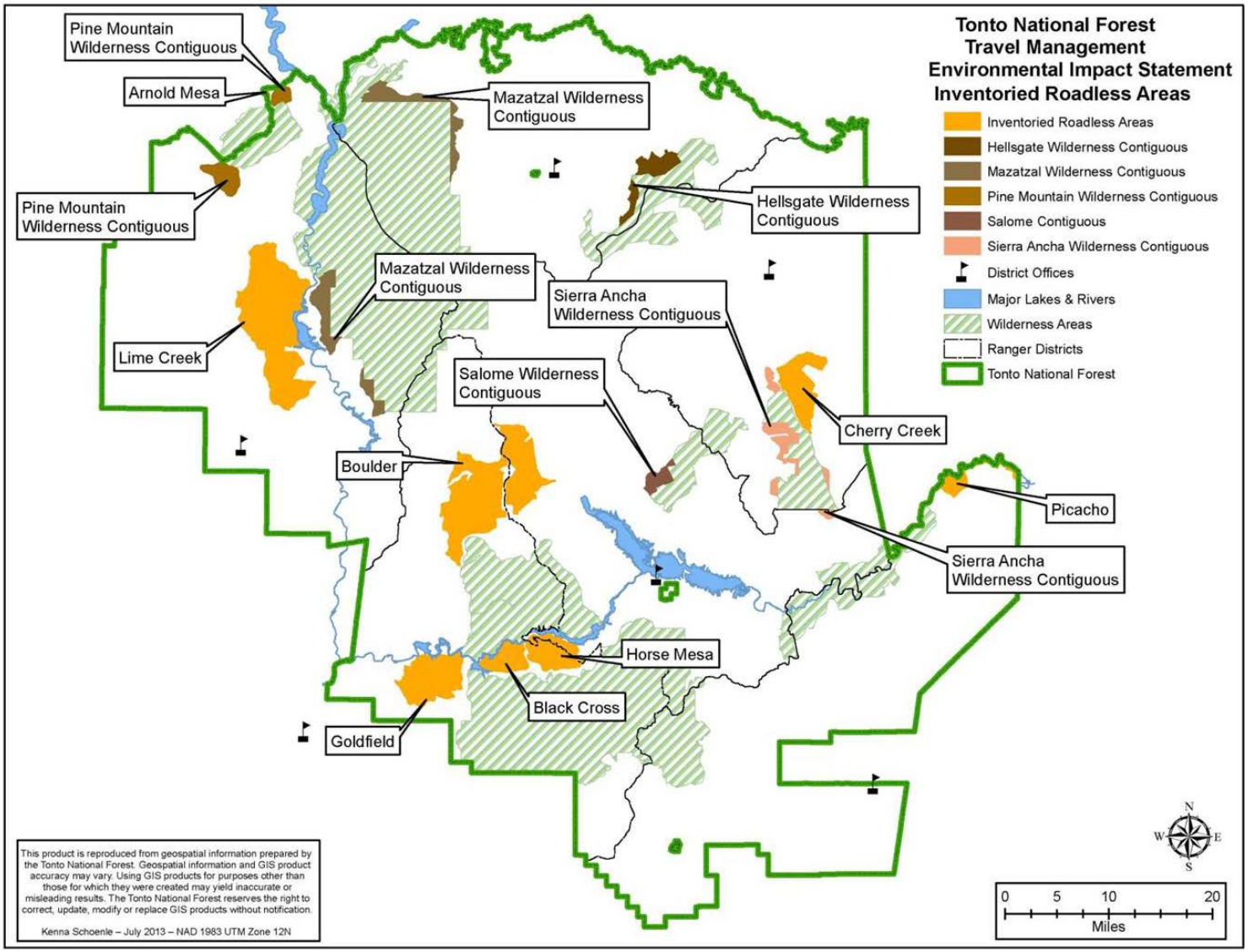

Figure 33. Map of Inventoried Roadless Areas on Tonto National Forest

Currently, there are nearly 70 miles of motorized routes within IRAs, including nine miles of inventoried unauthorized routes. Fifty-nine miles of these routes are Forest Service Roads that have been identified and tracked in databases. Almost Two miles of State Highway 87 is also considered inside an IRA on the Tonto National Forest.

Environmental Consequences

Inventoried Roadless Area Indicators

Inventoried Roadless Areas are managed for nine roadless characteristics resources or features that are often present in and characterize Inventoried Roadless Areas. These characteristics that follow are the indicators used in the Roadless Area Analysis:

- Soil, water, and air resources;
- Sources of public drinking water;
- Diversity of plant and animal communities;
- Habitat for threatened, endangered, and sensitive (TES) species and species dependent on large undisturbed areas of land;
- Primitive and semi-primitive motorized and non-motorized classes of recreation;
- Reference landscape for research study or interpretation;
- Natural appearing landscapes with high scenic quality;
- Traditional cultural properties and sacred sites; and
- Other locally unique characteristics – Wild and Scenic Rivers, Arizona Trail, Great Western Trail, etc.

Direct and Indirect Effects

All Action Alternatives will prohibit general public cross-country travel in IRAs. Motorized routes within IRAs will be closed unless designated for motor vehicle use, including those that are inventoried unauthorized. This will improve resource conditions of all nine roadless characteristics and primitive classes of recreation opportunities within the IRAs. Roads within designated IRAs often affect roadless characteristics. Currently, there are 56.23 miles of known motorized routes within IRAs on the Tonto National Forest.

In terms of big game retrieval and personal use fuelwood gathering using a motor vehicle, Alternative B will have the least impact to roadless characteristics as it does not permit motorized retrieval and allows for minimal fuelwood gathering in the IRAs. Alternative D, on the other hand, will have the greatest impact to roadless characteristics as it allows for retrieval of deer, elk, and bear within one mile on both sides of designated roads and motorized trails. In terms of fuelwood gathering, while it permits it within the entire fuelwood gathering permit area, seven of the IRAs are outside of this area. Of those areas that are partially or completely within a fuelwood area, gathering with a motor vehicle could decrease roadless characteristics. For Alternative A, the effects from these activities will only be present on the northern two districts currently open to cross-country travel. Alternative C will have similar effects to Alternative D in terms of big game retrieval and similar effects to Alternative B for fuelwood gathering.

Each alternative was analyzed based on the effects to the roadless characteristics for each Inventoried Roadless Area (Table 36).

Table 36. Direct and Indirect Effects to IRA Characteristics by Alternative

Alternative A (No Action)	Alternative B	Alternative C	Alternative D
Soil, Water, Aquatic and Air Resources			
This alternative will continue existing management of motorized routes, nearly 56 miles, within the IRAs. Watershed conditions in IRAs in the Cave Creek, Globe, Mesa, and Tonto Basin ranger districts where cross-country travel is not permitted will be minimally affected by this alternative. Watershed conditions in IRAs in the Payson and Pleasant Valley ranger districts may be impacted by authorized cross-country travel that enters into these areas, particularly if cross-country travel results in numerous passes in the same locations and develops into unauthorized routes.	This alternative proposes to designate the fewest miles (2.7 miles) of motorized routes of the action alternatives. This alternative will decommission approximately 67 miles of roads in the IRAs. This has the greatest potential for recovery of watershed conditions in the IRAs.	This alternative will designate 39.03 miles of motorized routes in IRAs and will propose decommissioning of 33.13 miles within these areas. Impacts of this alternative on soil and water conditions in IRAs will be greater than Alternative B, but may be less than Alternative A because of the greater number of miles of roads proposed for decommissioning in this alternative. These actions will facilitate recovery of watershed conditions where these routes occur within IRAs.	This alternative will authorize 63 miles of motorized routes within IRAs and will propose decommissioning of 6.5 miles within these areas. This alternative will authorize more motorized routes within IRAs than any of the other alternatives. Soil and watershed impacts within the IRAs will be greatest from this alternative. This alternative will prevent expansion of unauthorized routes, will eliminate use on uninventoried unauthorized routes, and decommission 6.5 miles of motorized routes within IRAs. These actions will facilitate recovery of watershed conditions where these routes occur within IRAs
Sources of Public Drinking Water			
None of the Inventoried Roadless Areas are within or affect Designated Municipal Watersheds. Much of the Forest lies within the Salt and Verde River watersheds, which supply drinking water to the Phoenix Metropolitan Area. Impacts to watershed conditions from unlimited cross-country travel on the northern ranger districts and motorized routes (which affect drinking water quality) will be greatest in this alternative.	With the least miles of proposed designated motorized routes, this alternative will have the smallest impact on watershed conditions and their effects on drinking water supply.	The effects of this alternative on watershed conditions and drinking water supply will be greater than Alternative B but less than Alternatives A and D.	The effects of this alternative on watershed conditions and drinking water supply will be greater than Alternatives B and C and similar to Alternative A.

Alternative A (No Action)	Alternative B	Alternative C	Alternative D
Diversity of Plant and Animal Communities			
Where roads and trails exist within IRAs, they provide a vector for introduction of new non-native invasive species. This alternative has 56.23 miles of routes within IRAs which will leave these areas most open to invasion by noxious weeds and nonnative species via motorized travel vectors. Overall habitat conditions for sensitive plant species dependent on large undisturbed areas of land are stable. Due to existing condition of cross-country motorized travel being permitted with the associated expansion of unauthorized routes, localized areas may be degrading because of fragmentation and "edge effects."	This alternative proposes the fewest miles of motorized routes within IRAs (2.69 miles), and will have the least likelihood of introduction and spread of noxious weeds and non-native invasive plants to these areas. Habitat conditions will see improvement from existing conditions, which could generally lead to improvement in desired future conditions.	This alternative will reduce motorized routes to 39.03 miles and will decrease the likelihood of introduction and spread of noxious weeds and non-native invasive plants to these areas Habitat conditions will see improvement from existing conditions, which could generally lead to improvement in desired future conditions, but at a slower potential pace than Alternative B.	Alternative D will propose 65.62 miles of motorized access within IRAs. This alternative will have the greatest chance of introduction and spread of noxious weeds and non-native invasive plants. Impacts to diversity of plant and animal communities will likely increase from existing conditions. These effects may result in a trend of moving away from desired future conditions for wildlife diversity.
Habitat for TES and Species Dependent on Large Undisturbed Areas of Land			
Overall habitat conditions for TES and species dependent on large undisturbed areas of land are stable, but in some cases declining for species like the Chiricahua leopard frog. Due to the existing condition of cross-country motorized travel being permitted to continue with the associated expansion of unauthorized routes, localized areas are degrading and likely will continue degrading.	Routes proposed for designation are not found within TES habitat and will improve conditions for species that are dependent on large tracts of undisturbed land.	Routes proposed for designation are not found within TES habitat. Compared to the current condition, this alternative will improve conditions for species that are dependent on large tracts of undisturbed land.	Routes proposed for designation are not found within TES habitat. Compared to the current condition, this alternative will likely not improve conditions for species that are dependent on large tracts of undisturbed land.
Primitive, Semiprimitive Non-motorized and Semi-primitive Motorized Classes of Dispersed Recreation			

Alternative A (No Action)	Alternative B	Alternative C	Alternative D
There are currently 56.23 miles of road providing access within IRAs. A number of the IRAs located on the forest are contiguous to a wilderness area or are located in close proximity to designated wilderness offering opportunities for primitive, semi-primitive non-motorized recreational activities. Cross-country travel is currently allowed within permitted areas for motorized fuelwood gathering within the Mazatzal Contiguous, Hellsgate Contiguous, Boulder, Salome Contiguous, Cherry Creek, and Picacho IRAs.	Alternative B proposes the least motorized routes (2.69 mile) within IRAs. There could be visitor dissatisfaction due to being restricted from places they have traditionally accessed using motorized routes within IRAs. The reduction in road mileage provides additional primitive and semiprimitive non-motorized opportunities within IRAs on the Forest and the least opportunities for a Semi-primitive Motorized Setting. This alternative will benefit visitors who prefer a recreating in IRAs without motor vehicles.	Alternative C proposes a decrease (39.03 miles) of motorized routes compared to the current condition. This alternative will decrease the motorized opportunity to access IRAs, but will still provide an opportunity to those wishing to recreate in the IRAs using motor vehicles.	Alternative D proposes to increase motorized routes within IRAs (65.62). This alternative will favor those recreationists who prefer a semi-primitive motorized setting and will be least desirable to those wishing to recreate in the IRAs without motor vehicles.
Natural Appearing Landscapes with High Scenic Quality			
Currently, existing landscape character within the Black Cross, Boulder, Lime Creek, and Horse Mesa IRAs is becoming less natural in appearance due to cross-country travel on unauthorized routes and likely will continue. The Bulldog Permit Zone located within the Goldfield IRA has contributed to improving existing landscape character.	This alternative will decommission 66.85 miles of roads in the IRAs and designate only 2.69 miles. Overall this will result in the greatest potential for existing landscape character to become more natural in appearance.	This alternative will decrease the number of motorized routes in IRAs (17.2 miles less than the current condition) and will decommission nearly 33 miles of motorized routes. This will be less than Alternative B, greater than Alternative D potential for existing landscape character to become more natural in appearance.	This alternative will increase (9 miles more than current condition) motorized routes within IRA and decommission 6.5 miles. This will result in the least potential for existing landscape character to become more natural.
Reference Landscapes for Research Study or Interpretation			
See effects under Special Management Areas of this section			
Traditional Cultural Properties and Sacred Sites*			
Allowing unrestricted cross-country travel to continue on any part of the Forest will result in an increase in the	Alternative B greatly reduces potential direct and indirect effects to TCP, sacred sites, and traditional use areas	This alternative has similar effects as those described in Alternative B in	This alternative has similar effects as those described in Alternative B

Alternative A (No Action)	Alternative B	Alternative C	Alternative D
cumulative effect on known contemporary Indian uses by degrading traditional use areas, damaging TCPs, sacred sites, and disrupting traditional activities and may inhibit or limit the use of such areas. Likewise, the potential remains for trespass onto reservation lands from uncontrolled and unclassified routes. Access to traditional resources and places of significance to Tribes will remain unchanged.	by restricting cross-country travel, reducing the potential for trespass onto Tribal lands. In particular, restricting motorized vehicles to designated routes will reduce the potential for disruption of traditional cultural or religious activities. However, closure of some existing roads and eliminating cross-country travel may reduce opportunities for resource gathering, visitation of sacred and other traditionally significant sites and increase the need for non-motorized travel for elderly traditional practitioners.	terms of prohibiting cross-country travel. However, particularly for motorized big game retrieval, it also has greater potential than Alternative B for motorized recreational activities to disrupt traditional activities sensitive to public intrusion and increases the potential for trespass onto tribal land	in terms of prohibiting cross-country travel. This alternative, with the most proposed motorized access, particularly in regards to roads, will have the most potential for providing Tribal access to sacred and traditional places and resources. By the same token, it also has greater potential than the other alternatives for motorized recreational activities to disrupt traditional activities sensitive to public intrusion and increases the potential for trespass onto tribal land. Otherwise, effects on Tribal access to traditional resources and significant places under this alternative will be similar to what they will be under the Alternative C.

* More information can be found in the Heritage Resources and Contemporary Indian Uses Reports in the project record.

Cumulative Effects

The cumulative effects analysis evaluates past, present, and reasonably foreseeable actions on roadless characteristics in IRAs. This analysis specifically considers those activities that have influenced motorized or non-motorized travel in the IRAs and their associated effects on roadless characteristics.

The cumulative effects analysis area for this analysis includes the 13 Inventoried Roadless Areas within the boundary of the Tonto National Forest. Consideration was given to cumulative effects beyond the IRA boundary to include wilderness areas on the Tonto, Prescott and Coconino National Forests and the White Canyon Wilderness administered by the Tucson Field Office of the Bureau of Land Management.

Access to and within IRAs has been developed over time from past Native American use, mining, military travel, timber harvest, road construction, and trail construction and reconstruction activities. There are 35 miles of roads located within the IRAs on the Forest. The most miles occur in the Boulder, Lime Creek, Cherry Creek, and Hellsgate Wilderness Contiguous IRAs.

Road and trail maintenance, as well as weed treatment, occurs along the transportation system located within the Tonto National Forest IRAs (see trail maintenance discussion within Recreational Opportunities section). Grazing and Outfitter and Guide permittees all utilize the road transportation system to access the IRAs on system roads for their operations. This road system is also used for firefighting operations.

Treating noxious weeds will enable native vegetation to reestablish and greatly improve many roadless characteristics, such as the soil resource, diversity of plant and animal communities, and their associated habitat, and the naturalness associated with the area's landscape character and integrity. It also limits the expansion of weed infestations throughout non-infested areas within the IRAs.

Short term effects to recreational opportunities in primitive and semi-primitive environments may occur if recreationists expecting solitude encounter weed control crews working in the IRAs. Apparent naturalness may also be affected in the short term where grubbing, pulling, and/or mechanical treatments are obvious.

A number of proposed projects could affect and improve IRA characteristics over the next five years. Weed treatment, vegetation projects, ongoing trail maintenance and reconstruction, and fire management activities all have the potential for cumulative effects on the areas' roadless characteristics.

All Action Alternatives have the potential for the following cumulative effects within IRAs:

- In most cases the projects proposed within IRAs trend towards improving Roadless Area character.
- User dissatisfaction over the loss of the following motorized opportunities within IRAs:
    - Motorized cross-country travel.
    - Unlimited opportunities for motorized dispersed camping and motorized big game retrieval within IRAs located within the Mazatzal Wilderness Contiguous, Hellsgate Contiguous, Cherry Creek, and Sierra Ancha Wilderness Contiguous IRAs.

  - Motorized access on specific roads within the IRAs proposed for closure.
  - Trails designated for non-motorized use within an IRA, where visitor expectations for that IRA has been for a semi-primitive motorized setting.
- User satisfaction for those dependent upon the opportunities for primitive and semi-primitive non-motorized recreation settings within IRAs.

Special Management Areas

In the Forest Plan, additional opportunities were identified to provide areas for scientific study and protection through the establishment of research natural areas, botanical areas, or designation as natural areas under the Arizona Parks Board Natural Area Program. The Forest Plan indicates that OHV use is prohibited off of designated routes in all of these Natural Research Areas (NRA), Proposed Natural Research Areas, wildlife areas, and experimental forest (Figure 34).

Affected Environment

Two of the areas listed in the Forest Plan were never established; the Desert Botanical Garden and the Superstition Museum. The Desert Botanical Garden was to have boundaries established by 1988 within the Goldfield Inventoried Roadless Area and the Superstition Museum was only listed under Special Area Recommendations and not further described. Also, the Fossil Creek Natural Area is within the Fossil Creek Wild and Scenic Area that is being administered by the Coconino National Forest and is being analyzed by them. Therefore, these three areas are not discussed here any further.

Two additional Special Management areas on the Tonto National Forest include a wildlife area and an experimental forest. In the Three Bar Wildlife Area and the Sierra Ancha Experimental Forest, the plan restricts OHV use to system roads (Forest Plan, pages 161 and 175 respectively). The Sierra Ancha Experimental Forest is located west of the Sierra Ancha Wilderness Area and managed by the Rocky Mountain Research Station.

Environmental Consequences

Roads within designated and proposed special management areas may affect the characteristics for which these areas have been designated or proposed. There is currently 60.45 miles of known motorized routes within these special management areas on the Tonto National Forest.

Alternative A – Direct and Indirect

Most special management areas have less than three miles of motorized routes within their boundaries, including 0.75 of unauthorized routes in the proposed Sycamore Creek and Blue Point Cottonwood NRA. The Three Bar Wildlife Area and the Sierra Ancha Experimental Forest currently have 22.90 and 31.70 miles of motorized routes respectively in their management areas, including 0.29 miles of unauthorized routes in the Sierra Ancha Experimental Forest.

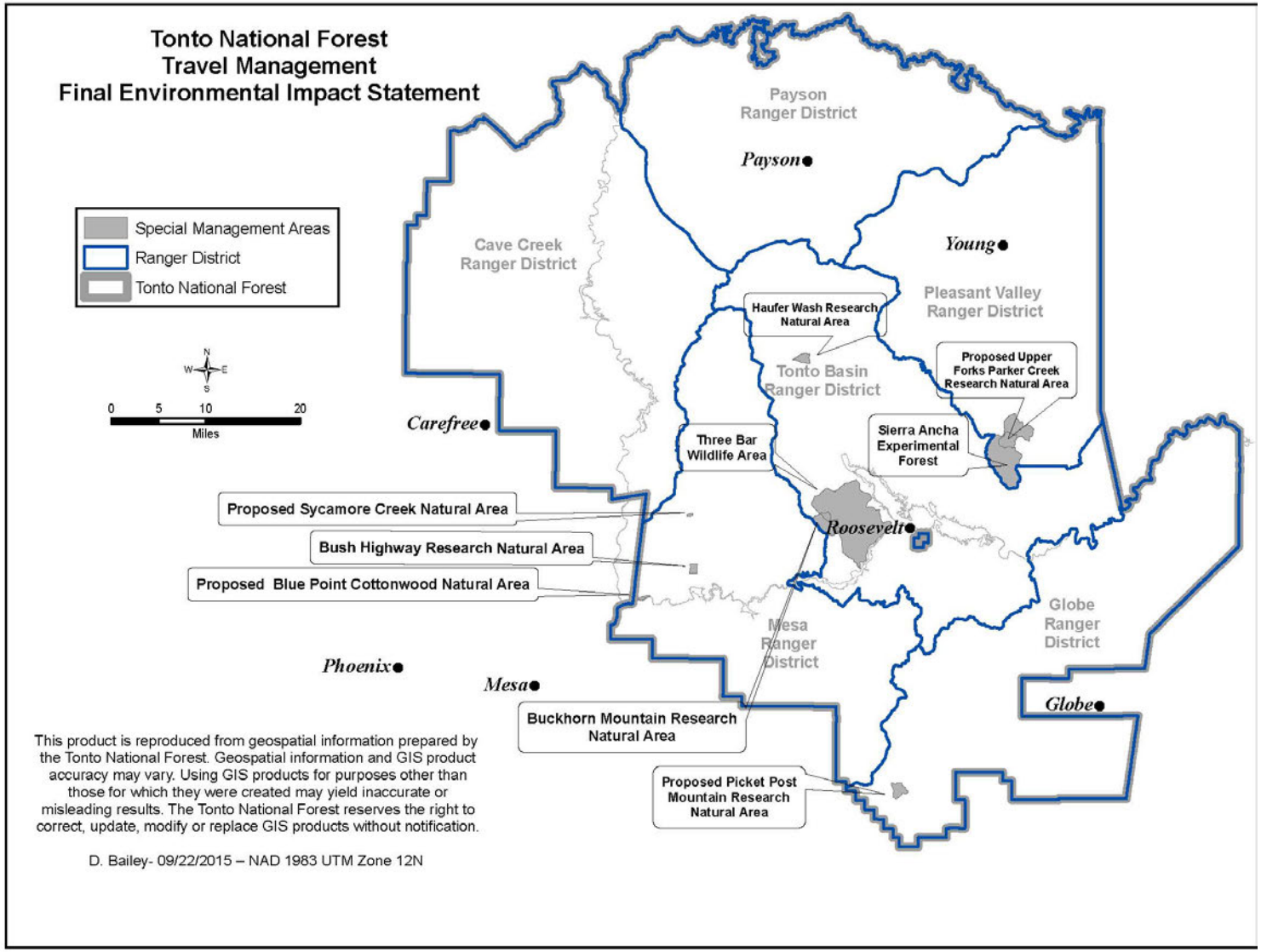

Figure 34. Map of Special Management Areas on Tonto National Forest

In terms of a non-motorized trail experience, four special management areas provide this opportunity: Buckhorn Mountain NRA; proposed Upper Forks Parker Creek NRA; Sierra Ancha Experimental Forest, and Three Bar Wildlife Area. Motorized cross-country travel is prohibited within all of these special areas. Buckhorn Mountain RNA and proposed Picket Post Mountain RNA have no motorized routes that are open to the public (the 0.05 miles of motorized routes with proposed Picket Post Mountain are for administrative use only and not open to the public). These areas provide primitive and unconfined recreation opportunities for forest visitors, while meeting the intent of these areas to provide non-disruptive research and education and keep the areas in their natural or unmodified condition and to protect natural features and vegetation.

Alternative B – Direct and Indirect

This alternative proposes to reduce the number of miles of motorized routes within special management areas to nearly half of the existing condition. Proposed Upper Forks Parker Creek will have no motorized routes within its boundaries. In proposed Picket Post Mountain RNA, the motorized routes (0.05 miles) are for administrative use only.

Alternative B will likely have less conflict with management goals to provide non-disruptive research and education and keep the areas in their natural or unmodified condition and to protect natural features and vegetation of these special management areas, when compared to the current condition and other action alternatives.

Alternative C – Direct and Indirect

Alternative C proposes to reduce the motorized route system within special management areas to 46.30 miles. In proposed Picket Post Mountain and Upper Forks Parker Creek RNAs, the motorized routes (0.05 miles and 0.55 respectively) are for administrative use only and not open to public motor vehicle use. This alternative will decrease conflict with management goals to provide non-disruptive research and education and keep the areas in their natural or unmodified condition and to protect natural features and vegetation of these special management areas.

Alternative D – Direct and Indirect

Alternative D proposes to reduce the miles of motorized routes in special management areas from current condition, but will have the most motorized routes of the action alternatives. Just like Alternatives B and C, the routes within proposed Picket Post Mountain NRA will be for administrative use only.

Of the action alternatives, this alternative will have the least decrease in conflict with management goals to provide non-disruptive research and education and keep the areas in their natural or unmodified condition and to protect natural features and vegetation of these special management areas.

Cumulative Effects

The cumulative effects analysis evaluates past, present, and reasonably foreseeable action upon Special Areas located on the Tonto National Forest. All actions will vary the miles of motorized access on designated routes; however, these areas will continue to have a prohibition on cross-country travel and will meet the intent of the management goals of these special areas. Currently, there are no proposed projects within or adjacent to these areas that will have a cumulative effect over the direct and indirect effects of this proposal.

Visual Resources

As the American population increases and more areas become urbanized, the Forest Service has seen an increase in public concern about the natural scenic qualities of national forests. Research shows that there is a high degree of public agreement regarding scenic preferences. This research indicates that people value most highly the more visually attractive and natural-appearing landscapes (U.S. Forest Service, 2000). High quality scenery, especially scenery with natural-appearing landscapes, enhances people's lives and benefits society (U.S. Forest Service, 2000).

People utilize travelways and use areas throughout the national forests. In addition, they utilize travelways and areas located throughout and outside of national forest boundaries that provide views into national forests. Travelways represent linear concentrations of public viewing including highways, roads, trails, rivers, and other waterways. Portions of landscapes visible from travelways and use areas are important to constituents for their scenic quality, aesthetic values, and landscape merits (U.S. Forest Service, 2000)

Roads create disruptions in the natural appearing landscape and diminish visual quality by reducing the natural appearance of the landscape. The major visual impact of roads is their linear configuration, which must be superimposed upon nonlinear landscapes. Roads along with trails' linear alterations in the landscape can be mitigated through sound design. Unmitigated, they present uncharacteristic line qualities in forest landscapes.

Visual Resource Management

The Visual Management System (VMS) was used for forest plans developed from the mid-1970s until the mid-1990s as the preferred analysis tool for determining effects to scenery from proposed activities; "It has become necessary to both inventory the visual resource and provide measurable standards for the management of it" (U.S. Forest Service, 1974, p. 2). The analysis of visual resources for forest plans were based on each national forest's character type, an area of land that has common distinguishing visual characteristics of landform, rock formations, water forms, and vegetative patterns. Character types are used as a frame of reference to classify physical features of a given area as toby their degree of scenic quality (U.S. Forest Service, 1974).

The Tonto National Forest's character types include Upper Tonto and the Sonoran Arizona Uplands, both subtypes of Tonto Landscape Character Type. The dominant physiographic feature of the Upper Tonto Subtype (Payson and Pleasant Valley ranger districts) is the Mogollon Rim while the Sonoran Arizona Uplands subtype (Cave Creek, Globe, Mesa, and Tonto Basin ranger districts), includes the Upper Salt River Valley (U.S. Forest Service, 1989).

In the development of the Tonto National Forest Plan (Forest Plan), all land was inventoried to determine the landscape scenic attractiveness (variety class inventory) and the public's visual expectations (sensitivity level inventory) according to the visual management system:

- Variety Classes classify landscapes into different degrees of varieties: A – Distinctive, B – Common and C – Minimal. The majority of the Forest contains features common throughout this character type, classified as Variety Class B. An example of distinctive scenic quality, classified as Variety Class A, is stretches of the Upper Salt River.
- Sensitivity Levels are a measure of people's concern for the scenic quality of the National Forests: Level 1 – Highest Sensitivity, Level 2 – Average Sensitivity, Level 3 – Lowest Sensitivity. The foreground distance zones are classified as Level 1 while middle

ground distance zones are classified as Level 2. Level 3 classifications are isolated to background distance zones.

A component of sensitivity level is distances zones. Distance zones are the portions of a particular landscape seen from roads, trails, use areas, and water bodies. The zones and importance of viewer position in relation to the landscape indicate the degree to which landscapes are visible and important to the public. The three distance zones are foreground (extends ¼ to ½ mile from observer), middle ground (extends from foreground 3 to 5 miles), and background (extends from middle ground to horizon) (U.S. Forest Service, 1974).

Based on these inventories all Tonto land was assigned a visual quality objective (VQO). Visual quality objective is defined in the Forest Plan as a desired level of excellence based on physical and sociological characteristics of an area. It refers to degree of acceptable alteration of the characteristic landscape. There are five levels defined in the Forest Plan:

- Preservation (VQO) – A visual quality objective that provides for ecological changes only.
- Retention (VQO) – A visual quality objective that, in general, means man's activities are not evident to the casual forest visitor.
- Partial Retention (VQO) – A visual quality objective which in general means man's activities may be evident but must remain subordinate to the characteristic landscape.
- Modification (VQO) – A visual quality objective meaning man's activity may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color, or texture. It should appear as a natural occurrence when viewed in foreground or middle ground.
- Maximum Modification (VQO) – A visual quality objective meaning man's activity may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background.

VQOs establish minimum acceptable thresholds for landscape alterations from an otherwise natural-appearing forest landscape. The threshold of effects is exceeded when alterations do not meet the visual intensity and dominance criteria of the VQO.

Affected Environment

The Forest's scenery is known for its rugged and beautiful country ranging from saguaro cactus-studded desert at altitude of 1,300 feet to pine-forested mountains 7,900 feet, unique Sonoran Desert, and stone canyons. The scenery of the forest is experienced along two National Forest Scenic Byways running through it: From the Desert to the Tall Pines Scenic Road (State Route 288) and Apache Trail Historic Road (State Route 88). Additional significant roads for experiencing scenery are the Gila-Pinal Scenic Road (US Highway 60) along with the Copper Corridor Scenic Road East and West (State Route 177).

On the Tonto, mountains and certain visually significant landscape types (e.g., surface water, riparian, diverse natural vegetation) are typically considered sources of scenic viewsheds. Thirty seven percent of the overall land area consists of mountains (lands with slope greater than 20 percent). Eleven percent of the overall land area consists of forest, 36 percent woodland, 10 percent shrublands, 12 percent grasslands, 28 percent desert, and 3 percent riparian and water,

Although roads and trails cause visual contrasts noticeable on the landscape, they often provide the platform for viewing scenery and other natural features. The top recreational activities on the Forest according to the 2009 National Visitor Use Monitoring (NVUM) survey (U.S. Forest Service) include hiking/walking, viewing natural features (scenery), relaxing, motorized trail activity, driving for pleasure, OHV use, and motorized water travel, camping, and picnicking. All of these activities are directly related to scenic quality. As a result, visitors place a high value on scenic quality and have an interest and concern on effects to scenic quality (U.S. Forest Service, 2009)[71].

Roads and Trails Designated for Motorized Use

For most Forest visitors, the use of a motor vehicle is an integral part of their time spent on the Forest since the majority of activities one could pursue on a national forest involve driving on forest roads. Whether it is to access a trailhead or dispersed camping site, collect firewood, or view scenery and wildlife, motor vehicle use generally has a major influence on where and how the public uses public land.

The existing road system does not include trails specifically dedicated to ATVs or off-road motorcycles.

Motorized Cross-Country Travel

Managing motorized recreation is particularly challenging on the southern ranger districts of the forest with their fragile desert ecosystems and high demand for motorized access. The desert ecosystem does not provide many natural barriers to prevent users from riding anywhere their vehicle will take them, often creating unauthorized routes. Motorized cross-country travel has the greatest negative effects on visual quality and integrity on the Tonto National Forest.

Unauthorized routes vary in width from single-track routes used by off-road motorcyclists to over forty feet wide. Evidence of vehicle travel on unauthorized routes is often visible from system roads on the Forest. This has the potential to create negative visual impacts by introducing non-characteristic linear features on a non-linear landscape. In some cases, the visual impact is that of an unimproved road intersecting the road or highway. Often the road is unnoticed due to topographic and vegetative screening (meeting retention VQO) or briefly seen for short durations, remaining subordinate to the characteristic landscape (meeting partial retention VQO). The visual disturbance of some unauthorized routes in vegetation types of the northern ranger districts are less due to the screening. In the sparsely vegetated landscape such as the open, shrub, and desert shrub, and Sonoran desert vegetation types of the southern ranger districts, the unauthorized routes may be more visible especially in steeper topography in foreground and middleground viewing zones.

The repetitive passage on these routes, when located perpendicular to the slope of the natural terrain, known as fall-line alignments, triggers erosion in areas with fragile soils creating bare areas that lack vegetation and are quite visible to the casual observer. This introduction of uncharacteristic visual lines contributes to degradation of the visual qualities of the landscape. Often horseback riders that travel cross-county repeatedly in the same location create unauthorized routes that are inviting for motorized recreationists. The more popular the route becomes with motorized recreationists the wider it expands along with the scar on the landscape, degrading the visual qualities of the landscape. The overall density in some locations tends to detract from the foreground and middleground viewing of the landscape at the forest scale. OHV

[71] For more information on the National Visitor Use Monitoring survey, see the Recreation section of this chapter.

use and associated resource damage is concentrated along the southern portions of the Forest within the urban interface, such as the Sycamore and the Rolls on the Mesa Ranger District and Desert Vista on the Cave Creek Ranger District. Because the Sonoran Desert is fragile, vegetation is slow to become established or reestablished after it has been damaged by the repetitive passage of vehicles which is quite visible to the casual observer.

Permit Zones

The only permit zone currently on the Forest is the 34,720-acre Bulldog Canyon on Mesa Ranger District, one of the southern districts. Much of the Bulldog Canyon Permit Zone is in portions of the Forest managed for VQOs of retention and partial retention. Barriers and gates were installed in 1997 to delineate the permit zone's boundaries. Even though the barriers and gates are constructed with materials and finishes that are similar to the surrounding landscape, they are visually evident to the casual forest visitor.

Motor Vehicle Use for Big Game Retrieval

In many portions of Pleasant Valley and Payson ranger districts, which are currently open to cross-country travel, the open nature of the vegetation and the generally gentle topography encourages motorized retrieval. Most hunters take advantage of motorized retrieval unless topography makes it too difficult. As previously mentioned, when retrieval creates a repetitive passage on the ground, the effects to visual quality can be affected.

Motor Vehicle Use for Dispersed Camping

Based on Forest Service employee observation and expertise in the field, the majority of dispersed camping access on the Tonto is by motorized vehicles, where visitors drive vehicles to a campsite. (This is in contrast to camping at a developed campground where amenities such as restrooms, water, and defined camping spurs are provided). From simple car-camping with tents, to overnight camping with larger vehicles such as motor homes, or "RVs", camping outside of developed campgrounds in areas without amenities is desirable for many people.

Generally, dispersed camping is more popular at higher elevations on Payson and Pleasant Valley Ranger Districts from May through September, where cross-country travel is permitted. The Cave Creek, Globe, Mesa, and Tonto Basin Ranger Districts are generally more popular during colder seasons (although cross-country travel is prohibited on these southern districts unless posted open; however, illegal cross-country travel is known to occur. Typically, these campsites include an open, cleared area from vehicles parking and turning around. On the southern districts, dispersed campsites tend to be user created pullouts along existing roads and in desert washes. This activity often creates a repetitive passage on the ground, effecting visual quality.

Environmental Consequences

Methodology and Assumptions

When the Forest visual resource inventory and mapping process was completed for the Forest Plan in the 1980s, GIS systems did not exist so the maps were completed manually and were overlays of Mylar. Hard copies of the original Mylar overlays were digitized and integrated into the GIS system in 2006.

A review of the graphic representation of the 2006 VQO GIS dataset (Figure 35) indicated that what currently exists is not represented by the dataset. For example, preservation VQO tends to occur in wilderness areas on Forest Service land; however, on the Tonto National Forest only a

small portion of the Forest was identified as preservation for the 1985 Forest Plan and is not in a wilderness area.

As seen in Table 37, the acreage of forest-wide VQOs prescribed in the Forest Plan standards does not match the 2006 VQO GIS dataset from digitized VQO maps. The discrepancies are due to numerous factors with the lands assigned preservation VQO having the greatest information gaps. One major contributing factor is 748,010 acres or 25 percent of the Forest had no VQO assigned to them on the VQO maps, the majority of which were wilderness areas (shown as Unknown VQO in the table). Another indicator of the data gap is according to Forest Plan standards there are 593,000 acres or 21 percent of the forest assigned as preservation VQO, while the 2006 VQO GIS dataset indicates less than 1,000 acres. Another factor impacting preservation VQO inaccuracies was during the 2006 process to integrate hard copies of the forest VQO maps into the GIS system, there were multiple duplicate hard copies and many of them included handwritten notes indicating revisions, while others were labeled as “wrong VQOs” and none of them were dated. It was not always apparent which VQO maps should be digitized since it was not clear which were the most updated. Since the 1980s inventory was completed by employees that have retired from the Tonto National Forest, and there is no documentation, it is not clear why wilderness areas were not classified as preservation on the VQO maps and why other parts of the forest were not assigned VQOs. The hard copies of VQO maps that appeared to be the most updated were digitized. As noted above, typically wilderness areas on Forest Service land are managed as preservation VQO so the 2006 VQO GIS dataset does not accurately reflect the VQOs for wilderness areas on the forest.

Table 37. Forest-wide Visual Quality Objectives Comparison of Standards and 2006 GIS Dataset

	1985 Forest Plan Standards (Acres)	Percent of Forest	GIS Dataset from 2006 Digitized VQO Maps (Acres)	Percent of Forest
Preservation	593,000	21	975	0
Retention	319,000	11	291,743	10
Partial Retention	918,000	32	953,902	32
Modification	484,000	17	504,779	17
Maximum Modification	559,000	19	466,283	16
Unknown	0	0	748,010	25
Total	**2,873,000**	**100**	**2,965,692**	**100**

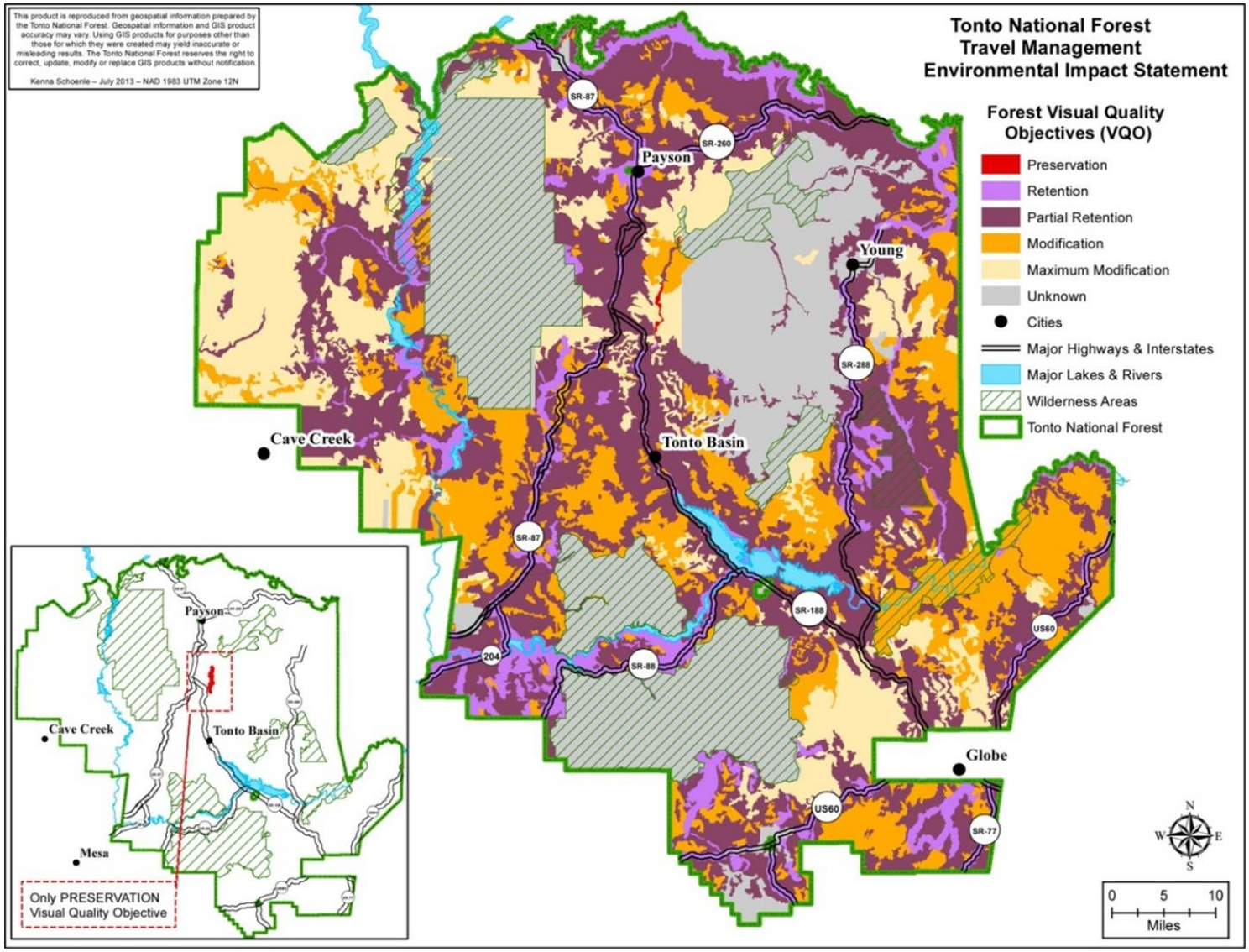

Figure 35. Map of Forest Visual Quality Objectives on Tonto National Forest (2006 Dataset)

Since the VQO maps were integrated into the GIS system in 2006 there have been numerous changes in the versions of GIS software the forest uses causing differences in forest boundary, wilderness boundaries, etc., which has contributed to discrepancies for all VQOs. Major changes in visitor use, recreation areas, and travel routes to name a few have also made the old inventory out-of-date for all VQOs. The Forest VQO maps have not been updated (variety classes, sensitivity levels, and visual quality objectives refined) during past site-specific projects, which also has contributed to discrepancies for all VQOs. However, the current 2006 VQO GIS dataset is the best available data.

There are fewer discrepancies for the remaining modification, maximum modification, partial retention, and retention VQOs.

At this time, the 2006 GIS VQO dataset is the best available science. Due to the inaccuracies in VQO data, the alternatives will be evaluated on other criteria in addition to consistency with VQOs. The analysis will also be based on the effect of barriers in proposed permit zones, proposed decommissioning of existing roads and unauthorized routes, and areas open to motorized cross-country travel on visual quality.

Alternative A – Direct and Indirect Effects

This alternative is the no action and acts as the baseline, allowing the decision maker to understand the effects of travel management if no decision is made.

Decommissioned Existing Roads

In the no action, there will be no decommissioning of routes outside of what is necessary to continue the management of the current Forest System Roads. There will be no change from the existing condition,

Areas Open To Motorized Cross-Country Travel

Currently, there are no designated OHV areas and cross-country travel is permitted on the Payson and Pleasant Valley Ranger Districts. Cross-country travel is restricted on the southern districts, although it is known to occur. There will be no change from the current condition. However, the visual qualities of the landscape could deteriorate if the motor vehicle use on the Tonto National Forest increases.

Permit Zones

Currently, there is only one permit zone: Bulldog Canyon. The existing pipe rail barriers can be seen from major roads and would continue being visually evident to the casual forest visitor. There is no anticipated change from the existing condition.

Alternative B – Direct and Indirect Effects

This alternative proposes to decommission approximately 2,367 miles of existing roads and the addition of four permit zones.

Decommissioned Existing Roads

Once the decommissioning and rehabilitation (obliterating and seeding) of these roads is completed, the landscape would become more “natural” in appearance, which would have a beneficial effect on the quality of visual resources. Of the proposed 2,367 miles of roads proposed to be decommissioned, approximately 346 miles are in areas of the forest managed for retention VQO and 1,043 miles for partial retention VQO.

Areas Designated for Motor Vehicle Use

In Alternative B, there would be no designated OHV areas proposed. It is unlikely that these heavily used areas would revegetate without intensive rehabilitation[72] .

Permit Zones

Alternative B proposes to add four permit zones, in addition to the current Bulldog Canyon. These four zones may require miles of barrier to enforce its boundaries, which will detract from the visual character. These barriers are likely to be visually evident to the casual forest visitor like the barriers for Bulldog Canyon. The more barriers necessary to enforce the permit zone, the more they could detract from the visual character. These effects can be reduced by making the barriers with materials that blend with the surrounding landscape and using natural features whenever possible to limit access, such as rock formations.

Of the proposed 150,925 acres of permit zones, approximately 29,451 acres are in areas of the forest managed for retention VQO and 66,504 acres for partial retention VQO.

Alternative C – Direct and Indirect Effects

This alternative proposes to decommission 1,276 miles of existing roads, designate three additional permit zones, and add 8 OHV areas totaling 2,089 acres.

Decommissioned Existing Roads

Once the decommissioning and rehabilitation (obliterate and seed) of these roads is completed, the landscape would become more “natural” in appearance, which would have a beneficial effect on the quality of visual resources. Of the proposed 1,276 miles of roads proposed to be decommissioned, approximately 197 miles are in areas of the forest managed for retention VQO and 553 miles for partial retention VQO.

Areas Designated for Motor Vehicle Use

In most cases, the visual qualities of the landscape in proposed designated OHV areas has already been adversely affected by heavy motorized use (often illegal) so the actual effects of designating these areas would not likely be different from existing conditions. Of the 2,089 total OHV area acres, 642 acres of the total acres for the OHV areas would be in retention VQO and 801 acres in partial retention VQO.

Permit Zones

Alternative C proposes to add three permit zones, in addition to the current Bulldog Canyon These four zones may require miles of barrier to enforce its boundaries, which will detract from the visual character. These barriers are likely to be visually evident to casual forest visitors like the barriers for Bulldog Canyon. The more barriers necessary to enforce the permit zone, the more they could detract from the visual character. These effects can be reduced by making the barriers with materials that blend with the surrounding landscape and using natural features whenever possible to limit access, such as rock formations. Of the proposed 116,798 acres of permit zones, approximately 24,668 acres are in areas of the forest managed for retention VQO and 51,897 acres for partial retention VQO.

[72] There is question as to whether certain areas could be returned to a natural state. In the case of Sycamore area, to rehabilitate the stream channel for flow and habitat, will likely require extensive construction activities that may affect the visual quality.

Alternative D – Direct and Indirect Effects

This alternative proposes to decommission 194 miles of existing roads, retain the Bulldog Canyon Permit Zone, and add 8 OHV areas totaling 2,089 acres.

Decommissioned Existing Roads

Once the decommissioning and rehabilitation (obliterating and seeding) of these roads is completed, the landscape would become more "natural" in appearance, which would have a beneficial effect on the quality of the visual resources. Of the proposed 194 miles of roads proposed to be decommissioned, approximately 36 miles are in areas of the forest managed for retention VQO and 98 miles for partial retention VQO.

Areas Designated for Motor Vehicle Use

Alternative D would designate the same amount and acreage of OHV areas as Alternative C, so the effects would be the same.

Permit Zones

This alternative would maintain the existing permit zone, so there would be no change from the current condition.

Cumulative Effects

No Action (Alternative A)

In the No Action, cross-country travel would continue on the northern districts where it is allowed and on the southern districts even though it is restricted but is known to occur, which would result in visible impacts, especially in the southern districts that are closest to the Phoenix metropolitan area. Route proliferation has the potential to expand visual disturbances into previously untrammeled areas with a consequent degradation of visual enjoyment of the forest.

Past human activities, management activities, and natural processes have altered the existing visual character, creating its current condition. Some of the activities contributing to alteration of the landscape are primarily the result of constructing utility corridors, power substations, and communication sites; highway expansion, and recreational facilities. Additional activities include forest restoration, fire management (suppression, prescribed burning, and fuel breaks/reduction) from projects like the Four Forest Restoration Initiative; ongoing grazing management from projects like the Sunflower and 7/K, Walnut, and Tonto Basin allotments and mining activities like those associated with the Resolution Cooper Baseline project. Many of the impacts from past activities were severe, leaving substantial scars on the landscape, while others such as highway expansion projects are presently hidden by vegetative growth and mitigation measures which sufficiently blended the alterations with the existing visual character. In addition, ecologically-based visual disturbances have occurred on the Forest including catastrophic wildfires and insect and disease outbreaks. In the long-term, wildfires are positive elements that have contributed to the Forest‘s natural visual character, patterns, and diversity.

A wide variety of uses occurs on the Forest, much of it recreational. Recreational use is expected to increase dramatically during the next 20 years. Sightseeing and driving for pleasure are examples of activities that directly use roads as part of the recreational experience. The character of and access to scenic views, would directly depend on the road system for many people.

Action Alternatives

Cumulative effects for the action alternatives would be the same as the direct and indirect effects because projects on the forest that have the potential to diminish visual quality would have mitigation measures and design features to reduce their effects, such as road construction and powerline installation which require mitigations for visual qualities. Currently, there are no known projects outside the forest that would have lasting effects on visual quality. In addition, given the size of the Tonto National Forest, the likelihood that these projects would affect the overall visual quality of the Forest is not likely. Cumulatively, all of the action alternatives would enhance the quality of the Tonto National Forests' visual resources.

Socioeconomics

This section addresses the potential social and economic impacts associated with the implementation of the Travel Management Rule. It outlines current regulatory direction, which guides the development of management activities and the issues addressed. It discusses the methodology of analysis, summarizes the existing condition, and discloses the direct, indirect, and cumulative effects of Alternative A (No Action), Alternative B, Alternative C (modified proposed action), and Alternative D while relating to current society and economy in the vicinity of the project area.

This socioeconomic analysis will discuss population demographics, major economic sectors related to public lands, economic specialization, and transfer payments to counties. This information will help address the following questions, "What influence does the management of motor vehicle access on the Tonto National Forest have on forest visitors" and "What portion of county government revenues depend on motor vehicle access?"

In addition to social and economic impacts, the assessment of environmental justice and impacts to communities provide measures of success used to assess how effectively the proposed activities meet the project's purpose and need.

Affected Environment

Tonto National Forest is adjacent to the northern edge of the Phoenix metropolitan area, which has a population greater than four million people. The city of Phoenix itself has a population of approximately 1.5 million[73], making it the sixth largest city in the United States. The Phoenix area is a popular destination for conferences, conventions, and tourism with its warm and sunny year-round climate, wide variety of business, cultural, and recreational offerings, serviced by many direct flights from most major U.S. cities. These factors combine to make the Tonto Nation Forest one of the most heavily-visited national forests, with nearly 5 million recreational visitors annually (U.S. Forest Service, 2012).

Social and Demographic Indicators

The existing conditions for social and demographics in this section include population trends, age distribution, and race and ethnicity percentages. In addition, each of these indicators is presented based on county and national data, along with Tonto National Forest visitation data[74].

[73] According to the United States Census 2012 population estimates (U.S. Census Bureau Quick Facts accessed on June 14, 2013).
[74] Additional information about benchmark indicators for the four-county area in relationship to national values can be found in appendix A of the Socioeconomics Report in the project record.

Four-County Area Trends

The Economic Profile System-Human Dimensions Toolkit (EPS-HDT) was used to provide detailed socioeconomic reports for this project. This toolkit was designed by Headwaters Economics[75], an independent, nonprofit research group whose mission is to improve community development and land management decisions in the West.

Using the Economic Profile System Analyst (EPSA) tool developed by Headwaters Economics, a socioeconomic profile was produced for the four counties that overlap with the Tonto National Forest: Gila, Maricopa, Pinal, and Yavapai Counties (Figure 36).

Four-County Population

For 2011, the estimated total population of the four-county area is estimated at 4,414,301 (Headwaters Economics, 2013c). Specifically, the estimated 2011 population for each of these counties was: Gila 53,380 (4 percent), Maricopa 3,798,374 (56 percent), Pinal 351,709 (15 percent), and Yavapai 210,838 (25 percent).

Four-County Age Distribution

For public land managers, understanding the age distribution associated is beneficial in determining if management actions might affect some age groups more than others. It also may highlight the need to understand the different needs, values, and attitudes of different age groups. From 2000 to 2011, the age category with the largest estimated increase was those 45 to 64 years old; while the age category with the smallest estimated increase was those 35 to 44 years old (Headwaters Economics, 2013c).

Four-County Race and Ethnicity Distribution

As shown in Table 38, the percentage of Hispanic or Latino individuals in the four-county area is nearly twice the percentage of the national average (Headwaters Economics, 2013c). Additionally, the percentage of Black or African American individuals in the four-county area is three times lower than the national average, while the percentage of American Indians in the four-county area is slightly more than double the national average (Headwaters Economics, 2013c).

[75] Information can be found at: www.headwaterseconomics.org

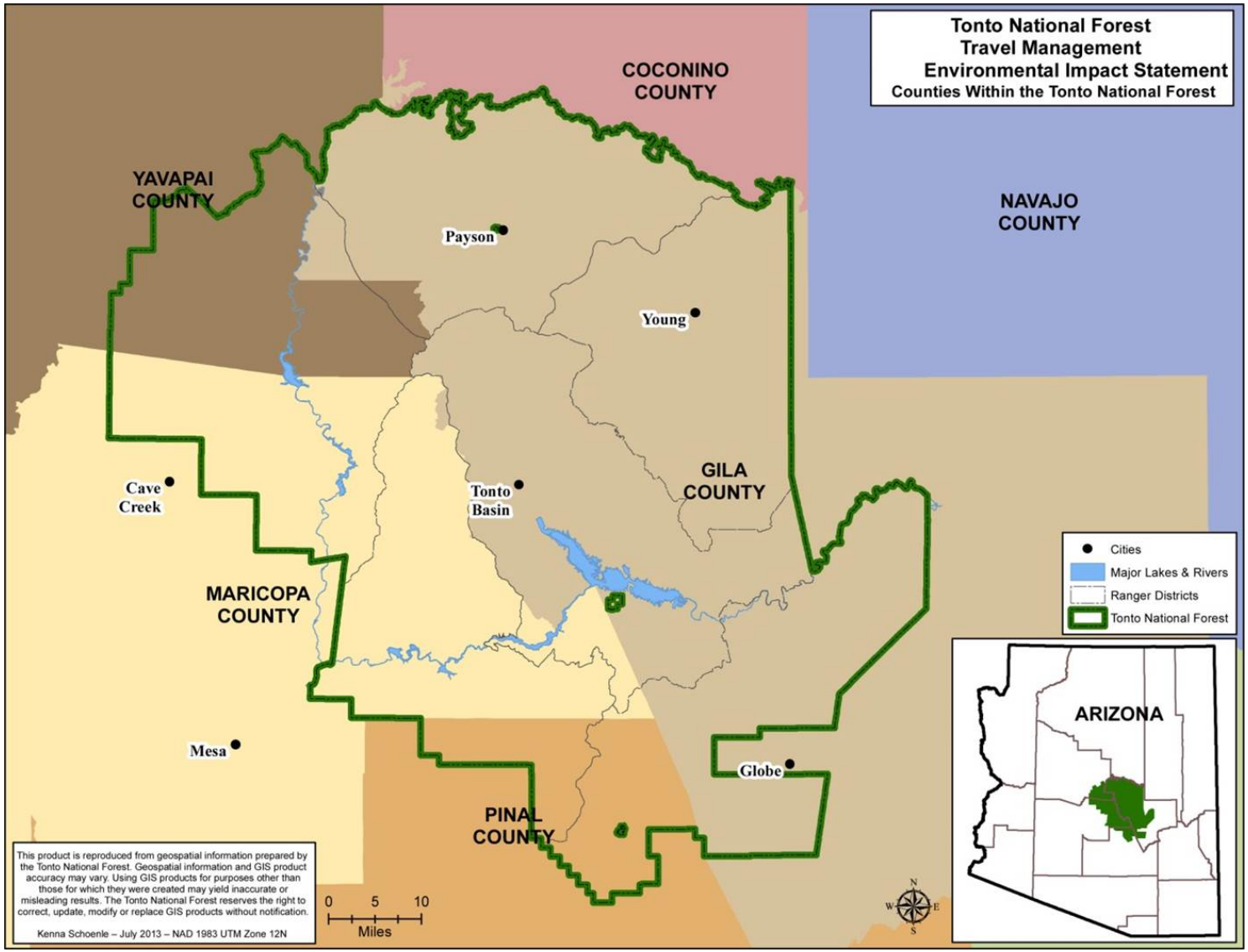

Figure 36. Map of the Tonto National Forest and the Four-County Area (Gila, Maricopa, Pinal, and Yavapai Counties)

Table 38. Race/Ethnicity of Population for 2011 by County, including Four-County Area and U.S.

Race	Gila County	Maricopa County	Pinal County	Yavapai County	Four County Area	U.S.
Hispanic or Latino (of any race)	17.8%	29.4%	28.8%	13.4%	28.4%	16.1%
Not Hispanic or Latino	82.2%	70.6%	71.2%	86.6%	71.6%	83.9%
White alone	65.9%	59.1%	58.3%	82.1%	60.2%	64.2%
Black or African American alone	0.4%	4.7%	4.2%	0.5%	4.4%	12.2%
American Indian alone	14.5%	1.6%	5.0%	1.6%	2.0%	0.7%
Asian alone	0.2%	3.3%	1.6%	0.7%	3.0%	4.7%
Native Hawaiian/ Pacific Is. alone	0.1%	0.2%	0.4%	0.0%	0.2%	0.2%
Some other race	0.1%	0.1%	0.2%	0.1%	0.2%	0.2%
Two or more races	1.1%	1.6%	1.5%	1.5%	1.6%	1.9%
Total Population	**53,380**	**3,798,374**	**351,709**	**210,838**	**4,414,301**	**306,603,772**

Four-County Persons with Disabilities Distribution

For public land managers, understanding the adjacent population that has a disability can be beneficial in determining if management actions might affect this group disproportionately. It also may highlight the need to understand the different needs, values, and attitudes associated with this group. According to United States Census data for Arizona (accessed on June 27, 2013), there are approximately 456,000 persons with disabilities in the four-county area. Nearly 17 percent of Gila and Yavapai County residents identify themselves as being disabled, while Maricopa and Pinal County residents that identify themselves as being disabled is approximately 10 percent and 12 percent respectively (United States Census, accessed June 27, 2013).

Forest Visitation Trends

The National Visitor Use Monitoring (NVUM) program provides reliable information about recreation visitors to national forest system managed lands at the national, regional, and forest level[76]. Based on data from the 2008 NVUM survey, there were approximately 4.8 million people that visited the Tonto National Forest (USDA Forest Service, 2012).

Visitors that stopped at a survey site were asked about the purpose of their visit to the forest on that day. If it was not recreation related, the interview ended. Sixty-two percent were on Tonto National Forest for the purpose of recreating.

[76] For more information about the National Visitor Use Monitoring survey, see the Recreation section of this chapter.

Forest Visitation Race and Ethnicity Distribution

When completing the 2008 NVUM survey, respondents were able to choose more than one racial group, resulting in the total may be more than 100 percent. In addition, race and ethnicity were asked as two separate questions. Thirteen percent of the forest visitors indicated that they were Hispanic or Latino (U.S. Forest Service, 2012), which is less than half of the four-county area percentage. Black or African American visitors made up 2.3 percent and American Indian/Alaskan Native visitors made up 3.9 percent, nearly half of the four-county area percentage and double the four-county area percentage respectively

Forest Visitation by Persons with Disabilities

Providing barrier-free facilities for recreation visitors is an important part of facility and service planning and development for the Forest Service. In addition, persons with disabilities may be more reliant on motorized access to participate in activities on the Tonto National Forest. For the Tonto National Forest, approximately seven percent of visitors identified that they had some form of disability (U.S. Forest Service, 2012)

Motor Vehicle Use on the Tonto National Forest

According to a 2008 survey (U.S. Forest Service, 2012), Tonto National Forest visitors indicated that they participated in the following motor vehicle use related activities[77]:

- Motorized trail activity (18 percent)
- Driving for pleasure (15 percent)
- OHV use (11 percent)

In addition, visitors were asked about their use of special facilities or areas (U.S. Forest Service, 2012). Based on this information, approximately 21 percent of forest visitors indicated they had used a designated off road vehicle area, approximately 14 percent of forest visitors indicated they had used a forest road, approximately 19 percent of forest visitors indicated they had used motorized single track trails, and approximately 21 percent of forest visitors indicated they had used motorized dual track trails (U.S. Forest Service, 2012).

Motor Vehicle Use in Arizona

Based on study (Arizona State Parks, 2009), OHV users represent almost 22 percent of the Arizona population which include residents who use motorized vehicle on trails for multiple purposes. Of that, 11 percent of Arizona residents reported that motorized trail use accounted for the majority of their time and are considered “core” users. OHV recreation is one of the most extensive recreational activities taking place on public and state lands in Arizona and is forecasted to continue to grow at an increasingly rapid rate (Arizona State Parks, 2013).

Frequent Recreation Participants with Disabilities

In a statewide 2013 study (Arizona State Parks), 25 percent of those surveyed identified themselves or someone in the household as having a disability. Also part of this survey, a subset of Arizonans surveyed was identified as those who participated in an activity once a week or more (frequent participators). Table 39 shows the recreational activities for frequent participators that identified themselves or someone in the household as having a disability (Arizona State

[77] Survey respondents could select multiple activities.

Parks, 2013). Of those activities that require the use of a motorized vehicle, participation was at or above 25 percent.

Table 39. Disability Status Related to Recreational Activities

Activity	General Disability*	Hearing	Speech	Mental	Visual	Mobility	Chemical Sensitivity
Bird-watching and photography	25.0%	5.6%	0.0%	2.9%	1.7%	12.8%	2.2%
Visit a local park	21.9%	4.7%	0.0%	2.7%	2.7%	12.4%	1.6%
Visit a natural or wilderness area	18.6%	4.3%	0.3%	1.3%	2.1%	10.9%	1.1%
Nature study or environmental education activities	20.4%	4.6%	0.0%	3.9%	1.3%	9.2%	2.6%
4-wheel driving	30.2%	5.8%	0.0%	4.5%	1.8%	20.1%	1.3%
Off-highway vehicle use	25.5%	6.7%	0.0%	2.7%	1.3%	16.4%	0.9%
RV camping	35.4%	6.9%	0.0%	2.8%	4.2%	23.6%	0.0%
Walking, jogging or running on trails or at a park	17.7%	4.0%	0.2%	2.5%	1.8%	9.4%	1.3%
Fishing	30.9%	9.1%	0.0%	2.8%	3.2%	20.6%	1.2%
Hunting	22.9%	5.3%	0.0%	1.9%	1.9%	16.4%	0.5%
Day hiking	17.6%	4.3%	0.0%	2.6%	1.7%	8.7%	1.1%

*Respondents were allowed to choose more than one activity that they frequently participated in.

Economic and Forest Contribution Indicators

The existing conditions for economic and forest contribution in this section includes major economic sectors related to public lands, economic specialization, and transfer payments to counties. In addition, each of these indicators is presented based on county and national data, along with Tonto National Forest visitation data[78].

Four-County Area Land Base Ownership

As is the case in many western states, counties have a higher percentage of federally managed land than the national average. With the exception of Pinal County (19.5 percent), nearly half or above of the county land base for the other counties in the four-county area is federally managed (Headwaters Economics, 2013h). In terms of land base, nearly half of Gila County is managed by the Forest Service and roughly a third of Yavapai County is managed by the Forest Service, while the percentage managed by the Forest Service for Maricopa and Pinal Counties more closely reflect the national average (Table 40).

[78] Additional information about benchmark indicators for the four-county area in relationship to national values can be found in Appendix A of the Socioeconomic Report as part of the project record.

Table 40. Land Ownership for 2011 by County, including Four-County Area and U.S.

Land Ownership	Gila County	Maricopa County	Pinal County	Yavapai County	Four County Area	U.S.
Private Lands	4.0%	29.0%	25.6%	29.4%	24.1%	58.7%
Federal Lands	57.2%	52.9%	19.5%	46.0%	45.1%	28.8%
Forest Service	55.0%	11.0%	6.4%	33.8%	24.5%	8.4%
State Lands	1.0%	12.7%	34.6%	24.6%	18.4%	8.4%
Tribal Lands	37.7%	4.6%	20.3%	0.1%	12.1%	4.0%
City, County, Other	n/a	0.9%	0.0%	0.0%	0.3%	0.2%
Total Area (Acres)	**3,069,101**	**5,903,622**	**3,439,308**	**5,201,845**	**17,613,876**	**2,286,279,509**

Federal Land Payments to Counties

According the Profile of Federal Land Payments (Headwaters Economics, 2013j), federal land payments are distributed to state and local governments by the geography of origin. State and local government cannot tax federally owned lands the way they would if the land were privately owned. Therefore there are a number of federal programs that exist to compensate county governments for the presence of federal lands. These programs can represent a significant portion of local government revenue in rural counties with large federal land holdings (i.e., the four-county area), or based on the permitted use.

There are two main methods that Forest Service uses to pay counties: Payments in Lieu of Taxes (PILT), and Forest Service Revenue Sharing. Payments are funded by federal appropriations (e.g., PILT) and from receipts received by federal agencies from activities on federal public lands (e.g., timber, grazing, and minerals). The PILT payments compensate county governments for nontaxable federal lands within their borders. PILT is based on a maximum per-acre payment reduced by the sum of all revenue sharing payments and subject to a population cap. Forest Service Revenue Sharing is a payment based on Forest Service receipts and must be used for county roads and local schools. Payments include the Secure Rural Schools and Community Self-Determination Act. In 2012, the Forest Service revenue sharing payment was approximately $5,520,000.

As shown in Table 41, in fiscal year (FY) 2012 PILT and Forest Service Payments still provide almost all the Federal Payments to the counties (Headwaters Economics, 2013j). These payments are also well above the national average for the four-county area and Maricopa County in particular. In FY 2012, PILT made up the largest percent of federal land payments in four-county-county area (63.6 percent), and U.S. Fish and Wildlife Services (USFWS) Refuge Payments and Federal Mineral Royalties made up the smallest (0 percent).

Table 41. Components of Federal Land Payments to State/Local Governments, FY 2012

Percentage of Total by County	Gila County	Maricopa County	Pinal County	Yavapai County	All Four Counties	U.S.
PILT	63.5%	80.3%	70.1%	51.7%	63.6%	13.5%
Forest Service Payments	36.4%	14.5%	25.7%	47.1%	34.4%	11.1%
BLM Payments	0.1%	5.2%	4.2%	1.2%	2.0%	2.2%
USFWS Refuge Payments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Federal Mineral Royalties	0.0%	0.0%	0.0%	0.0%	0.0%	73.2%
Total ($)	**5,152,217**	**3,490,585**	**1,635,784**	**5,774,114**	**16,052,701**	**2,902,317,025**

As a federal land management agency, the Forest Service's revenue sharing programs are intended to offset the loss of tax revenue to counties that would normally be collected if the land ownership was state, county, city, or private.

County governments can incur a number of costs associated with activities that take place on federal public lands within their boundaries (Headwaters Economics, 2013j). For example, counties must maintain county roads used by logging trucks and recreational traffic traveling to and from federal lands, and they must pay for law enforcement and emergency services associated with public lands. Several federal land payment programs, particularly those from the Forest Service, are specifically targeted to help pay for these costs. These programs include:

- **Unrestricted:** Consist of (1) PILT, (2) U.S. Fish and Wildlife Service Refuge Revenue Sharing, and (3) any distributions of federal mineral royalties from the state government.
- **Restricted, County Roads:** Consist of (1) Secure Rural Schools and Community Self-Determination Act (SRS) Title I, (2) Forest Service 25 Percent Fund, (3) Forest Service Owl payments (between 1993 and 2000 only), and (4) Forest Grasslands. Federal law mandates payments be used for county roads and public schools. Each state determines how to split funds between the two services.
- **Restricted, Special County Projects:** Consist of (1) SRS Title III funds that are distributed to county government for use on specific projects, such as Firewise Communities projects, reimbursement for emergency services provided on federal land, and developing community wildfire protection plans.

From 1986 to 2012, unrestricted federal payments grew from approximately $5,356,000 to $10,236,000 (Headwaters Economics, 2013j). During that same time period, federal land payments restricted to county roads increased approximately 143 percent.

Four County Area Major Economic Sectors

Table 42 shows the changes in employment by industry between 1990 and 2000 and between 2001 and 2011 for the four-county area (Headwaters Economics, 2013a). Of the industries listed in the tables, agriculture, mining, manufacturing (including forest products), and government employment are traditionally sectors that are associated to Forest Service management. In addition for this analysis, travel and tourism will be included.

Table 42. Changes in Employment by Industry

Employment Sector	2001-2011	1990-2000
Total Employment	15.5%	52.3%
Nonservices related	-23.3%	41.6%
Farm	25.1%	8.4%
Forestry, fishing, and related activities*	-4.5%	62.2%
Mining (including fossil fuels)	65.8%	-25.3%
Construction	-25.6%	99.6%
Manufacturing^	-24.9%	17.0%
Services related	24.8%	61.5%
Utilities	5.7%	54.1%†
Wholesale trade	3.5%	49.7%
Retail trade	12.6%	47.5%
Transportation and warehousing	12.5%	---
Information	-24.8%	n/a
Finance and insurance‡	31.4%	68.6%
Real estate and rental and leasing	67.9%	---
Services	---	70.7%
Professional and technical services	24.9%	---
Management of companies/enterprises	34.9%	---
Administrative and waste services	8.2%	---
Educational services	137.5%	---
Health care and social assistance	59.1%	---
Arts, entertainment, and recreation	34.3%	---
Accommodation and food services	16.5%	---
Other, except public administration	15.5%	---
Government	15.6%	23.0%

*Was called “agricultural services, forestry, fishing and other” in the 1990-2000 data.
^Was called “Manufacturing (including forest products)” in the 1990-2000 data.

Influence of Travel and Tourism

Public lands can play a role in stimulating local employment by providing opportunities for recreation (Headwaters Economics, 2013i). Communities adjacent to public lands can benefit economically from visitors who spend money in hotels, restaurants, gift shops, and elsewhere. In addition, some migrants to communities with high levels of environmental and recreational amenities visit first as tourists and then return permanently with their families and businesses. Public lands can therefore also stimulate growth in nontourism sectors via in-migration. In the four-county area, travel and tourism make up approximately 17 percent of the total for private industry employment (Headwaters Economics, 2013i). From 1998 to 2011, industries associated with travel and tourism in the four-county increased by approximately 19 percent; during that

same time period, nontravel and tourism industries in the four-county area increased by approximately 15 percent (Headwaters Economics, 2013i).

On the Tonto National Forest, there are currently 130 outfitting and guiding services with active special use permits that mostly focus on recreation opportunities. These services include hiking groups, motor vehicle tours, river access shuttles, rock climbing, and fishing and hunting guides. Most of these services depend on access of forest roads and motorized routes to provide the opportunity that they receive payment for.

In terms of the contribution associated with game and nongame management, it was estimated that nearly 58 million dollars came from hunting, fishing, and wildlife viewing[79]. However, based on the United States Census data aggregated by country, it is not possible to determine which counties directly benefited from this contribution.

Economic Contributions Associated with Motor Vehicle Use

In July 2006, the Arizona Motor Vehicle Division reported that approximately 230,000 all-terrain vehicles and cycles were titled or registered in Arizona. OHV decal sales for calendar year 2011 indicate that 481,823 vehicles that weighed less than 1,800 pounds were registered (Arizona State Parks, 2013). These figures do not include untitled OHVs, out of state visitors, or other OHVs that recreate in Arizona.

Sales of off-highway motorcycles and all-terrain vehicles (ATVs) in Arizona grew steadily from 1995 (a total of 3,518 motorcycles and 1,605 ATVs) to 2006 (a total of 10,189 motorcycles and 4,449 ATVs), resulting in a 623 percent increase (Arizona State Parks, 2009). In addition, the popularity of side-by-side vehicles (i.e., recreational off-highway vehicles, also called utility terrain vehicles) increased yearly since its introduction in 2001; by 2008, side by side vehicle sales surpassed ATV sales in Maricopa County (Arizona State Parks, 2009).

Environmental Justice

In 1994, President Clinton issued Executive Order 12898. This order mandates that all federal agencies analyze the potential for their actions to disproportionately affect minority and low-income populations.

With the exception of Hispanic or Latino populations, the population size and differences between the four county area and forest visitation would not likely disproportionately affect these groups. However, based on a survey targeting Arizonans that were actively involved in outdoor recreation (Arizona State Parks, 2013), less than ten percent identified themselves as Hispanic or Latino. Based on this information, travel management would not likely disproportionately affect this group.

Another indicator for analyzing environmental justice is related to income, specifically those that live below the poverty level. Current weighted average estimates indicate that the poverty threshold for unrelated individuals is $11, 722 annually and for household ranges from $14,960 (two people) to $47, 536 (nine people or more) (U.S. Census Bureau, accessed June 28, 2013).

In 2011 Arizona, approximately 12 percent of families had an income that was below the poverty level, a number that is one percent greater than the national average (United States Census, accessed June 28, 2013). For all people in Arizona during the same time period, approximately 16 percent of the population was below the poverty level, nearly two percent higher than the

[79] For more information, see the Game and Nongame section of this chapter.

national average (United States Census, accessed June 28, 2013). In terms of the four-county area, the percentage for individuals below the poverty line is nearly identical, while families below the poverty are between the average for Arizona and the nation (Headwaters Economics, 2013c). However, when individual counties in the four-county area are examined independently, Gila County individuals (20.9 percent) and families (12.9 percent) below the poverty level are greater than the four-county area, Arizona, and national averages.

With the exception of Gila County, poverty level differences across the four-county area, Arizona, and nationally is within one or two percent points, although the national average is the lowest in terms of percentages. The poverty rate for Gila County may merit environmental justice consideration, particularly where Forest Service management actions may affect employment, income, and other sources of economic well-being attached to the Forest.

Environmental Consequences

This analysis determines the effects of travel management on the four countries adjacent to the Tonto National Forest (Gila, Maricopa, Pinal, and Yavapai) based on implementation of the four alternatives, the No Action, Alternative B, the Modified Proposed Action (Alternative C), and Alternative D. In addition, this analysis determines the effects of the four alternatives on current recreation demographics.

Assumptions and Methodology

Assumptions Associated with County Level Social Trends

Arizona's population is projected to increase, nearly doubling from 2010 to 2030[80]. With a projected population for 2030 of approximately 5.6 million people, it is reasonable to assume that visitation to the Tonto National Forest would also increase. However, without detailed information about whether or not the percentage increase for the forest would mirror that of the state is unclear.

Additionally, without a targeted survey or other forest and county specific data related to travel management, motor vehicle access on the Tonto National Forest is not likely to affect the demographics for either the four-county area or individual counties. Because of this, analysis of these demographics related to the four alternatives will likely not have any effect, either negative or positive.

Assumptions Associated with County Level Economic Trends[81]

Based on the data from Table 40, over half of the Gila County land base is within Forest Service boundaries, while a third of Yavapai County and less than 12 percent of Maricopa and Pinal Counties are within Forest Service Boundaries (Headwaters Economics, 2013h).

When it comes to the economic contribution of the Tonto National Forest to the Four-County Area, there are several mechanisms to take into consideration, including federal land payments, payments in lieu of taxes, and Forest Service Revenue Sharing.

For the four-county area, less than one percent of the total revenue (approximately $16 million) comes from federal lands, of which the Forest Service portion is approximately half. In Gila

[80] According to the United States Census: http://www.census.gov/population/projections/data/state/projectionsagesex.html accessed on July 1, 2013.
[81] For more information about economic effects associated with hunting, fishing, and wildlife, see the Game and Nongame Species (Wildlife Related Recreation) section of this chapter.

County, which has the greatest percentage of federal land within its land base (most of which is Forest Service) only 3.8 percent of the total revenue (approximately 5.2 million) comes from the federal land sources (Headwaters Economics, 2013j). Additionally, in 2012 the four-county area received approximately $2.2 million in federal land payments to offset the maintenance of country roads (Headwaters Economics, 2013j).

Decisions related to travel management, including the miles of roads and trails open to motor vehicle use, for the Tonto National Forest are not expected to affect any of four-county economic trends, including tourism and sales of off-road vehicles, because the contributions associated with the Tonto National Forest are such a small percent (less than five percent) of the overall economic contributions to the counties adjacent to the forest. In addition, areas open to motorized cross-country travel and permit zones are not expected to affect any of four-county economic trends, including tourism and sales of off-road vehicles, for the same reasons as roads and trails open to motor vehicle use.

It is understood that some individuals may be greatly affected by the Tonto National Forest's travel management decision, especially if that decision includes a greater decrease in motor vehicle use access. Without that level of quantitative data, the intensity that individuals may be affected cannot be determined. Because the effects of travel management on the four-county area, and even by individual counties, are so negligible, it is assumed that the four alternatives being analyzed would not have any effect, either negative or positive, on economic trends for Gila, Maricopa, Pinal, or Yavapai Counties.

Assumptions Associated with Forest Visitation Trends

As stated earlier in this document, when the 2008 NVUM survey was being administered, a total of 3,496 individuals were interviewed. To extrapolate the number of total visitors, traffic counters were also set up throughout the Tonto National Forest. As such, when the 2008 survey (U.S. Forest Service, 2012) results indicated that a certain percentage of the visitation participated in a specific activity or came from a certain area, it is not a percentage of the calculated visitors, but instead a weighted estimate to illustrate the trends associated with recreation on the Tonto National Forest.

As indicated earlier, nearly 22 percent of the Arizona population (Arizona State Parks, 2009), or approximately 1.4 million people identified that they use motorized vehicle on trails for multiple purposes[82]. Without more site specific data, it is unclear if the 22 percent would apply to the four-county area or the individual counties adjacent to the Tonto National Forest, as the data was gathered and extrapolated for the entire state. With the largest population base for the state within the Phoenix metropolitan area, there is a high probability that the percentage participating in motorized recreation on the adjacent Tonto National Forest is greater than the percentage for the state. But without data to support this observation, no analysis will be completed to determine the specific effects of travel management on the Tonto National Forest on 22 percent of the state's population.

As populations in Arizona increase, and the potential for a similar increase in motorized use, contributions related to motorized travel would be expected to also increase; however, since these contributions are so small to the overall economy of the four-county area, this increase is

[82] According to the United States Census: http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk accessed on July 1, 2013.

not likely to effect the overall economy or demographic distribution of the counties adjacent to the forest.

Assumptions Associated with Environmental Justice

In small towns within and adjacent to the Tonto National Forest, some individuals and families depend on the ability to gather fuelwood or hunt game species as a means of subsistence. These people may also be those that are below the poverty level, although there is no current data to indicate this direct connection. Often, the gathering of fuelwood and the retrieval of game requires the use of a motorized vehicle. Currently, forest users are able to get a permit to collect fuelwood in designated areas within the Globe, Payson, Pleasant, and Tonto Basin Ranger Districts. In addition, the Arizona Game and Fish Department issues hunting permits; and on the Payson and Pleasant Valley Ranger Districts cross country travel is permitted, including for the retrieval of game. If the Tonto National Forest decides to take no action to implement the travel management rule, the ability to access these resources using a motor vehicle will continue.

There is no legal requirement to allow people with disabilities to use motor vehicles in areas that are closed to motor vehicle use. Restrictions on motor vehicle use that are applied consistently to everyone are not discriminatory. Generally, granting an exemption from designations for people with disabilities would not be consistent with the resource protection and other management objectives of travel management and would fundamentally alter the nature of the Forest Service's travel management program (29 U.S.C. 794; 7 CFR 15e.103).

Under section 504 of the Rehabilitation Act of 1973, no person with a disability can be denied participation in a Federal program that is available to all other people solely because of his or her disability. Consistent with 36 CFR 212.1, FSM 2353.05, and Title V, Section 507(c), of the Americans With Disabilities Act, wheelchairs and mobility devices, including those that are battery-powered, that are designed solely for use by a mobility-impaired person for locomotion and that are suitable for use in an indoor pedestrian area, are allowed on all National Forest System lands that are open to foot travel.

For persons with disabilities, they may qualify for the Arizona Game and Fish Department CHAMP permit, which may be issued to persons who have a permanent disability or combination of disabilities. According to Arizona Game and Fish Department’s website , a CHAMP Permit authorizes the holder to take wildlife from a motor vehicle if it is off the roadway and the engine is off and to use a motor vehicle in off-road locations to wait for game as long as the locations are not in conflict with other laws. This permit does not authorize the use of a vehicle to chase or pursue wildlife. Based on 2012 data provided by the Arizona Game and Fish Department (manager of the program), approximately 81 CHAMP permits were issued for game management units on the Tonto National Forest.

No Action (Alternative A)

This alternative acts as the baseline, allowing the decision maker to understand the effects of travel management if no decision is made. As indicated in Chapter 2 of the Final EIS, although there is a specific amount of roads open for motorized travel, many of the designated closed and decommissioned roads are currently open to motorized travel. Without knowing specifically which roads are currently open, the analysis for this alternative will be based on the existing road data, including the inconsistencies outlined in Chapter 2 of this document.

Direct and Indirect Effects

As indicated in the assumptions section of this report, the effects from travel management on the Tonto National Forest on the social and economic trends of the four-county area are negligible and cannot be quantitatively analyzed.

Environmental Justice Effects

When it comes to accessing dispersed camping sites using a motor vehicle, the Payson and Pleasant Valley ranger districts allow everyone this opportunity, regardless of disability, and there is no charge to the forest visitor associated with this type of use. On the remaining four districts, this type of access is not permitted, although there are several examples where it is currently happening on the ground based on disturbance. For those that would need motorized access (based the inability to pay for developed sites or disabilities) to disperse camp in these districts, they could be negatively affected; however, there is no site specific data to indicate the magnitude of this effect.

With the exception of dispersed camping, implementation of this alternative is not expected to affect persons with disabilities related to access and motor vehicle use.

Cumulative Effects

Because the direct and indirect effects, even those associated with environmental justice, are negligible under this alternative, and travel management decisions on adjacent forests that impact one or more counties in the four-county area still allow for fuelwood gathering and access for those persons with disabilities, there are no cumulative effects associated with social and economic trends.

Alternative B

This alternative proposes to decrease the current motorized route system by nearly half, not allow for the retrieval of game species via a motor vehicle, limits motorized access to designated dispersed camping sites, and decreases the distance off of designated roads and motorized trails that motor vehicles can be used to gather fuelwood.

Direct and Indirect Effects

Although this alternative decreases motorized access on designated routes, does not allow the use of a motor vehicle to retrieve big game, and decreasing the area for permitted fuelwood gathering using a motor vehicle and limits dispersed camping to designated sites, the effects from travel management on the Tonto National Forest on the social and economic trends of the four-county area are negligible.

Environmental Justice Effects

In this alternative, gathering fuelwood using a motorized vehicle is limited to within 300 feet of designated roads and motorized trails within fuelwood gathering permit areas. In the No Action Alternative, the area available for fuelwood gathering is approximately 1.35 million acres. In this alternative, that area is decreased to approximately 133,000 acres. As fuelwood becomes scarce in this corridor, permit holders may be unable to fuelwood[83]. For those that live below the poverty level that depend on fuelwood for household heating and cooking, this substantial decrease could disproportionately affect this segment of the population. Each year approximately

[83] A detailed account of fuelwood permits and gathering trends can be found in the Short-Term Uses and Long-Term Productivity section of this chapter.

1,500 permits are issued and are for the Tonto National Forest only. However, no economic data is collected when a permit is issued. Thus, of the 1,500 permits issued yearly there is no way to determine what percentage of the permits is issued to those that live below the poverty line.

For those individuals that depend on game species to feed themselves or their family, potentially those living below the poverty level, this restriction could negatively affect this segment of the population if they rely on motor vehicles to retrieve game. However, since the Arizona Game and Fish Department does not currently offer a reduced rate license fee for those below the poverty level, nor do they track economic data on those applying for a license[84]; it is not possible to quantify these effects.

This alternative limits motorized access for dispersed camping to designated dispersed sites that are accessible by a designated road or motorized trail (approximately 65 acres total). This limitation has the potential to negatively affect those that would need motorized access (based the inability to pay for developed sites or disabilities) to disperse camp in these districts.

Cumulative Effects

Because the direct and indirect effects on the general population are negligible under this alternative, there are no cumulative effects associated with social and economic trends for the four-county area.

This alternative has the potential to negatively affect those below the poverty level, one of the potential Environmental Justice populations, if additional economic stressors are present, such as difficulty finding means for heating and cooking sources like personal use fuelwood. However, without detailed data that is currently not available, it is not possible to quantify this effect.

Alternative C

This alternative proposes to allow the use of a motor vehicle for the retrieval of some game species (elk and bear) up to one mile from designated roads and motorized trails, limit the use of a motor vehicles to accesses dispersed camping to designated spur roads connecting to other designated roads and motorized trails, and decreases the distance off of a designated roads and motorized trails that motor vehicles can be used to gather fuelwood.

Direct and Indirect Effects

Although this alternative decreases motorized access on designated routes and to retrieve big game while decreasing the area for permitted fuelwood gathering using a motor vehicle, the effects from travel management would be negligible. Additionally, the effect to the overall economy or demographic distribution of the counties adjacent to the forest would be the same as Alternative B.

Environmental Justice Effects

In this alternative, gathering fuelwood using a motorized vehicle is limited to within 300 feet on both sides of designated roads and motorized trails within fuelwood gathering permit areas, resulting in approximately 165,000 acres (a substantial decrease from the existing condition). Although the designated motorized route system would be different than Alternative B, the width of the permitted motorized gathering corridor (300 feet both sides) would be the same and would

[84] Information from http://www.azgfd.gov/h_f/hunting.shtml accessed July 2, 2013.

have the same effects to those that rely on fuelwood gathering for heating and cooking needs, often those that live below the poverty level.

In terms of hunting, this alternative would allow permitted hunters to retrieve elk and bear within one mile of designated roads and motorized trails. This results in approximately 1.3 million acres open, as opposed to approximately 704,000 acres open to motorized retrieval in the No Action Alternative. For those individuals that depend on game species to feed themselves or their family (potentially those living below the poverty level), this increase in motorized access could positively affect this segment of the population if they rely on motor vehicles to retrieve game. However, since the Arizona Game and Fish Department does not currently offer a reduced rate license fee for those below the poverty level, nor do they track economic data on those applying for a license[85], it is not possible to quantify these effects.

This alternative allows motorized access for dispersed camping along approximately 94 miles of designated full-size vehicle motorized trail spurs off designated routes. Although these routes currently exist on the ground, they are not part of the existing system and do not have known geographic coordinates or survey data. This proposed change in camping access has the potential to positively affect those that would need motorized access (based the inability to pay for developed sites or disabilities) to disperse camp. However, since there is no site specific data to indicate the magnitude of this effect, no quantitative analysis can be conducted.

Cumulative Effects

Because the direct and indirect effects on the general population are negligible under this alternative, there are no cumulative effects associated with social and economic trends for the four-county area.

This alternative would have the same effects as Alternative B to those below the poverty level, one of the potential Environmental Justice populations, in terms of gathering fuelwood using a motor vehicle.

Alternative D

This alternative proposes to decrease the current motorized route system by about 100 miles, allow the use of a motor vehicle for the retrieval of game species up to one mile on both sides of all designated roads and motorized trails, limit the use of a motor vehicle to accesses dispersed camping up to 300 feet on both sides of all designated roads and motorized trails, and allow the use of a motor vehicles anywhere in the permitted fuelwood gathering area to gather fuelwood.

Direct and Indirect Effects

Although this alternative increases motorized access across the forest, the effects from travel management on the Tonto National Forest on the social and economic trends of the four-county area are negligible and cannot be quantitatively analyzed. Thus, the effects from this alternative are anticipated to be the same as those in Alternatives B and C.

Environmental Justice Effects

In this alternative, gathering fuelwood using a motorized vehicle would stay the same as the No Action Alternative, resulting in an area of approximately 1.35 million acres. Although this alternative proposes no change from the current conditions, it is not currently possible to determine if this area is large enough and distributed in such a manner as to not put undue

[85] Information from http://www.azgfd.gov/h_f/hunting.shtml accessed July 2, 2013.

hardship on those below the poverty level that depend on this resource to heat their house or cook their food.

In terms of hunting, this alternative would allow permitted hunters to retrieve elk, bear, and deer within the appropriate game units on the Tonto National Forest[86]. For those individuals that depend on game species to feed themselves or their family (potentially those living below the poverty level), this increase in motorized access could positively affect this segment of the population if they rely on motor vehicles to retrieve game. However, since the Arizona Game and Fish Department does not currently offer a reduced rate license fee for those below the poverty level, nor do they track economic data on those applying for a license[87]; it is not possible to quantify these effects.

This alternative allows motorized access for dispersed camping within 300 feet on both sides of all designated roads and motorized trails, resulting in approximately 336,000 acres open for accessing dispersed camping using a motor vehicle and allows use within all six ranger districts on the Tonto nation forest. This proposed change has the potential to positively affect those that would need motorized access (based on the inability to pay for developed sites or disabilities) to disperse camp in these districts. However, since there is no site specific data to indicate the magnitude of this effect, no quantitative analysis can be conducted.

Cumulative Effects

Because the direct and indirect effects on the general population are negligible under this alternative, there are no cumulative effects associated with social and economic trends for the four-county area.

Heritage Resources

Affected Environment

During the past 30 years, Tonto National Forest Heritage Resource specialists, permitted consultants, and volunteers, in compliance with Sections 106 and 110 of the 1966 National Historic Preservation Act (NHPA), as amended, have inventoried approximately 7 percent of nearly 3 million acres that comprise the Forest. Well over 10,000 archaeological, historical, and cultural sites (collectively known herein as cultural resources) have been recorded by that effort. Based on the number and quality of sites recorded in this small percentage of the Forest, it is apparent that the Tonto National Forest has a very high density of significant archaeological sites overall. Many of these sites are fragile and easily damaged by motorized vehicles running over them and all of them are susceptible to further damage, and even loss, from erosion that often accompanies uncontrolled cross-country motorized travel. In addition to direct physical impacts to archaeological and historic sites, indirect impacts to the environmental context of these sites can result from both cross-country travel and high densities of established routes.

The Forest currently contains 4,959 miles of roads open to the public, many of which, owing to high archaeological and historical site density, have inevitably impacted a variety of cultural resources. Many of these roads originated in the late 19th century and have been in continual use ever since. Many more were built prior to the passage of the NHPA, and were constructed without regard for their potential impacts to archaeological or historic sites. As a result, hundreds

[86] For more information on game management units, please see the Game and Nongame Species section of this chapter.
[87] Information from http://www.azgfd.gov/h_f/hunting.shtml accessed July 2, 2013.

of archaeological sites on the Tonto National Forest have been documented in the inventory as having been damaged by past road construction and maintenance activities.

Visiting archaeological sites has long been a popular recreational pursuit on the Tonto National Forest; so that today we also protect sites for the public. Many years of working with the state-sponsored Arizona Site Stewards program and Forest Service law enforcement officers have demonstrated that vehicular access near or leading to archaeological sites greatly contributes to their protection, as does frequent visitation by the public. Vehicular access makes it easier to patrol and monitor and frequent public visitation increases the potential for illegal activity to be reported.

In 2010, a condition and damage assessment of 96 previously recorded archaeological sites on the Tonto National Forest was conducted as a volunteer project for the Forest by the Center for Desert Archaeology (CDA) to provide data for this analysis (Hedquist and Ellison, 2010)[88]. This analysis was done to investigate the relationship between site damage and proximity to roads on the Tonto National Forest. Analysis of the amount of damage done over the last 35 years to sites within a sample of 225 sites on the Forest—all Priority Heritage Asset sites and sites with documented damage assessment—shows that there has been a dramatic reduction in the level of vandalism.

An archaeological survey conducted in 2010 under contract for this analysis (Roberts and Mitchell, 2010), has been completed for a 50 foot (15 meters) wide corridor along 170 unclassified, unauthorized routes proposed at that time for designation as system roads and motorized trails, along with three OHV areas proposed for designation on Globe and Mesa ranger districts. This inventory was conducted under the guidelines established by the Protocol. It identified a total of 86 archaeological sites ranging in size and complexity from simple artifact scatters to multi-room masonry structures. Included were several historic sites and one or two that may reflect the use of the area by Yavapai and/or Apache in the last several centuries. But the vast majority of these sites were prehistoric, related to the Hohokam archaeological culture, and dating to various times between approximately 800 and 1400 A.D.

Environmental Consequences

Assumptions and Methodology

Assumptions Associated with Unauthorized Routes and Decommissioned Roads

In compliance with the Southwestern Region Programmatic Agreement between the Advisory Council on Historic Preservation, Forest Service Region 3 and the State Historic Preservation Officers (SHPOs) of New Mexico, Texas, Oklahoma and Arizona (1994, as amended 2003) (Programmatic Agreement), all newly designated roads, trails, corridors, and areas must comply with Section 106. If any cultural resources are found, the protection measures identified in the Protocol must be implemented to avoid or mitigate any impacts. Documentation is needed to demonstrate that either the route does not encounter any cultural resources or that any adverse effects have been resolved in compliance with section 106, just like any other ground-disturbing activity under the terms of the Programmatic Agreement. No new route can be displayed on the MVUM without completing this process. Where mitigation is not feasible, the routes cannot be designated as open for public or administrative only use or included in the MVUM.

[88] More information about this survey can be found in the Heritage Resource Report in the project record.

Mitigation of impacts to cultural resources resulting from the designation of motorized routes is best accomplished by avoidance. It can also be achieved by maximizing opportunities to localize recreational activities, especially those involving motor vehicle use, to those areas where cultural resources are least likely to be affected. Specific recommendations regarding particular routes will be developed upon analysis of the survey data and field inspection of site locations; routes may be realigned and relocated to avoid sites or they may, if potential impacts are too great or the terrain does not effectively allow relocation, be dropped from the proposal. Decommissioning unauthorized routes is outside the scope of this analysis and will require separate analyses and decisions.

Assumptions Associated with Areas Open to Motorized Cross-country Travel

Under the current Forest plan, the southern Ranger Districts, Cave Creek, Globe, Mesa, and Tonto Basin are closed to unrestricted cross-country motorized travel, but it is allowed on the Payson and Pleasant Valley Districts. Under the terms of the Protocol, designation of a specific area for unrestricted cross-country motorized access, like the designation of a previously unauthorized route, requires Section 106 consultation and, unless the specific exemptions under the protocol apply, must be surveyed, evaluated, and any effects to archaeological sites resolved under the protection measures established in the Protocol before they can be added to the MVUM.

Assumptions Associated with Permit Zones

There is currently only one permit zone on the Forest. Since travel in a permit zones is restricted to designated roads and by implementing the Travel Management Rule, motorized travel would only be permitted on designated roads, trails, and areas, the effects associated with permit zones will not be analyzed separate from the current and proposed motorized route system.

Assumptions Associated with Motorized Big Game Retrieval

Although specific documentation of impacts to sites due to motorized big game retrieval is not Although specific documentation of impacts to sites due to motorized big game retrieval is not readily available, it is unlikely that this activity in and of itself would have a significant effect on archaeological sites. The dispersed, short-term and non-repetitive nature of the impact, relatively few permits issued, limited duration of hunting seasons, and typically low hunter success rates on the Tonto National Forest, combined with a natural tendency to avoid riding or driving over difficult obstacles such as collapsed prehistoric masonry walls, suggests that the probability of damage to archaeological sites resulting from this activity would be low. Nevertheless, unrestricted cross-country OHV travel always has a potential for impacting archaeological sites, degrading traditional use areas, and disrupting traditional activities. Though it may be difficult to accurately quantify, authorizing or designating parameters for motorized big game retrieval may be a potential source of impact, especially where it opens up areas to legal cross-country travel that were previously restricted.

Assumptions Associated with Motorized Access for Dispersed Camping

Motorized access to dispersed camping locations, whether they are adjacent to roads and trails or located at a distance, has the same potential to impact cultural resources as any other type of cross country motorized travel. Since this seems to be a repetitive behavior as camp sites are used over and over again, this impact may be significant depending on the type of site and its environmental context. Management of motorized access to dispersed camping locations can be done in several ways: roadside parking without designated camping sites, designated camping

sites with designated access routes, and designated corridors for motorized access to dispersed camping.

Roadside parking for access to dispersed campsites adjacent to roads is exempted under the Protocol and allowable under the current Plan on the northern districts where cross-country travel is currently allowed. This has been the traditional way that forest users have camped on all Districts of the Tonto National Forest. Because this activity typically takes place in heavily disturbed areas along edges of existing roads, there are few new threats to cultural resources. Nevertheless, if areas are found during routine monitoring where roadside parking is damaging cultural resources, then those areas may be designated as closed to parking if effects to cultural resources cannot be avoided or mitigated. Unauthorized routes that are to be designated can also be closed to parking, if archaeological inventory identifies the potential for impacts that cannot be resolved under the protection measures established in the Protocol.

Designated camping areas and motorized routes to access them and designated fixed distance corridors along system roads, even exempt roads, both require Section 106 consultation under the Protocol and, unless the specific exemptions under the protocol apply, must be surveyed, evaluated, and any effects to archaeological sites resolved under the protection measures established in the Protocol before they can be added to the MVUM.

Assumptions Associated with Motor Vehicle Use for Fuelwood Gathering

Cross-country motorized travel is authorized as part of any permit to collect fuelwood, regardless of whether the District issuing is closed or open to such activity. As a permitted use, it is not considered to be in the same category as unrestricted cross-country travel and the permits include rules for motorized access into the permit areas that are designed to limit environmental damage. Also, firewood permit areas move around to prevent overuse, limiting the potential for repetitive impacts on any given permitted location. Generally, these permit areas are defined ahead of time and where cross–country travel is restricted, firewood areas may be subject to archaeological clearance, in which case it is common practice to modify permit boundaries to limit the exposure of archaeological sites to vehicular impacts. While the small numbers of permits, low potential for repetitive impacts, and limitations on access built into the permits reduce concerns for damage to archaeological sites, cross-country OHV travel always has a potential for impacting archaeological sites, degrading traditional use areas, and disrupting traditional activities.

Alternative A – Direct and Indirect Effects

Current conditions include a total of about 4,959 miles of Forest system roads open to the public and maintained for both high clearance and passenger vehicles. Cross-country motorized travel is allowed but is restricted to the higher elevation Payson and Pleasant Valley ranger districts. There are also about 736 miles of unauthorized routes that have been inventoried across the Forest, many of which are currently in use; there are also many more unauthorized routes resulting from cross-country travel than have been inventoried.

Cross-country Travel

Continued cross-country travel on Payson and Pleasant Valley ranger districts would result in continued damage to cultural resources. Enforcement of restrictions on uncontrolled motorized travel off of system roads on other ranger districts would reduce impacts to cultural resources.

Motor Vehicle Use for Big Game Retrieval

Although specific documentation of impacts to sites due to motorized big game retrieval is not readily available, it is unlikely that this activity in and of itself as currently experienced on the Forest, where cross-country travel is open on only two ranger districts, would have a significant effect on archaeological sites.

Motor Vehicle Use for Dispersed Camping

Continued vehicular access to dispersed camping on Payson and Pleasant Valley ranger districts outside the roadside zone covered by the Protocol would not reduce the potential for impacts, especially as many known dispersed camping sites are located well outside the roadside parking zone. Continued cross-country access to dispersed camping on the other districts, though not authorized, would continue to create a potential for impacts to cultural resources.

Motor Vehicle Use for Fuelwood Gathering

Cross-country travel for fuelwood gathering always has a potential for impacting archaeological sites, degrading traditional use areas, and disrupting traditional activities. The effects to archaeological sites may be mitigated somewhat by the conditions applied to all fuelwood permits, but the potential threat remains.

Alternative B – Direct and Indirect Effects

Under this alternative, approximately 686 miles of the inventoried unauthorized routes would not be designated. A total of about 50 miles of unauthorized routes would be added to the system and designated for motor vehicle use. The resulting motorized route system would total approximately 2,560 miles of designated roads and motorized trails open to the public, for a net reduction of 2,399 miles.

Approximately 1.96 miles (3.8 percent) of 50 foot wide corridors along those unclassified routes proposed for designation as roads or motorized trails in this alternative were inventoried by archaeological survey (Roberts and Mitchell, 2010). Since the survey was contracted additional routes have been proposed for designation and some of the routes previously identified were dropped from consideration. Over 48 of the 50 miles of unauthorized routes proposed for designation still require inventory before they can be evaluated for addition to the MVUM. This additional archaeological survey, under the terms of the Protocol, would be phased in as funding becomes available. Of the four routes surveyed, two were encumbered by archaeological sites, the routes passing through them with varying degrees of disturbance. These routes would also be held from inclusion in the MVUM pending further analysis and the application of protective measures or they would be eliminated from the proposal if no suitable mitigation is feasible.

Areas Designated for Motor Vehicle Use

Compared to the current condition, by prohibiting travel off of designated routes and not designating over 686 miles of unauthorized routes, this alternative would significantly reduce direct and indirect effects to cultural resources by restricting cross-country travel and by employing the protection measures identified in the Protocol. Any restriction or reduction of uncontrolled off-road travel would reduce impacts to cultural resources. It differs from the other alternatives primarily by closing nearly all unauthorized routes and eliminating all cross-country travel areas, including motorized big game retrieval.

In terms of the total number and nature of routes, effects on cultural resources from this alternative are significantly reduced compared to the current condition. By eliminating virtually

all cross-country travel, including big game retrieval, it affords more protection to cultural resources from the direct effects of unregulated vehicular impacts than any other alternative.

Motor Vehicle Use for Big Game Retrieval

Since no motorized big game retrieval would be allowed under this alternative, there would be no effect on cultural resources.

Motor Vehicle Use for Dispersed Camping

Under this alternative, motorized access for dispersed camping would be limited to designated campsites and designated access routes. The protocol requires that any such designated areas or routes be subject to consultation and would require archaeological clearance prior to being added to the MVUM. Therefore, motorized access to dispersed camping under this alternative would have no direct effect on cultural resources.

Motor Vehicle Use for Fuelwood Gathering

Under current conditions, cross-country travel is allowed anywhere within the permit area. Under this alternative, such access is permitted only within 300 feet on both sides of designated motorized routes within the permit areas. This would reduce the potential for impacting archaeological sites, degrading traditional use areas, and disrupting traditional activities, but does not eliminate it.

Alternative C – Direct and Indirect Effects

Under this alternative, approximately 383 miles of existing unauthorized routes would not be designated. A total of 353 miles of unauthorized roads and trails would be added to the system and designated for motor vehicle use. The resulting motorized route system would total about 3,652 miles of designated roads and motorized trails open to the public for a net decrease from the current condition of over 1,307 miles, but would restrict cross-country travel to designated corridors and areas.

Approximately 124 miles (37.4 percent) of 50 foot wide corridors along those unclassified routes proposed for designation as roads or motorized trails in this alternative were inventoried by archaeological survey (Roberts and Mitchell, 2010). Since the survey was contracted additional routes have been proposed for designation and some of the routes previously identified were dropped from consideration. Approximately 230 of the 353 miles of unauthorized routes proposed for designation still require inventory before they can be evaluated for addition to the MVUM. This additional archaeological survey, under the terms of the Protocol, would be phased in as funding becomes available. Of the 117 routes surveyed, 13 were encumbered by archaeological sites, the routes passing through them with varying degrees of disturbance. These routes would also be held from inclusion in the MVUM pending further analysis and the application of protective measures or they would be eliminated from the proposal if no suitable mitigation is feasible.

The actual incidence of damage to sites identified by the survey is fairly low (only about 11 percent of the surveyed routes impacted archaeological sites), with most of the vehicular impacts associated with those routes that began as cross-country ATV and motorcycle trails but have widened over time. Since many of these routes have been in use for years, this does not suggest that their presence has led to any marked increase in vandalism. It is unlikely that designation of the proposed unauthorized routes would have a significant direct impact on cultural resources,

particularly once protective measures are applied or the affected routes are dropped from consideration.

Areas Designated for Motor Vehicle Use

Under this alternative, 383 miles of unauthorized routes would not be designated as motorized routes and cross–country travel will be prohibited other than limited motorized big game retrieval, and within four designated OHV areas and four "tot lots" where vehicular access would not be confined to specific routes, and cross country use would be allowed. Designated OHV areas and tot lots are subject to the same archaeological survey and clearance requirements as designated routes. Two of the tot lots have been surveyed and found to contain no cultural resources (Roberts and Mitchell, 2010; Howe and Nez, 2010); the other two remain to be inventoried. The 2010 archaeological survey (Roberts and Mitchell, 2010) examined the proposed Golf Course area and identified no cultural resources. The proposed Bartlett Lake Areas, Roosevelt Lake Areas, and Sycamore OHV area have not been specifically surveyed for designation but are known to contain archaeological sites. Prior to designation, archaeological survey and additional Tribal consultation would need to be completed and the protection measures identified in the Protocol applied. Given the presence of known archaeological sites in these areas, there may well also be Tribal concerns. Therefore, it is likely that all of these areas would need to be modified and any necessary mitigation completed before their final designation and inclusion on the MVUM. Archaeological survey, under the terms of the Protocol, would be phased in as funding becomes available and areas added to subsequent versions of the MVUM as they acquire archaeological clearance.

Compared to the current condition, by prohibiting travel off of designated routes and outside of designated areas and by employing the protection measures identified in the Protocol where cross country travel would be permitted, this alternative would significantly reduce impacts to cultural resources.

Motor Vehicle Use for Big Game Retrieval

In this alternative, motorized big game retrieval would be allowed under this alternative for retrieving elk and bear within one mile of any designated motorized route, limited only by the presence of other closure orders and designated areas where motorized travel is not permitted. This would authorize limited cross-country travel on several Districts where it is currently prohibited. Specific documentation of impacts to sites due to motorized big game retrieval is not readily available and it is unlikely that this activity would have a significant effect on archaeological sites, given the low numbers of permits issued for these animals on the Forest relative to the large area involved and the short seasons in which it would take place, but the inclusion of authorized cross-country travel corridors for big game retrieval to this alternative diminishes the beneficial effect of extending the restriction of cross-country travel to the entire Forest. It allows the practice to continue on the high elevation Districts, at least within the designated corridors during elk and bear seasons, but while the overall area in acres may be reduced for the Forest as a whole, it allows limited legal cross-country travel on parts of the low elevation Districts that were previously restricted from such use. However, none of the 1,575,382 acres proposed for inclusion in these corridors have been surveyed specifically for this purpose and conducting archaeological survey of this large an area is unfeasible since it is not possible to narrow the survey down owing to the randomness and unpredictability of the location and length of routes that might be used. It is anticipated that only about 209 legally harvested bear or elk would even be available for motorized retrieval, so the dispersed driving would be very limited. The impacts would be similar to district wide fuelwood gathering that is exempt from further

Section 106 compliance under the Programmatic Agreement. Authorization of motorized big game retrieval under this alternative could result in greater impacts to cultural resources than under Alternatives A and B, but it is not likely to be adverse.

Motor Vehicle Use for Dispersed Camping

Under this alternative, motorized access for dispersed camping would be limited to designated full-size vehicle motorized trail spurs off designated routes. Although these routes currently exist on the ground, they are not part of the existing system and do not have known geographic coordinates or survey data. Compliance with Section 106 compliance under the Programmatic Agreement will be required prior to these routes being added to the MVUM. Therefore, motorized access to dispersed camping under this alternative would have no direct effect on cultural resources.

Motor Vehicle Use for Fuelwood Gathering

Under this alternative, cross-country travel is permitted only within 300 feet of a designated motorized route within the permitted area, as in Alternative B. This would reduce the potential for impacting archaeological sites, degrading traditional use areas, and disrupting traditional activities, relative to the current condition, but does not eliminate it. Therefore, the potential for impact to cultural resources is the same as for Alternative B.

Alternative D – Direct and Indirect Effects

Under this alternative, approximately 152 miles of existing unauthorized routes would not be designated for motorized use. A total of 552 miles of unauthorized roads and trails would be added to the system and designated for motor vehicle use. The resulting motorized route system would total about 4,859 miles of Forest system roads and motorized trails open to the public for a net increase from the current condition of over 100 miles, but would restrict cross-country travel to designated routes and areas.

Approximately 120 miles (20.5 percent) of 50 foot wide corridors along those unclassified routes proposed for designation as roads or motorized trails in this alternative were inventoried by archaeological survey (Roberts and Mitchell, 2010). Since the survey was contracted additional routes have been proposed for designation and some of the routes previously identified were dropped from consideration. Approximately 464 of the 584 miles of unauthorized routes proposed for designation still require inventory before they can be evaluated for addition to the MVUM. This additional archaeological survey, under the terms of the Protocol, would be phased in as funding becomes available. Of the 115 routes surveyed, 18 were encumbered by archaeological sites, the routes passing through them with varying degrees of disturbance. These routes would also be held from inclusion in the MVUM pending further analysis and the application of protective measures or they would be eliminated from the proposal if no suitable mitigation is feasible.

The actual incidence of damage to sites identified by the survey is fairly low (less than 16 percent of the surveyed routes impacted archaeological sites), with most of the vehicular impacts associated with those routes that began as cross-country ATV and motorcycle trails. Although many of these routes have been in use for years, there is no indication that their presence has led to any marked increase in vandalism. It is unlikely that designation of the proposed unauthorized routes would have a significant direct impact on cultural resources, particularly once protective measures are applied or the affected routes are dropped from consideration.

Compared to the current condition, by prohibiting travel off of designated routes, this alternative would reduce direct and indirect effects to cultural resources by restricting cross-country travel and by employing the protection measures identified in the Protocol, similar to the Proposed Action. It differs from Alternatives B and C primarily by increasing the number of motorized routes open to the public, and by opening up motorized big game retrieval to additional species and hunting units. As with the Proposed Action, any restriction or reduction of uncontrolled off-road travel would reduce impacts to cultural resources.

Areas Designated for Motor Vehicle Use

Under this alternative, 88 miles of unauthorized routes would be closed and cross–country travel prohibited other than that associated with CHAMP permits and within four designated OHV areas and four "tot lots" where vehicular access would not be confined to specific routes, and cross country use would be allowed. Designated OHV areas and tot lots are subject to the same archaeological survey and clearance requirements as designated routes. Two of the tot lots have been surveyed and found to contain no cultural resources (Roberts and Mitchell, 2010; Howe and Nez, 2010); the other two remain to be inventoried. The 2010 archaeological survey (Roberts and Mitchell, 2010) examined the proposed Golf Course area and identified no cultural resources. The proposed Bartlett Lake, Roosevelt Lake, and Sycamore OHV areas have not been specifically surveyed for designation but are known to contain archaeological sites. Prior to designation, archaeological survey and additional Tribal consultation would need to be completed and the protection measures identified in the Protocol applied. Given the presence of known archaeological sites in these areas, there may well also be Tribal concerns. Therefore, it is likely that all of these areas would need to be modified and any necessary mitigation completed before their final designation and inclusion on the MVUM. Archaeological survey, under the terms of the Protocol, would be phased in as funding becomes available and areas added to subsequent versions of the MVUM as they acquire archaeological clearance.

Compared to the current condition, by prohibiting travel off of designated routes and outside of designated areas and by employing the protection measures identified in the Protocol, this alternative would significantly reduce impacts to cultural resources.

Motor Vehicle Use for Big Game Retrieval

In this alternative, motorized big game retrieval would be allowed under this alternative for retrieving mule deer, whitetail deer, elk, and bear and would be limited to a specified corridor along all designated motorized routes, one mile on both sides. It would also be limited by the presence of other closure orders and designated areas where motorized travel is not permitted. This would authorize cross-country travel on several ranger districts where it is currently prohibited. Specific documentation of impacts to sites due to motorized big game retrieval is not readily available and while it is unlikely that this activity would have a significant effect on archaeological sites. It is anticipated that only about 550 legally harvested bear, elk, whitetail deer, and mule deer would even be available for motorized retrieval, so the dispersed driving would be very limited. However, the authorization of cross-country travel for big game retrieval under this alternative would diminish the beneficial effect of extending the restriction of cross-country travel to the entire Forest. It allows the practice to continue on the high elevation ranger districts, at least during hunting seasons, and it allows limited legal cross-country travel on parts of the low elevation ranger districts that were previously restricted from such use. Overall, 2,068,208 acres would be open to potential impacts to cultural resources resulting from cross-country motorized travel. Since conducting archaeological survey of this large an area is unfeasible and since it is not possible to narrow the survey down owing to the randomness and

unpredictability of the location and length of routes that might be used, authorization of motorized big game retrieval under this Alternative would result in greater impacts to cultural resources than any of the other alternatives. The impacts would be similar to district wide fuelwood gathering that is exempt from further Section 106 compliance under the PA. Authorization of motorized big game retrieval under this Alternative is not likely to adversely affect cultural resources.

Motor Vehicle Use for Dispersed Camping

Under Alternative D, cross-country motorized access to dispersed camping areas would be allowed within a 600 foot corridor (300 feet on each side) along all designated roads and motorized trails. Since designated corridors for dispersed camping access are areas wherein cross-country travel is allowed, they are subject to the same requirements under the Protocol as the proposed designated OHV areas. As a result, unless the specific exemptions under the protocol apply, they would not be available for inclusion on the MVUM until they have been surveyed and any necessary protective measures are applied and any mitigation is complete or they would be eliminated from the proposal if no suitable mitigation is feasible. Application of the Protocol would prevent impacts to cultural resources under this alternative, but at present, none of the 336,038 acres proposed for inclusion in these corridors have been surveyed specifically for this purpose. Any additional archaeological survey, under the terms of the Protocol, would be phased in as funding becomes available and corridors added to subsequent versions of the MVUM as they acquire archaeological clearance.

Motor Vehicle Use for Fuelwood Gathering

Under this alternative, cross-country travel is throughout the permitted area, and is no change from the current condition. Therefore, the potential for impact to cultural resources is the same as for alternative A.

Cumulative Effects Associated with the Action Alternatives

Past Actions. As previously noted, archaeological sites are, by their very nature, are previously affected, reduced by the transformation processes of erosion, and decay from their original pristine state. Any effect to such sites, is therefore cumulative. Many have also been affected by historic and recent human activity, including management activities undertaken by the Forest and resource use and extraction projects undertaken prior to the implementation of Section 106 of the National Historic Preservation Act. Such actions that are known to have affected archaeological sites on the Tonto National Forest include unrestricted livestock grazing, timber harvesting, road and trail construction, and a wide variety of recreational activities. There were also the decades of essentially unrestricted vandalism and looting. All of these activities have the potential to cause permanent damage to the structures, artifacts, and cultural deposits making up archaeological sites and many sites on the Forest bear the scars of damages resulting from them. The effects of unrestricted motorized cross-country travel have been discussed in the affected environment section of this report.

Tonto National Forest Foreseeable Actions. Reasonably foreseeable actions that can affect cultural and historical and Tribally significant resources represent a continuation of the land use practices of the past: livestock grazing, fuels reduction and forest thinning, timber harvesting, mining, watershed improvements, recreation management (obliteration of social trails and dispersed campsites, construction and designation of trails and campsites), lands special use permits (new issuances and maintenance on existing structures), new road construction, and personal use activities such as fuelwood harvesting that often entail cross-country vehicular

access. While these activities can directly and indirectly affect cultural and historical and Tribally significant resources, as well as cause destruction or modification to their environmental contexts, these actions must comply with Section 106. They are planned to minimize (and when possible, to eliminate) effects to these properties and have measures designed to mitigate disturbance that may occur from project implementation. By applying the standards and protection measures in the Protocol and by eliminating cross-country travel and reducing the amount of land subject to ground disturbance by vehicle use, it is not expected that any of these alternatives would result in any significant increase in cumulative effects associated with cultural resources on the Tonto National Forest.

Illegal activities such as vandalism and looting by pothunters clearly affect cultural and historical and tribally significant resources. Since these activities are illegal, they cannot be predicted and so in the strictest sense are not foreseeable in any legal sense. Still, since these activities have been reduced in recent years but not entirely eradicated, they can be expected to continue at some level. They can be reduced by monitoring and law enforcement.

Contemporary Indian Uses

Affected Environment

Tonto National Forest contains many plant and animal species, water sources, minerals, and geographic landforms and places that have significance to contemporary Indian Tribes for their use in traditional economies, religious practices, or in Tribal and clan histories.

An important consideration in the fulfillment of the Forest Service mission is the trust relationship the Forest Service has with these Tribes and the potential impact Forest Service policy, program, and project decisions may have on them. The Tonto National Forest recognizes that several area Tribes have cultural ties to and knowledge about lands now managed by the Forest Service. Many tribal members regularly visit the Forest to harvest traditional plant resources such as acorns, piñon nuts, arroweed, agave, willow, cattails, and beargrass, to collect medicinal plants and mineral resources for personal and ceremonial uses, and to collect firewood. For tribal members, no artifacts, cultural items, or remains may be collected from archaeological sites without an ARPA (Archaeological Resources Protection Act) permit from the Forest. Motorized use for the gathering of forest resources is only allowed on designated roads. Tribal members also regularly visit traditional cultural properties and sacred sites on the Forest. Resource collection and site visitation are both activities that require motorized access, particularly for Tribal elders, who make up the majority of traditional practitioners. They use the existing roads to get to the places they want to go, but tend to conduct their activities on foot once they get there. The Tribes, therefore, wish to maintain access but also desire to protect important natural and cultural resources from damage, including that caused by construction of new roads and trails and by uncontrolled cross-country motor vehicle traffic. Roads on Cave Creek, Mesa, Globe, Payson, and Pleasant Valley ranger districts also access Tribal land adjacent to the Forest. Some of these roads are used by Tribal members to get to their activity areas on the Forest. Access to and maintenance of these roads is, therefore, a significant concern. On the other hand, these same roads are also seen as providing opportunities for trespass onto tribal lands by non-Tribal members.

Some general locations used by Tribal members to conduct traditional activities such as plant collection and religious rites on the Forest are known, but no specific locations were identified during scoping that are within the Area of Potential Effect (APE) for this analysis (the Tonto

National Forest). It is known, however, that Tribal members utilize both designated and unauthorized routes to access traditional resource gathering areas and sacred sites on the Tonto National Forest, typically using trucks and other full-size vehicles rather than ATVs or motorcycles. Such small scale, low frequency uses of the Forest by Tribal members are currently allowed without requiring permits except for the removal of timber products. Access is allowed on any designated road and timber removal permits do not authorize cross-country travel except on those Districts where it is currently allowed.

Most traditional practitioners typically use full-size vehicles rather than ATVs or motorcycles and occasionally drive them cross-country to facilitate resource gathering, especially for elderly traditional practitioners.

Environmental Consequences

Significant Tribal places, whether sacred sites or resource collecting areas, or places associated with clan or Tribal histories, are located throughout the Forest, though their specific locations often remain known only to Tribal members. They can be archaeological or historic sites, landmarks, or simply places on the landscape used for traditional activities. Like other heritage resources, they are subject to several different types of impact from activities associated with recreation and Forest management that can degrade their physical characteristics and disrupt the traditional or religious activities associated with them. Like archaeological and historic sites, they are irreplaceable and individually unique and their integrity is wholly dependent on the contextual relationship with the environment in which they are found, something that cannot be recreated or restored once disturbed. They are also, by their very nature, previously affected, reduced by any activities taking place there since the land passed out of their control. Any effect to such sites, therefore, is cumulative.

Direct effects to sacred sites and traditional use areas can be generally defined as anything that results in removal of, displacement of, or damage to the physical features of the landscape associated with the traditional use or alteration of the vegetative composition of the area in the case of collecting sites.

Unrestricted motorized travel off of system roads has the potential to create those kinds of impacts, as does the repeated use of unauthorized routes. Direct effects can include alterations of a sacred site’s setting or context, sometimes to the extent that they are no longer recognizable and the various landscape features associated with their past use cannot be relocated. Unrestricted and uncontrolled off-highway vehicular use that results in erosion and changes in vegetative composition and density or alterations in the presence or availability of particular plant species can be especially damaging to traditional collecting areas.

Indirect impacts can include modern trash contamination and the introduction of noise and light pollution from vehicles and camping and the presence of people and activities that may be seen as degrading to either the sacred nature of a place or to the experience of conducting traditional activities there. They can also take the form of conflicts with other recreational or economic uses that affect the ability of traditional practitioners to access these areas.

Assumptions and Methodology

Areas Designated for Motor Vehicle Use

Under the current Forest plan, the southern Ranger Districts (Cave Creek, Globe, Mesa, and Tonto Basin) are closed to unrestricted cross-country motorized travel, but it is allowed on the

Payson and Pleasant Valley Districts. Under the terms of the Protocol, designation of a specific area for unrestricted cross-country motorized access, like the designation of a previously unauthorized route, requires Section 106 consultation and unless the specific exemptions in the protocol apply, they must be surveyed, evaluated, and any effects to cultural resources, including traditional cultural properties, resolved under the protection measures established in the Protocol before they can be added to the MVUM. As new information is developed, the MVUM may be modified to reflect any resolution of conflicts. Similar guidance for contemporary use areas, although not specifically covered by the protocol, is appropriate.

Permit Zones

There is currently only one permit zone on the Forest. Permit zones would create no impacts to contemporary Indian uses. As such, they will not be analyzed further.

Motor Vehicle Use for Big Game Retrieval

Although specific documentation of impacts to contemporary Indian uses due to motorized big game retrieval is not readily available, it is unlikely that this activity in and of itself would have a significant effect on them. The short-term, dispersed, and non-repetitive nature of the impact, relatively few permits issued, limited duration of hunting seasons, and typically low hunter success rates on the Tonto National Forest combine to minimize the potential for conflict[89]. Nevertheless, unrestricted cross-country OHV travel always has a potential degrading traditional use areas and disrupting traditional activities. Though it may be difficult to accurately quantify, authorizing or designating parameters for motorized big game retrieval may be a potential source of impact, especially where it opens up areas to legal cross-country travel that were previously restricted.

Motor Vehicle Use for Dispersed Camping

Restriction of motorized access to dispersed camping locations, whether they are adjacent to roads and motorized trails or located at a distance, has the potential to impact contemporary Indian uses since they often require short or long term stays on the Forest and typically do not involve formal campgrounds. Roadside parking for access to dispersed campsites adjacent to roads is exempted under the Protocol and allowable under the current Plan on the northern ranger districts where cross-country travel is currently allowed. This has been the traditional way that Tribal traditional practitioner users have camped on all ranger districts of the Tonto National Forest, but camp areas may also extend some distance from the roads in order to secure a degree of seclusion.

Motor Vehicle Use for Fuelwood Gathering

Cross-country motorized travel is authorized as part of any permit to collect fuelwood. As a permitted use, it is not considered to be in the same category as unrestricted cross-country travel and the permits include rules for motorized access into the permit areas that are designed to limit environmental damage. Also, fuelwood permit areas rotate to prevent overuse, limiting the potential for repetitive impacts on any given permitted location. Generally, these permit areas are defined ahead of time and where cross–country travel is restricted, fuelwood areas may be subject to archaeological clearance, in which case it is common practice to modify permit boundaries to limit the exposure of archaeological sites to vehicular impacts. While the small numbers of permits, low potential for repetitive impacts, and limitations on access built into the

[89] For more information about hunting and the quantitative data associated with it on the Tonto National Forest, see the Game and Nongame section of this chapter.

permits reduce concerns for damage to archaeological sites, cross-country OHV travel always has a potential for impacting archaeological sites, degrading traditional use areas, and disrupting traditional activities.

Alternative A – Direct and Indirect Effects

Access to areas that Tribal people have historically visited would not change under this alternative. Tribal people needing access to collection sites necessary for ceremonial activities and other traditional uses would continue to have the same opportunities to drive to collection sites. No Tribe has indicated that the current road system is inadequate for their continued use of the Forest. Retaining the road system as it is currently used would provide necessary access and allow traditional practitioners to continue to use the area. However, uncontrolled off-road travel would result in continued damage to sacred sites and traditional use areas and may inhibit or limit the use of such areas. Likewise, the potential remains for trespass onto reservation lands from uncontrolled and unclassified routes. While not strictly speaking a matter of contemporary Indian use, reduction of trespass onto adjacent reservations was identified in consultation as a concern.

Cross-country Travel

Continued cross-country travel on Payson and Pleasant Valley ranger districts would result in continued potential for impacting significant Tribal sites, degrading traditional use areas, and disrupting traditional activities. Enforcement of restrictions on uncontrolled motorized travel off of system roads on other ranger districts would reduce impacts to contemporary Indian uses.

Motor Vehicle Use for Big Game Retrieval

It is unlikely that this activity in and of itself as currently experienced on the Forest, where cross-country travel is open on only two ranger districts, would have a significant effect on contemporary Indian uses.

Motor Vehicle Use for Dispersed Camping

Continued vehicular access to dispersed camping will not impact the practice of contemporary Indian uses that involves camping. On the other hand, continued cross-country access to dispersed camping areas would continue to create a potential for impacts to sacred sites and traditional use areas.

Motor Vehicle Use for Fuelwood Gathering

Cross-country OHV travel for fuelwood gathering always has a potential for adversely affecting significant Tribal sites, degrading traditional use areas, and disrupting traditional activities. These effects may be mitigated somewhat by the conditions applied to all fuelwood permits, but the potential threat remains.

Alternative B – Direct and Indirect Effects

Under this alternative, approximately 686 miles of the inventoried unauthorized routes would not be added to the system. A total of about 50 miles of unauthorized routes would be added to the system and designated for motor vehicle use. The resulting motorized route system would total approximately 2,560 miles of Forest system roads and motorized trails open to the public, for a net reduction of 2,339 miles. It would also virtually eliminate all cross-country travel.

This alternative greatly reduces potential direct and indirect effects to sacred sites and traditional use areas by restricting cross-country travel, reducing the potential for trespass onto Tribal lands,

and by employing protection measures to cultural resources and traditional cultural properties identified in the Protocol for any newly designated route, corridor, or area. In particular, restricting motorized vehicles to designated routes would reduce the potential for disruption of traditional cultural or religious activities. However, closure of some existing roads may reduce opportunities for traditional resource gathering, visitation of sacred and other traditionally significant sites and increase the need for non-motorized travel for elderly traditional practitioners. Likewise, eliminating cross-country motorized travel on the northern ranger districts and reducing the number of available motorized access routes throughout the Forest by closing unauthorized existing roads could reduce access to areas that Tribal people have historically visited without restraint. Tribal people needing motorized access to collection sites necessary for ceremonial activities and other traditional uses related to subsistence (e.g. medicinal or food plant gathering or fuelwood cutting) may have fewer opportunities to drive to collection sites with this alternative. Activities authorized under separate NEPA decisions, such as traditional gatherings, may be exempted from restrictions of the Travel Management Rule and an authorized Forest officer can allow specific limited-use authorization for cross-country motorized access or use of a road closed to the public under the terms of a permit for collection of such products.

Areas Designated for Motor Vehicle Use

Any restriction or reduction of uncontrolled off-road travel would reduce impacts to sacred sites and traditional use areas and would reduce the potential for trespass onto Tribal lands but may restrict motorized access for the practice of contemporary Indian uses.

Motor Vehicle Use for Big Game Retrieval

Since no motorized big game retrieval would be allowed under this alternative, there would be no effect on contemporary Indian uses. By excluding motorized big game retrieval, this alternative also further reduces potential direct and indirect effects to sacred sites and traditional use areas and reduces the potential for trespass onto Tribal lands.

Motor Vehicle Use for Dispersed Camping

Under this alternative, motorized access for dispersed camping would be limited to designated campsites and designated access routes. Assuming that these designated camping areas and routes include those used by Tribal people for access to sacred sites and traditional use areas, motorized access to dispersed camping under this alternative would have no direct effect on contemporary Indian uses. Of course, if the designated campsites and access routes did not include those traditionally used by Tribal members for these purposes, then this alternative could be seen as limiting Tribal Access.

Motor Vehicle Use for Fuelwood Gathering

Under current conditions, cross-country travel is allowed anywhere within the fuelwood permit area. Under this alternative, such access is permitted only within 300 feet on both sides of a designated motorized route within the permit area. This would reduce the potential for impacting sacred sites, degrading traditional use areas, and disrupting traditional activities, but does not eliminate it.

Alternative C – Direct and Indirect Effects

Under this alternative, approximately 383 miles of existing unauthorized routes would not be added to the system. A total of 353 miles of unauthorized roads and trails would be added to the system and designated for motor vehicle use. The resulting motorized route system would total

about 3,652 miles of Forest system roads and motorized trails open to the public for a net increase from the current condition of over 1,307 miles, but would restrict cross-country travel to designated routes and areas.

This alternative greatly reduces potential direct and indirect effects to sacred sites and traditional use areas by restricting cross-country travel, reducing the potential for trespass onto Tribal lands, and by employing protection measures identified in the Protocol for any newly designated route, corridor, or area. In particular, restricting motorized vehicles to designated routes would reduce the potential for disruption of traditional cultural or religious activities. By the same token, particularly regarding motorized big game retrieval, it also has greater potential than Alternative B for motorized recreational activities to disrupt traditional activities sensitive to public intrusion and increases the potential for trespass onto tribal land.

Areas Designated for Motor Vehicle Use

Under this alternative, cross–country travel would be limited for motorized big game retrieval and within four designated OHV areas and four "tot lots" where vehicular access would not be confined to specific routes, and cross country use would be allowed. Two of the tot lots have been surveyed and found to contain no cultural resources (Roberts and Mitchell, 2010; Howe and Nez, 2010); the other two remain to be inventoried. Given the presence of known archaeological sites in these areas, there may well also be Tribal concerns. Therefore, it is likely that all of these areas would need to be modified and any necessary mitigation completed before their final designation and inclusion on the MVUM. Archaeological survey and ethnohistoric research (depending on the outcome of Tribal consultation) would be phased in as funding becomes available and areas added to subsequent versions of the MVUM as they acquire archaeological clearance.

Compared to the current condition, by prohibiting travel off of designated routes and outside of designated areas and by employing the protection measures similar to those identified in the Protocol, this alternative would significantly reduce potential impacts to sacred sites and traditional use areas. However, closure of some existing roads may reduce opportunities for resource gathering, visitation of sacred and other traditionally significant sites and increase the need for non-motorized travel for elderly traditional practitioners. Likewise, eliminating cross-country travel on the northern ranger districts and reducing the number of available access routes throughout the Forest by closing unauthorized routes could reduce access to areas that Tribal people have historically visited without restraint. Tribal people needing access to collection sites necessary for ceremonial activities and other traditional uses related to subsistence (e.g. medicinal or food plant gathering or fuelwood cutting) may have fewer opportunities to drive to collection sites with this alternative. This alternative does, however, provide more access opportunities for contemporary Indian uses than Alternative B

Motor Vehicle Use for Big Game Retrieval

Specific documentation of impacts to sites due to motorized big game retrieval is not readily available and it is unlikely that this activity would have a significant effect on contemporary Indian uses, given the low numbers of permits issued for these animals on the Forest relative to the large area involved and the short seasons in which it would take place. However, allowing motorized big game retrieval, even under the limited conditions of this alternative, does increase the potential for direct and indirect effects to sacred sites and traditional use areas and increases the potential for trespass onto Tribal lands above what would be associated with Alternative B, though it is unknown to what degree.

None of the 1,575,382 acres proposed for inclusion in these corridors have been surveyed specifically for this purpose and conducting archaeological or ethnohistoric survey of this large an area is unfeasible. It is not possible to narrow the survey down owing to the randomness and unpredictability of the location and length of routes that might be used. The impacts would be similar to district wide fuelwood gathering that is exempt from further Section 106 compliance under the Programmatic Agreement. Authorization of motorized big game retrieval under this alternative would result in greater potential impacts to contemporary Indian uses than under Alternatives A and B, but it is not likely to be adverse.

Motor Vehicle Use for Dispersed Camping

Under this alternative, motorized access for dispersed camping would be limited to designated full-size vehicle motorized trail spurs off designated routes. Although these routes currently exist on the ground, they are not part of the existing system and do not have known geographic coordinates or survey data. The protocol requires that any such designated routes be subject to consultation and would require archaeological clearance prior to being added to the MVUM. As discussed in Alternative B, assuming that these designated camping areas and routes include those used by Tribal people for access to sacred sites and traditional use areas, motorized access to dispersed camping under this alternative would have no direct effect on contemporary Indian uses. Of course, if the designated campsites and access routes did not include those traditionally used by Tribal members for these purposes, then this alternative could be seen as limiting Tribal Access.

Motor Vehicle Use for Fuelwood Gathering

Under this alternative, cross-country travel is permitted only within 300 feet on both sides of a designated motorized route, as in alternative B. This would reduce the potential for impacting sacred sites, degrading traditional use areas, and disrupting traditional activities, relative to the current condition, but does not eliminate it. Therefore, the potential for impact to access for traditional uses is the same as for alternative B.

Alternative D – Direct and Indirect Effects

Under this alternative, approximately 152 miles of existing unauthorized routes would not be added to the system. A total of 552 miles of unauthorized roads and trails would be added to the system and designated for motor vehicle use. The resulting motorized route system would total about 4,859 miles of Forest system roads and motorized trails open to the public for a net increase from the current condition of over 100 miles, but would restrict cross-country travel to designated routes and areas.

Except for the expansion of motorized big game retrieval, this alternative greatly reduces potential direct and indirect effects to sacred sites and traditional use areas by restricting cross-country travel, reducing the potential for trespass onto Tribal lands, and by employing protection measures identified in the Protocol for any newly designated route, corridor, or area. In particular, restricting motorized vehicles to designated routes would reduce the potential for disruption of traditional cultural or religious activities.

This alternative, with the most proposed motorized access, particularly in regards to miles of designated roads, would have the most potential for providing Tribal access to sacred and traditional places and resources. By the same token, it also has greater potential than the other alternatives for motorized recreational activities to disrupt traditional activities sensitive to public intrusion and increases the potential for trespass onto tribal land. Otherwise, effects on

Tribal access to traditional resources and significant places under this alternative would be similar to what they would be under the Alternative C.

Areas Designated for Motor Vehicle Use

Under this alternative, cross–country travel prohibited other than that associated with CHAMP permits and within four designated OHV areas and four "tot lots" where vehicular access would not be confined to specific routes, and cross country use would be allowed.

Compared to the current condition, by prohibiting travel off of designated routes and outside of designated areas and by employing protection measures similar to those identified in the Protocol, this alternative would significantly reduce potential impacts to sacred sites and traditional use areas. However, closure of some existing roads may reduce opportunities for resource gathering, visitation of sacred and other traditionally significant sites and increase the need for non-motorized travel for elderly traditional practitioners. Likewise, eliminating cross-country travel on the northern ranger districts and reducing the number of available access routes throughout the Forest by closing unauthorized routes could reduce motorized access to areas that Tribal people have historically visited without restraint. Tribal people needing motorized access to collection sites necessary for ceremonial activities and other traditional uses related to subsistence (e.g. medicinal or food plant gathering or fuelwood cutting) may have fewer opportunities to drive to collection sites with this alternative. This alternative does, however, provide more access opportunities for contemporary Indian uses than Alternatives B and C.

Motor Vehicle Use for Big Game Retrieval

In addition to that associated with CHAMP permits, motorized big game retrieval would be allowed under this alternative for retrieving mule deer, whitetail deer, elk, and bear and would not be limited to a specified corridor along designated motorized routes. This would authorize cross-country travel on several districts where it is currently prohibited. Specific documentation of impacts to sites due to motorized big game retrieval is not readily available and it is unlikely that this activity would have a significant effect on contemporary Indian uses, given the low numbers of permits issued for these animals on the Forest relative to the large area involved and the short seasons in which it would take place, but allowing essentially unrestricted motorized big game retrieval, does increase the potential for direct and indirect effects to sacred sites and traditional use areas and increases the potential for trespass onto Tribal lands well above even the elevated levels that would be associated with Alternative C, though it is unknown to what degree.

Since none of the 2,068,208 acres open to potential impacts have been surveyed specifically for this purpose and conducting archaeological or ethnohistoric survey of this large an area is unfeasible and since it is not possible to narrow the survey down owing to the randomness and unpredictability of the location and length of routes that might be used, authorization of motorized big game retrieval under this alternative would result in the greatest potential impacts to contemporary Indian uses than under alternatives A, B and C.

Motor Vehicle Use for Dispersed Camping

Under Alternative D, cross-country motorized access to dispersed camping areas would be allowed within a 600 foot corridor (300 feet on each side) along all designated roads and motorized trails. Assuming that these designated camping corridors include those campsites used by Tribal people for access to sacred sites and traditional use areas, motorized access to dispersed camping under this alternative would have no direct effect on contemporary Indian

uses. Since designated corridors for dispersed camping access are areas where cross-country travel is allowed, they are subject to the same requirements under the Protocol as the proposed designated OHV areas. As a result, unless the specific exemptions under the protocol apply, they would not be available for inclusion on the MVUM until archaeological surveys and Tribal consultations have been done and any necessary protective measures are applied and any mitigation is complete or they would be eliminated from the proposal if no suitable mitigation is feasible. At present, none of the 336,038 acres proposed for inclusion in these corridors have been surveyed specifically for this purpose. Archaeological survey and ethnohistoric research (depending on the outcome of Tribal consultation), would be phased in as funding becomes available and corridors would be added to subsequent versions of the MVUM as they acquire archaeological clearance.

Motor Vehicle Use for Fuelwood Gathering

Under this alternative, cross-country travel is throughout the permitted area, as in alternative A. Therefore, the potential for impacting sacred sites, degrading traditional use areas, and disrupting traditional activities is the same as for alternative A.

Cumulative Effects Associated with Action Alternatives

From the time that control of those lands now comprising the Tonto National Forest left tribal hands, there has been a diminution of the number and quality of significant Tribal places throughout the Forest. Everything from homestead entry patents and land exchanges to mine development to reservoir inundation has reduced Tribal access to the land and its sacred and traditional places and in many cases destroyed them. Forest management activities from timber harvesting to livestock grazing to campground construction to road building have altered the landscape and vegetation of many of these areas, often eliminating the specific resources on which traditional uses were focused. Recreational use has had similar effects and introduced new conflicts with other user groups and further restrictions of access to traditional places. As these areas continue to disappear under reservoirs, into open pit mines, and under highways and campgrounds, preservation of those remaining areas and continued vehicular access to them, particularly for elder practitioners, has become paramount. Foreseeable Forest uses would differ little in the future from what they have been in the past and so would continue to reduce the number and quality of these places. However, a renewed Forest Service commitment to protect sacred sites and traditional use areas may mitigate these losses somewhat. Therefore, despite the potential reduction in physical destruction under Alternatives B, C, and D and the potential improvement of access under some circumstances, the cumulative effect under all alternatives is the continued reduction or restriction of motorized access to traditional lands and resources by Tribal members.

Game and Nongame Species (Wildlife Related Recreation)

For the purposes of this analysis, wildlife related recreation is defined as hunting, fishing, and wildlife viewing. Wildlife related recreation is inherently tied to motorized recreation as all three activities generally require the use of motor vehicles to reach destinations to participate in each respective activity. This is especially true on public lands, like the Tonto National Forest. Motorized vehicles often provide the means for hunters and anglers to reach hunting or fishing areas as designated by the Arizona Game and Fish Department. Therefore, the use of motorized vehicles by wildlife related recreationists often contributes significantly to the ability of the Arizona Game and Fish Department to meet wildlife conservation objectives.

Specifically, the use of hunting as a wildlife management and wildlife conservation tool arose out of a movement, led by prominent hunters near the turn of the last century, to stop over-exploitation of wildlife by market hunters and the desire to have wildlife accessible to all people. Since then, hunters have contributed billions of dollars to wildlife management that benefit countless wildlife species. These funds support wildlife management agencies, which manage all wildlife species, not just those that are hunted. This unique and successful conservation paradigm is responsible for supporting a wide variety of conservation activities, including law enforcement, research, information and education, habitat management and acquisition, as well as wildlife population restoration and management. The importance of hunting to wildlife conservation in the broad sense is not tied simply to population control. Game populations are renewable resources that literally pay the bills for a far-reaching, comprehensive system of sustainable wildlife conservation that has proven itself superior to any other widely implemented model. (Heffelfinger, 2013; Mahoney, 2013)

Affected Environment

Arizona is rich in biological diversity, ranking among the top five states in the nation for the number of native bird, reptile, and mammal species, and in the top ten for overall diversity of vertebrates. Some nonnative species were established intentionally, as is the case with rainbow trout; while others such as quagga mussels have arrived as unwelcome or invasive species, and yet others appeared as they expanded their range. A few species, like the Mexican gray wolf and the California condor, were extirpated in Arizona, but have been reestablished through reintroduction programs (Arizona Game and Fish Department, 2012b).

Tonto National Forest, managed under the principles of multiple uses, plays a vital role in Arizona by supporting crucial wildlife habitat and maintaining Arizona's wildlife heritage as well as providing significant opportunities for wildlife related recreation and associated economic effects of such. Motorized access to public lands is important in maintaining funding for Arizona Game and Fish Department programs that support wildlife conservation. The Arizona Game and Fish Department uses hunting as a wildlife management tool and depends on hunting and angling access to public lands to meet identified objectives. Hunting on the Tonto National Forest includes: nine out of Arizona's ten big game species (elk, mule deer, whitetail deer, bighorn sheep, pronghorn, bear, mountain lion, turkey, and javelina), small game (quail, dove, tree squirrel, rabbit, and migratory birds), fur bearing mammals, and predatory mammals. The Tonto National Forest contains rivers, lakes, creeks, and ponds that offer diverse fishing opportunities. These include six out of eight of central Arizona's major reservoirs, two trout hatcheries, numerous coldwater fish streams, and two of Arizona's major rivers (Verde River and Salt River). Furthermore, the biological diversity of the Tonto National Forest provides a wide array of wildlife viewing opportunities.

Hunting Participation on the Tonto National Forest

The Tonto National Forest is divided into game management units, each of which has a different set of species and seasons that hunting can take place (Figure 37).

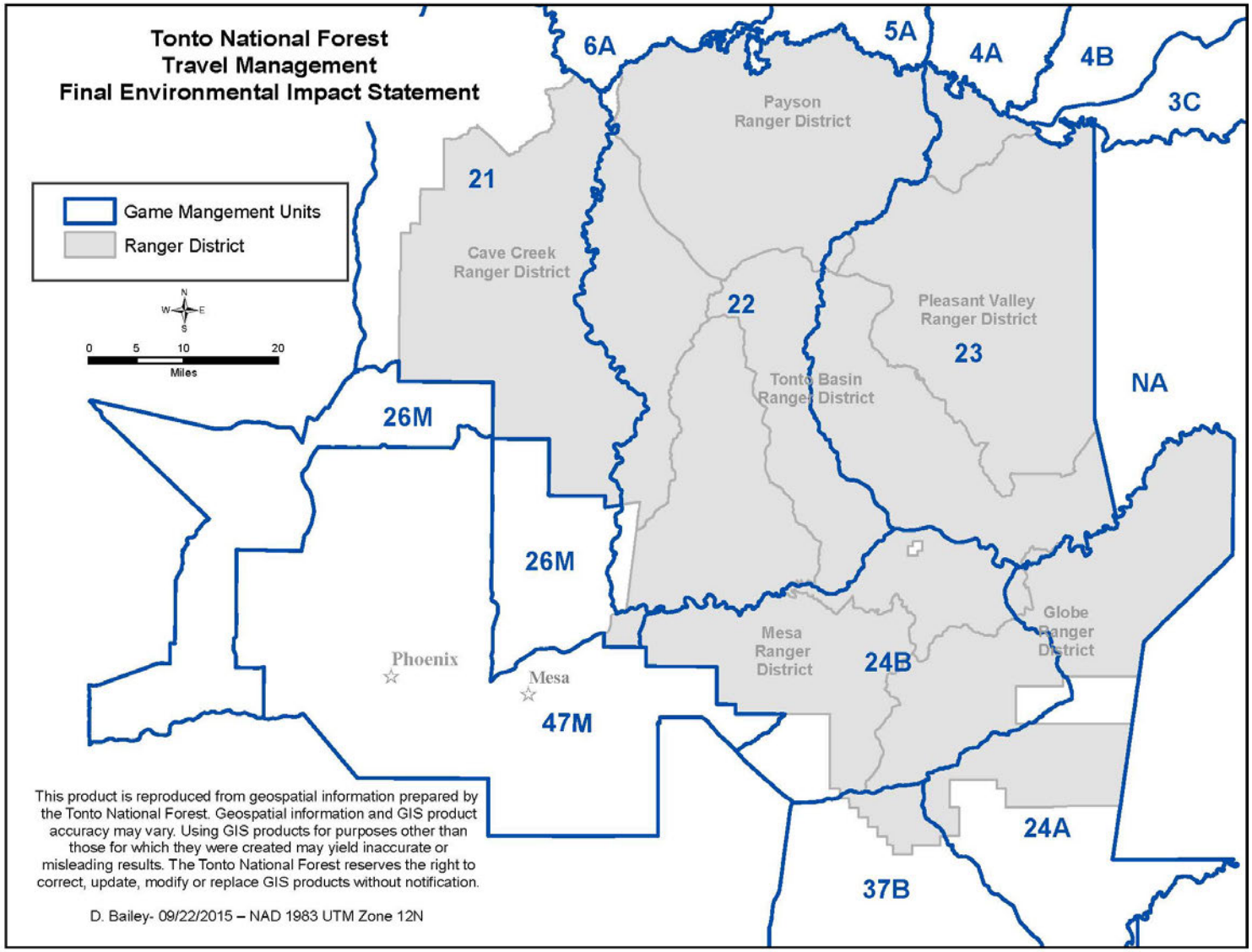

Figure 37. Map of Game Management Units Overlapping the Tonto National Forest

Providing an accurate account of participation of hunting and fishing and other wildlife related recreation on the Tonto National Forest can be difficult. For example, determining the overall number of people interested in fishing or hunting statewide is relatively easy because people wishing to participate in those activities must purchase hunting or fishing licenses, but not all people who buy licenses hunt solely on the Tonto National Forest. To determine the number of hunters that may hunt on the Tonto National Forest, the Arizona Game and Fish Department relies heavily on a well-established hunter questionnaire program to estimate how many hunters hunt in a particular game management unit and to provide information on game species harvest (Arizona Game and Fish Department, 2008). In the case of big game hunting, these licenses or tags are distributed via a lottery draw and the numbers of people who wish to participate far exceed those that are allowed to participate due to the need to regulate the number of animals harvested (Table 43)[90]. For example, in 2011 there were 1,503 applicants (people wishing to participate) for only six desert bighorn sheep tags (people who actually participated) in Game Management Units[91] 22 and 24B on the Tonto National Forest.

Table 43. Hunt Applicants and Permits Issued by GMU on Tonto National Forest in 2011

Species	Game Management Unit	Number of Authorized Permits	Number of 1st Choice Applicants
Whitetail Deer	21, 22, 23, 24A, 24B	3,975	4,917
Mule Deer	21, 22, 23, 24A, 24B	2,750	4,322
Any Antlered Deer	22, 23	275	579
Pronghorn	21	35	424
Elk	21, 22, 23, 24A	2,040	5,556
Turkey	22, 23, 24A	1,590	2,646
Javelina	21, 22, 23, 24A, 24B	4,420	5,207
Bighorn Sheep	22, 24B	6	1,503
Total		15,091	25,158

For bear hunting on the Tonto National Forest, the majority of bear hunting permits are issued during the fall hunt seasons that begin in August and run through the end of December. The five year average number of bear hunters on the Tonto National Forest is approximately 1,680 hunters and five year average black bear harvest is 69 animals.

Annual black bear harvest on the Tonto National Forest comprises approximately one quarter to one third of the statewide harvest for black bears.

The majority of black bears harvested on the Tonto National Forest are harvested during the early fall from August through October. Most (57.6 percent) black bears harvested in Arizona

[90] Black bear is not included in this list because the majority of black bear hunts that occur on the Tonto National Forest do not require an individual to apply for a hunt, but rather the nonpermit-tag is available over the counter. The five-year average number of black bear hunters on the Tonto National Forest is approximately 1,680 hunters. This estimate is derived by taking the number of black bear nonpermit-tags sold statewide and multiplying by the percentage of black bear harvested on Tonto National Forest lands. This estimate assumes that the level of black bear harvest is directly proportional with the number of nonpermit-tags sold.

[91] For a map of the game management units on the Tonto National Forest, see Alternative A's description in Chapter 2.

between 1998 and 2002 were killed in areas located primarily south of the Mogollon Rim, and most (55 percent) were harvested in September (Arizona Game and Fish Department, 2012a). The harvest locations of bears on the Tonto National Forest are often at elevations less than 6,000 feet with temperatures sometimes exceeding 80 degrees Fahrenheit during those months. Average adult size of female black bears is 150 pounds and male bears are 275 pounds with some males weighing more than 400 pounds. Due to the conditions described above, the need for black bear hunters on the Tonto National Forest to retain the ability to use motorized vehicles to retrieve the legally harvested animal may be warranted. With the five year average black bear harvest on the Tonto National Forest being 69 animals and the estimated annual motorized big game retrievals for black bear estimated at 15 trips, effects on wildlife and wildlife habitat are likely nominal[92].

Although the Tonto National Forest receives the highest levels of expenditures for hunting of any National Forest in the Southwestern Region (American Sportfishing Association, 2006), data derived from the National Visitor Use Monitoring report for the Tonto National Forest indicates that 2.5 percent of visitors to the Tonto National Forest are hunters (U.S. Forest Service, 2012). These figures may further represent that the Tonto National Forest is one of the most highly visited National Forests in the United States with each recreational activity (e.g., hunting, hiking, boating) contributing significantly to the number of visits and economic effects when reported separately as a distinct recreational activity.

While the interest in participating in big game hunting has generally increased statewide, the same has not been observed with interest in small game hunting. Although data for small game hunter participation on the Tonto National Forest is not available, a decline of small game hunter participation on the Tonto National Forest that is consistent with the statewide decline.

Angling Participation on the Tonto National Forest

Angling participation on the Tonto National Forest is the highest of any National Forest in Arizona due to the diversity of fishable waters on the Tonto National Forest and their proximity to the Phoenix Metropolitan Area (American Sportfishing Association, 2006; Pringle, 2004). This includes the Mogollon Rim area streams (East Verde River, Tonto Creek, Canyon Creek, etc.), the Salt River Lakes (Roosevelt, Apache, Canyon, and Saguaro), and the Verde River Lakes (Bartlett and Horseshoe) (Figure 38).

[92] For a more detailed account for these calculations, see Appendix A of the Arizona Game and Fish Department Report which is part of the project record.

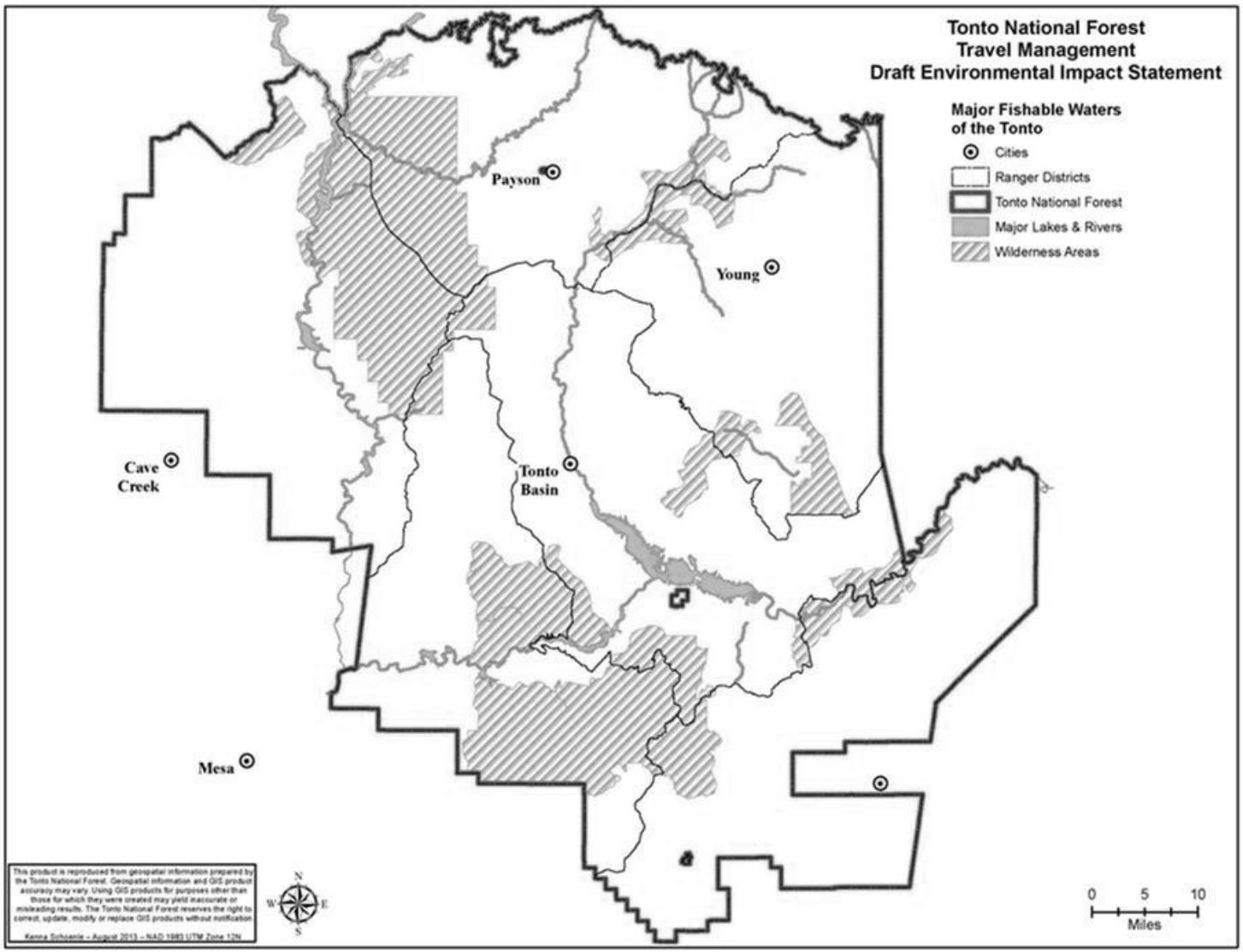

Figure 38. Map of Major Fishable Waters on the Tonto National Forest

These waters combined include a high diversity of sportfish species including; bass, trout, walleye, catfish, sunfish, and even opportunities to fish for native roundtail and headwater chub. In 2001 the Arizona Game and Fish Department did a statewide survey of angler use. Numbers derived from that survey indicate that there were 1,252,663 angler use days on the Tonto National Forest, making it one of the most heavily used fishing destinations in Arizona (Pringle 2004). On average Arizona anglers spent approximately 19 days fishing in 2001 (Pringle, 2004) and based on decrease in fishing license sales since 2001, it is believed to be even lower today. The major lakes on the Tonto National Forest (Roosevelt Lake, Bartlett Lake, Saguaro Lake, Canyon Lake, and Apache Lake make up five of the top eleven lakes in the state for highest angler use days. Data derived from the National Visitor Use Monitoring report for the Tonto National Forest indicates that 9.5 percent of visitors to the Tonto National Forest were anglers (U.S. Forest Service, 2012).

Economics Associated with Hunters and Anglers on the Tonto National Forest

The ability of the Arizona Game and Fish Department to adequately represent current public interests in wildlife is being tested by an ongoing societal shift in the way people value and interact with wildlife. The Arizona Game and Fish Department conserves game, sport fish, and nongame wildlife species, primarily using revenues from discretionary spending of customers relating to hunting and fishing license sales. Increasingly, fewer people are interested in hunting and fishing as a proportion of the entire population, yet there has been growth in other forms of wildlife-related recreation, such as wildlife viewing. Although valuable and contributory to local economies (U.S. Fish and Wildlife Service, 2012), wildlife viewing activities provide little direct revenue for the Arizona Game and Fish Department, but likely contribute significantly to local communities. Tied to these trends is the increasing interest in providing input in how wildlife is managed. People have many different preferences for wildlife-related recreation programs and services. Greater diversity in viewpoints has contributed to increased conflict, as well as contradictory social values among stakeholders (Arizona Game and Fish Department, 2012b).

Although economic data for angling on the Tonto National Forest is not specifically available, the statewide economic effect estimates that anglers spent $830 million, and contribute $1.1 billion to the state's economy (Pringle, 2004). Tonto National Forest angling economic data would be expected to be a high proportion of the statewide data based on the angling use days described above.

According to the 2006 report for State and National Economic Impacts of Fishing, Hunting and Wildlife-Related Recreation on U.S. Forest Service-Managed Lands (American Sportfishing Association) Tonto National Forest had the most expenditures for wildlife related recreation in the southwestern region:

- $24,350.674 for hunting;
- $21,583,552 for fishing; and
- $11,898,625 for wildlife viewing

Much of this information was obtained from the 2006 United States Fish and Wildlife Service National Survey of Fishing, Hunting and Wildlife-Associated Recreation (U.S. Fish and Wildlife Service, 2008) and the National Visitor Use Monitoring Program (U.S. Forest Service, 2012).

From 2000 to present, the Arizona Game and Fish Department has observed a relatively stable number of hunting licenses sold.

Fishing License sales over the years have steadily declined due to many factors including: change in demographics of Arizona's human population, economic issues, prolonged drought and weather patterns, wildfires, land management agency actions (e.g., closures, restrictions, fees, etc.), accessibility of waters, and availability of sportfish.

Environmental Consequences

Travel management planning and subsequent implementation may have effects on wildlife resources of which are held in public trust by the Arizona Game and Fish Department and may have effects on hunters, anglers, and other wildlife related recreationists on Tonto National Forest. Arizona remains the 8th fastest growing state in the U.S., with a population of 6.4 million in 2011[93]. A growing human population places increasing demands on wildlife populations, in part because of shrinking wildlife habitat due to human development. Increasing human population and decreasing wildlife habitat also results in loss of areas in which to recreate, concentrates human activity in existing recreation areas, increases human-wildlife conflicts, increases density of watercraft and off-highway vehicles, and may reduce the quality of habitat available for wildlife.

Control and management of large herbivore (ungulate) populations is a critical component of maintaining the Tonto National Forest's ecosystem. Public hunting has been the most effective tool for managing herbivore populations and often depends on reasonable motorized access to wildlife populations. The harvest and management objectives on the Tonto National Forest rely heavily on relatively predictable hunter harvest to reduce negative effects to vulnerable habitats. The ability to meet these objectives may be compromised with significant reductions in motorized access. As Arizona's hunters age (Arizona Game and Fish Department, 2012b), the need for motorized big game retrieval may increase to a point that harvest needs may not be met by hunter demand if those hunters choose not to harvest animals due to restrictions on motorized big game retrieval. Current demand for big game hunting on the Tonto National Forest does not indicate a decrease in demand for big game permits.

Regardless of what alternative is chosen, implementation of the travel management plan on the Tonto National Forest may result in positive and negative effects to the wildlife populations and the Arizona Game and Fish Department's ability to manage wildlife on the Tonto National Forest. Furthermore, effects on wildlife related recreation may occur.

Alternative A – Direct and Indirect Effects

Effects to Game and NonGame Wildlife

Under this alternative, current management of motorized travel on the Tonto National Forest would continue. Existing road densities and motorized cross-country travel would continue to have detrimental effects to wildlife and wildlife habitat defeating the intent and purpose of the Travel Management Rule.

Effects on Wildlife Related Recreation and Associated Economics

Under this alternative, the movement of environmental conditions (soil, water, wildlife, air, etc.) away from the desired future condition may occur. Under existing conditions and levels of motorized recreational use on the Tonto National Forest (U.S. Forest Service, 2012), natural resources would continue to deteriorate and not be sustainable for wildlife populations and their

[93] According to the United States Census 2012 population estimates; http://quickfacts.census.gov/qfd/states/04/0455000.html accessed on June 14, 2013.

habitats[94]. The subsequent loss of wildlife may result in the Tonto National Forest not being a destination for those that enjoy visiting for wildlife related recreation. Those communities that rely heavily upon Tonto National Forest visitation for wildlife related recreation may suffer from loss of revenue.

Under this alternative, approximately 2,050,400 acres (72 percent of the Tonto National Forest) would be available for walk-in wildlife related recreation access within one mile of roads and motorized trails open for public use. The existing level of motorized wildlife related recreational access (roads and motorized trails open to the public) appears to be sufficient for meeting Arizona Game and Fish Department wildlife management objectives and offers continued opportunities for recreationists that prefer to recreate in areas away from motorized travel as well.

Under this alternative the Cave Creek, Mesa, Globe, and Tonto Basin ranger districts would remain closed to cross-country travel and therefore motorized big game retrieval would not be permitted on those districts. This may affect those hunters that are not knowledgeable of the existing restriction, but the effect would be minimal as it is estimated that 550 hunters forestwide use motorized big game retrieval.

Alternative B – Direct and Indirect Effects

Effects to Game and NonGame Wildlife

Under this alternative, movement towards desired future conditions for wildlife and wildlife habitat would occur as there would likely be less motorized disturbance to wildlife populations and wildlife habitats in areas where road closures take place and through the elimination of cross-country travel. The Arizona Game and Fish Department has historically been supportive of efforts by the Tonto National Forest to reduce road densities where they are deemed duplicative and from which a pattern of use has been analyzed and determined to be detrimental to wildlife resources. The general prohibition against cross-country travel would likely improve wildlife habitat for all species. It is unknown how quickly wildlife and wildlife habitat would respond favorably to this action. Many factors would determine the rate of improvement of wildlife populations and habitat including: weather patterns, how quickly the Tonto National Forest could implement the action, the public's response and reaction to the action, and current status of wildlife populations. With the exception of elk populations (which have shown the ability to quickly increase and expand populations), other game species would likely not increase to a point beyond Arizona Game and Fish Department population objectives within 10 years after implementation of the action.

The reduction in road density, elimination of cross-country travel, and reduction in motorized disturbance on wildlife may benefit wildlife related recreationists who prefer to recreate in areas away from motorized travel, but based on anecdotal observations from wildlife professionals in the Arizona Game and Fish Department, the use of motorized vehicles for wildlife related recreation has increased commensurate with the statewide increase in the use of motorized vehicles over the last 10 to 20 years (Arizona State Parks, 2013). This action may result in further regulation pertaining to wildlife related recreation. This additional burden upon recreationists to remain legitimate may create conversion of those wildlife related recreationists to other forms of recreation and the subsequent loss of economic effects.

[94] For more information, see the Wildlife and Plant Habitat Resources section of this chapter.

Wildlife and wildlife habitat would likely improve within designated permit zones. It is likely that responsible motorized recreationists would respond by obtaining a permit for the area, other less responsible recreationists may abandon use of the area and recreate somewhere else that may be more detrimental to wildlife and wildlife habitat and into areas that have not already been heavily affected by motorized recreation.

In regards to motorized dispersed camping, this alternative only allows for approximately 65 acres designated for such purposes. It is likely that restrictions of available campsites would result in a difficult situation for recreationists unable to locate a legal campsite during periods of high use such as hunting seasons or for anglers at Forest Lakes which allow motorized dispersed camping. The restrictions on dispersed motorized camping may lead to less hunting as dispersed motorized camping is the most common form of camping used by hunters on the Tonto National Forest. The significant restrictions to motorized dispersed camping (restricted to approximately 65 designated acres) may have positive effects to wildlife and wildlife habitat as there would be less motorized disturbance and less human effect on the environment. On the other hand, this reduction of motorized use and potential restriction on hunters' ability to find and harvest big game animals may lead to wildlife populations that are above population objectives and subsequent habitat damages.

Effects on Wildlife Related Recreation and Associated Economics

Under this alternative, movement towards and away from desired future conditions for wildlife related recreation and associated economics may occur. The reduction in road density, elimination of cross-country travel, and reduction in motorized disturbance on wildlife may benefit wildlife related recreationists who prefer to recreate in areas away from motorized travel. On the other hand, the number of road closures (2,367 miles of decommissioned routes) may create confusion amongst recreationists when attempting to determine if particular roads are open or closed, particularly if adequate and reasonable signage is not maintained on the ground. Furthermore, if the requirement to possess a Motor Vehicle Use Map (MVUM) is not well established and/or the quality and scale of the MVUM does not provide enough information for a reasonable person to determine whether a road is open or closed, may result in Tonto National Forest visitors not being satisfied with their visit. This potential confusion amongst wildlife related recreationists may turn them away from pursuing further wildlife related recreation and/or they may go elsewhere resulting in subsequent loss of economic effects.

For permit zones, if wildlife and wildlife habitat improve as anecdotally observed on the Mesa Ranger District at Bulldog Canyon Permit Zone, wildlife related recreation may increase. Wildlife related recreationists tend to avoid areas of the Tonto National Forest that suffer from heavy motorized use (e.g. Lower Sycamore, Sugarloaf, and lower section of Four Peaks Road) because wildlife is scarce due to degraded wildlife habitat conditions.

This alternative does not allow for any motorized big game retrieval and therefore, approximately 550 elk, deer, and bear hunters combined would annually be precluded from using a motor vehicle to retrieve their animal (Arizona Game and Fish Department, 2013b). This alternative eliminates the ability of the Arizona Game and Fish Department to implement the Challenged Hunter Access Mobility Permit (CHAMP) program. It is unknown as to how both groups of hunters may react to removal of these privileges, but they may stop hunting, change their hunting behavior, hunt somewhere else, and/or choose to violate the restriction. Under this alternative, approximately 1,813,400 acres (63 percent) of the Tonto National Forest) are available for walk-in wildlife related recreation access within one mile of roads and motorized trails open for public use. The level of motorized access (roads and motorized trails open to the

public) may result in the Arizona Game and Fish Department not being able to meet big game harvest and wildlife management objectives at the game management unit level and subsequent statewide level. A concern with the removal of motorized big game retrieval is the spoilage of meat before hunters are able to retrieve their animals. Retrieval by motorized means allows hunters to remove the meat in a more efficient manner than packing the meat out without the use of motorized vehicles. Many hunting seasons for deer, elk, and bear occur in the months of August, September, and October when ambient temperatures on the Tonto National Forest are relatively warm (70 to 80 degrees Fahrenheit) which may contribute to spoilage of meat.

In regards to motorized dispersed camping, this alternative allows for approximately 65 acres designated for such purposes. It is likely that restrictions of available campsites would result in a difficult situation for recreationists unable to locate a legal campsite during periods of high use such as hunting seasons or for anglers at Tonto National Forest lakes which allow motorized dispersed camping. This could lead to stratification of hunt structures resulting in more seasons with fewer permits to mitigate this issue. This, in turn, could lead to seasons occurring later in the fall and into the winter in order to meet management goals, which could result in the disruption of deer breeding season and exacerbate road damage during wet periods of the year. The restrictions on dispersed motorized camping may lead to less hunting as dispersed motorized camping is the most common form of camping used by hunters on the Tonto National Forest.

The limitation on dispersed motorized camping under this alternative may force recreationists to those existing designated spur roads and campsites into close proximity to each other and potentially expanding the footprint of these camping areas. Depending on the locations of the designated campsites, it may affect the ability of the Tonto National Forest's hunters to reach wildlife populations that need population control through hunting in support of specific wildlife habitat objectives (e.g., Canyon Creek riparian area, removal of bears in wildland-urban interface areas, etc.). Furthermore, a significant portion of the Tonto National Forest's anglers use motorized dispersed camping to access fishing areas at Tonto National Forest lakes and streams. Depending on the location of the designated sites and the distance from these lakes and streams, anglers may react by not participating, choosing to participate somewhere else, and/or by choosing to violate provisions of the Plan. Specific locations on the Tonto National Forest where this negative effect on hunter and angler participation may be most evident is Fossil Creek corridor, East Verde River, Weber Creek, and the Lower Verde River near Box Bar. In addition to affecting those using the Tonto National Forest for hunting and fishing, closure of roads and motorized trails that lead to dispersed campsites may affect users not hunting, but instead simply enjoying wildlife.

It is expected under this alternative, that hunter and angler harvest and participation rates would decline, particularly as they relate to those hunters and anglers who wish to stay overnight on the Tonto National Forest at dispersed camping sites which would be significantly restricted. A quantitative analysis of this effect is not available, as it would be speculative in nature.

Alternative C – Direct and Indirect Effects

Effects to Game and NonGame Wildlife

As with Alternative B, movement towards desired future conditions for wildlife and wildlife habitat would occur with this alternative as there would likely be less motorized disturbance to wildlife populations and wildlife habitats in areas where road closures take place and through the elimination of cross country travel. The rate of movement towards desired future conditions may be slower than that of Alternative B. Similar responses may occur to wildlife and wildlife habitat

as those mentioned in Alternative B with the exception that there are fewer restrictions to motorized dispersed camping. The availability of motorized dispersed camping in this alternative would likely not have an effect on hunters' ability to find and harvest big game animals and subsequently wildlife populations objectives would likely remain within guidelines for sustainable wildlife habitat conditions.

Effects on Wildlife Related Recreation and Associated Economics

The same or similar effects on wildlife related recreation as described in alternative B would occur with this alternative although effects would be less. The addition of OHV Areas at Bartlett Lake and Roosevelt Lake would legitimize existing use and wildlife related recreation would likely not be affected. As described in alternative B, permit zones may result in responsible motorized recreationists obtaining a permit for the area, while other less responsible recreationists may abandon use of the area and recreate somewhere else that may be more detrimental to wildlife and wildlife habitat and into areas that have not already been heavily affected by motorized recreation. St. Clair and Desert Vista permit zones are located immediately adjacent to each other on the Cave Creek Ranger District in an area heavily affected by motorized use; and therefore, the likelihood of displacement of existing motorized users somewhere else on the Tonto National Forest may be higher and associated effects to wildlife, wildlife habitat, and associated recreation may occur.

Under this alternative, motorized big game retrieval would be allowed for bear and elk hunters up to one mile from a designated road or trail. Therefore, approximately 341 deer hunters would annually be precluded from using a motor vehicle to retrieve their animal (Arizona Game and Fish Department, 2013b). While this alternative permits retrieval of bear and elk using a motor vehicle, it may still effect how hunters behave in comparison to the current condition. Under this alternative approximately 2,081,500 acres (73 percent of the Tonto National Forest) are available for walk-in wildlife related recreation access within one mile of roads and motorized trails open for public use. This alternative allows for essentially the same level of motorized wildlife related recreational access (roads and motorized trails open to the public) as the existing condition from which would be sufficient for meeting Arizona Game and Fish Department wildlife management objectives. The Arizona Game and Fish Department Challenged Hunter Access Mobility Permit (CHAMP) program would be retained under this alternative, which benefits disabled hunters.

This alternative allows for motorized dispersed camping within 100 feet on each side of designated road and trails for approximately 91,390 acres available for such purposes. Although many dispersed camping sites may exist on short spur roads and trails beyond 100 feet, it is likely that this restriction would not create an environment where wildlife related recreationists are unable to locate a legal campsite during periods of high use, such as hunting seasons or for anglers at Tonto National Forest lakes which allow motorized dispersed camping.

It is expected that under this alternative, hunter and angler harvest and participation rates would remain relatively unchanged. A quantitative analysis of the effect on hunter and angler participation rates is not available, as it would be speculative in nature.

Alternative D – Direct and Indirect Effects

Effects to Game and NonGame Wildlife

Under this alternative, current management of motorized travel on the Tonto National Forest would include approximately 4,900 miles of roads and motorized trails open to the public. Road densities and motorized travel on the Tonto National Forest would continue to have detrimental

effects to wildlife and wildlife habitat defeating the intent and purpose of the Travel Management Rule. It is likely that under this alternative, the effects to wildlife and wildlife habitat would be similar to the existing conditions.

Effects on Wildlife Related Recreation and Associated Economics

Under this alternative, the movement of environmental conditions (soil, water, wildlife, air, etc.) away from the desired future condition may occur. Under existing conditions and levels of motorized recreational use on the Tonto National Forest (U.S. Forest Service, 2012), natural resources would continue to deteriorate and not be sustainable for wildlife populations and their habitats[95]. The subsequent loss of wildlife may result in the Tonto National Forest not being a destination for those who enjoy visiting the Tonto National Forest for wildlife related recreation. Those communities which rely heavily upon Tonto National Forest visitation for wildlife related recreation may suffer from loss of revenue.

In regards to motorized big game retrieval under this alternative, approximately 550 elk, deer, and bear hunters combined would annually be allowed to use a motor vehicle to retrieve their animal[96] within one mile on both sides of all designated motorized routes. This alternative allows for cross-country travel for motorized big game retrieval on four ranger districts (Cave Creek, Mesa, Tonto Basin, Globe) which previously have been closed for this activity. The effects to wildlife and wildlife habitat are likely nominal considering there is a low number of retrievals (550 trips) annually across the entire Forest. Effects would be greatest on those wildlife habitats found in the Sonoran Desert habitats because damage from motorized vehicles in that environment take more time to recover. Effects on wildlife related recreation and associated economics for motorized big game retrieval would be nominal. Under this alternative approximately 2,204,500 acres (77 percent of the Tonto National Forest) are available for walk-in wildlife related recreation access within one mile of roads and motorized trails open for public use. This alternative allows for essentially the same level of motorized wildlife related recreational access (roads and motorized trails open to the public) as the existing condition which would be sufficient for meeting Arizona Fish and Game Department wildlife management objectives.

This alternative allows for motorized dispersed camping within 300 feet on each side of designated road and trails for approximately 336,000 acres available for such purposes. This restriction would not create an environment where wildlife related recreationists are unable to locate legal campsites during periods of high use, such as hunting seasons or for anglers at Tonto National Forest lakes which allow motorized dispersed camping. Recreationists would likely continue camping in existing motorized dispersed camping sites and therefore likely be little to no effects on wildlife or wildlife habitats.

It is expected that under this alternative, hunter and angler harvest and participation rates would remain relatively unchanged; although, as mentioned in the effects on wildlife, wildlife populations may decline over time due to motorized travel effects on individuals and habitats resulting in decreased satisfaction and reduced participation in hunting and angling. A quantitative analysis of this effect is not available as it would be speculative in nature.

[95] For more information, see the Wildlife and Plant Habitat Resources section of this chapter.
[96] For more information, see Appendix A in the Arizona Game and Fish Department Report in the project record.

Cumulative Effects

The cumulative effects analysis area for this project is the Tonto National Forest and in some cases other National Forests and lands open to the public for wildlife related recreation. Other National Forests and other lands open to the public for wildlife related recreation are included because the effects of this action may affect recreational use patterns across these lands. The past 20 to 30 years and the next 10 years are the primary focus for cumulative effects, because effects of motorized travel on the Tonto National Forest's wildlife and wildlife related recreation and would be significant as they relate to the growth in human population over this period. In general, predictions about changes in wildlife related recreational use which may occur on the Tonto National Forest are difficult to make and somewhat speculative in nature. However, it would be reasonable to assume that under all alternatives, levels of motorized use would continue to increase along with population growth following current trends. It would also be reasonable to assume that motorized vehicle use patterns may change with time.

Past actions related to wildlife and wildlife related recreation within this analysis area have occurred regularly over the last 20 to 30 years and are too numerous to list. Some of these actions have been small, project specific actions such as construction of wildlife habitat improvement projects (e.g., water catchments, juniper thinning), while others have been large, landscape level changes to wildlife and wildlife related recreation such as the Cave Creek Complex Fire in 2005 that burned approximately 244,000 acres and the Willow Fire in 2004 that burned approximately 120,000 acres. Other past actions/occurrences with significant effects to wildlife and wildlife related recreation include elk population growth and expansion on the forest over the last 30 years, Tonto National Forest closure orders (target shooting) and subsequent changes to recreational behavior and use patterns, drought and other long-term weather patterns, fees associated with Tonto National Forest recreation (e.g., hunting/fishing licenses, Tonto Pass) and significant reduction in mule deer population. However, all these actions have created the current condition, or baseline, from which the analysis is conducted.

Some proposed reasonable foreseeable actions related to wildlife and wildlife related recreation within the analysis area include: reauthorization of grazing allotments, fuels reduction projects and forest thinning (e.g., the Four Forest Restoration Initiative), watershed improvement projects, recreation management, special use permits, personal use activities, road construction (e.g., U.S. Highway 60, State Route 87, State Route 288), wildfires and fire management, continued increase in motorized use of the Tonto National Forest related to human population expansion, management of invasive aquatic species in the Salt River Lakes and other sites, law enforcement, human-wildlife conflicts, management of wildlife diseases, translocations and reintroductions of fish and wildlife.

It is important to understand the effects of travel management implementation on adjacent forests to understand the cumulative effects of complying with the Final Travel Management Rule. Both the Coconino and Kaibab National Forest have recently implemented Travel Management Plans and published motor vehicle use maps. The following anecdotally observed effects may be helpful with effects analysis for this project:

- Prior to implementation of the Travel Management Plan and public distribution of the motor vehicle use map, the Coconino National Forest placed many numbered signs on roads/motorized trails which had not been previously signed for some time. Many of the roads/motorized trails, which were signed, were not opened in the Plan and not published on the motor vehicle use map. As a result, the public began using some of these numbered roads/motorized trails, effectively opening some areas which had not

been previously open. In some cases this created negative effects on wildlife and created unlawful uses as the routes were not on the motor vehicle use map. In some cases, Coconino National Forest and Arizona Game and Fish Department personnel have been retroactively pulling these signs since implementation.

- After publication of the motor vehicle use map some errors were detected, creating confusion among visitors.
- Some visitors became confused with what roads/motorized trails were open and were not able to easily detect what roads/motorized trails were open because the motor vehicle use map did not have topographic features.
- The Garmin and smart phone applications were received well by visitors and helped considerably with visitors in understanding open roads/motorized trails and locations of camping corridors.
- Some hunters expressed satisfaction with the creation of the "roadless or quiet areas" that were created with implementation of the Plan, yet became dissatisfied when they planned their hunting experience around these areas only to be disturbed by other hunters not following the motor vehicle use map. Other hunters were not satisfied.
- The Kaibab National Forest integrated existing spur roads and existing locations of campsites, whereas the Coconino National Forest used camping corridors. Some new campsites in previously undisturbed areas have been developed on the Coconino National Forest, as a result of visitors being forced into a camping corridor.
- Some hunters expressed dissatisfaction on the Coconino National Forest that they could not retrieve their animal by motorized means, while those gathering fuelwood were able to use motor vehicles cross-country to gather wood.

Alternative A - No Action

Under this alternative, wildlife habitat damage from all reasonably foreseeable projects may continue to expand into areas that remain relatively intact and insulated from the negative effects of mostly unregulated motorized recreation. Therefore, the cumulative effect of the no action would move wildlife populations and wildlife related recreation away from desired future conditions.

Alternative B

It is expected that under this alternative, hunter and angler harvest and participation rates would decline, particularly as they relate to those hunters and anglers who wish to stay overnight on the Tonto National Forest because dispersed camping site would be significantly restricted. Effects would likely extend to nonconsumptive wildlife related recreationists, who prefer to camp in undeveloped sites. If other actions on or adjacent to the Tonto National Forest further decrease camping opportunities, the cumulative effects will likely be increased.

Alternative C

Under this alternative the cumulative effects on wildlife and wildlife related recreation would be moderate and beneficial in movement towards the desired future condition. Specifically, the elimination of cross-country travel and designation of open roads and motorized trails would be beneficial for wildlife and make the Tonto National Forest consistent in regards to the prohibition of cross-country travel. Restrictions outlined in the alternative on dispersed motorized camping, motorized big-game retrieval, and permit zones are not likely to change

wildlife related recreation significantly unless other actions on or adjacent to the Tonto National Forest further decrease these opportunities, which will likely decrease overall satisfaction.

Alternative D

It is likely that under this alternative, effects to wildlife and wildlife habitat would move away from desired future conditions. In the short term (less than five years) there would likely be minimal effect to wildlife related recreation; but in the long term (20 to 30 years), it is likely that the undesirable effects of increasing motorized travel on wildlife populations and habitat may create an environment where the level of motorized recreation is not sustainable with managing desirable populations of wildlife, especially if there are other actions on or adjacent to the Tonto National Forest that also increase motor vehicle use. Should this level be obtained, it is likely that the Tonto National Forest would no longer be a destination for those involved in wildlife related recreation and associated economic effects would be lost.

Law Enforcement

The Tonto National Forest is not increasing in size, but there is an ever-increasing demand for the finite resources, including those related to recreation use[97]. Thus it defies logic to expect the resource to do anything but deteriorate, because the current management plan has been unsuccessful in sufficiently protecting the resources. In addition, the stance of allowing an activity just because it was historically allowed is not a valid concept, especially for human safety and forest protection.

Because of the increase in potential motorized users visiting the Tonto National Forest, more than one enforcement tool would be necessary. At a minimum, the following would be needed:

- A map that is readable. This action may include multiple maps or a map for every ranger district in order to get the level of detail necessary to inform the public.
- Signs on the routes done in a consistent manner.
- Barriers/obliteration of decommissioned/closed/unavailable to the public roads.
- Training and meetings among staff and law enforcement officers and cooperators to ensure consistent understanding of the plan.

Existing Conditions

Currently, the proliferation of unauthorized roads and trails on the desert ranger districts (Cave Creek, Mesa, Tonto Basin, and Globe) of the Tonto National Forest cannot be denied[98].

In many cases, Forest Service employees have not been successful in adequately posting and/or identifying (on the ground) these unauthorized roads and trails to the public. Once they have been established through repeated use the public is often unable to tell unauthorized roads and trails from authorized Forest Service System routes. Typically these unauthorized trails start as a single set of motorcycle or ATV tracks of minimal width (10 to 50 inches) and grow wider and deeper as more vehicles drive on it until they eventually accommodate full-sized vehicles (6 to 8 feet in width). In many cases, when signs are installed indicating a road or trail was closed to motorized vehicles, the signs are often illegally removed, destroyed or otherwise rendered

[97] For more detail about these increases, see the Final Recreation Specialist Report and Final Socioeconomic Report in the project record.
[98] For more information, see Appendix A of the Law Enforcement Report in the project record.

unreadable. There is significant motive for someone who wants to drive a vehicle in an area that is posted closed, to remove the signs indicating motor vehicles use is prohibited. Once this is done, the area appears to be open as it is not marked closed.

From a legal standpoint, we (Forest Service Law Enforcement Officers) are obligated to ensure a "reasonable person" knew or should have known that they were operating off of a designated road or trail or in a location or manner that is contrary to rules or laws. Currently, this is extremely difficult to do. Removal of the signs coupled with building new unauthorized access points around signs and physical barriers contributes to the difficulty in prosecuting persons operating motor vehicles on these roads and areas. For those forest visitors that want to follow the laws and regulations, they could easily end up on an unauthorized route or on a closed road without intending to.

Environmental Consequences

Assumptions

The best chance of successfully enforcing any measure, regardless of the issue, is for the majority to understand the importance of the measure and thus want to comply. As it relates to the travel management planning, successful enforcement requires, at a minimum:

- The majority of the public to understand the importance of the management plan, the rules of the management plan and have a desire to comply with those rules. The number of Forest Service law enforcement is small in comparison to the number of forest visitors. Which means it is extremely difficult to educate the public in the field and achieve compliance.
- State and local agencies must also understand the importance of the plan and be willing and active partners in implementing the plan.

It is inconceivable that unlimited access to all user groups for all activities would be sustainable. It is almost guaranteed that concessions will need to be made by almost all interested parties, no matter the alternative selected for managing motorized travel. With that in mind the single most important factor in enforcing the plan will be for those parties to understand the need for the management.

One area that has been successful in preventing or reducing significant road proliferation, because of success in enforcing where motor vehicles may and may not go is the Bulldog Canyon Permit Area[99] on the Mesa Ranger District. This is the only area on the forest currently managed this way. The permit is free, but in order to get the combination to access the area, the public is required to come in and sign the permit or fill it out online. When they get the permit, they are provided with gate combinations, rules, and a map of the authorized roads.

It is virtually impossible to measure how often, if ever, motorized big game retrieval has an unintended consequence of creating an authorized trail/route. That being said, it is entirely plausible that someone witnessing either the act of motorized big game retrieval or the tracks of the vehicle afterwards would believe that driving cross-country was legal or that driving along those tracks was legal. This could result in establishing an unauthorized route. "Track following" is one of the mechanisms by which unauthorized routes are created in the desert districts. This is

[99] For more information about this area, see Chapter 2, Alternative A description.

somewhat mitigated by the lower volume of OHV activity on these districts and especially in places and times where motorized recovery of big game does occur.

Alternative A (No Action)

Roads and Trails Open to Motorized Travel

Given population growth and the increased numbers of off highway motor vehicles, it is illogical to assume that the proliferation of unauthorized roads would decline or cease under the current management scheme. Currently, almost 700 miles of unauthorized roads and trails on the forest have been identified. This is not the entire amount of unauthorized roads; it is only what we have identified.

In the last five years, law enforcement officers and Forest Protection Officers have documented 443 violation notices, warning notices, and incident reports on Tonto National Forest for driving off-road (36 CFR 261.56)[100]. Of those, 151 (34 percent) occurred in the Bulldog Canyon Permit Area. At approximately 34,720 acres, the Bulldog Canyon Permit Area constitutes approximately 1.2 percent of the total Tonto National Forest land base and 1.5 percent of nonwilderness land area. While it is not a foolproof system, the law enforcement officers have been much more successful in enforcing off-road violations in this area. The reasons for the increased success are likely a combination of several factors. In order to get the combination to enter the area, the public must sign for the permit which clearly indicates what roads and trails are legal to operate motor vehicles, and thus they have been "duly noticed" about what is illegal motorized travel. Law enforcement officers will be more likely to patrol the area given that they can take action against those that are not complying with the permit then they would be to patrol of areas that have been so seriously degraded that it is almost impossible to prove illegal off road travel enough to take corrective action.

However, this permit area may effectively increase usage on other adjacent areas by persons who either do not want to get a permit or do not know how.

Other areas where enforcement has been more successful have been areas closed by Forest Order due to large fires and subsequent flooding issues, such as the Saint Clair and Bushnell Tanks areas, on the Cave Creek and Mesa ranger districts. These areas have been fenced and gated off, which has almost eliminated motor vehicle access all together.

Motorized Cross-country Travel

In the northern districts (Payson and Pleasant Valley Ranger Districts), the impacts of off-road activity are not as obvious. Off-road travel is permitted on these districts as long as it does not result in resource damage. Enforcement is dependent on establishing that damage occurred. Determining if damage was done is sometimes subjective and can be a point of contention. Fuelwood cutting and collecting is common on these districts and big game retrieval does occur. There may or may not be road and trail proliferation as an unintended consequence of using motor vehicles to travel cross-country while conducting these permitted activities. While the unauthorized trail may eventually constitute damage, it is difficult to hold individuals responsible. The enforcement program of Tonto National Forest does not have data to indicate the significance of cross-country travel on these districts.

[100] For more detailed information about violation notices, warning notices, and incident reports, see the Final Law Enforcement Report in the project record.

We also have an inconsistency with cross-country travel/off road travel in the Bartlett Lake and Roosevelt Lake Recreation Areas where we currently allow motorized travel and dispersed camping below the high water mark at both lakes when the water levels are low enough to accommodate vehicular travel even though off road travel is not otherwise permitted on those ranger districts.

Permit Zones

As already indicated, the Bulldog Canyon OHV Area is the only permit zone under current conditions. It constitutes the one area where we have been much more successful in preventing or reducing significant road proliferation and have successfully enforced driving off road violations.

Motor Vehicle Use for Big Game Retrieval

Motorized big game retrieval is authorized on the Payson and Pleasant Valley Ranger Districts as long as it does not cause resource damage. While not considered a significant issue from a law enforcement standpoint, there have been cases of individuals not understanding the restrictions and that big game retrieval does not apply to Wilderness areas nor does it allow for driving off road to pursue animals prior to their harvest. The CHAMP permit (for hunters with disabilities) allows qualifying persons with the permit to use their motor vehicle off designated roads to wait for big game and to retrieve big game as long as it is not in conflict with other laws is currently honored on Tonto National Forest. Investigation of cross-country travel offenses in areas where big game retrieval is authorized is more complicated because of the requirement to establish that the cross-country travel did not occur due to big game retrieval.

Motor Vehicle Use for Dispersed Camping

Tonto National Forest does not have any existing dispersed camping corridors. As a general rule, we allow dispersed camping throughout the forest, and we typically face the same enforcement issues with the routes to and from dispersed camp site as we do with travelling on unauthorized/user-created roads. If a reasonable person cannot tell that the route to the camp site is unauthorized, it is extremely difficult to justify enforcement action against that person. The fact that the sites exist is prima facie evidence that the public uses them. As indicated earlier in this report, it is much easier to do enforcement when the public wants to comply with the rules. Since the public has already demonstrated they want to use these sites, if we can get them designated, proper enforcement would be the simplest for this option and reduce the likelihood of increased resource damage due to motorized access to dispersed camping areas. We have an inconsistency with the application of the rule under our current management structure where we allow cross-country/off road travel in the Bartlett Lake and Roosevelt Lake Recreation Areas.

Additional Information Pertaining to Motor Vehicle Use Designation

Use of motor vehicles is not restricted for fuelwood gathering, as long as it is conducted in a designated area at designated time and the person has a valid permit. Determining if a violation has occurred requires law enforcement personnel to establish whether the cross-country motor vehicle usage was conducted legally under the conditions of either valid fuelwood gathering activity, big game retrieval, or dispersed camping. This does complicate investigations and requires additional time and effort.

Alternative B

Roads and Trails Designated for Motor Vehicle Use

Under this alternative, the reduction in miles of roads would likely have both positive and negative effects associated with law enforcement. The positive results from fewer roads to travel for enforcement reasons, but would also potentially cause a higher violation rate because it would be an unpalatable option for much of the public. The magnitude and/or interaction of those impacts are hard to determine, but in general the less the majority of the public likes the alternative, the more difficult it is to get compliance.

Areas Designated for Motor Vehicle Use

Under this alternative, cross-country travel would no longer be allowed in general on the Payson and Pleasant Valley ranger districts. Fuelwood gathering would be allowed within 300 feet of open routes in existing gathering areas. This could simplify enforcement somewhat considering someone would have very little defense if they were travelling cross country. However, the challenge of getting the public accustomed to the new rules, since cross-country travel has been allowed previously, would be a negative aspect of this alternative.

Permit Zones

The Bulldog Canyon Permit area is the only permit zone we have currently. Under this alternative, we would add four additional permit areas: Sycamore and The Rolls on the Mesa Ranger District and St. Clair and Desert Vista on the Cave Creek Ranger District. Tonto National Forest law enforcement personnel have been much more successful in citing and prosecuting illegal off road motorized travel in the existing permit zone (Bulldog Canyon) than the rest of the forest. As a general rule, adding the other permit areas would likely increase our effectiveness in those areas as well.

There is potential for negative effects associated with the added permit zones from an enforcement standpoint. A percentage of recreationists on the forest are not willing to go get a permit, even if it is free. This is based on public comments made in the field[101] and the change in usage patterns based on observation of the existing permit zone. The result of those restrictive areas would either lead users to become noncompliant and enter the permit area illegally or they would recreate in a different area. If we increase the permit areas as suggested, it would likely push more motor vehicle activity into areas that currently do not have that level of motor vehicle activity. The overall objective of enforcement is not to write more tickets but to be effective enough to deter violations and thus help protect the resource from increased damage under the travel management plan. While the permit zone is more effective in clear cut enforcement as the user has been duly noticed and has an understandable map of where they may and may not go, it is difficult to determine what affect these permit zones would have on adjacent resources.

The proposed Sycamore Area is very seriously degraded and many of the trails are “braided” to the point of being difficult to differentiate between the original route and unauthorized routes. In addition, controlling access into that area would be especially difficult as the terrain does not lend itself well to providing any natural barriers. Currently it provides an opportunity for the afore-mentioned portion of the public that does not wish to get a permit. For those reasons, I estimate that it would be difficult to conduct efficient or successful enforcement in that area.

[101] The Tonto National Forest Patrol Captain has personally been told by members of the public that they do not want to get a permit and do not want to mess with it. They would rather have freedom to recreate as they please.

Motor Vehicle Use for Big Game Retrieval

The Arizona Game and Fish Department has provided statistics which indicate motorized big game retrieval is not a commonly practiced activity and is probably not one of the leading causes of resource damage caused by motorized travel[102]. Then logic would dictate that not allowing motorized big game retrieval under this alternative would not create a significant law enforcement burden. In addition, no user group (whether it is big game hunters, bird watchers, or any of the other activities that the public participates in on public land) would have the ability to legally drive cross-country to participate in their activity.

Motor Vehicle Use for Dispersed Camping

Under this alternative, motorized access for dispersed camping would be limited to designated dispersed sites which are accessible by a designated road or motorized trail. Enforcement under this plan would be a process that would need to be expanded over the years. It would take a significant amount of work to identify, document, get archaeological clearances for, and post all of the appropriate dispersed camping sites with suitable motorized access. Illegal dispersed camping would be difficult to enforce until we accomplished those tasks sufficiently. If we assume that the historically used existing dispersed sites would constitute the vast majority of the total dispersed sites, the long term effect would be beneficial from an enforcement stand point for the following reasons. The public has already demonstrated their willingness to use those dispersed sites or they would not exist. Their willingness to use the sites is the equivalent of voluntary compliance and likely the easiest option to enforce. The overall management objective is to provide dispersed camping opportunity, while protecting the resource. This alternative accomplishes that. The vast majority of those sites would be familiar to both Forest Service law enforcement officers and Arizona Game and Fish enforcement officers. The primary enforcers of the rules and laws would typically have a thorough understanding of use patterns and would likely be critical in developing and refining the list of dispersed sites over the initial few years.

Additional Information Pertaining to Motor Vehicle Use Designation

Under this alternative, fuelwood cutting and gathering would be restricted to within 300 feet on both sides of an open route. This could present some confusion and difficulty when determining whether or not a motor vehicle is within the 300 foot buffer. First the measurement has to be taken (or estimated) and as part of that it has to be determined from what point on the open route to take the measurement. This could prove challenging on some of the very winding routes. It may require some increased diligence to make sure there is not a closer point from somewhere further along the route and also to determine if the vehicle must be within 300 foot of the route they used to get the location or from any open route.

Alternative C

Roads and Trails Designated for Motor Vehicle Use

Under this alternative there will be more miles of public access, but significantly more of it will be motorized trails. While enforcement of the Code of Federal Regulations (36 CFR 212.5) are fairly clear on designated roads, it is unclear how state motor vehicle code (with the exception related to driving intoxicated and reckless driving which apply everywhere) will be applied to motorized trails. In general terms, it will take some time and effort to educate the public on the significance of motorized trails and how to tell them from roads. The increase in the administrative use only roads and trails will cause some enforcement complications, because the

[102] For more information, see the Game and Nongame section of this chapter.

public may not understand why access is limited to only certain users. The overall amount of roads and trails miles accessible to the public will likely garner public support and thus achieve more voluntary compliance, which is the preferred condition for enforcement strategy.

Areas Designated for Motor Vehicle Use

Under this alternative, motorized cross country travel would be limited to eight areas: specific parts of Bartlett Lake (Cave Creek Ranger District); Golf Course (Globe Ranger District); specific parts of Roosevelt Lake (Tonto Basin Ranger District); Sycamore (Mesa Ranger District), and four proposed "tot lots" totaling approximately 12 acres. From an enforcement standpoint, having the designated areas allowing cross country travel would be simpler to understand and may also serve to protect the resources in the remainder of the forest. Clearly a certain user group exists that demands this type of recreational opportunity. Providing some limited opportunity for cross country travel may result in fewer attempts at cross country travel in the other areas of the forest.

Providing tot lots (areas exclusively for beginner or children riders) is a needed management alternative. Segregating those riders from the other areas would give the public a much safer environment to train the beginning riders and allow educational efforts to be more focused on those areas with the hope of increasing safety and compliance for the generations to come.

The areas designated in Bartlett Lake are within the high and low water marks, but only in areas that will be accessible by designated routes. Natural features preclude a motor vehicle from circling the entire lake based on lake levels of the past 15 years, making enforcement of these designated areas easier. However, since lake levels at Bartlett can rise or lower quickly and the terrain within the OHV areas have variable elevation, trapping users within the designated area without a legal way to escape in their vehicle without traveling cross-country or driving through water is a likely scenario. Additionally, Forest Service Road 1064, which could serve as an additional entry/exit point to the OHV area on the west side of the lake, is designated for decommissioning, which would be very difficult to enforce, especially as the potentially only way out of a portion of the OHV area as the lake rises. Within the last ten years, I have witnessed Bartlett Lake levels rise a vertical foot per day on at least two occasions. This can prevent safe exit of vehicles and trailers for persons camping along the shore. Since we are designating these areas around Bartlett as OHV areas, this designation will carry a certain connotation that motor vehicle use can happen anywhere at any time in any manner. However, the intent is to provide motor vehicle access to popular camping and day use sites along the lake. Currently, there is conflict between those using a motor vehicle to access other recreational opportunities at the lake, such as fishing, camping, and swimming, and those that wish to ride between the high and low water marks as a form of recreation itself. Additional restrictions, such as the designation of class of vehicle or the imposition of safety related features such as limits on speed, in these areas are necessary to prevent this conflict.

The areas designated in Roosevelt Lake are within the high and low water marks, but only in areas where people have previously visited while avoiding areas that provide habitat for threatened, endangered, and sensitive species. Without natural features prohibiting motor vehicle use outside of designated areas, like on Bartlett, delineation and enforcement of the OHV areas around Roosevelt Lake will be more difficult.

Permit Zones

Under this alternative, there would be four permit zones, which would increase the permit areas from 34,720 acres to approximately 117,000 acres which is approximately five percent of the non-wilderness lands of the Tonto National Forest.

Adding the other three permit zones would likely increase the resource protection in those areas as well. Two of the areas are on the Cave Creek Ranger District and the office is located on Bartlett Dam Road which is the Primary access route to the St Claire and one of the primary routes to the Desert Vista permit areas. This should serve to increase the public's opportunity to get permits and explanations of them. Likewise both Forest Service law enforcement officers and Arizona Game and Fish Department deputies would access this road network regularly since it is the only access to Bartlett and Horseshoe Lake Recreation areas, which would put them in close proximity to patrol the permit areas.

Motor Vehicle Use for Big Game Retrieval

Motorized big game retrieval is proposed to be allowed within one mile from designated routes to retrieve elk and bear as long as the area is not closed to motorized traffic for some other reason, such as designated Wilderness. Creating a one-mile buffer around all the designated routes would likely encompass almost all the area of suitable bear and elk habitat that is not in wilderness. This would likely remove the need for law enforcement officers to measure the one mile distance, which makes determination of that element of the crime easier, but they may have to follow a vehicle for the entire distance to determine if they are conducting cross-country travel for the purpose of retrieving an elk or bear. I don't foresee a significant issue with the hunters engaging in that much off road travel based on the statistics given by the Arizona Game and Fish Department. The potential issue will be the appearance of special treatment given to hunters and the attempts of others to use that to conceal or justify their cross country travel.

The CHAMP permit (for hunters with disabilities) allows qualifying persons with the permit to use their motor vehicle off designated roads to wait for big game and to retrieve big game as long as it is not in conflict with other laws is currently honored on Tonto National Forest. Investigation of cross country travel offenses in areas where big game retrieval is authorized is more complicated because of the requirement to establish that the cross country travel did not occur due to big game retrieval.

Motor Vehicle Use for Dispersed Camping

By designating existing unauthorized routes to currently used dispersed camp sites, we effectively reduce the likelihood of further resource damage from additional unauthorized routes that would be established under other alternatives. In addition, the public has already proven that they will use these routes to meet their camping needs. As indicated in the assumptions section, since the public has chosen these routes they will understand the routes purpose and be much more likely to comply with the route designation. Law enforcement officers with the Forest Service and cooperating agencies are already familiar with the existence, usage patterns, and locations of these routes, making enforcement simpler and more effective.

Additional Information Pertaining to Motor Vehicle Use Designation

Use of motor vehicles for fuelwood gathering would be restricted to a distance of 300 feet on both sides from a route within permitted areas. This requires law enforcement officers to make a determination of distance from the route, and complicates enforcement somewhat. For example,

where exactly to take the measurement, what instrument to use (if any), and how precise do we expect the public to be would all need to be taken into consideration.

Alternative D

Roads and Trails Designated for Motor Vehicle Use

Under this alternative there would be approximately 1,500 more miles for motorized access than alternative C. In addition, more of these miles would retain the road designation. This would have minimal effects on law enforcement. It would, however, reduce the frequency of patrol on some of those roads and trails because of the increased mileage to patrol.

Areas Designated for Motor Vehicle Use

This alternative is identical to alternative C for areas open to motorized cross-country travel and would have the same effects.

Permit Zones

This alternative includes no change in existing condition as it relates to permit zones, resulting in only the Bulldog Canyon Permit Zone being proposed. Bulldog Canyon Permit Area is the only permit zone under current conditions. As a result, the effects are identical to alternative A for permit zones.

Motor Vehicle Use for Big Game Retrieval

This alternative would allow cross-country travel to retrieve deer, bear, and elk forest-wide except Wilderness and other existing closures. This would not likely significantly greatly increase cross country travel for big game retrieval. It might greatly increase the burden of proving violators that really aren't attempting to retrieve big game but claim they are. It might also increase the likelihood of inadvertently creating unauthorized routes. The soils in the desert districts that this alternative opens up do not recover from vehicular travel very well. The tracks of someone retrieving big game are more visible for a longer time and the volume of vehicles on these districts is higher all of which increase the likelihood of inadvertently causing an unauthorized route due to track following.

Motor Vehicle Use for Dispersed Camping

Repeated use of motor vehicles at dispersed sites does cause some degradation of the site in many cases. Often resource damage is not only associated with the motor vehicle usage in the site, but also from the route created when the motor vehicle leaves a designated route to access the site. Some damage to vegetation and cultural resources does occur at dispersed campsites, but it is likely that camping corridors with a 300 foot buffer on both sides along those routes would result in more damage as people would be potentially disallowed from camping in existing sites and would have to explore, select, and likely improve another location within the buffer. How much damage would occur depends largely on if the existing campsites within the corridors are sufficient to accommodate the demand. As of this time, there is not sufficient information to determine this. The enforcement issues stem from proving the distance from a designated route and determining if the cross-country travel is a result of legal dispersed camping activity or not. The entire camping corridor would need to have archaeological clearances. In addition, persons may trim trees for tents and camper access as well as firewood, and they may dig pits and move rocks for fire rings. It should be noted that these activities sometimes occur in our developed recreation sites as well.

Additional Information Pertaining to Motor Vehicle Use Designation

Like with the existing condition, use of motor vehicles is not restricted for fuelwood gathering as long as it is conducted in a designated area at designated time and the person has a valid permit. Determining if a violation has occurred requires law enforcement personnel to establish whether the cross-country motor vehicle usage was conducted legally under the conditions of either valid fuelwood gathering activity, big game retrieval, or dispersed camping. This could complicate investigations and may require additional time and effort.

Wildlife and Plant Habitat Resources

This section summarizes existing conditions and effects from all alternatives to threatened and endangered species, critical habitats and critical habitats considered, Forest Service sensitive species, other animal species considered, management indicator species, and migratory bird priority species that could occur or could have habitat within the project area.

Threatened, Endangered, and Candidate

Wildlife on the Tonto National Forest is managed by maintaining habitat to support viable populations of all native vertebrate and invertebrate species and other desirable species as required by the National Forest Management Act (NFMA) of 1976 (P.L. 94-588). Other regulations provide for specific management of special status species based on their designations under various statutes, policies, and plans for which the Forest Service is required to comply.

Affected Environment

Tonto National Forest is managed for multiple uses, and plays a vital role in Arizona by supporting crucial wildlife habitat and maintaining Arizona's wildlife heritage as well as providing significant opportunities for wildlife related recreation and associated economic effects. Owing to the diversity of habitats, the forest has rich biological diversity and numerous wildlife species which include 310 birds, 94 mammals including nine big game wildlife species, 55 reptiles, 14 amphibians, 16 native fishes, and 28 non-native fishes. In addition, there are three special status invertebrates, and 24 special status plant species.

Mammals: Small mammals such as bats, squirrels, rats, and mice contribute to most of the mammal diversity within Tonto National Forest. Larger mammals are hunted as game, such as Rocky Mountain elk, mule deer, white-tailed deer, javelina, and black bear[103] .

Birds: Birds within the Tonto National Forest breed, migrate, or seasonally occur within the forest. Nearctic migratory birds, those species that nest in North America and migrate south to Central America, South America, and Caribbean for the winter, are of special concern because of their declining populations[104] .

Reptiles: Tonto National Forest supports 23 lizard, 29 snake, and three Chelonian species[105].

[103] Refer to the Tonto National Forest mammal checklist for a complete list of mammals within the forest (U.S. Forest Service, 2008).
[104] Refer to the Tonto National Forest bird checklist for a complete list of birds within the forest (U.S. Forest Service, 2011).
[105] Refer to the Tonto National Forest reptile and amphibian checklist for a complete list of reptiles within the forest (U.S. Forest Service, 2008).

Amphibians: Tonto National Forest supports six species of toads, six species of frogs, one species of salamander, and one non-native bullfrog species. These water-dependent amphibians occur in or near springs, livestock tanks, streams, and rivers within the forest[106].

Fish: The Tonto National Forest has a diverse fish fauna that inhabits approximately 500 miles of streams that flow on the Forest. There are 14 native stream-dwelling fishes and about seven stream-dwelling nonnative sport fish on the forest. All native fishes found on the Tonto National Forest are rare and are declining locally and range wide. These native fish species range from the Sonoran desert zone to mixed conifer zone[107].

All federally-listed, proposed, and candidate species on the Tonto National Forest were evaluated for this project. This assessment addresses 22 species (and proposed/designated critical habitat when applicable) listed in Table 44.

[106] Ibid.
[107] Refer to the Tonto National Forest fish checklist for a complete list of fish within the forest (U.S. Forest Service, 2008).

Table 44. Federally Listed, Proposed, and Candidate Species on Tonto National Forest

Common Name	Scientific Name	Federal Status	Critical Habitat
Birds			
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	Yes
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Yes
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	Threatened	Proposed
Yuma clapper rail	*Rallus longirostris yumanensis*	Endangered	No
Reptiles			
Narrow-headed gartersnake	*Thamnophis rufipunctatus*	Threatened	Proposed
Northern Mexican gartersnake	*Thamnophis eques megalops*	Threatened	Proposed
Sonoran desert tortoise	*Gopherus morafkai*	Proposed Removal from Candidate List (Dec. 2015)	---
Amphibians			
Chiricahua leopard frog	*Lithobates chiricahuensis*	Threatened	Yes
Fish			
Colorado pikeminnow	*Ptychocheilus lucius*	Experimental Non-Essential Population	No
Desert pupfish	*Cyprinodon macularius*	Endangered	No
Gila chub	*Gila intermedia*	Endangered	Yes
Gila topminnow	*Poeciliopsis occidentalis occidentalis*	Endangered	No
Loach minnow	*Tiaroga cobitis*	TE	Yes
Razorback sucker	*Xyrauchen texanus*	Endangered	Yes
Spikedace	*Meda fulgida*	TE	Yes
Headwater chub	*Gila nigra*	Proposed Listing as Threatened (Dec. 2015)	---
Roundtail chub	*Gila robusta*	Proposed Listing as Threatened (Dec. 2015)	---
Mammals			
Mexican wolf	*Canis lupus baileyi*	PE Experimental Non-Essential Population	No
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	Endangered	No

Common Name	Scientific Name	Federal Status	Critical Habitat
Ocelot	*Leopardus pardalis*	Endangered	No
Plants			
Arizona cliffrose	*Purshia subintegra*	Endangered	No
Arizona hedgehog cactus	*Echinocereus triglochidiatus* var. *arizonicus*	Endangered	No

Environmental Consequences

All action alternatives would reduce adverse impacts to threatened and endangered species (TES) species and critical habitats resources forest-wide by reducing motorized cross-country travel outside of wood gathering and motorized big game retrieval corridors. The miles of open roads will decrease in almost all potential natural vegetation types (PNVTs). Although all alternatives would reduce overall motorized vehicle disturbance, action alternatives may increase the intensity of effects to TES species and critical habitats within camping and wood gathering corridors. All effects—direct, indirect, and cumulative—are evaluated to come to determinations of effects for TES resources in this report.

General Effects of Roads on Wildlife from Motor Vehicles

Roads and trails directly affect terrestrial species by killing individuals crossing, basking, or foraging on or adjacent to roads. Human population growth and transportation needs could threaten to exacerbate levels of isolation on national forests. Overtime, this can reduce recruitment, particularly with species that have long maturation times (Bury et al., 1977).

Roads and trails indirectly affect terrestrial species through: 1) loss of habitat due to conversion of native vegetation to a particular road/trail surface (paved, gravel, dirt); 2) fragmentation of habitats due to a road and trail system development; 3) interruption in migratory patterns of wildlife to reach breeding habitat or winter range habitat; and 4) lack of habitat use by wildlife due to disturbance caused by use of the road or trail system. Roads and trails can also provide a means of dispersal for some species like small mammals. The indirect effect is different for different species and the benefits for low use roads could outweigh the negative effects.

While the totals of direct habitat loss are relatively low, there is an indirect habitat loss that includes the area around roads where wildlife will avoid using habitat. This does not mean the animals never use the areas, only that the majority of animals tend to avoid these zones while the road is in use.

General Effects of Disturbance on Wildlife from Motor Vehicles

The disturbance effects from motorized use of routes on wildlife, whether roads or trails, are similar. Lack of wildlife use in habitats along roads and trails can be correlated to the level of use a road receives over time. Low use roads may tend to have wildlife using roadside habitats more frequently than roads with high traffic volume (Edge and Marcum, 1991). Off-road vehicle travel on undesignated routes (i.e., cross-country) is presently allowed from existing roads (excluding previously closed areas), regardless of road type on the Payson and Pleasant Valley Ranger districts. Other user created routes occur on the remaining four ranger districts with varying degrees of concentration and use. Off-road vehicle use affects wildlife directly by harassment, displacement, and the reduction in the security of areas between roads. Wisdom et al. (2004) found that recreational activities had a substantial effect on movement rates and flight responses for elk, with ATV use and mountain biking having greater effects on movement rates and flight responses than horseback riding and hiking.

Many studies have been conducted on the effects of noise disturbance on wildlife displacement and avoidance. Noise from developing, using, and maintaining roads affect wildlife within hearing distance. Noise from off-road vehicles can be at volumes and levels that harass desert animals (Bury, 1980), even in underground retreats and burrows (Bondello, 1976). Studies examining road avoidance by species are relatively numerous (primarily for big game species such as elk, deer, and bear). The most common interaction identified in the literature was

displacement and avoidance, where animals altered their use of habitats in response to motorized routes. The effects to wildlife behavior and habitat utilization due to noise from road and trail use may extend as far as several hundred meters from the road or trail. Studies of noise effects document physiological effects to wildlife causing energy loss, which ultimately affect animal survival and reproduction (Wisdom et al., 2004). One study documents that noise immobilized leopard frogs longer, which could leave them more susceptible to being run over while crossing roads and trails (Nash et al., 1970). Noise impacts relevant to this assessment fall into several categories: (1) change in use within the designated open road system; (2) noise related to the use of newly designated roads and trails; and (3) noise associated with dispersed camping and the change in use.

The presence of roads and the intensity of motorized use can affect wildlife. When located under an open canopy, a simple linear strip of dirt or gravel can function as a physical or psychological hindrance to the movements of animals (Stamps et al., 1987).

Analysis Factors for Specific Species

The analysis of the alternatives for this document for threatened, endangered and candidate species is organized by seven analysis factors. These factors are as follows:

- Routes designated for motor vehicle use;
- Densities of designated routes;
- Decommissioned and closed routes;
- Areas designated for motor vehicle use;
- Motor vehicle use for big game retrieval;
- Motor vehicle use for dispersed camping; and
- Personal use fuelwood gathering and other forest products.

A detailed description of each of the factors used to quantify changes in effects on listed species and their habitats between existing conditions and the alternatives can be found in the biological assessment[108]. In addition to quantifying miles and acres in potential habitat for a given listed species (defined as known occupied habitat are well as areas of suitable habitat for a species), for some species, miles and acres of potential effects in a buffer are also quantified. The distance of 0.25 miles was used for consideration of all avian species for this analysis. The 0.25 mile buffer accounts for potential noise effects to nesting birds as a result of the proposed action. This distance is an accepted distance in research to a nest from activities causing avian species to abandon or avoid nests during egg incubation especially within the critical first few weeks of parents keeping vulnerable young thermoregulated and well feed.

Birds: Affected Environment and Environmental Consequences

Mexican Spotted Owl

Mexican spotted owls (MSO) have been found on five of the six Ranger Districts: Globe, Mesa, Payson, Pleasant Valley, and Tonto Basin. On the northern portion of the Tonto National Forest, MSO occupies mixed conifer and ponderosa pine/Gambel oak vegetation types, usually characterized by high canopy closure, high stem density, multi-layered canopies within the stand,

[108] The biological assessment can be found in the project record.

numerous snags, and downed woody material. MSO also occupy canyon habitat in the central and southern portions of the Tonto National Forest where there is complex riparian habitat for foraging and rock crevices and/or trees for nesting and roosting.

As of April 2015, there are 71 MSO protected activity centers (PACs) on the Tonto National Forest, all of which have nest cores delineated. There are approximately 45,322 acres that make up the PACs and approximately 9,193 acres of habitat in nest cores. Nineteen percent of PAC acres and 17 percent of nest core acres are located in the Four Peaks, Mazatzal, Sierra Ancha, and Superstition wilderness areas.

Forested recovery habitats outside of PACs on the Tonto National Forest are very limited due to the impacts of past large fires such as Rodeo-Chediski and the prevalence of private inholdings numbering from a house or two to hundreds of houses. These areas might provide MSO with habitat for foraging, dispersal, or overwintering, but are unlikely to provide future nest-roost habitat.

Primary constituent elements developed for listed species are those habitat components that are essential for the primary biological needs of a species (e.g. habitat for nesting, genetic exchange, forging, and shelter). The Primary constituent elements of critical habitat for MSO can be found in the Tonto National Forest biological assessment for the Travel Management Plan.

Alternative A—Existing Condition

Motorized use within or adjacent to MSO habitat has the potential to influence behavior, survival, reproduction and distribution of MSO, as well as to alter habitat. The current level of impact is expected to continue if Alternative A is implemented and possibly increase for all indirect and direct effects as the projected population in the Phoenix and adjoining areas increases[109]. An increase in forest users, with no route designation, would lead to an expected increase to disturbance to MSO and habitat degradation without a designated travel management plan if Alternative A is implemented. Table 45 through Table 47 contain information about the existing condition, Alternative A, for the seven analysis factors considered for determining effects for MSO.

Table 45. Alternative A – Existing Conditions in and Near Mexican Spotted Owl Protected Activity Centers

Analysis Factors	In PAC	0.25 miles of PAC
Routes designated for motor vehicle use (miles)	65.65	200.41
Density of designated routes (miles per square miles)	0.89	1.40
Decommissioned and closed routes (miles)	0.00	0.00
Areas open to motorized vehicle use (acres)	28,3780	55,570
Motor vehicle use for big game retrieval (acres)	28,380	55,570
Motor vehicle use for dispersed camping (acres)	28,380	55,570
Personal use fuelwood gathering (acres)	0.00	0.00

[109] See the Socioeconomic report in the project record for more information.

Table 46. Alternative A – Existing Conditions in and Near Mexican Spotted Owl Nest Cores

Analysis Factors	In Nest Core	0.25 Miles of Core
Routes designated for motor vehicle use (miles)	13.08	85.66
Density of designated routes (miles per square mile)	0.89	1.47
Decommissioned and closed routes (miles)	0.00	0.00
Areas open to motorized vehicle use (acres)	6,137	23,707
Motor vehicle use for big game retrieval (acres)	6,137	23,707
Motor vehicle use for dispersed camping (acres)	6,137	23,707
Personal use fuelwood gathering (acres)	0.00	0.00

Table 47. Alternative A – Existing Conditions in Designated Critical Habitat for Mexican Spotted Owl

Analysis Factor	In Designated Critical Habitat
Routes designated for motor vehicle use (miles)	1,209.55
Density of designated routes (miles per square mile)	1.72
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	194,545
Motor vehicle use for big game retrieval (acres)	194,545
Motor vehicle use for dispersed camping (acres)	194,545
Personal use fuelwood gathering (acres)	187,033

No new routes would be designated in the 34 PACs that currently do not have any routes (48 percent of the PACs on the Tonto National Forest). In twelve PACs, (seventeen percent of the PACs on the Tonto National Forest), no routes would be eliminated or reduced. In these PACs, a total of 11.12 miles of routes would be designated with an average of 0.93 miles per PAC and a range of 0.04 to 2.85 miles. Of this total, 3.22 miles would be for administrative purposes only, including over half (0.46 miles) of the 0.85 miles designated in nest cores. Designation of unauthorized user-created routes in PACs would be limited to 1.81 miles of routes in three PACs. In the Mount Ord PAC on the Mesa and Tonto Basin Ranger District, 0.35 miles of unauthorized routes would be designated to provide the public with access to existing dispersed campsites in close proximity to hunting opportunities and motorized trails just east of Highway 87. The Turkey Peak NE PAC is in very close proximity to the several subdivisions on the Pleasant Valley Ranger District. Since cross-country travel is not currently restricted on this District, a large number of user created routes exist in the surrounding area, including in 2.0 miles of mapped routes in this PAC. Under the proposed action, 3.41 miles of routes in the PAC would be decommissioned or not designated, including 0.64 miles of unauthorized routes, reducing the miles of mapped routes by 50 percent. In the Cove PAC on the Payson Ranger District, 0.24 miles of user-created routes would be designated as an administrative use only motorized trail. Topography and vegetation would provide a dampening effect of potential noise effects to nesting or roosting birds in the three PACs for these 1.81 miles of user-created routes designated under the proposed action.

Direct and Indirect Effects

This alternative would not close any existing roads or motorized trails, nor prevent cross-country motorized travel within the Payson and Pleasant Valley Ranger Districts. Approximately 1,210 miles of roads and no trails would be open to the public for motorized travel within MSO critical habitat. With no change in the seven analysis factors for designated routes, decommissioned routes, road density, areas designated for motorized use, big game retrieval, dispersed camping,

and fuelwood gathering , motorized travel would continue to directly and indirectly cause localized disturbance to owls and designated critical habitat. With this alternative, year round cross-country motorized use would continue to occur on the Payson and Pleasant Valley Ranger Districts (where the majority of PACS and critical habitat occur), resulting in direct effects from human disturbance during nesting season from associated recreational activities (e.g. OHV use at nesting, roosting, or foraging sites) or indirectly through alteration of habitat caused by vegetation damage, soil compaction, illegal user routes created and increased risk of wildland fire. Due to expected increases in levels of cross country OHV travel (due to projected increased human population), this alternative would allow the level of recreational activities within some protected activity centers to increase, exceeding that which was occurring prior to the owl be listed. This increase would not follow forest plan guidelines or Mexican Spotted Owl Recovery Plan (USDI Fish and Wildlife Service, 2012) recommendations.

Alternative A would increase habitat fragmentation by unmanaged recreational wood and forest product harvesting where cross-country motorized access is provided throughout the Payson and Pleasant Valley Ranger Districts resulting in cumulative effects to individual owls and critical habitat. Large dead trees (snags) along roads and campsites would continue to be removed that pose a hazard reducing this primary constituent element. Unmanaged development of user-created motorized dispersed campsites, roads, and trails could further alter owl habitat.

Alternative B—Direct and Indirect Effects

The effect of this alternative on a forest wide basis for MSO would be a reduction in designated roads, authorized cross-country motorized, and a major reduction in motorized dispersed camping use within MSO PACs, core areas, and critical habitat on the Forest (Table 48 through Table 50). Alternative B would benefit the species the most by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation.

Table 48. Alternative B – Effect Changes from Existing Condition in and Near Mexican Spotted Owl Protected Activity Centers

Analysis Factors	Existing Condition		Alternative B		Change in Effects	
	In PAC	0.25 miles of PAC	In PAC	0.25 miles of PAC	In PAC	0.25 miles of PAC
Routes designated for motor vehicle use (miles)	65.65	200.41	7.16	68.93	-58.49	-131.48
Density of designated routes (miles per square miles)	0.89	1.40	0.10	0.45	-0.79	-0.95
Decommissioned and closed routes (miles)	0.00	0.00	62.74	139.69	+62.74	+139.69
Areas open to motorized vehicle use (acres)	28,380	55,570	0.00	0.00	-28,380	-55,570
Motor vehicle use for big game retrieval (acres)	28,380	55,570	0.00	0.00	-28,380	-55,570
Motor vehicle use for dispersed camping (acres)	28,380	55,570	0.72	2.70	-28,379.28	-55567.30
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00	0.00

Table 49. Alternative B – Effect Changes from Existing Condition in and Near Mexican Spotted Owl Nest Cores

Analysis Factors	Existing Condition		Alternative B		Change in Effects	
	In Nest Core	0.25 Miles of Core	In Nest Core	0.25 Miles of Core	In Nest Core	0.25 Miles of Core
Routes designated for motor vehicle use (miles)	13.08	85.66	1.53	21.87	-11.55	-63.79
Density of designated routes (miles per square mile)	0.89	1.47	0.10	0.34	-0.79	-1.13
Decommissioned and closed routes (miles)	0.00	0.00	12.77	68.64	-12.77	-68.64
Areas open to motorized vehicle use (acres)	6,137	23,707	0.00	0.00	-6,137	-23,707
Motor vehicle use for big game retrieval (acres)	6,137	23,707	0.00	0.00	-6,137	-23,707
Motor vehicle use for dispersed camping (acres)	6,137	23,707	0.00	1.26	-6,137	-23,705.74
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00	0.00

Table 50. Alternative B – Effect Changes from Existing Conditions in Designated Critical Habitat for Mexican Spotted Owl by Analysis Factor

Analysis Factor	Existing Condition	Alternative B	Changes in Effects
Routes designated for motor vehicle use (miles)	1,209.55	529.81	-679.74
Density of designated routes (miles per square mile)	1.72	0.76	-0.96
Decommissioned and closed routes (miles)	0.00	543.00	+543.00
Areas open to motorized vehicle use (acres)	194,545	0.00	-194,545
Motor vehicle use for big game retrieval (acres)	194,545	0.00	-194,545
Motor vehicle use for dispersed camping (acres)	194,545	10.64	-194,534.36
Personal use fuelwood gathering (acres)	187,033	15,880.43	-171,152.57

For the seven analysis factors, Alternative B would have substantial reductions for route reduction and road density in PACS and cores and moderate reduction in critical habitat For MSO. Substantial reductions acres of motorized dispersed camping, and motorized personal use fuelwood gathering would occur in PACs, cores, and critical habitat. There would be over 543 miles of decommissioned roads and cross-country motorized travel would be eliminated. No motorized big game retrieval would occur. This reduction in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in 92 percent of PACS and 89 percent in overall road density, 99 percent of acres of motorized dispersed camping in critical of habitat, and 92 percent of motorized personal use fuelwood gathering.

Alternative B would largely benefit Mexican spotted owls by:

- Eliminating cross-country travel on the Payson and Pleasant Valley Ranger Districts which encompasses 79 percent of critical habitat of the MSO habitat on the forest.
- Not allowing motorized big game retrieval off of roads.
- Substantially reducing the number of miles of open roads and motorized trails and disturbance from cross-country travel within MSO PACS, cores, and critical habitat.
- Eliminating year round disturbance PACS and cores during nesting and early fledging periods on the Payson and Pleasant Valley Ranger Districts.

Overall, Alternative B would benefit owls by reducing access to and activity near occupied sites, reducing disturbances to individuals and their habitat.

On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at any one site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to owls in concentrated areas.

No PAC or core areas on the Forest would be impacted by cross-country motorized travel for motorized fuelwood gathering. There would be a 92 percent decrease in cross-country motorized travel for fuelwood gathering in critical habitat, and the reductions would benefit the species by reducing impacts associated with noise disturbance from motor vehicles, reducing disturbance

due to human presence, and reducing habitat degradation. In areas in critical habitat where motorized access for fuelwood gathering would be allowed, impacts to critical habitat could be substantial within 300 feet on both sides of designated roads where motorized fuelwood gathering would be concentrated. Collection of downed wood for fuelwood could impact one of the primary constituent elements (PCE) of critical habitat related to maintenance of adequate prey species, specifically the PCE requiring high volumes of fallen trees and other woody debris along designated road corridors[110].

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall, less MSO habitat in PACs, cores, and critical habitat would affect the species for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within protected activity centers (PACS) bringing the level of use closer to that which was occurring prior to the Mexican spotted owl being listed.

Past actions and ongoing implementation such as travel management efforts in the adjacent Apache-Sitgreaves and Coconino National Forests will result in a cumulative effect of supporting the increase of primary constitute elements for critical habitat in the Upper Gila Mountain Recovery Unit over the long term (ten or more years).

Alternative C—Direct and Indirect Effects

The effect of this alternative on a forest wide basis for MSO would be a reduction in designated roads, authorized cross-country motorized, and a major reduction in dispersed camping use within MSO PACs, core areas, and critical habitat on the Forest (Table 51 through Table 53). Alternative C would benefit the species by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation, but not to as great a degree as Alternative B.

[110] For further information see short term long term productivity under recreation section in Chapter 3.

Table 51. Alternative C – Effect Changes from Existing Condition in and Near Mexican Spotted Owl Protected Activity Centers

Analysis Factors	Existing Condition		Alternative C		Change in Effects	
	In PAC	0.25 miles of PAC	In PAC	0.25 miles of PAC	In PAC	0.25 miles of PAC
Routes designated for motor vehicle use (miles)	65.65	200.41	40.18	144.70	-25.47	-55.71
Density of designated routes (miles per square miles)	0.89	1.40	0.56	0.94	-0.33	-0.46
Decommissioned and closed routes (miles)	0.00	0.00	29.72	63.92	+29.72	+63.92
Areas open to motorized vehicle use (acres)	28,380	55,570	0.00	0.00	-28,380	-55,570
Motor vehicle use for big game retrieval (acres)	28,380	55,570	30,042.96	61,850.77	+1,662.96	+6,280.77
Motor vehicle use for dispersed camping (acres)	0.00	0.00	24	137	24	137
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00	0.00

Table 52. Alternative C – Effect Changes from Existing Condition in and Near Mexican Spotted Owl Nest Cores

Analysis Factors	Existing Condition		Alternative C		Change in Effects	
	In Nest Core	0.25 Miles of Core	In Nest Core	0.25 Miles of Core	In Nest Core	0.25 Miles of Core
Routes designated for motor vehicle use (miles)	13.08	85.66	7.01	60.76	-6.07	-24.90
Density of designated routes (miles per square mile)	0.89	1.47	0.47	0.94	-0.42	-0.53
Decommissioned and closed routes (miles)	0.00	0.00	7.29	29.75	+7.29	+29.75
Areas open to motorized vehicle use (acres)	6,137	23,707	0.00	0.00	-6,137	-23,707
Motor vehicle use for big game retrieval (acres)	6,137	23,707	6,729.28	26,764.19	+592.28	+3,057.19
Motor vehicle use for dispersed camping (acres)	0.00	0.00	3	52	3	52
Personal use fuelwood gathering (acres)	0.00	0.00	45.18	168.63	+45.18	+168.63

Table 53. Alternative C – Effect Changes from Existing Conditions in Designated Critical Habitat for Mexican Spotted Owl by Analysis Factor

Analysis Factor	Existing Condition	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	1,209.55	764.58	-444.97
Density of designated routes (miles per square mile)	1.72	1.09	-0.63
Decommissioned and closed routes (miles)	0.00	93.23	+93.23
Areas open to motorized vehicle use (acres)	194,545	0.00	-194,545
Motor vehicle use for big game retrieval (acres)	194,545	294,865.76	-100,320.76
Motor vehicle use for dispersed camping (acres)	0.00	518	518
Personal use fuelwood gathering (acres)	187,033	20,951.29	-166,081.71

For the seven analysis factors, Alternative C would have substantial reductions for route reduction in PACS, road density, number of motorized dispersed campsites, and motorized personal use fuelwood gathering. There would be over 93 miles of decommissioned roads and cross-country motorized travel would be eliminated. This reduction in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in 63 percent of PACS and 63 percent in overall road density, a large number of motorized dispersed camping in critical of habitat, and 89 percent of motorized personal use fuelwood gathering.

Alternative C would largely benefit Mexican spotted owls by:

- Eliminating cross-country travel on the Payson and Pleasant Valley Ranger Districts which encompasses 79 percent of the MSO critical habitat on the forest.
- Substantially reducing the number of miles of open roads and motorized trails and disturbance from cross-country travel within MSO PACS, cores, and critical habitat.
- Eliminating year round disturbance PACS and cores during nesting and early fledging periods on the Payson and Pleasant Valley Ranger Districts.

Overall, Alternative C would benefit owls by reducing access to and activity near occupied sites, reducing disturbances to individuals and their habitat, but not as to as great a degree as Alternative B.

Dispersed camping using motor vehicles would be restricted to designated spur roads instead of corridors, impacting approximately 24 motorized dispersed campsites sites in MSO PACs, three dispersed campsites in MSO core areas, and 518 of MSO critical habitat on the Forest would be impacted by dispersed camping using motor vehicles under Alternative C. On roads that would remain, motorized dispersed camping could increase some due to displaced campers who would no longer be able to access closed roads. Since impacts at any one site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities, and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to owls in concentrated areas.

No PAC and only 45 acres of core areas on the Forest would be impacted by cross-country motorized travel for fuelwood gathering; this would be a decrease in cross-country motorized travel for fuelwood gathering in these areas by 89 percent of the existing condition in MSO critical habitat, and would benefit the species by reducing impacts associated with noise

disturbance from motor vehicles, reducing disturbance due to human presence, and reducing habitat degradation. In areas in core and critical habitat where motorized access for fuelwood gathering would be allowed, impacts to critical habitat could be substantial within 300 feet on both sides of designated roads where fuelwood gathering would be concentrated. Collection of downed wood for fuelwood could impact one of the PCE of critical habitat related to maintenance of adequate prey species, specifically the PCE requiring high volumes of fallen trees and other woody debris[111].

The total area for motorized big game retrieval would increase in MSO critical habitat. However, this disturbance is for a limited time period from August through December and limited expected trips which occur outside of the critical nesting period and early fledging period for owls. Overall, limiting big game retrieval to after the nesting and early fledging period would substantially lessen disturbance impacts for MSO under Alternative C from the current situation of year round travel on the Payson and Pleasant Valley Ranger Districts[112].

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall less MSO habitat in PACs, core, and critical habitat would affected for the long term (ten or more years.), but to a lesser degree than Alternative B. This alternative would reduce the level of recreation activities within protected activity centers (PACS) during critical nesting and early fledging period and bring the level of use closer to that which was occurring prior to the Mexican spotted owl being listed.

The cumulative effects for Alternative C are expected to be similar to Alternative B and would support the increase of primary constitute elements for critical habitat in the Upper Gila Mountain Recovery Unit over the long term (ten or more years).

Alternative D—Direct and Indirect Effects

Alternative D decommissions the least amount of road miles and increases the overall miles of roads from the existing condition and increases road density in MSO PACs and cores (Table 54 through Table 56). The effect of this alternative on a forest wide basis for MSO would be an overall increase in designated roads (though some roads will still be decommissioned in PACs and core areas) and motorized personal fuelwood gathering in 0.25 miles of cores, and increase in motorized big game retrieval acres from Alternative B and C. A major reduction in motorized dispersed camping use acres within MSO PACs, core areas, and critical habitat would occur under Alternative D.

[111] For further information see short term uses and long term productivity section in this chapter.
[112] For further information, see the Game and Nongame Species section of this chapter.

Table 54. Alternative D – Effect Changes from Existing Condition in and Near Mexican Spotted Owl Protected Activity Centers

Analysis Factors	Existing Condition		Alternative C		Change in Effects	
	In PAC	0.25 miles of PAC	In PAC	0.25 miles of PAC	In PAC	0.25 miles of PAC
Routes designated for motor vehicle use (miles)	65.65	200.41	67.32	201.19	+1.67	+0.78
Density of designated routes (miles per square miles)	0.89	1.40	0.94	1.31	+0.05	-0.09
Decommissioned and closed routes (miles)	0.00	0.00	2.59	7.43	+2.59	+7.43
Areas open to motorized vehicle use (acres)	28,380	55,570	0.00	0.00	-28,380	-55,570
Motor vehicle use for big game retrieval (acres)	28,380	55,570	32,686.17	66,165.23	+4,306.17	+10,595.23
Motor vehicle use for dispersed camping (acres)	28,380	55,570	4,460.83	11,685.34	-23,919.17	-43,884.66
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00	0.00

Table 55. Alternative D – Effect Changes from Existing Condition in and Near Mexican Spotted Owl Nest Cores

Analysis Factors	Existing Condition		Alternative C		Change in Effects	
	In Nest Core	0.25 Miles of Core	In Nest Core	0.25 Miles of Core	In Nest Core	0.25 Miles of Core
Routes designated for motor vehicle use (miles)	13.08	85.66	14.05	87.75	+0.97	+2.09
Density of designated routes (miles per square mile)	0.89	1.47	0.93	1.36	+0.04	-0.11
Decommissioned and closed routes (miles)	0.00	0.00	0.25	2.76	+0.25	+2.76
Areas open to motorized vehicle use (acres)	6,137	23,707	0.00	0.00	-6,137	-23,707
Motor vehicle use for big game retrieval (acres)	6,137	23,707	7,169.20	28,326.85	+1,032.20	+4,619.85
Motor vehicle use for dispersed camping (acres)	6,137	23,707	969.91	5,052.54	-5,167.09	-18,654.46
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00	0.00

Table 56. Alternative D – Effect Changes from Existing Conditions in Designated Critical Habitat for Mexican Spotted Owl by Analysis Factor

Analysis Factor	Existing Condition	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	1,209.55	1,034.25	-175.30
Density of designated routes (miles per square mile)	1.72	1.47	-0.25
Decommissioned and closed routes (miles)	0.00	38.57	+38.57
Areas open to motorized vehicle use (acres)	194,545	0.00	-194,545
Motor vehicle use for big game retrieval (acres)	194,545	324,398.42	+129,853.42
Motor vehicle use for dispersed camping (acres)	194,545	59,516.06	-135,028.94
Personal use fuelwood gathering (acres)	187,033	181,279	-5,753.08

For the seven analysis factors, Alternative D would have slight increases for routes in PACS, road density in PACs and cores, and a slight forest wide increase of motor vehicle use for big game retrieval in PACs, nest cores, and critical habitat. A slight decrease of acres of motorized dispersed campsites in PACS and core habitat for MSO would also occur. There would be substantial increase in motorized big game retrieval within critical habitat forest wide and no change in motorized use for personal fuelwood gathering from Alternative A. There would be over 93 miles of decommissioned roads, and cross country motorized travel would be eliminated. The reduction in motorized dispersed campsites and motorized personal fuelwood gathering in critical habitat would eliminate the potential for noise disturbance and habitat alteration; however, the slight increase in motorized big game retrieval habitat in PACS, cores and moderate in critical habitat would partially negate the otherwise slight decreases.

Alternative D would slightly benefit Mexican spotted owls by:

- Eliminating cross-country travel on the Payson and Pleasant Valley Ranger Districts which encompasses 79 percent of the MSO PAC and core areas on the forest.
- Slightly reducing acres of motorized dispersed camping in cores and PACs.
- Eliminating year round disturbance cross-country travel on the Payson and Pleasant Valley Ranger Districts.

Overall, Alternative D would slightly benefit owls by reducing year round access to and activity near occupied sites, reducing disturbances to individuals and their habitat, but not as to as great a degree as Alternatives B and C.

On roads that would remain, motorized dispersed camping could increase some due to displaced campers who would no longer be able to access closed roads. Since impacts at any one site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to owls in concentrated areas.

No changes from the existing condition for motorized fuelwood gathering would occur under Alternative D, so no benefit for the species by reducing impacts associated with noise disturbance from motor vehicles, reducing disturbance due to human presence, and reducing habitat degradation would occur. In areas in critical habitat where motorized fuelwood gathering

would be allowed impacts to habitat could be substantial. Collection of downed wood for fuelwood could impact one of the PCE of critical habitat related to maintenance of adequate prey species, specifically the PCE requiring high volumes of fallen trees and other woody debris.

The total area for motorized big game retrieval would moderately increase in MSO critical habitat by 41 percent. However, this disturbance is for a limited time period from August through December and limited expected trips which occur outside of the critical nesting period and early fledging period for owls[113].

Overall, this alternative would have a slight reduction in disturbance and habitat degradation from motorized use for year round use limiting some use to hunting season only and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall, less MSO habitat in PACs, core, and critical habitat would affected for the long term (ten or more years), but to a much lesser degree than Alternatives B and C. This alternative would reduce the level of recreation activities within protected activity centers (PACS) during critical nesting and early fledging period and bring the level of use closer to that which was occurring prior to the Mexican spotted owl being listed.

The cumulative effects for Alternative D are expected to be similar to Alternative B and C and would support the increase of primary constitute elements for critical habitat in the Upper Gila Mountain Recovery Unit over the long term (ten or more years).

Southwestern Willow Flycatcher

The southwestern willow flycatcher has been documented breeding and approximately 12,380 acres of potential habitat occurs on Cave Creek, Globe, Payson, and Tonto Basin Ranger Districts. Approximately 24 percent of potential flycatcher habitat is located in the Mazatzal and Salt River Canyon wilderness areas.

Methodology

For analysis of southwestern willow flycatcher (flycatcher), changes in effects will be analyzed inside potential habitat as well as 300 feet and a 0.25 mile of potential habitat. Roads within 300 feet of aquatic habitats are considered to be hydrologically connected to the adjacent stream or water body (U.S. Forest Service, 2010). The 0.25 mile buffer accounts for potential noise effects to nesting birds as a result of the proposed action. The majority of riparian corridors on the Tonto National Forest do not exceed 0.25 miles; therefore, no effect is expected to nesting or foraging of flycatchers outside of the 0.25 miles buffer.

Alternative A- Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition. Motorized use within or adjacent to flycatcher habitat has the potential to influence behavior, survival, reproduction and distribution of southwestern willow flycatcher, as well as to alter habitat.

The current level of impact is expected to continue if Alternative A is implemented and possibly increase for all indirect and direct effects as the projected population in the Phoenix and adjoining areas increases (Table 57 and Table 58)[114]. An increase in forest users, with no route

[113] Ibid.

[114] The polygons of the Roosevelt OHV area used for this analysis are approximations of those areas currently used by OHVs and would not include any sensitive resources inside its boundary when finalized. As a result, these numbers will decrease during implementation.

designation, would lead to an expected increase to disturbance to flycatchers and habitat degradation if Alternative A is implemented.

Table 57. Alternative A – Existing Conditions in Southwestern Willow Flycatcher Habitat

Analysis Factors	Existing Condition		
	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat
Routes designated for motor vehicle use (miles)	23.41	40.60	79.11
Density of designated routes (miles per square mile)	1.21	1.94	1.97
Decommissioned and closed routes (miles)	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	219.60	333.18	412.30
Motor vehicle use for big game retrieval (acres)	219.60	333.18	412.30
Motor vehicle use for dispersed camping (acres)	219.60	333.18	412.30
Personal use fuelwood gathering (acres)	0.00	0.00	0.00

Table 58. Alternative A – Existing Conditions in Designated Critical Habitat for Southwestern Willow Flycatcher

Analysis Factor	In Designated Critical Habitat
Routes designated for motor vehicle use (miles)	23.41
Density of designated routes (miles per square mile)	1.21
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	219.60
Motor vehicle use for big game retrieval* (acres)	219.60
Motor vehicle use for dispersed camping (acres)	219.60
Personal use fuelwood gathering (acres)	0.00

*The value calculated for this factor under the proposed action includes areas that have perennial water and would not be accessible by motorized vehicle. Since the amount of water can vary from year to year and season to season, these values represent the maximum area open under the driest conditions.

Direct and Indirect Effects

This alternative would not close any existing roads or motorized trails. Approximately 23.41 miles of routes would be designated in potential flycatcher habitat and critical habitat, including two perennial streams on Tonto Creek. Within the 300 foot buffer, an additional approximately 17.19 miles of routes would be designated. Another 55.70 miles of routes would be designated in the 0.25 mile buffer. With no change in the seven analysis factors for designated routes, decommissioned routes, road density, areas designated for motorized use, big game retrieval, dispersed camping, and fuelwood gathering , motorized travel would continue to directly and indirectly cause localized disturbance to flycatchers and designated critical habitat. With this alternative, year round motorized use would continue to occur on within southwestern willow flycatcher critical habitat (where the second largest known nesting flycatcher area occurs within the U.S.), resulting in direct effects from human disturbance during nesting season from associated recreational activities (e.g. OHV use at nesting, roosting, or foraging sites) or indirectly through alteration of habitat caused by vegetation damage, vegetation removal for campfires, soil compaction, illegal user routes created and increased risk of wildland fire. Due to expected increases in levels of cross country OHV travel (due to projected increased human

population), this alternative would allow the level of motorized recreational activities within critical habitat to increase, exceeding that which was occurring prior to the flycatcher being listed. This increase would not follow forest plan guidelines or Southwestern Willow Flycatcher Recovery Plan (USDI Fish and Wildlife Service, 2002) recommendations.

Routes designated in potential flycatcher habitat and the 300 foot buffer under Alternative A are located within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks. Increased levels could result in potential effects to flycatchers and their prey through changes in water quality and temperature, fine sediments on river and creek bottoms, and growth and regeneration of riparian vegetation. Additionally, topography and vegetation would not provide a dampening effect of potential noise effects from designated routes on nesting and foraging flycatchers. There is also an increase in the potential of introducing invasive and non-native organisms into waterways at perennial stream crossings. One crossing is a current system road, with a hardened crossing, reducing the potential for effects at this location. While routes designated under the proposed action would have effects on flycatcher and their habitats, nearly a quarter of potential habitat is located in wilderness where no routes would be designated and the 40 percent decrease in the miles of routes in potential habitat from existing conditions would reduce the magnitude of effects to flycatchers.

Cumulatively over time, Alternative A would increase habitat fragmentation by unmanaged motorized use and ongoing harvesting of woody products utilized for dispersed campsites within flycatcher habitat on the second largest know population. Willows and tamarisk providing nesting habitat and cover for flycatcher that pose a hazard along roads and campsites would continue to be removed, reducing this primary constituent element. Unmanaged development of user-created dispersed campsites, roads, and trails could further alter flycatcher habitat.

Alternative B—Direct and Indirect Effects

The effect of this alternative on a forest wide basis for southwestern willow flycatcher would be a substantial reduction in designated roads, authorized cross-country motorized big game retrieval, and dispersed camping use within flycatcher habitat on the Forest. Alternative B and would benefit the species the most by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation.

For Alternative B there would be five permit zones where motorized vehicles stay on designated routes and cannot travel cross-country. No permit zones would be designated within potential flycatcher habitat, but a small portion of the St. Clair Permit Zone on the Cave Creek Ranger District would be within the 300 foot and 0.25 mile buffers (5.29 and 86.39 acres, respectively). The portion of the permit zone that overlaps potential flycatcher habitat would be between the KA Ranch and Devil's Hole. The closest flycatcher detection is more than one mile upstream of the area and this area is located in the Cliff Sensitive Species Area Seasonal Closure (Order 12-14-052), which limits motorized vehicle travel in the area during the bald eagle breeding season (from December through June). As a result, potential noise effects to nesting and foraging birds from use of this portion of the permit zone would be expected to be insignificant and discountable.

Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use big game retrieval, and dispersed camping would all substantially be reduced under Alternative B (Table 59).

Table 59. Alternative B – Effect Changes from Existing Condition in Southwestern Willow Flycatcher Habitat

Analysis Factors	Existing Condition			Alternative B			Change in Effects		
	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat
Routes designated for motor vehicle use (miles)	23.41	40.60	79.11	8.59	20.64	46.46	-14.82	-19.96	-32.65
Density of designated routes (miles per square mile)	1.21	1.94	1.97	0.44	0.69	0.75	-0.77	-1.25	-1.22
Decommissioned and closed routes (miles)	0.00	0.00	0.00	16.02	27.22	51.58	+16.02	+27.22	+51.58
Areas open to motorized vehicle use (acres)	219.60	333.18	412.3	0.00	0.00	0.00	-219.60	-333.18	-412.3
Motor vehicle use for big game retrieval (acres)	219.60	333.18	412.3	0.00	0.00	0.00	-219.60	-333.18	-412.30
Motor vehicle use for dispersed camping (acres)	219.60	333.18	412.30	3.72	5.01	5.95	-215.88	-328.17	-406.35
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

For the seven analysis factors, Alternative B would have substantial reductions for route reduction and road density and dispersed camping, and in proposed and critical habitat for Southwestern willow flycatcher. No motor vehicle use for big game retrieval occurs under Alternative B providing further reductions which could lead to habitat alteration or degradation. Substantial reductions of acres of motorized dispersed camping, and personal use fuelwood gathering (associated with motorized dispersed campsites) would occur within flycatcher potential and critical habitat. There would be over 16 miles of decommissioned roads in habitat 27 miles within 300 feet and 52 miles within 0.25 miles of flycatcher habitat. This reduction in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in 64 percent of habitat and 64 percent in overall road density, and 99 percent of acres of motorized dispersed camping in habitat.

Alternative B would largely benefit Southwestern Willow flycatcher by:

- Reducing motorized use in flycatcher habitat that results in indirect effects of habitat degradation.
- Reducing routes located within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in flycatcher habitat.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving flycatcher prey base and improve growth and regeneration of riparian.
- Reducing year round disturbance in potential and critical habitat caused by motorized disturbance during nesting and early fledging periods.

Overall Alternative B would benefit flycatchers by reducing access to and activity near nesting and forging sites, reducing disturbances to individuals and their habitat.

On roads that would remain dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at anyone site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to flycatchers in concentrated areas.

No potential or critical flycatcher habitat on the Forest would be impacted by cross-country motorized travel for fuelwood gathering. All permitted fuelwood gathering occurs outside of potential and critical flycatcher habitat.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall, less flycatcher potential and critical habitat would be affected for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within potential and critical habitat bringing the level of use closer to that which was occurring prior to the flycatcher being listed.

For Alternative B, past actions and ongoing implementation such as travel management efforts on other forests inhabited by flycatchers will result in a cumulative effect of supporting the

increase of primary constitute elements for critical habitat in the over the long term (ten or more years).

Alternative C—Direct and Indirect Effects

The effect of this alternative on a forest wide basis for southwestern willow flycatcher would be a reduction in designated roads, and a substantial reduction in authorized cross-country motorized travel, motorized big game retrieval and motorized dispersed camping use within flycatcher habitat on the Forest. Alternative C would benefit the species compared to the current condition by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation, more than Alternatives A and D, but to a lesser degree than Alternative B.

No permit zones would be designated within potential flycatcher habitat, but a small portion of the St. Clair Permit Zone on the Cave Creek Ranger District would be within the 300 foot and 0.25 mile buffers (5.29 and 86.39 acres, respectively).

Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use big game retrieval and dispersed camping would all be reduced under Alternative C (Table 60).

Table 60. Alternative C – Effect Changes from Existing Condition in Southwestern Willow Flycatcher Habitat

Analysis Factors	Existing Condition			Alternative C			Change in Effects		
	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat
Routes designated for motor vehicle use (miles)	23.41	40.60	79.11	15.15	33.50	72.16	-8.26	-7.10	-6.95
Density of designated routes (miles per square mile)	1.21	1.94	1.97	0.78	1.12	1.16	-0.43	-0.82	-0.81
Decommissioned and closed routes (miles)	0.00	0.00	0.00	9.46	14.37	25.88	+9.46	+14.37	+25.88
Areas open to motorized vehicle use (acres)	219.60	333.18	412.30	2.92	5.18	26.33	-216.68	-328.0	-385.97
Motor vehicle use for big game retrieval (acres)	219.60	333.18	412.30	15.22	63.82	275.85	-204.38	-269.36	-136.45
Motor vehicle use for dispersed camping (acres)	0.00	0.00	0.00	63	73	95	63	73	95
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

For the seven analysis factors, Alternative C would have substantial reductions for route reduction and road density and motorized dispersed camping, and in proposed and critical habitat for Southwestern willow flycatcher. Substantial reductions of motorized dispersed camp sites, and no motorized personal use fuelwood gathering (associated with motorized dispersed campsites) would occur within flycatcher potential and critical habitat. There would be over 9 miles of decommissioned roads in habitat fourteen miles within 300 feet and 26 miles within 0.25 miles of flycatcher habitat. This reduction in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in 65 percent of habitat and 36 percent in overall road density.

Alternative C would largely benefit Southwestern Willow flycatcher by:

- Reducing motorized use in flycatcher habitat that results in indirect effects of habitat degradation.
- Reducing routes located within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in flycatcher habitat.
- Reducing levels of sediment and pollutants. This, in turn, could improve water quality and lower water temperature, thus improving flycatcher prey base and improve growth and regeneration of riparian vegetation.
- Reducing year round disturbance in potential and critical habitat caused by motorized disturbance during nesting and early fledging periods.

Overall Alternative C would benefit flycatchers by reducing access to and activity near nesting and forging sites, reducing disturbances to individuals and their habitat, but not to as great a degree as Alternative B.

On roads that would remain dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at anyone site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to flycatchers in concentrated areas.

No potential or critical flycatcher habitat on the Forest would be impacted by cross-country motorized travel or fuelwood gathering allowed through motorized access. All permitted fuelwood gathering occurs outside of potential and critical flycatcher habitat.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall less flycatcher potential and critical habitat would be affected for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within potential and critical habitat bringing the level of use closer to that which was occurring prior to the flycatcher being listed.

For Alternative C, past actions and ongoing implementation such as travel management efforts on other forests inhabited by flycatchers will result in a cumulative effect of supporting the increase of primary constitute elements for critical habitat over the long term (ten or more years), similar to Alternative B.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis for southwestern willow flycatcher (flycatcher) slightly increases the overall miles of roads from the existing condition and increases road density, areas open to motorized vehicle use acres for big game retrieval. Alternative D would impact the species the most by increasing impacts associated with noise disturbance from motor vehicles, disturbance due to human and increasing habitat degradation (Table 61).

Table 61. Alternative D – Effect Changes from Existing Condition in Southwestern Willow Flycatcher Habitat

Analysis Factors	Existing Condition			Alternative D			Change in Effects		
	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat
Routes designated for motor vehicle use (miles)	23.41	40.60	79.11	23.81	45.96	94.83	+0.4	+5.36	+15.72
Density of designated routes (miles per square mile)	1.21	1.35	1.26	1.23	1.54	1.52	+0.02	+0.19	+0.26
Decommissioned and closed routes (miles)	0.00	0.00	0.00	0.72	1.72	2.81	+0.72	+1.72	+2.81
Areas open to motorized vehicle use (acres)	219.60	333.18	412.30	405.36	507.63	704.54	+185.76	+174.45	+292.24
Motor vehicle use for big game retrieval (acres)	219.60	333.18	412.30	8,241.80	11,358.96	22,137.63	+8,022.20	+11,025.78	+21,725.33
Motor vehicle use for dispersed camping (acres)	219.60	333.18	412.30	1,444.85	2,454.96	5,064.41	+1,225.25	+2,121.78	+4,652.11
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

For the seven analysis factors, Alternative D would have slight increases in routes and road density in proposed and critical habitat for Southwestern willow flycatcher. A substantial increase in areas open to motorized vehicle, use motorized dispersed camping acres, and motor vehicle use for big game retrieval would occur under Alternative D. There would only 0 .72 miles of decommissioned roads in habitat 1.72 miles within 300 feet and 2.81 miles within 0.25 miles of flycatcher habitat. Overall, however, there would be slight increase in number of designated routes and road density. The slight increase in roads and road density and substantial increase in areas open to motorized vehicles, motorized big game retrieval, and motorized dispersed camping would increase the potential for noise disturbance and habitat alteration.

Alternative D would impact Southwestern Willow flycatcher and have a negative impact by:

- Increasing designated routes and road density use in flycatcher habitat that results in indirect effects of habitat degradation.
- Likely increasing routes and dispersed camping sites located within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in flycatcher habitat.
- Possibly increasing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving flycatcher prey base and improve growth and regeneration of riparian.
- Increasing year round disturbance in potential and critical habitat caused by motorized disturbance and dispersed campsites associated with motorized use during nesting and early fledging periods.

Overall Alternative D would not benefit flycatchers by reducing access to and activity near nesting and forging sites, reducing disturbances to individuals and their habitat, and would have the overall greatest impact of the alternatives to flycatchers.

On roads that would remain, a slight increase in designated routes and a substantial increase in motorized dispersed camping is expected. Impacts at any one site are expected to be of short duration and low intensity, however, the substantial increase for motorized dispersed camping is expected to impact habitat and disturbance impacts associated with motorized use. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to flycatchers in concentrated areas.

No potential or critical flycatcher habitat on the forest would be impacted by cross-country motorized travel for motorized fuelwood gathering. All permitted fuelwood gathering occurs outside of potential and critical flycatcher habitat.

Overall, this alternative would increase disturbance and habitat degradation from motorized use and access which would add to the long-term impacts of activities concentrated in isolated areas particularly with three of the seven analysis factors for areas open to motorized vehicle use, motorized big game retrieval, and motorized dispersed camping acres. Effects from noise and human disturbance are expected to be minimal to non-existent from motorized big game retrieval, because the hunting season would not overlap the breeding season for this species. However, habitat degradation could occur from the increased use by the trampling of vegetation and soil compaction. Overall, more flycatcher potential, and critical habitat would be affected for the long term (ten or more years.). This alternative would increase the level of motorized

recreation activities within potential and critical habitat, increasing the level of use from the current condition and surpassing use which was occurring prior to the flycatcher being listed.

For Alternative D, past actions and ongoing implementation such as travel management efforts on other forests inhabited by flycatchers will result in a cumulative effect of supporting the increase of primary constitute elements for critical habitat over the long term (ten or more years). However, due to the potential increase of impacts under Alternative D on the Tonto National Forest, overall the cumulative reduction would be limited to other forests and private entities reducing impacts.

Western Yellow-billed Cuckoo

Approximately 9,637 acres of potential habitat for western yellow-billed cuckoos can be found on the Cave Creek, Globe, Payson, and Tonto Basin Ranger Districts along the Verde and Salt Rivers and creeks including Campaign, Cherry, Coon, Pinto, Rye, and Tonto. Less than 0.01 percent of potential cuckoo habitat is located in the Hellsgate and Mazatzal wilderness areas. Much of this habitat overlaps with flycatcher habitat so effects to the species under the four Alternatives are similar.

Methodology

For analysis of western yellow-billed cuckoo (cuckoo), changes in effects will be analyzed inside potential habitat as well as 300 feet and a 0.25 mile of potential habitat. Roads within 300 feet of aquatic habitats are considered to be hydrologically connected to the adjacent stream or water body (U.S. Forest Service, 2010). The 0.25 mile buffer accounts for potential noise effects to nesting birds as a result of the proposed action. The majority of riparian corridors on the Tonto National Forest do not exceed 0.25 miles; therefore, no effect is expected to nesting or foraging of cuckoos outside of the 0.25 miles buffer.

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition. Motorized use within or adjacent to yellow-billed cuckoo potential habitat has the potential to influence behavior, survival, reproduction and distribution of cuckoo's, as well as to alter habitat.

The current level of impact is expected to continue if Alternative A is implemented and possibly increase for all indirect and direct effects as the projected population in the Phoenix and adjoining areas increases (TABLES)[115]. An increase in forest users, with no route designation, would lead to an expected increase to disturbance to yellow-billed cuckoo and habitat degradation if Alternative A is implemented.

[115] The values calculated for retrieval under the proposed action include areas that have perennial water and would not be accessible by motorized vehicle. Since the amount of water can vary from year to year and season to season, these values represent the maximum area open under the driest conditions.

Table 62. Alternative A – Existing Conditions in Western Yellow-Billed Cuckoo Potential Habitat

Analysis Factors	Existing Condition		
	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat
Routes designated for motor vehicle use (miles)	30.57	49.01	100.59
Density of designated routes (miles per square mile)	2.03	2.19	2.15
Decommissioned and closed routes (miles)	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	214.04	334.94	749.73
Motor vehicle use for big game retrieval (acres)	214.04	334.94	749.73
Motor vehicle use for dispersed camping (acres)	214.04	334.94	749.73
Personal use fuelwood gathering (acres)	903.00	2,150	6,716

Table 63. Alternative A – Existing Conditions in Proposed Critical Habitat for Western Yellow-Billed Cuckoo

Analysis Factor	In Proposed Critical Habitat
Routes designated for motor vehicle use (miles)	28.04
Density of designated routes (miles per square mile)	1.96
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	0.00
Motor vehicle use for big game retrieval* (acres)	0.00
Motor vehicle use for dispersed camping (acres)	0.00
Personal use fuelwood gathering (acres)	760.00

Direct and Indirect Effects

This alternative would not close any existing roads or motorized trails. Approximately 30 miles of routes would be designated in potential yellow-billed cuckoo (cuckoo) habitat, including two perennial streams on Tonto Creek. Within the 300 foot buffer, an additional approximately 49 miles of routes would be designated. Another 100 miles of routes would be designated in the 0.25 mile buffer. With no change in the seven analysis factors for designated routes, decommissioned routes, road density, areas designated for motorized use, big game retrieval, dispersed camping, and fuelwood gathering, motorized travel would continue to directly and indirectly cause localized disturbance to yellow billed cuckoos and potential habitat. With this alternative, year round motorized use would continue to occur on within yellow-billed cuckoo potential habitat, resulting in direct effects from human disturbance during nesting season from associated recreational activities (e.g. OHV use at nesting, roosting, or foraging sites) or indirectly through alteration of habitat caused by vegetation damage, vegetation removal for campfires, soil compaction, illegal user routes created and increased risk of wildland fire. Due to expected increases in levels of cross country OHV travel (due to projected increased human population), this alternative would allow the level of motorized recreational activities within potential habitat to increase, exceeding that which was occurring prior to the cuckoo being listed. This increase would not follow proposed primary constituent elements (PCEs) in proposed critical habitat for riparian woodlands, adequate prey base, and dynamic riverine process recommended by USDI Fish and Wildlife Service (2014).

Routes designated in potential cuckoo habitat and the 300 foot buffer under Alternative A are located within the river or creek channel, floodplain or adjacent upland areas and can contribute

to levels of sediment and other pollutants in these rivers and creeks. Increased levels could result in potential effects to cuckoos and their prey through changes in water quality and temperature, fine sediments on river and creek bottoms, and growth and regeneration of riparian vegetation, particularly willows and cottonwoods. Additionally, topography and vegetation would not provide a dampening effect of potential noise effects from designated routes on nesting and foraging cuckoos. There is also an increase in the potential of introducing invasive and non-native organisms into waterways at perennial stream crossings. One crossing is a current system road, with a hardened crossing, reducing the potential for effects at this location. The magnitude of effects to the species would remain the same as current condition.

Alternative A would increase habitat fragmentation by unmanaged motorized use and ongoing harvesting of woody products utilized for dispersed campsites within cuckoo habitat. Willows and cottonwoods providing nesting habitat and cover for cuckoos along roads and campsites would continue to be removed that pose a hazard reducing the proposed primary constituent elements. Unmanaged development of user-created motorized dispersed campsites, roads, and trails could further alter cuckoo habitat.

Alternative B—Direct and Indirect Effects

The effect of this alternative on a forest wide basis for yellow-billed cuckoo would be a substantial reduction in designated roads, authorized cross-country motorized, motorized big game retrieval, and motorized dispersed camping use within potential yellow-billed cuckoo habitat on the Forest. Alternative B would benefit the species the most by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as preventing habitat degradation.

Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use, motorized big game retrieval, and motorized dispersed camping would all substantially be reduced under Alternative B (Table 64 and Table 65).

Table 64. Alternative B – Effect Changes from Existing Condition in Western Yellow-Billed Cuckoo Potential Habitat

	Existing Condition			Alternative B			Change in Effects		
Analysis Factors	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat
Routes designated for motor vehicle use (miles)	30.57	49.01	100.59	13.59	23.53	49.75	-16.98	-25.48	-50.87
Density of designated routes (miles per square mile)	2.03	2.19	2.15	0.90	1.05	1.06	-1.13	-1.14	-1.09
Decommissioned and closed routes (miles)	0.00	0.00	0.00	16.25	28.03	60.06	+16.25	+28.03	+60.06
Areas open to motorized vehicle use (acres)	214.04	334.94	749.73	0.00	0.00	0.00	-214.04	-334.94	-749.73
Motor vehicle use for big game retrieval (acres)	214.04	334.94	749.73	0.00	0.00	0.00	-214.04	-334.94	-749.73
Motor vehicle use for dispersed camping (acres)	214.04	334.94	749.73	4.14	4.33	5.23	-209.90	-330.61	-744.50
Personal use fuelwood gathering (acres)	903.00	2,150	6,716	98.10	177.64	413.06	-804.90	-1,972.36	-6,302.94

Table 65. Alternative B – Effect Changes from Existing Conditions in Proposed Critical Habitat for Western Yellow-Billed Cuckoo by Analysis Factor

Analysis Factor	Existing Condition	Alternative B	Changes in Effects
Routes designated for motor vehicle use (miles)	28.04	13.15	-14.89
Density of designated routes (miles per square mile)	1.96	0.92	-1.04
Decommissioned and closed routes (miles)	0.00	14.16	+14.16
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	3.96	+3.96
Personal use fuelwood gathering (acres)	760.00	94.87	-665.13

For Alternative B, there would be five permit zones where motorized vehicles stay on designated routes and cannot travel cross-country. No permit zones would be designated within potential cuckoo habitat.

For the seven analysis factors, Alternative B would have substantial reductions for route reduction and road density and motorized dispersed camping, and in proposed habitat for yellow-billed cuckoo. No motor vehicle use for big game retrieval occurs under Alternative B, increasing further reductions which could lead to habitat alteration or degradation. Substantial reductions of acres of motorized dispersed camping, and personal use fuelwood gathering (associated with motorized dispersed campsites) would occur within cuckoo potential habitat. There would be over 16 miles of decommissioned roads in habitat 28 miles within 300 feet and 60 miles within 0.25 miles of cuckoo habitat. This reduction in roads and motorized trails designated for motorized use would eliminate the potential for noise disturbance and habitat alteration in 54 percent of habitat and 53 percent in overall road density, and 88 percent of acres of motorized personal fuelwood gathering in habitat.

Alternative B would largely benefit yellow-billed cuckoo by:

- Reducing motorized use in cuckoo habitat that results in indirect effects of habitat degradation.
- Reducing routes located within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in cuckoo habitat.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving cuckoo prey base and improve growth and regeneration of riparian.
- Reducing year round disturbance in potential habitat caused by motorized disturbance during nesting and early fledging periods which may improve breeding success.

Overall, Alternative B would benefit cuckoos by reducing access to and activity near nesting and forging sites, reducing disturbances to individuals and their habitat.

On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at any one site are expected to be of short duration and low intensity, habitat and disturbance impacts are

expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to cuckoos in concentrated areas.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall less cuckoo potential habitat would be affected for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within potential habitat bringing the level of use closer to that which was occurring prior to the cuckoo being listed.

For Alternative B past actions and ongoing implementation such as travel management efforts on other forests and public land management agencies land inhabited by cuckoos will result in a cumulative effect of supporting the increase of primary constitute elements for critical habitat in the over the long term (ten or more years).

Alternative C—Direct and Indirect Effects

The effect of this alternative on a forest wide basis for yellow-billed cuckoo would be a substantial reduction in designated roads, authorized cross-country motorized, big game retrieval, and dispersed camping use within potential yellow-billed cuckoo habitat on the Forest. Alternative C would benefit the species more than Alternative A and D, but to less of a degree than Alternative B, by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation.

Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use for big game retrieval, and dispersed camping would all substantially be reduced under Alternative C (Table 66 and Table 67).

Table 66. Alternative C – Effect Changes from Existing Condition in Western Yellow-Billed Cuckoo Potential Habitat

Analysis Factors	Existing Condition			Alternative C			Change in Effects		
	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat
Routes designated for motor vehicle use (miles)	30.57	49.01	100.59	21.21	34.10	73.70	-9.36	-14.91	-26.89
Density of designated routes (miles per square mile)	2.03	2.19	2.15	0.71	1.53	1.57	-1.32	-0.66	-0.58
Decommissioned and closed routes (miles)	0.00	0.00	0.00	10.03	19.03	38.19	+10.03	+19.03	+38.19
Areas open to motorized vehicle use (acres)	214.04	334.94	749.73	0.00	0.00	0.00	-214.04	-334.94	-749.73
Motor vehicle use for big game retrieval (acres)	214.04	334.94	749.73	15.57	151.21	553.70	-198.47	-183.73	-196.03
Motor vehicle use for dispersed camping (acres)	214.04	334.94	749.73	78	84	104	-136.04	-250.94	-645.73
Personal use fuelwood gathering (acres)	903.00	2,150	6,716	166.39	307.93	636.90	-736.61	-1842.07	-6,079.1

Table 67. Alternative C – Effect Changes from Existing Conditions in Proposed Critical Habitat for Western Yellow-Billed Cuckoo by Analysis Factor

Analysis Factor	Existing Condition	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	28.04	19.47	-8.57
Density of designated routes (miles per square mile)	1.96	1.36	-0.6
Decommissioned and closed routes (miles)	0.00	9.24	+9.24
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	18.72	+18.72
Motor vehicle use for dispersed camping (acres)	0.00	75	+75.00
Personal use fuelwood gathering (acres)	760.00	105.42	-654.58

The effect of this alternative on a forest wide basis for yellow-billed cuckoo would be a reduction in designated roads and a substantial reduction in authorized cross-country motorized, motorized big game retrieval and motorized dispersed camping use within cuckoo potential habitat on the Forest. Alternative C would benefit the species compared to the current condition by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation.

No permit zones would be designated within potential cuckoo habitat. Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use, motorized big game retrieval and motorized dispersed camping would all be reduced under Alternative C.

For the seven analysis factors, Alternative C would have substantial reductions in route reduction, road density, and motorized dispersed camping in proposed habitat for yellow-billed cuckoo. Motor vehicle use for big game retrieval occurs under Alternative C which could lead to habitat alteration or degradation. Substantial reductions of motorized dispersed camp sites, and personal use fuelwood gathering (associated with motorized dispersed campsites) would occur within flycatcher potential and critical habitat. There would be over 10 miles of decommissioned roads in habitat 19 miles within 300 feet and 38 miles within 0.25 miles of cuckoo potential habitat. This reduction in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in 33 percent of habitat and 33 percent in overall road density.

Alternative C would largely benefit yellow-billed cuckoo by:

- Reducing motorized use in cuckoo habitat that results in indirect effects of habitat degradation.
- Reducing routes located within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in cuckoo habitat.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving cuckoo prey base and improve growth and regeneration of riparian.
- Reducing year round disturbance in potential and critical habitat caused by motorized disturbance during nesting and early fledging periods.

Overall Alternative C would benefit cuckoos by reducing access to and activity near nesting and forging sites, reducing disturbances to individuals and their habitat, but not to as great a degree as Alternative B.

On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at any one site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to cuckoo's in concentrated areas.

A substantial reduction of 87 percent from motorized travel for fuelwood gathering in potential cuckoo habitat on the Forest would occur.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall less cuckoo potential habitat would affected for the long term (ten or more years.), but to a lesser degree than Alternative C. This alternative would reduce the level of motorized recreation activities within potential and critical habitat bringing the level of use closer to that which was occurring prior to the cuckoo being listed.

For Alternative C, past actions and ongoing implementation such as travel management efforts on other forests inhabited by flycatchers will result in a cumulative effect of supporting the increase of primary constitute elements for critical habitat over the long term (ten or more years), similar to Alternative B.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a slight decrease in designated roads, and road density. Big game retrieval and dispersed camping use within potential yellow-billed cuckoo habitat on the Forest would be substantially increased under Alternative D and would negatively impact the species the most in regards the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation (Table 66 and Table 67).

Table 68. Alternative D – Effect Changes from Existing Condition in Western Yellow-Billed Cuckoo Potential Habitat

	Existing Condition			Alternative D			Change in Effects		
Analysis Factors	**In Habitat**	**300 Feet of Potential Habitat**	**0.25 Mile of Potential Habitat**	**In Habitat**	**300 Feet of Potential Habitat**	**0.25 Mile of Potential Habitat**	**In Habitat**	**300 Feet of Potential Habitat**	**0.25 Mile of Potential Habitat**
Routes designated for motor vehicle use (miles)	30.57	49.01	100.59	27.85	47.76	101.56	-2.72	-1.25	+0.97
Density of designated routes (miles per square mile)	2.03	2.19	2.15	1.85	2.14	2.17	-0.18	-0.05	+0.02
Decommissioned and closed routes (miles)	0.00	0.00	0.00	1.99	3.79	8.06	+1.99	+3.79	+8.06
Areas open to motorized vehicle use (acres)	214.04	334.94	749.73	285.41	331.87	569.83	+71.37	-3.07	-179.9
Motor vehicle use for big game retrieval (acres)	214.04	334.94	749.73	8,133.87	11,712.23	23,970.56	+7,919.83	+11,377.29	+23,220.83
Motor vehicle use for dispersed camping (acres)	214.04	334.94	749.73	1,579.21	2,676.41	5,575.10	+1,365.17	+2,341.47	+4,825.37
Personal use fuelwood gathering (acres)	903.00	2,150	6,716	903.17	2,149.81	6,724.24	+0.17	-0.19	+8.24

Table 69. Alternative D – Effect Changes from Existing Conditions in Proposed Critical Habitat for Western Yellow-Billed Cuckoo by Analysis Factor

Analysis Factor	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	28.04	25.32	-2.72
Density of designated routes (miles per square mile)	1.96	1.77	-0.19
Decommissioned and closed routes (miles)	0.00	1.99	+1.99
Areas open to motorized vehicle use (acres)	0.00	285.41	+285.41
Motor vehicle use for big game retrieval (acres)	0.00	7,728.61	+7,728.61
Motor vehicle use for dispersed camping (acres)	0.00	1,418.07	+1,418.07
Personal use fuelwood gathering (acres)	760.00	759.64	-0.36

The effect of this alternative on a forest wide basis for the yellow-billed cuckoo slightly increases the overall miles of roads from the existing condition and increases road density. Alternative D would impact the species the most by increasing impacts associated with noise disturbance from motor vehicles, disturbance due to human and increasing habitat degradation.

For the seven analysis factors, Alternative D would have slight increases in routes and road density in proposed habitat for the yellow-billed cuckoo. A moderate increase in areas open to motorized vehicle use acres for big game retrieval, and a substantial increase in motor vehicle use for big game retrieval and dispersed camping acres would occur for cuckoos under Alternative D. There would only 2 miles of decommissioned roads in habitat 4 miles within 300 feet and 8 miles within 0.25 miles of cuckoo habitat. Overall, however, there would be slight increase in number of designated routes and road density. The slight increase in roads and road density and moderate increase in areas open to motorized vehicles, motorized big game retrieval, and dispersed camping would increase the potential for noise disturbance and habitat alteration.

Alternative D would impact yellow-billed cuckoos and have a negative impact by:

- Increasing designated routes and road density use in cuckoo habitat that results in indirect effects of habitat degradation.
- Likely increasing routes and associated dispersed camping located within or adjacent to the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in cuckoo habitat.
- Possibly increasing levels of sediment and pollutants could improve water quality and lower water temperature, thus reducing cuckoo prey base and reducing growth and regeneration of riparian vegetation.
- Increasing year round disturbance in potential and critical habitat caused by motorized disturbance and dispersed campsites associated with motorized use during nesting and early fledging periods.

Overall, Alternative D would not benefit cuckoos by reducing access to and activity near nesting and forging sites or reducing disturbances to individuals and their habitat, and would have the overall greatest impact of the alternatives to cuckoos.

On roads that would remain, a slight increase in designated routes and a substantial increase in motorized dispersed camping is expected. Impacts at any one site are expected to be of short

duration and low intensity, however, the substantial increase for dispersed camping is expected to impact habitat and disturbance impacts associated with motorized use. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to cuckoos in concentrated areas.

Overall, this alternative would increase disturbance and habitat degradation from motorized use and access which would add to the long-term impacts of activities concentrated in isolated areas particularly with three of the seven analysis factors for areas open to motorized vehicle use, motorized big game retrieval, and motorized dispersed camping acres. Effects from noise and human disturbance are expected to be minimal to non-existent from motorized big game retrieval, because the hunting season would not overlap the breeding season for this species. However, habitat degradation could occur from the increased use by the trampling of vegetation and soil compaction. Overall, more cuckoo potential habitat would be affected for the long term (ten or more years.). This alternative would increase the level of motorized recreation activities within potential and critical habitat increasing the level of use from the current condition and surpassing use which was occurring prior to the cuckoo being listed.

For Alternative D past actions and ongoing implementation such as travel management efforts on other forests inhabited by cuckoos will result in a cumulative effect of supporting the increase of primary constitute elements for critical habitat over the long term (ten or more years). However, due to the potential increase of impacts under Alternative D on the Tonto National Forest, overall the cumulative reduction would be limited to other forests and private entities reducing impacts.

Yuma Clapper Rail

The Tonto National Forest is at the fringe of the Yuma clapper rail's range. Potential habitat is limited to approximately 40.53 acres of cattail habitat on Roosevelt Lake and areas immediately adjacent on the Salt River and Tonto Creek. No potential habitat for clapper rails is located in designated wilderness.

Methodology

In conjunction with the USFWS and former Tonto National Forest biologist Amyann Madara-Yagla, Tonto National Forest GIS data was refined in April 2015 to identify potential habitat. Potential habitat is considered all areas with cattails on and adjacent to Roosevelt Lake.

Formal Yuma clapper rail surveys have been conducted on the Tonto National Forest by Salt River Project (SRP) under Roosevelt Lake Conservation Program. Surveys are conducted for the Yuma clapper rail when conditions are conducive at the confluence of Tonto Creek and Roosevelt Lake to provide a minimum of 3 acres of habitat. Two Yuma clapper rails were detected in 2002 and a lone bird was detected in 2004. Since 2004, Salt River Project (SRP) has not conducted surveys due to reservoir fluctuations and the lack of the 3 acres minimum habitat requirement.

For analysis of Yuma clapper rail (clapper rail), changes in effects will be analyzed inside potential habitat, as well as 300 feet and a 0.25 mile of potential habitat. Roads within 300 feet of aquatic habitats are considered to be hydrologically connected to the adjacent stream or water body (U.S. Forest Service, 2010). The 0.25 mile buffer accounts for potential noise effects to nesting birds as a result of the proposed action.

Alternative A —Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition. Motorized use within or adjacent to Yuma clapper rail potential habitat has the potential to influence behavior, survival, reproduction and distribution of rails, as well as to alter habitat. Currently limited use to no use of the seven analysis factors in the 40.53 acres of potential Yuma clapper rail habitat on the forest would continue to have minimal effect to the rail (Table 70)[116].

Table 70. Alternative A – Existing Conditions in Yuma Clapper Rail Potential Habitat

	Existing Condition		
Analysis Factors	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat
Routes designated for motor vehicle use (miles)	0.07	0.32	4.90
Density of designated routes (miles per square mile)	1.17	0.65	1.58
Decommissioned and closed routes (miles)	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	0.00	0.00
Personal use fuelwood gathering (acres)	0.00	0.00	0.00

Alternatives B and C—Direct and Indirect Effects

Motorized use within or adjacent to Yuma clapper rail potential habitat has the potential to influence behavior, survival, reproduction and distribution of Yuma clapper rails, as well as to alter habitat. The effect of these alternatives on a forest wide basis would be minimal, so no change from the current condition is expected (Table 71 and Table 72). Current limited use to no use of the seven analysis factors in the 40.53 acres of potential Yuma clapper rail habitat on the forest would have discountable effects to the rail.

[116] The values calculated for retrieval under the proposed action include areas that have perennial water and would not be accessible by motorized vehicle. Since the amount of water can vary from year to year and season to season, these values represent the maximum area open under the driest conditions.

Table 71. Alternative B – Effect Changes from Existing Condition in Yuma Clapper Rail Potential Habitat

Analysis Factors	Existing Condition			Alternative B			Change in Effects		
	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat
Routes designated for motor vehicle use (miles)	0.07	0.32	4.90	0.00	0.28	2.88	-0.07	-0.04	-2.02
Density of designated routes (miles per square mile)	1.17	0.65	1.58	0.00	0.57	1.04	-1.17	-0.08	-0.54
Decommissioned and closed routes (miles)	0.00	0.00	0.00	0.07	0.28	4.06	+0.07	+0.28	+4.06
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00	+0.54
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 72. Alternative C – Effect Changes from Existing Condition in Yuma Clapper Rail Potential Habitat

Analysis Factors	Existing Condition			Alternative C			Change in Effects		
	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat
Routes designated for motor vehicle use (miles)	0.07	0.32	4.90	0.00	0.28	4.18	-0.07	-0.04	-0.72
Density of designated routes (miles per square mile)	1.17	0.65	1.58	0.00	0.57	1.52	-1.17	-0.08	-0.06
Decommissioned and closed routes (miles)	0.00	0.00	0.00	0.07	0.28	2.76	+0.07	+0.28	+2.76
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00	0.00	0.11	10.64	0.00	+0.11	+10.64
Motor vehicle use for dispersed camping (acres)	0.00	0.00	0.00	0	1	12	0.00	+1	+12
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis for Yuma clapper rail would be a slight to substantial increase in five of the seven analysis categories in designated roads, road density, areas open to motorized vehicle use, motor vehicle use for big game retrieval, motorized dispersed camping (Table 73). No change would occur for roads closed or for motorized fuelwood gathering. Motorized big game retrieval and motorized dispersed camping use within potential Yuma clapper rail habitat on the Forest would be substantially increased under Alternative D and would impact the species the most in regards the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation.

Table 73. Alternative D – Effect Changes from Existing Condition in Yuma Clapper Rail Potential Habitat

Analysis Factors	Existing Condition			Alternative D			Change in Effects		
	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat	In Habitat	300 Feet of Potential Habitat	0.25 Mile of Potential Habitat
Routes designated for motor vehicle use (miles)	0.07	0.32	4.90	0.07	0.53	6.21	0.00	+0.21	+1.31
Density of designated routes (miles per square mile)	1.17	0.65	1.58	1.17	1.08	2.26	0.00	+0.43	+0.68
Decommissioned and closed routes (miles)	0.00	0.00	0.00	0.00	0.03	0.72	0.00	+0.03	+0.72
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	15.73	76.35	138.38	+15.73	+76.35	+138.38
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00	40.52	313.13	1,762.39	+40.52	+313.13	+1,762.39
Motor vehicle use for dispersed camping (acres)	0.00	0.00	0.00	4.29	51.00	365.10	+4.29	+51.00	+365.10
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative effects for the Yuma clapper rail for all alternatives would be similar due to the limited habitat (40 acres) on the forest and reservoir fluctuates resulting in the lack of the three acres minimum habitat requirement, since 2004. In years where Roosevelt Lake water levels are conducive to producing clapper rail habitat the minimal habitat affected on the Tonto under all four alternatives would be considered discountable over the species range.

Reptiles: Affected Environment and Environmental Consequences

Narrow-headed gartersnake

Approximately 29,931 acres of potential habitat for narrow-headed gartersnake occurs on Cave Creek, Globe, Payson, Pleasant Valley, and Tonto Basin Ranger Districts. This includes portions of the East Verde, Salt, and Verde Rivers and Canyon, Haigler, Houston, and Tonto Creeks with 48 percent in the Hellsgate, Mazatzal, and Salt River Canyon wilderness areas. Populations are described as low to very low densities in potential habitat on the Tonto National Forest (79 FR 38677, Appendix A).

Alternative A- Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition. The 43.112 miles and 10,080 acres of motor vehicle use, motorized big game retrieval, and motorized dispersed camping within or adjacent to narrow-headed gartersnake potential habitat has the potential to continue to negatively influence behavior, survival, reproduction and distribution of narrow-headed gartersnakes, as well as to alter habitat (Table 74)[117]. Unrestricted cross-country travel on the Payson and Pleasant Valley Ranger Districts can affect narrow-headed gartersnakes by increasing access to riparian areas. This in turn can increase sedimentation into streams, causing damage to riparian vegetation, increasing the potential spread of nonnative aquatic organisms and diseases, and increase the potential for forest users to handle/collect gartersnakes.

Table 74. Alternative A: Existing Conditions in Potential Habitat for Narrow-Headed Gartersnake

Analysis Factor	Existing Condition
Routes designated for motor vehicle use (miles)	43.12
Density of designated routes (miles per square mile)	0.92
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	10,080
Motor vehicle use for big game retrieval (acres)	10,080
Motor vehicle use for dispersed camping (acres)	10,080
Personal use fuelwood gathering (acres)	9,453

This alternative would not close any existing roads or motorized trails. Approximately 43.12 miles of routes would be designated in potential narrow-headed gartersnake habitat (narrow-headed). With no change in the seven analysis factors for designated routes, decommissioned routes, road density, areas designated for motorized use, motorized big game retrieval, motorized dispersed camping, and motorized fuelwood gathering, motorized travel would continue to directly and indirectly cause localized disturbance to narrow-headed and potential habitat. With

[117] The values calculated for retrieval under the proposed action include areas that have perennial water and would not be accessible by motorized vehicle. Since the amount of water can vary from year to year and season to season, these values represent the maximum area open under the driest conditions.

this alternative, year round motorized use would continue to occur on within Narrow-headed potential habitat, resulting in direct effects from human disturbance from associated recreational activities (e.g. OHV use at basking or foraging sites) or indirectly through alteration of habitat caused by vegetation damage, vegetation removal for campfires, soil compaction, illegal user routes created and increased risk of wildland fire. Due to expected increases in levels of cross country OHV travel (due to projected increased human population), this alternative would allow the level of motorized recreational activities within critical habitat to increase, exceeding that which was occurring prior to the narrow-headed being listed.

Routes designated in potential narrow-headed habitat under Alternative A are located within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks. Increased levels could result in potential effects to narrow-headed gartersnakes and their prey through changes in water quality and temperature, fine sediments on river and creek bottoms, and growth and regeneration of riparian vegetation. Additionally, topography and vegetation would not provide a dampening effect of potential noise effects from designated routes on basking and hunting gartersnakes. There is also an increase in the potential of introducing invasive and non-native organisms into waterways at perennial stream crossings. One crossing is a current system road, with a hardened crossing, reducing the potential for effects at this location. While routes designated under the proposed action would have effects on narrow-headed and their habitats, nearly a quarter of potential habitat is located in wilderness where no routes would be designated and the 48 percent decrease in the miles of routes in potential habitat from existing conditions would reduce the magnitude of effects to narrow-headed gartersnakes.

Alternative A would increase habitat fragmentation by unmanaged motorized use and ongoing harvesting of woody products utilized for motorized dispersed campsites within narrow-headed habitat. Downed woody material providing cover for hunting and being preyed on along roads and campsites would be continued to be removed that pose a hazard reducing this primary constituent element. Unmanaged development of user-created dispersed campsites, roads, and trails could further alter narrow-headed potential habitat.

Alternative B—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a substantial reduction in authorized cross-country, motor vehicle use for big game retrieval, and motorized dispersed camping use within potential Narrow-headed gartersnake potential habitat on the Forest (Table 75). There would be a slight increase in miles of designated routes for motor vehicle use and acres for motorized fuelwood gathering. Alternative B would benefit the species by reducing the potential for noise disturbance from motorized vehicles, disturbance due to human presence (including handling of gartersnakes), reducing the potential spread of nonnative aquatic organisms and diseases, as well as habitat degradation in riparian areas and upland adjacent to riparian areas.

Table 75. Alternative B – Effect Changes from Existing Conditions in Potential Habitat for Narrow-headed Gartersnake by Analysis Factor

Analysis Factor	Existing Condition	Alternative B	Changes in Effects
Routes designated for motor vehicle use (miles)	43.12	44.92	+1.80
Density of designated routes (miles per square mile)	0.92	0.96	+0.04
Decommissioned and closed routes (miles)	0.00	0.12	+0.12
Areas open to motorized vehicle use (acres)	10,080	0.00	-10,080
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	10,080	2567.85	-7,512.15
Personal use fuelwood gathering (acres)	9,453	9,456.81	+3.81

For the seven analysis factors, Alternative B would have slight increases for designated routes, road density, motorized personal use firewood gathering, and substantial decreases for motorized dispersed camping in proposed critical habitat for narrow-headed gartersnake. No motor vehicle use for big game retrieval occurs under Alternative B and no permit zones would be designated within potential narrow-headed habitat which could lead to reduced habitat alteration or degradation. Substantial reductions of acres of motorized dispersed camping, and personal use fuelwood gathering (associated with motorized dispersed campsites) would occur within narrow-headed potential habitat. There would be an increase of 0.12 miles of roads in narrow-headed habitat. This slight increase in roads, motorized trails, and motorized personal use fuelwood gathering would be expected to have discountable effects to the potential for direct human disturbance. The reduction in motorized dispersed camping and big game retrieval reduces habitat alteration in 75 percent of habitat in dispersed camping areas and 100 percent in regards to retrieval.

Alternative B would largely benefit narrow-headed gartersnake by:

- Overall reducing motorized use in narrow-headed habitat that results in reduction of habitat degradation.
- Reducing dispersed camping and no motorized retrieval and associated activities of these analysis factors within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in narrow-headed habitat.
- Reducing motorized dispersed camping which reduces the potential for forest users handling snakes and interrupting their feeding behavior.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving narrow-headed prey base and improve growth and regeneration of riparian.
- Reducing the potential for introduced aquatic organisms and diseases.
- Reducing year round disturbance in potential habitat caused by motorized use.

Overall Alternative B would benefit narrow-headed by reducing access to and activity near basking and forging (gartersnake hunting) sites, and reducing disturbances to individuals and their habitat.

On roads that would remain dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at anyone site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to narrow-headed in concentrated areas.

A slight increase potential narrow-headed habitat on the Forest impacted by cross-country motorized travel for fuelwood gathering would occur. This is expected to have a discountable effect on narrow-headed gartersnakes.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall, less narrow-headed gartersnake potential and critical habitat would be affected for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within potential habitat maintaining or reducing the level of that which was occurring prior to the narrow-headed being listed.

The Alternative would result in beneficial cumulative effects of reducing impacts to riparian vegetation and sedimentation into narrow-headed gartersnake habitat when combined with similar travel management efforts on the Coconino, Prescott, and Apache-Sitgreaves and with vegetation management projects designed to reduce long-term sediment impacts from wildfire by reducing fire risk. This alternative could also slightly counteract the potential for impacts from climate change including prolonged drought and increased competiveness of nonnative species by reducing impacts on riparian vegetation and increasing the resilience of the system to disturbances.

Alternative C—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a substantial reduction in authorized motorized cross-country, dispersed camping, and personal use fuelwood gathering within potential Narrow-headed potential habitat on the Forest (Table 76). There would be a slight decrease in miles of designated routes for motor vehicle use. Alternative C, compared to Alternatives A and D, would benefit the species by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation through the motorized removal of fuelwood. The benefits of Alternative C in comparison to Alternative B would be similar for the narrow-headed gartersnake.

Table 76. Alternative C – Effect Changes from Existing Conditions in Potential Habitat for Narrow-headed Gartersnake by Analysis Factor

Analysis Factor	Existing Condition	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	43.12	39.07	-4.05
Density of designated routes (miles per square mile)	0.92	0.84	-0.08
Decommissioned and closed routes (miles)	0.00	5.98	+5.98
Areas open to motorized vehicle use (acres)	10,080	0.00	-10,080
Motor vehicle use for big game retrieval (acres)	10,080	9,544.93	-535.07
Motor vehicle use for dispersed camping (count)	0.00	78	+78
Personal use fuelwood gathering (acres)	9,453	1,534.27	-7,918.73

No permit zones would be designated within potential narrow-headed habitat. Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use, motorized big game retrieval, and motorized dispersed camping would all be reduced under Alternative C.

For the seven analysis factors, the effects of Alternative C would have slight reductions for route reduction, road density, and motor vehicle use for big game retrieval in proposed habitat for narrow-headed gartersnake. Substantial reductions of motorized dispersed campsites, and personal use fuelwood gathering (associated with motorized dispersed campsites) would occur within narrow-headed potential habitat. There would be over five miles of decommissioned roads in narrow-headed potential habitat. This reduction in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in ten percent of habitat and nine percent in overall road density.

Alternative C would largely benefit narrow-headed gartersnake by:

- Overall reducing motorized use in narrow-headed habitat that results in reduction of habitat degradation.
- Reducing dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in narrow-headed habitat.
- Reducing motorized dispersed camping which reduces the potential for forest users handling snakes and interrupting their feeding behavior.
- Reducing levels of sediment and pollutants which could improve water quality and lower water temperature, thus improving narrow-headed prey base and improve growth and regeneration of riparian.
- Reducing the potential for introduced aquatic organisms and diseases.
- Reducing year round disturbance caused by motorized use in potential habitat.

Overall, Alternative C would benefit narrow-headed gartersnake by reducing access to and activity near basking and foraging sites by reducing motorized dispersed campsites, reducing disturbances to individuals and their habitat to a slightly greater degree than Alternative B.

On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at anyone site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to narrow-headed in concentrated areas.

There would be an 84 percent reduction in potential narrow-headed gartersnake habitat on the Forest impacted by cross-country motorized travel for fuelwood gathering.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall less narrow-headed potential habitat would be affected for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within potential habitat reducing the level of use closer to that which was occurring prior to the narrow-headed being listed.

Cumulative beneficial effects of Alternative C would be similar to Alternative B. Any differences in cumulative effects between the two alternatives would be discountable.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a slight increase in number of designated roads, road density, and total miles of routes, motorized personal use fuelwood gathering and a substantial reduction in acres of motorized dispersed camping within Narrow-headed gartersnake potential habitat (Table 77). A moderate increase would occur in acres of motorized big game retrieval, increasing the risk of vehicle injury to the Narrow-headed gartersnake. Alternative D, overall, would slightly benefit the species by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation, but not to as great of a degree as Alternatives B and C.

Table 77. Alternative D – Effect Changes from Existing Conditions in Potential Habitat for Narrow-headed Gartersnake by Analysis Factor

Analysis Factor	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	43.12	44.92	+1.8
Density of designated routes (miles per square mile)	0.92	0.96	+0.04
Decommissioned and closed routes (miles)	0.00	0.12	+0.12
Areas open to motorized vehicle use (acres)	10,080	0.00	-10,080
Motor vehicle use for big game retrieval (acres)	10,080	13,203.33	+3,123.33
Motor vehicle use for dispersed camping (acres)	10,080	2567.85	-7,512.15
Personal use fuelwood gathering (acres)	9,453	9,456.81	+3.81

No motorized permit zones would be designated within potential narrow-headed habitat. Routes and density of routes designated for motor vehicle use would slightly increase under Alternative D. The miles of decommissioned routes, permitted areas open to motorized vehicle use, and motorized dispersed camping would all be reduced under Alternative D. A moderate increase in

motorized big game retrieval of 24 percent would occur and a slight increase in fuelwood gathering accessed by motorized use.

For the seven analysis factors, no motorized permit zones would be designated within potential narrow-headed habitat. Routes and density of routes designated for motor vehicle use would slightly increase under Alternative D. The miles of decommissioned routes, permitted areas open to motorized vehicle use, and motorized dispersed camping would all be reduced under Alternative D. A moderate increase in motorized big game retrieval of 24 percent would occur and a slight increase in fuelwood gathering accessed by motorized use. There would be over 0.12 miles of decommissioned roads in narrow-headed potential habitat. This increase in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in four percent of habitat and four percent in overall road density.

Alternative D would benefit narrow-headed gartersnake in some of the seven analysis factors and have a negative effect in others by:

- Overall a slight increase motorized use and fuelwood gathering provided by motorized access in narrow-headed habitat that could results in an increase of habitat degradation in some areas.
- Reducing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in narrow-headed habitat.
- Reducing motorized dispersed camping reduces the potential for forest users handling snakes and interrupting their feeding behavior.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving narrow-headed prey base and improve growth and regeneration of riparian vegetation.
- Reducing the potential for introduced aquatic organisms and diseases.
- Reducing year round disturbance in potential habitat caused by motorized use, but increasing the seasonal use acres for motorized retrieval.

Overall Alternative D would benefit narrow-headed by reducing access to and activity near basking and foraging sites in reducing motorized dispersed campsites, reducing disturbances to individuals and their habitat, but to a lesser degree than Alternative B and C.

On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at any one site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to narrow-headed in concentrated areas.

There would be a one percent increase in potential narrow-headed gartersnake habitat on the Forest impacted by cross-country motorized travel for fuelwood gathering.

Overall, the cumulative impacts for this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of

activities concentrated in isolated areas. Overall less narrow-headed potential habitat would be affected for the long term (ten or more years.). This alternative would reduce the overall level of motorized recreation activities within potential habitat reducing the level of use closer to that which was occurring prior to the narrow-headed being listed.

Northern Mexican Gartersnake

Approximately 14,129 acres of potential habitat for northern Mexican gartersnake occurs on the Cave Creek, Globe, Payson, and Tonto Basin Ranger Districts along the Verde River and Tonto Creek with nearly 53 percent in the Hellsgate and Mazatzal wilderness areas. Populations are described as low density in the Verde River and extant in Tonto Creek (79 FR 38677, Appendix A).

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition. The 12.34 miles and 1,176 acres of cross country motor vehicle use, big game retrieval, and dispersed camping within or adjacent to Northern Mexican gartersnake potential habitat has the potential to continue to negatively influence behavior, survival, reproduction, and distribution of narrow-headed gartersnakes, as well as to alter habitat (Table 78)[118]. Unrestricted cross-country travel on the Payson and Pleasant Valley Ranger Districts can affect Northern Mexican gartersnakes by increasing access to riparian areas. This in turn can increase sedimentation into streams, causing damage to riparian vegetation, increasing the potential spread of nonnative aquatic organisms and diseases, and increasing the potential for forest users to handle or collect gartersnakes.

Table 78. Alternative A – Existing Conditions in Potential Habitat for Northern Mexican Gartersnake

Analysis Factor	Existing Condition
Routes designated for motor vehicle use (miles)	12.34
Density of designated routes (miles per square mile)	0.56
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	1,176
Motor vehicle use for big game retrieval (acres)	1,176
Motor vehicle use for dispersed camping (acres)	1,176
Personal use fuelwood gathering (acres)	1,107

This alternative would not close any existing roads or motorized trails. Approximately 43.12 miles of routes would be designated in potential Northern Mexican gartersnake habitat (Mexican). With no change in the seven analysis factors for designated routes, decommissioned routes, road density, areas designated for motorized use, motorized big game retrieval, motorized dispersed camping, and motorized fuelwood gathering, motorized travel would continue to directly and indirectly cause localized disturbance to narrow-headed and potential habitat. With this alternative, year round motorized use would continue to occur on within Mexican potential habitat, resulting in direct effects from human disturbance from associated recreational activities (e.g. OHV use at basking and foraging sites) or indirectly through alteration of habitat caused by

[118] The values calculated for retrieval under the proposed action include areas that have perennial water and would not be accessible by motorized vehicle. Since the amount of water can vary from year to year and season to season, these values represent the maximum area open under the driest conditions.

vegetation damage, vegetation removal for campfires, soil compaction, illegal user routes created and increased risk of wildland fire. Due to expected increases in levels of cross country OHV travel (due to projected increased human population), this alternative would allow the level of motorized recreational activities within critical habitat to increase, exceeding that which was occurring prior to the Mexican being listed.

Routes designated in potential Northern Mexican gartersnake habitat under Alternative A are located within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks. Increased levels could result in potential effects to Mexican gartersnakes and their prey through changes in water quality and temperature, fine sediments on river and creek bottoms, and growth and regeneration of riparian vegetation. Additionally, topography and vegetation would not provide a dampening effect of potential noise effects from designated routes on basking and hunting gartersnakes. There is also an increase in the potential of introducing invasive and non-native organisms into waterways at perennial stream crossings. One crossing is a current system road, with a hardened crossing, reducing the potential for effects at this location. While routes designated under the proposed action would have effects to Mexican and their habitats, nearly a quarter of potential habitat is located in wilderness where no routes would be designated and the 53 percent decrease in the miles of routes in potential habitat from existing conditions would reduce the magnitude of effects to Mexican gartersnakes.

Alternative A would increase habitat fragmentation by unmanaged motorized use and ongoing harvesting of woody products utilized for motorized dispersed campsites within narrow-headed habitat. Downed woody material providing cover for hunting and being preyed on for narrow-headed along roads and campsites would be continued to be removed that pose a hazard reducing this primary constituent element. Unmanaged development of user-created motorized dispersed campsites, roads, and trails could further alter Mexican potential habitat.

This alternative would result in cumulative impacts to Mexican gartersnakes by degradation of riparian habitat and potential spread of nonnative species, expected increase in recreational areas that could further later gartersnake behavior.

Alternative B—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a substantial reduction in motor vehicle use for big game retrieval and motorized dispersed camping within potential Northern Mexican gartersnake potential habitat on the Forest (Table 79). There would be a slight decrease in miles of designated routes for motor vehicle use, road density, and miles of closed routes. Alternative B and would benefit the species by reducing the potential for noise disturbance from motorized vehicles, disturbance due to human presence (including handling of gartersnakes), reducing the potential spread of nonnative aquatic organisms and diseases, as well as habitat degradation in riparian areas and upland adjacent to riparian areas.

Table 79. Alternative B – Effect Changes from Existing Conditions in Potential Habitat for Northern Mexican Gartersnake by Analysis Factor

Analysis Factor	Existing Condition	Alternative B	Changes in Effects
Routes designated for motor vehicle use (miles)	12.34	9.72	-2.62
Density of designated routes (miles per square mile)	0.56	0.44	-0.12
Decommissioned and closed routes (miles)	0.00	3.71	+3.71
Areas open to motorized vehicle use (acres)	1,176	0.00	-1,176
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	1,176	0.18	-1,175.82
Personal use fuelwood gathering (acres)	1,107	169.50	-937.50

For Alternative B, there would be five permit zones where motorized vehicles stay on designated routes and cannot travel cross-country. No permit zones would be designated within potential Mexican habitat. Areas open to motorized vehicle use and motorized dispersed camping would all substantially be reduced under Alternative B.

For the seven analysis factors, the effects of Alternative B would have slight increases for designated routes, road density, motorized personal use firewood gathering, and substantial decreases for motorized dispersed camping, and in proposed critical habitat for Mexican gartersnake. No motor vehicle use for big game retrieval occurs under Alternative B, increasing further reductions which could lead to habitat alteration or degradation. Substantial reductions of acres of motorized dispersed camping, and personal use fuelwood gathering (associated with motorized dispersed campsites) would occur within Mexican potential habitat. There would be an increase of .12 miles of roads in Mexican habitat. This slight increase in roads, motorized trails, and motorized personal use fuelwood gathering would be expected to have discountable effects the potential for direct human disturbance. The reduction in motorized dispersed camping and game retrieval reduces habitat alteration in 75 percent of habitat in dispersed camping areas and 100 percent in regards to retrieval.

Alternative B would largely benefit Mexican gartersnake by:

- Overall reducing motorized use in Mexican habitat that results in reduction of habitat degradation.
- Reducing dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in Mexican habitat.
- Reducing dispersed camping which reduces the potential for forest users handling snakes and interrupting their feeding behavior.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving narrow-headed prey base and improve growth and regeneration of riparian.
- Reducing the potential for introduced aquatic organisms and diseases.
- Reducing year round disturbance in potential habitat caused by motorized use

Overall, Alternative B would benefit Mexican gartersnake by reducing access to and activity near basking and gartersnake hunting sites, reducing disturbances to individuals and their habitat.

On roads that would remain motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at any one site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to Mexican in concentrated areas.

A slight increase potential Mexican gartersnake habitat on the Forest impacted by motorized travel for fuelwood gathering would occur. This is expected to have a discountable effect on Mexican gartersnakes.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall less Mexican gartersnake potential and critical habitat would be affected for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within potential habitat maintaining or reducing the level of that which was occurring prior to the Mexican gartersnake being listed.

The Alternative would result in beneficial cumulative effects of reducing impacts to riparian vegetation and sedimentation into Northern Mexican gartersnake habitat when combined with similar travel management efforts on the Coconino, Prescott, and Apache-Sitgreaves National Forests and with vegetation management projects designed to reduce long-term sediment impacts from wildfire by reducing fire risk. This alternative could also slightly counteract the potential for impacts from climate change including prolonged drought and increased competiveness of nonnative species by reducing impacts on riparian vegetation and increasing the resilience of the system to disturbances.

Alternative C—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a substantial reduction in acres open to motorized vehicle use, motorized dispersed camping, and motorized personal use fuelwood gathering within potential Northern Mexican gartersnake potential habitat on the Forest (Table 80). There would be a slight decrease in miles of designated routes for motor vehicle use and an increase in motor vehicle use for big game retrieval. Alternative C would benefit the species by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as reducing habitat degradation through the removal of fuelwood.

Table 80. Alternative C – Effect Changes from Existing Conditions in Potential Habitat for Northern Mexican Gartersnake by Analysis Factor

Analysis Factor	Existing Condition	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	12.34	11.59	-0.75
Density of designated routes (miles per square mile)	0.56	0.52	-0.04
Decommissioned and closed routes (miles)	0.00	1.85	+1.85
Areas open to motorized vehicle use (acres)	1,176	0.00	-1,176.0
Motor vehicle use for big game retrieval (acres)	1,176	1,505.01	+329.01
Motor vehicle use for dispersed camping (count)	0.00	17	+17
Personal use fuelwood gathering (acres)	1,107	174.36	-932.64

No permit zones would be designated within potential Northern Mexican gartersnake habitat. Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use, motorized big game retrieval and motorized dispersed camping would all be reduced under Alternative C.

For the seven analysis factors, the effects of Alternative C would have slight reductions for route reduction and road density in proposed habitat for Northern Mexican gartersnake. Substantial reductions of motorized dispersed campsites, and personal use fuelwood gathering (often associated with motorized dispersed campsites) would occur within Mexican gartersnake potential habitat. There would be approximately 2 miles of decommissioned roads in Mexican potential habitat. This reduction in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in six percent of habitat and seven percent in overall road density.

Alternative C would largely benefit Northern Mexican gartersnake by:

- Overall reducing motorized use in Mexican habitat that results in reduction of habitat degradation.
- Reducing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in Mexican habitat.
- Reducing motorized dispersed camping which reduces the potential for forest users handling snakes and interrupting their feeding behavior.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving narrow-headed prey base and improve growth and regeneration of riparian.
- Reducing the potential for introduced aquatic organisms and diseases.
- Reducing year round disturbance in potential habitat caused by motorized use.

Overall, Alternative C would benefit Northern Mexican gartersnake by reducing access to and activity near basking and foraging sites by reducing motorized dispersed campsites, reducing disturbances to individuals and their habitat to a slightly lesser degree than Alternative B.

On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at anyone site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to Mexican in concentrated areas.

There would be an 84 percent reduction in potential Northern Mexican gartersnake habitat on the Forest impacted by cross-country motorized travel for fuelwood gathering.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall less Mexican potential habitat would be affected for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within potential

habitat reducing the level of use closer to that which was occurring prior to the Mexican gartersnake being listed.

Cumulative beneficial effects would be similar to Alternative B for Alternative C. Any differences in cumulative effects between the two alternatives would be discountable.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a slight increase in designated roads, density, and personal use fuelwood gathering (Table 81). A substantial increase in acres of motorized dispersed camping within Northern Mexican gartersnake potential habitat and an increase in acres of motorized big game retrieval would occur, increasing the risk of vehicle injury to the Northern Mexican gartersnake. Alternative D, overall, would benefit the species by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as reducing habitat degradation, but not to as great of a degree as Alternatives B and C.

Table 81. Alternative D – Effect Changes from Existing Conditions in Potential Habitat for Northern Mexican Gartersnake by Analysis Factor

Analysis Factor	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	12.34	13.43	+1.09
Density of designated routes (miles per square mile)	0.56	0.61	+0.05
Decommissioned and closed routes (miles)	0.00	0.00	0.00
Areas open to motorized vehicle use (acres) Permit Zones	1,176	0.00	-1,176.00
Motor vehicle use for big game retrieval (acres)	1,176	5,545.09	+4,369.9
Motor vehicle use for dispersed camping (acres)	1,176	832.83	-343.17

Routes and density of routes designated for motor vehicle use would slightly increase under Alternative D. The acres of permitted areas open to motorized vehicle use, and motorized dispersed camping would all be reduced under Alternative D. A moderate increase in motorized big game retrieval of 21 percent would occur and a slight increase in fuelwood gathering accessed by motorized use.

For the seven analysis factors, no motorized permit zones would be designated within potential narrow-headed habitat. Routes and density of routes designated for motor vehicle use would slightly increase under Alternative D. Permitted areas open to motorized vehicle use, and motorized dispersed camping would all be reduced under Alternative D. A moderate increase in motorized big game retrieval of 24 percent would occur and a slight increase in fuelwood gathering accessed by motorized use. There would be over 0.12 miles of decommissioned roads in Northern Mexican gartersnake potential habitat. This increase in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in four percent of habitat and four percent in overall road density.

- Alternative D would benefit Mexican gartersnake in some of the seven analysis factors and have a negative effect in others by:

- Overall a slight increase motorized use and fuelwood gathering provided by motorized access in Mexican habitat that could results in an increase of habitat degradation in some areas.
- Reducing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in Mexican habitat.
- Reducing motorized dispersed camping which reduces the potential for forest users handling snakes and interrupting their feeding behavior.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving Mexican prey base and improve growth and regeneration of riparian.
- Reducing the potential for introduced aquatic organisms and diseases.
- Reducing year round disturbance in potential habitat caused by motorized use, but increasing the seasonal use acres for retrieval.

Overall, Alternative D would benefit narrow-headed by reducing access to and activity near basking and foraging sites in reducing motorized dispersed campsites, reducing disturbances to individuals and their habitat, but to a lesser degree than Alternative B and C.

On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at anyone site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to narrow-headed in concentrated areas.

There would be a one percent increase in potential narrow-headed gartersnake habitat on the Forest impacted by cross-country motorized travel for fuelwood gathering.

For cumulative effects, overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Less narrow-headed potential habitat would be affected for the long term (ten or more years.). This alternative would reduce the overall level of motorized recreation activities within potential habitat reducing the level of use closer to that which was occurring prior to the narrow-headed being listed.

Sonoran Desert Tortoise

Approximately 1,016,735 acres of potential habitat for Sonoran desert tortoise (SDT) occurs on Cave Creek, Globe, Payson, and Tonto Basin Ranger Districts, including approximately 822,197 acres of desert communities and semi-desert grasslands potential natural vegetation types. Approximately twenty percent of potential habitat for the species is in the Four Peaks, Mazatzal, Salome, and Superstition wilderness areas.

On October 5, 2015 the US Fish and Wildlife Service made a finding to remove the Sonoran desert tortoise from the Endangered Species Act candidate list. This finding, proposed to be finalized at a later date, is the result of long-term commitments by federal agencies under an interagency agreement (the Tonto National Forest is a signatory), and Arizona Game and Fish

Department to address the primary threats to the tortoise. The completion of a comprehensive status assessment reviewing the primary threats was completed by the US Fish and Wildlife Service to reach this determination.

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition. The 1,769.03 miles and 287,379 acres of motorized personal fuelwood gathering allowed within to Sonoran desert tortoise potential habitat has the potential to continue to influence behavior, survival, reproduction, and distribution of Sonoran desert tortoise, as well as to alter habitat (Table 82). The current condition would continue if Alternative A was implemented, so no new effects would occur. However, the Sonoran Desert Conservation Agreement primary threats would not be addressed and the Tonto National Forest would not be in compliance in reducing the primary threats in the conservation agreement. The primary threats to SDT in Arizona on public lands are habitat destruction, fragmentation, and degradation. Causes of these threats include, but are not limited to: Invasive nonnative plant establishment; an altered fire regime; human-constructed barriers to movement; and off-road vehicle use. If Alternative A were chosen management to reduce the primary threats associated with motorized use would be difficult to comply with under the agreement. The over a million acres of potential habitat on the Forest could be comprised to a large enough degree to re-examine the tortoise for listing.

Table 82. Alternative A – Existing Conditions in Potential Habitat for Sonoran Desert Tortoise

Analysis Factor	Existing Condition
Routes designated for motor vehicle use (miles)	1,769.03
Density of designated routes (miles per square mile)	1.11
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	0.00
Motor vehicle use for big game retrieval (acres)	0.00
Motor vehicle use for dispersed camping (acres)	0.00
Personal use fuelwood gathering (acres)	287,379

Alternative B—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a reduction in motor vehicle use miles and road density for Sonoran desert tortoise potential habitat on the Forest (Table 83). Over 840 miles of roads in tortoise habitat would be decommissioned. There would be a substantial decrease in personal use fuelwood acres accessed by motorized use where downed debris provides cover from predators for tortoises. There would be a substantial increase in designated routes within habitat, which is partially offset by routes planned for closure. No change from the existing condition under the seven analysis factors would occur for acres open to motorized vehicle use or big game retrieval. Alternative B would benefit the species the most by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as reducing potential habitat degradation. Motorized use within or adjacent to Sonoran desert tortoise potential habitat has the potential to influence behavior, survival, reproduction and distribution of Sonoran desert tortoise, as well as to alter habitat.

Table 83. Alternative B – Effect Changes from Existing Conditions in Potential Habitat for Sonoran Desert Tortoise by Analysis Factor

Analysis Factor	Existing Condition	Alternative B	Changes in Effects
Routes designated for motor vehicle use (miles)	1,769.03	1,097.35	-671.68
Density of designated routes (miles per square mile)	1.11	0.69	-0.42
Decommissioned and closed routes (miles)	0.00	843.15	+843.15
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	21.74	+21.74
Personal use fuelwood gathering (acres)	287,379	28,246.68	-259,132.32

For the seven analysis factors, the effects of Alternative B would have slight decrease of designated routes, road density, slight increase in motorized dispersed camping, and a substantial decrease in motorized personal use firewood gathering in the potential habitat for Sonoran Desert Tortoise (tortoise). No motor vehicle use for big game retrieval occurs under Alternative B, further reducing habitat alteration or degradation. Substantial reductions in personal use fuelwood gathering (associated with motorized dispersed campsites) would occur within tortoise potential habitat. There would be a decrease of over 671 miles of roads in tortoise habitat. This decrease in roads, motorized trails, and motorized personal use fuelwood gathering would be expected to have beneficial effects by reducing potential for direct human disturbance.

Alternative B would largely benefit Sonoran desert tortoise by:

- Overall reducing motorized use in tortoise habitat that results in a direct effect of tortoises run over by motorized vehicles and indirect effects of habitat degradation.
- Reducing year round disturbance in potential habitat caused by unauthorized motorized use.
- Reducing the potential for the handling of tortoises by humans which could introduce organisms and diseases.

Overall, Alternative B would benefit tortoise by reducing access to and activity near burrows and forging sites and reducing disturbances to individuals and their habitat.

On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at anyone site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to SDT in concentrated areas.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall, less Sonoran desert tortoise habitat would be affected for the long term (ten or more years.).

The Alternative would result in beneficial cumulative effects of reducing impacts to desert vegetation in SDT habitat when combined with similar travel management efforts on the Coconino and Prescott National Forests as well as vegetation management projects designed to reduce long-term impacts from wildfire by reducing fire risk. This alternative could also slightly counteract the potential for impacts from climate change including prolonged drought and increased competiveness of nonnative species by reducing impacts on desert vegetation and increasing the resilience of the system to disturbances. This alternative would reduce the level of motorized recreation activities within potential habitat maintaining or reducing the level of which was occurring prior to the Sonoran desert tortoise becoming a candidate species.

Alternative C—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a reduction in motor vehicle use miles and road density in Sonoran desert tortoise potential habitat on the Forest (Table 84). Over 249 miles of roads in tortoise habitat would be decommissioned. There would be a substantial decrease in personal use fuelwood acres accessed by motorized use. There would be a moderate decrease in designated routes within habitat, which is partially offset by routes planned for closure. Motorized retrieval would be limited to hunting season and therefore, not have as great of a degree of impact as year round cross-country motorized use would. Alternative C would benefit the species, but to a lesser degree than Alternative B, by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as reducing potential habitat degradation. Motorized use within or adjacent to Sonoran desert tortoise potential habitat has the potential to influence behavior, survival, reproduction and distribution of Sonoran desert tortoise, as well as to alter habitat.

Table 84. Alternative C – Effect Changes from Existing Conditions in Potential Habitat for Sonoran Desert Tortoise by Analysis Factor

Analysis Factor	Existing Condition	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	1,769.03	1,519.24	-249.79
Density of designated routes (miles per square mile)	1.11	0.96	-0.15
Decommissioned and closed routes (miles)	0.00	448.59	+448.59
Areas open to motorized vehicle use (acres)	0.00	738.21	+738.21
Motor vehicle use for big game retrieval (acres)	0.00	156,423.49	+156,423.49
Motor vehicle use for dispersed camping (acres)	0.00	784	+784
Personal use fuelwood gathering (acres)	287,379	33,633.70	-253,745.3

For the seven analysis factors, the effects of Alternative C would have slight decrease of designated routes, road density, slight increase in motorized dispersed camping, and a substantial decrease in motorized personal use firewood gathering potential habitat for SDT. An increase in permitted motorized vehicle use acres and a substantial increase in motorized retrieval would occur under this Alternative. Substantial reductions in personal use fuelwood gathering (associated with motorized dispersed campsites) would occur within tortoise potential habitat. There would be a decrease of over 249 miles of roads in tortoise habitat. This decrease in roads, motorized trails, and motorized personal use fuelwood gathering would be expected to have beneficial effects in reducing potential for direct human disturbance, outweighing the increases in areas permitted for motor vehicle use and motorized big game retrieval.

Alternative C would largely benefit Sonoran desert tortoise by:

- Overall reducing motorized use in tortoise habitat that results in a direct effect of tortoises run over by motorized vehicles and indirect effects of habitat degradation.
- Reducing year round disturbance in potential habitat caused by unauthorized motorized use.
- Reducing the potential for the handling of tortoises by humans which could introduce organisms and diseases.
- Overall, Alternative C would benefit tortoise by reducing access to and activity near burrows and forging sites, reducing disturbances to individuals and their habitat.
- On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at any one site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to tortoise in concentrated areas.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Less Sonoran desert tortoise habitat would be affected for the long term (ten or more years.).

The Alternative would result in beneficial cumulative effects of reducing impacts to desert vegetation in SDT habitat when combined with similar travel management efforts on the Coconino and Prescott National Forests as well as with vegetation management projects designed to reduce long-term impacts from wildfire by reducing fire risk. This overall reduction would be similar, but to a lesser degree than Alternative B. This alternative could also slightly counteract the potential for impacts from climate change including prolonged drought and increased competiveness of nonnative species by reducing impacts on desert vegetation and increasing the resilience of the system to disturbances. This alternative would reduce the level of motorized recreation activities within potential habitat maintaining or reducing the level of which was occurring prior to the Sonoran desert tortoise becoming a candidate species.

Alternative D—Direct and Indirect Effects

There are substantial increases in miles of routes, areas open for motor vehicle use, big game retrieval, and dispersed camping within potential Sonoran desert tortoise potential habitat under Alternative D (Table 85). The Tonto National Forest, with large portions of desert habitat within the forest boundaries, provides a large portion of habitat for the Sonoran desert tortoise across the species range. Implementation of Alternative D would not be in keeping of the conservation measures within the Sonoran desert tortoise Candidate Conservation agreement that the Tonto National Forest is a signatory partner, by reducing the primary threats identified in the conservation agreement. The primary threats to SDT in Arizona on public lands are habitat destruction, fragmentation, and degradation. Causes of these threats include, but are not limited to: invasive nonnative plant establishment, an altered fire regime, human-constructed barriers to movement, and off-road vehicle use. If Alternative D were chosen management to reduce the primary threats associated with motorized use would be difficult to comply with under the agreement as motorized use would be expected to increase. The over a million acres of potential habitat on the Forest could be comprised to a large enough degree to re-examine the tortoise for listing.

Table 85. Alternative D – Effect Changes from Existing Conditions in Potential Habitat for Sonoran Desert Tortoise by Analysis Factor

Analysis Factor	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	1,769.03	1,824.02	+54.99
Density of designated routes (miles per square mile)	1.11	1.15	+0.04
Decommissioned and closed routes (miles)	0.00	96.86	+96.86
Areas open to motorized vehicle use (acres)	0.00	1,759.06	+1,759.06
Motor vehicle use for big game retrieval (acres)	0.00	669,398.22	+669,398.22
Motor vehicle use for dispersed camping (acres)	0.00	108,740.72	+108,740.72
Personal use fuelwood gathering (acres)	287,379	287,379	0.0

For the seven analysis factors, the effects of Alternative D would have slight increase for designated routes, road density, and a substantial increase in dispersed camping, permitted motorized vehicle use acres and big game retrieval would occur under this Alternative. No change in personal use fuelwood gathering by motorized access (associated with dispersed campsites) would occur within tortoise potential habitat. There would be a decrease of over 249 miles of roads in tortoise habitat. This increase in roads, motorized trails, and motorized personal use fuelwood gathering would be expected to have negative effects in reducing potential for direct human disturbance, and habitat degradation.

Alternative D would largely have negative effects on Sonoran desert tortoise by:

- Overall increasing motorized use in tortoise habitat that results in a direct effect of tortoises run over by motorized vehicles and indirect effects of habitat degradation.
- Increasing permitted motorized use areas in tortoise habitat year.
- Increasing the potential for the handling of tortoises by humans which could introduce organisms and diseases.

Overall, Alternative D would have negative impacts to tortoises by increasing access to and activity near burrows and forging sites, thus, increasing disturbances to individuals and their habitat. More Sonoran desert tortoise habitat would be affected for the long term (ten or more years) than under Alternative B and C and would be similar to the current condition.

The Alternative would result in negative cumulative effects of increasing impacts to desert vegetation in the over a million acres of tortoise habitat on the Tonto National Forest, when combined with similar travel management efforts on the Coconino and Prescott National Forests. Risk of human caused wildfire would increase with increased motorized dispersed camping and motorized access. This alternative would increase the level of motorized recreation activities within potential habitat maintaining or reducing the level which was occurring prior to the Sonoran desert tortoise becoming a candidate species.

Amphibians: Affected Environment and Environmental Consequences

Chiricahua Leopard Frog

Chiricahua leopard frogs (CLF) are currently known to occur only on the Payson and Pleasant Valley Ranger Districts. Since 1998, they have been detected in and released at over 30 sites in creeks, springs, and stock tanks in both Management Areas. Potential habitat for the species in

this document is defined as all sites where CLF has been detected or released since 1998, plus a one mile buffer to account for overland dispersal. This results in approximately 42,274 acres of potential CLF habitat on the Tonto National Forest.

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition (Table 86 and Table 87)[119]. The over 188 miles in potential and critical habitat of routes designated for motorized vehicle use, motorized big game retrieval, and motorized dispersed camping within Chiricahua leopard frog (leopard frog) potential and critical habitat has the potential to continue to negatively influence behavior, survival, reproduction and distribution of Chiricahua leopard frog, as well as to alter habitat. Slow moving animals, such as amphibians, are highly vulnerable to mortality as they cross forest roads. The current unrestricted cross country travel on the Payson and Pleasant Valley Ranger Districts, motorized roads and trails and motorized dispersed camping can increase access to occupied sites. This is turn could increase disturbance to dispersal habitat, and dispersing frogs, cause direct damage to shoreline and aquatic habitat, increase the potential for spreading nonnative aquatic organisms and diseases, and increase the potential for forest users to handle or collect frogs. In addition, motorized use adjacent to stock tanks or other frog habitat can cause sedimentation, which would make stock tanks less resistant to drought.

Table 86. Alternative A – Existing Conditions in Potential Habitat for Chiricahua Leopard Frog

Analysis Factors	Existing Condition
Routes designated for motor vehicle use (miles)	188.99
Density of designated routes (miles per square mile)	2.86
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	40,949
Motor vehicle use for big game retrieval (acres)	40,949
Motor vehicle use for dispersed camping (acres)	40,949
Personal use fuelwood gathering (acres)	24,373

Table 87. Alternative A – Existing Conditions in Designated Critical Habitat for Chiricahua Leopard Frog

Analysis Factor	Existing Condition
Routes designated for motor vehicle use (miles)	3.07
Density of designated routes (miles per square mile)	4.72
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	413.72
Motor vehicle use for big game retrieval (acres)	413.72
Motor vehicle use for dispersed camping (acres)	413.72
Personal use fuelwood gathering (acres)	110.34

[119] The values calculated for retrieval under the proposed action include areas that have perennial water and would not be accessible by motorized vehicle. Since the amount of water can vary from year to year and season to season, these values represent the maximum area open under the driest conditions.

This alternative would not close any existing roads or motorized trails. Approximately three miles of routes would be designated in leopard frog critical habitat. With no change in the seven analysis factors for designated routes, decommissioned routes, road density, areas designated for motorized use, motorized big game retrieval, motorized dispersed camping, and motorized fuelwood gathering , motorized travel would continue to directly and indirectly cause localized disturbance to leopard frogs in potential and critical habitat. With this alternative, year round motorized use would continue to occur within leopard frog potential and critical habitat, resulting in direct effects from human disturbance from associated recreational activities (e.g. hiking, shooting, OHV use at occupied sites) or indirectly through alteration of habitat caused by vegetation damage, vegetation removal for campfires, soil compaction, illegal user routes created, and increased risk of wildland fire. Due to expected increases in levels of cross country OHV travel (due to projected increased human population), this alternative would allow the level of motorized recreational activities within critical habitat to increase, exceeding that which was occurring prior to the Chiricahua leopard frog being listed.

Routes designated in potential and critical leopard frog habitat under Alternative A are located within the river or creek channel, floodplain, stock tanks, or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks. Increased levels could result in potential effects to leopard frogs and their prey through changes in water quality and temperature, fine sediments on river and creek bottoms, and growth and regeneration of riparian vegetation. Additionally, topography and vegetation would not provide a dampening effect of potential noise effects from designated routes on leopard frogs. There is also an increase in the potential of introducing invasive and non-native organisms into waterways at perennial stream crossings and stock tanks. One crossing is a current system road, with a hardened crossing, reducing the potential for effects at this location.

Alternative A would increase habitat fragmentation by unmanaged motorized use and ongoing harvesting of woody products utilized for dispersed campsites within leopard frog habitat. Downed woody material provides cover and resting areas for leopard frogs as they disperse along roads and campsites associated with riparian areas and would be continued to be removed that pose a hazard reducing this primary constituent element. Unmanaged development of user-created dispersed campsites, roads, and trails could further alter leopard frog potential and critical habitat.

Alternative B—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a substantial reduction in authorized cross-country motor vehicle use for big game retrieval and motorized dispersed camping, and motorized personal use fuelwood gathering within potential and critical Chiricahua leopard frog habitat on the Forest (Table 162 and Table 163). Alternative B would benefit the species the most by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation.

Table 88. Alternative B – Effect Changes from Existing Conditions in Potential Habitat for Chiricahua Leopard Frog by Analysis Factor

Analysis Factors	Existing Condition	Alternative B	Change in Effects
Routes designated for motor vehicle use (miles)	188.99	127.91	-61.08
Density of designated routes (miles per square mile)	2.86	1.94	-0.92
Decommissioned and closed routes (miles)	0.00	54.84	+54.84
Areas open to motorized vehicle use (acres)	40,949	0.00	-40,949
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	40,949	2.52	-40,946.48
Personal use fuelwood gathering (acres)	24,373	3,803.82	-20,569.18

Table 89. Alternative B – Effect Changes from Existing Conditions in Designated Critical Habitat for Chiricahua Leopard Frog by Analysis Factor

Analysis Factor	Existing Condition	Alternative B	Changes in Effects
Routes designated for motor vehicle use (miles)	3.07	2.96	-0.11
Density of designated routes (miles per square mile)	4.72	3.75	-0.97
Decommissioned and closed routes (miles)	0.00	0.60	+0.60
Areas open to motorized vehicle use (acres)	413.72	0.00	-413.72
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	413.72	0.00	-413.72
Personal use fuelwood gathering (acres)	110.34	32.88	-77.46

The over 127 miles in potential and over two miles in critical habitat of routes designated for motorized vehicle use, motorized big game retrieval, and motorized dispersed camping within Chiricahua leopard frog (leopard frog) potential and critical habitat has the potential to have a beneficial effect on influence behavior, survival, reproduction and distribution of Chiricahua leopard frog, as well as to improve habitat. Slow moving animals, such as amphibians are highly vulnerable to mortality as they cross forest roads. The current unrestricted cross country travel on the Payson and Pleasant Valley Ranger Districts would not occur under Alternative B. Motorized dispersed camping sites would be substantially reduced in potential and critical habitat. Disturbance in dispersal habitat, dispersing frogs, damage to shoreline and aquatic habitat, the potential for spreading nonnative aquatic organisms and diseases, and the potential for forest users to handle/collect frogs would all be reduced under this Alternative. Reduced motorized use adjacent to stock tanks or other frog habitat could reduce sedimentation, making stock tanks more resistant to drought.

No permit zones would be designated within potential or critical Chiricahua leopard frog habitat. Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use, motorized big game retrieval and motorized dispersed camping would all be reduced under Alternative B.

For the seven analysis factors, the effects of Alternative B would have slight reductions for route reduction and road density in potential and critical habitat for the leopard frog. Substantial reductions of motorized dispersed campsites and moderate reduction in personal use fuelwood gathering (often associated with motorized dispersed campsites) would occur within leopard frog

potential and critical habitat. There would be approximately 54 miles of decommissioned roads in leopard frog potential and 0.60 miles in critical habitat. This reduction in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in 32 percent of potential habitat and 32 percent in overall road density in potential habitat.

Alternative B would largely benefit Chiricahua leopard frog by:

- Overall reducing motorized use in leopard frog habitat that results in reduction of habitat degradation.
- Reducing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain, stock tanks or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in leopard frog habitat.
- Reducing motorized dispersed camping which reduces the potential for forest users handling frogs and interrupting their feeding behavior.
- Reducing levels of sediment and pollutants which could improve water quality and lower water temperature, thus improving leopard frogs' base and improve growth and regeneration of riparian vegetation.
- Reducing the potential for introduced aquatic organisms and diseases.
- Reducing year round disturbance in potential habitat caused by motorized use and lessening the risk of mortality caused by motorized vehicles.

Overall, Alternative B would benefit the leopard frog by reducing access to and activity near dispersal and occupied sites by reducing motorized dispersed campsites, reducing disturbances to individuals and their habitat.

On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at anyone site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to leopard frog in concentrated areas.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Less Chiricahua leopard frog potential and critical habitat would be affected for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within potential and critical habitat, reducing the level of use closer to that which was occurring prior to the leopard frog being listed.

The Alternative would result in beneficial cumulative effects of reducing impacts to riparian vegetation and sedimentation into Chiricahua leopard frog habitat when combined with similar travel management efforts on the Coconino, Prescott, and Apache-Sitgreaves National Forests as well as with vegetation management projects designed to reduce long-term sediment impacts from wildfire by reducing fire risk. This alternative could also slightly counteract the potential for impacts from climate change including prolonged drought and increased competiveness of

nonnative species by reducing impacts on riparian vegetation and increasing the resilience of the system to disturbances.

Alternative C—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a substantial reduction in authorized cross-country motor vehicle use for big game retrieval, motorized dispersed camping, and motorized personal use fuelwood gathering within potential and critical Chiricahua leopard frog habitat on the Forest (Table 90 and Table 91). Alternative C would benefit the species the most by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as decrease habitat degradation, but to slightly lesser degree than Alternative B.

Table 90. Alternative C – Effect Changes from Existing Conditions in Potential Habitat for Chiricahua Leopard Frog by Analysis Factor

Analysis Factors	Existing Condition	Alternative C	Change in Effects
Routes designated for motor vehicle use (miles)	188.99	142.86	-46.13
Density of designated routes (miles per square mile)	2.86	2.16	-0.7
Decommissioned and closed routes (miles)	0.00	39.89	+39.89
Areas open to motorized vehicle use (acres)	40,949	0.00	-40,949
Motor vehicle use for big game retrieval (acres)	40,949	39,242.36	-1,706.64
Motor vehicle use for dispersed camping (count)	0.00	137	+137
Personal use fuelwood gathering (acres)	24,373	4,246.78	-20,126.22

Table 91. Alternative C – Effect Changes from Existing Conditions in Designated Critical Habitat for Chiricahua Leopard Frog by Analysis Factor

Analysis Factor	Existing Condition	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	3.07	2.97	-0.1
Density of designated routes (miles per square mile)	4.72	3.76	-0.96
Decommissioned and closed routes (miles)	0.00	0.59	+0.59
Areas open to motorized vehicle use (acres)	413.72	0.00	-413.72
Motor vehicle use for big game retrieval (acres)	413.72	417.19	+3.47
Motor vehicle use for dispersed camping (count)	0.0	6	+6
Personal use fuelwood gathering (acres)	110.34	37.14	-73.20

The over 142 miles in potential and over two miles in critical habitat of routes designated for motorized vehicle use, motorized big game retrieval, and motorized dispersed camping within Chiricahua leopard frog (leopard frog) potential and critical habitat has the potential to have a beneficial effect to behavior, survival, reproduction, and distribution of Chiricahua leopard frog, as well as to improve habitat. Slow moving animals, such as amphibians are highly vulnerable to mortality as they cross forest roads. The current unrestricted cross country travel on the Payson and Pleasant Valley Ranger Districts would not occur under Alternative C. Motorized big game retrieval would be seasonal and, as temperatures drop in November and December, frog activity would substantially decrease making frogs less susceptible to motorized disturbance. Motorized

dispersed camping sites would be reduced in potential and critical habitat. Disturbance in dispersal habitat, dispersing frogs, damage to shoreline and aquatic habitat, the potential for spreading nonnative aquatic organisms and diseases, and the potential for forest users to handle or collect frogs would all be reduced under this Alternative. Reduced motorized use adjacent to stock tanks or other frog habitat could reduce sedimentation, making stock tanks more resistant to drought.

No permit zones would be designated within potential or critical Chiricahua leopard frog habitat. Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use, motorized big game retrieval and motorized dispersed camping would all be reduced under Alternative C.

For the seven analysis factors, the effects of Alternative C would have slight reductions for route reduction and road density in potential and critical habitat for the leopard frog. Substantial reductions of motorized dispersed campsites and moderate reduction in motorized personal use fuelwood gathering (often associated with dispersed campsites) would occur within leopard frog potential and critical habitat. There would be approximately 40 miles in potential and 0.60 miles in critical habitat of decommissioned roads in leopard frog habitat. This reduction in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in 25 percent of potential habitat and in 26 percent for overall road density in potential habitat.

Alternative C would largely benefit Chiricahua leopard frog by:

- Overall reducing motorized use in leopard frog habitat that results in reduction of habitat degradation.
- Reducing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain, stock tanks, or adjacent upland areas may help avoid contribution of sediment levels and other pollutants in these rivers and creeks in leopard frog habitat.
- Reducing motorized dispersed camping which reduces the potential for forest users handling frogs and interrupting their feeding behavior.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving leopard frogs base and improve growth and regeneration of riparian vegetation.
- Reducing the potential for introduced aquatic organisms and diseases.
- Reducing year round disturbance in potential habitat caused by motorized use and lessening the risk of mortality caused by motorized vehicles.

Overall, Alternative C would benefit the leopard frog by reducing access to and activity near dispersal and occupied sites in reducing motorized dispersed campsites, reducing disturbances to individuals and their habitat.

On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at any one site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire or wildland fire suppression activities and longer term loss and degradation of habitat from utility

line construction and maintenance would contribute cumulatively to impacts to leopard frog in concentrated areas.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities (i.e. dispersed camping) concentrated in isolated areas. Less Chiricahua leopard frog potential and critical habitat would be affected for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within potential and critical habitat reducing the level of use closer to that which was occurring prior to the leopard frog being listed.

Cumulative beneficial effects would be similar to Alternative B for Alternative C. Any differences in cumulative effects between the two alternatives would be discountable.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a slight reduction in authorized cross-country motor vehicle use for big game retrieval, motorized dispersed camping, and motorized personal use fuelwood gathering within potential and critical Chiricahua leopard frog habitat on the Forest (Table 92 and Table 93). Alternative D would benefit the species, but to a lesser degree than Alternatives B and C by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation.

Table 92. Alternative D – Effect Changes from Existing Conditions in Potential Habitat for Chiricahua Leopard Frog by Analysis Factor

Analysis Factors	Existing Condition	Alternative D	Change in Effects
Routes designated for motor vehicle use (miles)	188.99	181.33	-7.66
Density of designated routes (miles per square mile)	2.86	2.75	-0.11
Decommissioned and closed routes (miles)	0.00	1.62	+1.62
Areas open to motorized vehicle use (acres)	40,949	0.00	-40,949
Motor vehicle use for big game retrieval (acres)	40,949	39,838.58	-1,110.42
Motor vehicle use for dispersed camping (acres)	40,949	10,899.76	-30,049.24
Personal use fuelwood gathering (acres)	24,373	24,373	0.00

Table 93. Alternative D – Effect Changes from Existing Conditions in Designated Critical Habitat for Chiricahua Leopard Frog by Analysis Factor

Analysis Factor	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	3.07	3.55	+0.48
Density of designated routes (miles per square mile)	3.88	4.49	+0.61
Decommissioned and closed routes (miles)	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	413.72	0.00	-413.72
Motor vehicle use for big game retrieval (acres)	413.72	417.19	+3.47
Motor vehicle use for dispersed camping (acres)	413.72	153.40	-260.32
Personal use fuelwood gathering (acres)	110.34	110.41	+0.07

The over 181 miles in potential and three miles in critical habitat of routes designated for motorized vehicle use, motorized big game retrieval, and motorized dispersed camping within Chiricahua leopard frog (leopard frog) potential and critical habitat has the potential to have a beneficial effect on behavior, survival, reproduction, and distribution of Chiricahua leopard frog, as well as the potential to improve habitat. Slow moving animals, such as amphibians are highly vulnerable to mortality as they cross forest roads. The current unrestricted cross-country travel on the Payson and Pleasant Valley Ranger Districts would not occur under Alternative D. Motorized dispersed camping sites would be reduced in potential and critical habitat. Disturbance in dispersal habitat, dispersing frogs, damage to shoreline and aquatic habitat, the potential for spreading nonnative aquatic organisms and diseases, and the potential for forest users to handle or collect frogs would all be reduced under this Alternative. Reduced motorized use adjacent to stock tanks or other frog habitat could reduce sedimentation, making stock tanks more resistant to drought.

No permit zones would be designated within potential or critical Chiricahua leopard frog habitat. Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use, motorized big game retrieval, and motorized dispersed camping would all be reduced under Alternative D.

For the seven analysis factors, the effects of Alternative D would have slight reductions for route reduction and road density in potential and critical habitat for the leopard frog. Substantial reductions of motorized dispersed campsites and moderate reduction in personal use fuelwood gathering (often associated with motorized dispersed campsites) would occur within leopard frog potential and critical habitat. There would be approximately two miles of decommissioned roads in leopard frog potential and no decrease in critical habitat. This reduction in roads and motorized trails would eliminate the potential for noise disturbance and habitat alteration in eight percent of potential habitat and ten percent in overall road density in potential habitat.

Alternative D would benefit Chiricahua leopard frog by:

- Overall reducing motorized use in leopard frog habitat that results in reduction of habitat degradation.
- Reducing dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain, stock tanks or adjacent upland areas that can contribute to levels of sediment and other pollutants in these rivers and creeks in leopard frog habitat.
- Reducing motorized dispersed camping which reduces the potential for forest users handling frogs and interrupting their feeding behavior.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving leopard frogs' base and improve growth and regeneration of riparian vegetation.
- Reducing the potential for introduced aquatic organisms and diseases.
- Reducing year round disturbance in potential habitat caused by motorized use and lessening the risk of mortality caused by motorized vehicles.

Overall, Alternative D would benefit the leopard frog by reducing access to and activity near dispersal and occupied sites by reducing motorized dispersed campsites, reducing disturbances to individuals and their habitat.

On roads that would remain, motorized dispersed camping could increase by concentrating displaced campers who would no longer be able to access closed roads. Since impacts at any one site are expected to be of short duration and low intensity, habitat and disturbance impacts are expected to be minimal. Short-term disturbance from prescribed fire treatment, wildfire, or wildland fire suppression activities, and longer term loss and degradation of habitat from utility line construction and maintenance would contribute cumulatively to impacts to leopard frog in concentrated areas.

Overall, this alternative would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Less Chiricahua leopard frog potential and critical habitat would be affected for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within potential and critical habitat, reducing the level of use closer to that which was occurring prior to the leopard frog being listed, but to a lesser degree than Alternatives B and C.

Cumulative beneficial effects would be similar to Alternative B and Alternative C. Any differences in cumulative effects between the two alternatives would be expected to be slight.

Fishes: Affected Environment and Environmental Consequences

Colorado Pikeminnow

Based on past survey and release information, potential habitat for Colorado pikeminnow (pikeminnow) is limited to the Verde River north of Horseshoe Dam to the Forest boundary on the Cave Creek and Payson Ranger Districts of the Tonto National Forest. Designated critical habitat for the species does not occur on the Tonto National Forest.

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition (Table 94)[120]. The 25.89 miles of dirt routes designated for motorized vehicle use in potential habitat of Colorado pikeminnow has the potential to influence behavior, survival, reproduction, and distribution of, Colorado pikeminnow as well as to alter habitat. The impacts of dams (Horseshoe, Bartlett) on the lower Verde River and the introduction of nonnative fish species are the primary reasons for this species disappearance from the system (USDI Fish and Wildlife Service, 2002a). Though this alternative would continue to result in sediment delivery to the Verde River in greater amounts than Alternatives B and C considered in this analysis, sediment delivery in not a key factor influencing Colorado pikeminnow populations compared to the presence of dams and existence of nonnative fish. The designated routes below do not affect the presence of dams or cross the Verde River.

[120] The values calculated for retrieval under the proposed action include areas that have perennial water and would not be accessible by motorized vehicle. Since the amount of water can vary from year to year and season to season, these values represent the maximum area open under the driest conditions.

Table 94. Alternative A – Existing Conditions in Potential Colorado Pikeminnow Watersheds

Analysis Factors	Existing Condition
Routes designated for motor vehicle use (miles)	25.89
Density of designated routes (miles per square mile)	0.25
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	0.00
Motor vehicle use for big game retrieval (acres)	0.00
Motor vehicle use for dispersed camping (acres)	0.00
Personal use fuelwood gathering (acres)	0.00

Alternative B and C—Direct and Indirect Effects

The effect of these alternatives on a forest wide basis would be a minimal reduction of motor vehicle use miles and decommissioned roads within Colorado pikeminnow potential habitat on the Forest. Under the existing condition, limited potential habitat is affected by the seven analysis factors. Alternatives B and C would have minimal benefit as motorized use, which would result in increased sedimentation in streams, has limited effects to the species (Table 95 and Table 96). The development of dams and nonnative fish species has the greatest effects to the pikeminnow.

Table 95. Alternative B – Effect Changes from Existing Conditions in Potential Colorado Pikeminnow Watersheds by Analysis Factor

Analysis Factors	Existing Condition	Alternative B	Change in Effects
Routes designated for motor vehicle use (miles)	25.89	7.79	-18.10
Density of designated routes (miles per square mile)	0.25	0.08	-0.17
Decommissioned and closed routes (miles)	0.00	18.12	+18.12
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	0.36	+0.36
Personal use fuelwood gathering (acres)	0.00	0.00	0.00

Table 96. Alternative C – Effect Changes from Existing Conditions in Potential Colorado Pikeminnow Watersheds by Analysis Factor

Analysis Factors	Existing Condition	Alternative C	Change in Effects
Routes designated for motor vehicle use (miles)	25.89	23.02	-2.87
Density of designated routes (miles per square mile)	0.25	0.22	-0.03
Decommissioned and closed routes (miles)	0.00	2.88	+2.88
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	3,913.31	+3,913.31
Motor vehicle use for dispersed camping (count)	0.00	8	+8
Personal use fuelwood gathering (acres)	0.00	0.00	0.00

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a substantial increase in acres of motorized big game retrieval and acres available to motorized dispersed camping within Colorado pikeminnow potential habitat on the Forest (Table 97). However, these increases are not expected to cause a decrease in the pikeminnow population. Alternative D does not affect the presence of established dams or increase non-native fish in the area which are the primary causes of decline in pikeminnow populations.

Table 97. Alternative D – Effect Changes from Existing Conditions in Potential Colorado Pikeminnow Watersheds by Analysis Factor

Analysis Factors	Existing Condition	Alternative B	Change in Effects
Routes designated for motor vehicle use (miles)	25.89	25.90	+0.01
Density of designated routes (miles per square mile)	0.25	0.25	0.00
Decommissioned and closed routes (miles)	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	16,523.11	+16,523.11
Motor vehicle use for dispersed camping (acres)	0.00	1,530.51	+1,530.51
Personal use fuelwood gathering (acres)	0.00	0.00	0.00

Desert Pupfish

Potential habitat for desert pupfish is limited to the three introduction sites on the Mesa Ranger District: Mud, Walnut, and Hidden Water Springs. Arizona Game and Fish Department aquatic program, working with the US Fish and Wildlife Service and Tonto National Forests, determined potential reintroduction sites and manages these species on National Forest lands. Designated critical habitat for the species does not occur on the Tonto National Forest.

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition (Table 98)[121]. The 22.89 miles of routes designated for motorized vehicle use within desert pupfish potential habitat has the potential to continue to negatively influence behavior, survival, reproduction, and distribution of desert pupfish as well as to alter habitat. Existing motorized routes designated in potential pupfish watersheds under Alternative A are located within drainages, creek floodplains or adjacent upland areas and, while there will be no effects from creation of routes since they already exist, these routes can contribute to levels of sediment and other pollutants in these waterways. Increased levels could result in potential effects to pupfish and its habitat through changes in water quality and temperature, fine sediments in waterways, and growth and regeneration of aquatic and riparian vegetation. Additionally, there is an increase in the potential of introducing invasive and non-native organisms into waterways at stream crossings.

[121] The values calculated for retrieval under the proposed action include areas that have perennial water and would not be accessible by motorized vehicle. Since the amount of water can vary from year to year and season to season, these values represent the maximum area open under the driest conditions.

Table 98. Alternative A – Existing Conditions in Potential Desert Pupfish Watersheds

Analysis Factor	Existing Condition
Routes designated for motor vehicle use (miles)	22.82
Density of designated routes (miles per square mile)	0.51
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	0.00
Motor vehicle use for big game retrieval (acres)	0.00
Motor vehicle use for dispersed camping (acres)	0.00
Personal use fuelwood gathering (acres)	29.00

Alternative B and C—Direct and Indirect Effects

The effect of these alternatives on a forest wide basis would be a minimal reduction of motor vehicle use miles and decommissioned roads within potential habitat on the Forest (Table 99). Under the existing condition, limited potential habitat is affected by the seven analysis factors. Alternatives B and C would benefit the species by reducing the potential from disturbance due to human presence, as well as habitat degradation from access provide by motorized use. Existing motorized routes designated in potential pupfish watersheds under Alternatives B and C are located within drainages, creek floodplains or adjacent upland areas and, while there will be no effects from creation of routes since they already exist, but are currently not designated, these routes can contribute to levels of sediment and other pollutants in these waterways. Increased levels could result in potential effects to pupfish and its habitats through changes in water quality and temperature, fine sediments in waterways, and growth and regeneration of aquatic and riparian vegetation. Under Alternatives B and C fine sediments, pollutants and regeneration of aquatic vegetation would be expected to improve. The potential of introducing invasive and non-native organisms into waterways at stream crossings would be expected to be reduced under these two alternatives. The two perennial stream crossings on Alder Creek are not hydrologically connected to the occupied pupfish site at Walnut Spring, so such effects would be expected to be limited. While routes designated under Alternatives B and C could have effects on pupfish and their habitats, over 32 percent of potential pupfish watersheds are located in wilderness where no routes would be designated and the ten percent decrease in the miles of routes in potential watersheds from existing conditions would overall reduce the magnitude of potential effects on the species for both alternatives. Motorized big game retrievals, allowed under Alternative C, would only be allowed at hardened stream crossings, and are limited in their scope[122]. Effects of motor vehicle use for motorized big game retrieval is expected under Alternative C to be minimal due to limited harden crossings in desert pupfish habitat.

[122] See the Game and Nongame section of this chapter for more details.

Table 99. Alternatives B and C – Effect Changes from Existing Conditions in Potential Desert Pupfish Watersheds by Analysis Factor

Analysis Factor	Existing Condition	Alternative B	Changes in Effects	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	22.82	10.91	-11.91	23.34	+0.52
Density of designated routes (miles per square mile)	0.51	0.24	-0.27	0.52	0.01
Decommissioned and closed routes (miles)	0.00	14.71	+14.71	2.28	+2.28
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00	9,077.44	+9,077.44
Motor vehicle use for dispersed camping (acres) or Alternative C count	0.00	0.00	0.00	5	+5
Personal use fuelwood gathering (acres)	29.00	0.00	-29.00	12.33	-16.67

No permit zones would be designated within potential desert pupfish habitat under Alternative B or C. Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use, motorized big game retrieval and motorized dispersed camping would all be reduced under Alternative B. Alternative C would have slight increases in motor vehicle routes, and an increases in motor vehicle use for big game retrieval.

For the seven analysis factors, the effects of Alternatives B and C would have slight reductions for route reduction and road density in potential and critical habitat for the desert pupfish. Substantial reductions of motorized dispersed campsites and moderate reduction in personal use fuelwood gathering (often associated with motorized dispersed campsites) would occur within desert pupfish potential habitat. There would be approximately fourteen miles in potential habitat of decommissioned. This reduction in roads and motorized trails would eliminate the potential for habitat alteration in 52 percent of potential habitat and 52 percent in overall road density in potential habitat.

Alternatives B and C would largely benefit desert pupfish by:

- Overall reducing motorized use in desert pupfish habitat that results in reduction of habitat degradation.
- Reducing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain, stock tanks, or adjacent upland areas which have the potential to contribute to levels of sediment and other pollutants in these rivers and creeks in desert pupfish habitat.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving desert pupfish habitat through improved water quality and reduced sedimentation.

- Decommissioning the one perennial stream crossing would also reduce the potential for introducing invasive and non-native organisms into waterways in potential pupfish watersheds.

Overall Alternatives B and C would benefit the desert pupfish by reducing access to and human activity in or near stream habitat in reducing dispersed campsites, and reducing impacts to pupfish and their habitat.

Alternatives B and C would reduce habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall, less desert pupfish potential habitat would affected for the long term (ten or more years.). These alternatives would reduce the level of motorized recreation activities within potential habitat reducing the level of use closer to that which was occurring prior to the desert pupfish being listed. Cumulative beneficial effects would be similar to Alternatives B and C. Any differences in cumulative effects between the two alternatives would be discountable.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a minimal increase of motor vehicle use miles, road density, and motorized personal fuelwood gathering (Table 100). A moderate increase of acres open to motorized use and a substantial increase of motor vehicle use for big game retrieval and motorized dispersed camping would occur if Alternative D were implemented. Alternative D would have the most negative effects on the species by increasing the potential for habitat degradation from motor vehicles. Existing motorized routes designated in potential pupfish watersheds under Alternative D are located within drainages, creek floodplains or adjacent upland areas and, while there will be no effects from creation of routes since they already exist, but are currently not designated, these routes would continue to contribute to levels of sediment and other pollutants in these waterways under Alternative D. Increased levels could result in potential effects to pupfish and its habitats through changes in water quality and temperature, fine sediments in waterways, and growth and regeneration of aquatic and riparian vegetation. Additionally, there is an increase in the potential of introducing invasive and non-native organisms into waterways at stream crossings.

Table 100. Alternative D – Effect Changes from Existing Conditions in Potential Desert Pupfish Watersheds by Analysis Factor

Analysis Factor	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	22.82	25.37	+2.55
Density of designated routes (miles per square mile)	0.51	0.57	+0.06
Decommissioned and closed routes (miles)	0.00	0.25	+.25
Areas open to motorized vehicle use (acres)	0.00	21.11	+21.11
Motor vehicle use for big game retrieval (acres)	0.00	12,143.21	+12,143.21
Motor vehicle use for dispersed camping (acres)	0.00	1,298.82	+1,298.82
Personal use fuelwood gathering (acres)	29.00	29.19	+0.19

Approximately 21 acres would be designated within permit zones in potential desert pupfish habitat under Alternative D. Density of routes designated for motor vehicle use, miles of decommissioned routes, areas open to motorized vehicle use, motorized big game retrieval, and motorized dispersed camping would all be increase under Alternative D.

For the seven analysis factors, the effects of Alternative D would have slight increases for route reduction and road density in potential habitat for the desert pupfish. A substantial increase of motorized dispersed campsites would occur within desert pupfish potential habitat. This is expected to have the biggest potential impact to pupfish under Alternative D. There would be approximately 0.25 miles in potential habitat of decommissioned roads in desert pupfish habitat. The increase in roads and motorized trails would slightly increase the potential for habitat alteration in eleven percent of potential habitat. However, the substantial increase in motorized dispersed campsites, often associated with riparian areas, could increase this habitat alteration to moderate in potential desert pupfish habitat. Alternative D would mainly have a negative impact on desert pupfish by:

- Overall increasing motorized use in desert pupfish habitat that results in habitat degradation.
- Increasing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain, stock tanks or adjacent upland areas that have potential to contribute to levels of sediment and other pollutants in these rivers and creeks in desert pupfish habitat.
- Increasing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving desert pupfish habitat through improved water quality and reduced sedimentation.

Overall, Alternative D would have negative impacts and would be similar to Alternative A by increasing access to stream habitat and motorized dispersed campsites and increasing impacts to pupfish and their habitat.

This alternative would increase habitat degradation from motorized use and access which would increase the long-term impacts of activities concentrated in isolated areas. Overall more desert pupfish potential habitat would be affected for the long term (ten or more years.). This alternative would increase the level of motorized recreation activities within potential habitat increasing the level to that which was occurring prior to the desert pupfish being listed. Cumulative negative effects would be similar to Alternatives A. Any differences in cumulative effects between the two alternatives would be discountable.

Gila Chub, Gila topminnow, Loach Minnow, Razorback Sucker, and Spikedace

Gila Chub

On the Tonto National Forest, Gila chub historically occurred in Silver Creek on the Globe Ranger District and Mineral Creek on the Cave Creek Ranger District. Gila chub have not been detected in Mineral Creek since 2002 as a result of a 2000 mine spill. Since limited surveys have occurred in recent years to conclude chub have been extirpated, the U.S. Fish and Wildlife Service considers the Mineral Creek population, the last known population on the Forest, to be low and difficult to detect. Releases by Arizona Game and Fish Department and U.S. Fish and Wildlife Service have been proposed for Silver Creek in the future.

Gila Topminnow

Gila topminnows (topminnow) are known to occur, or potential habitat exists, in springs and small streams on all six Ranger Districts. This includes populations in Mud and Hidden Water Springs and Lime and Fossil Creeks.

Loach Minnow

Based on past survey and release information, potential habitat for loach minnow is limited to Fossil Creek on the Cave Creek and Payson Ranger Districts.

Razorback Sucker

Based on past survey and release information, potential habitat for razorback sucker is limited to the Verde River north of Horseshoe Dam to the Forest boundary on the Cave Creek and Payson Ranger Districts.

Spikedace

Based on past survey and release information, potential habitat for spikedace is limited to Fossil Creek on the Cave Creek and Payson Ranger Districts and Spring Creek on the Pleasant Valley Ranger District of the Tonto National Forest.

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition for five of the listed species occurring on the Tonto National Forest; Gila chub, Gila topminnow, loach minnow, razorback sucker and spikedace (Table 101 through Table 105)[123]. The miles in potential and critical habitat for the Gila chub, razorback sucker, and spikedace and miles in potential habitat for the Gila topminnow and loach minnow of routes designated for motorized vehicle use, motorized big game retrieval, and motorized dispersed camping within habitat has the potential to influence behavior, survival, reproduction and distribution as well as to alter habitat for the five aforementioned listed fish species. Roads have effects on hydrologic processes that could affect the Gila chub, Gila topminnow, loach minnow, razorback sucker and spikedace by concentrating flow, diverting or rerouting water from paths the water would otherwise would take were the road not present. Roads can add sediment to a stream or river system. Road ditches that drain water and sediment from roads on nearby hill slopes often develop swales an ephemeral channels. The formation of these channels increases erosion and fine sediment delivery to streams. Road crossings can act as barriers to migration and lead to water temperature changes. Fish passage can be limited to poorly designed channel crossings of roads. This alternative would result in negative effects by continuing to contribute a high level of sediment that would combine with increased sediment from short-term sediment pulses associated with impacts to high recreational use from motorized travel. The present rate of sediment delivery under Alternative A could result in increased impacts on these species.

Table 101. Alternative A – Existing Conditions in Critical Habitat and Potential Chub Watersheds for Gila Chub

Analysis Factor	Existing condition	
	Potential Watersheds	Critical Habitat
Routes designated for motor vehicle use (miles)	73.78	0.53
Density of designated routes (miles per square mile)	2.75	0.98
Decommissioned and closed routes (miles)	0.00	0.00
Areas open to motorized vehicle use (acres)	0.00	0.00

[123] The values calculated for retrieval under the proposed action include areas that have perennial water and would not be accessible by motorized vehicle. Since the amount of water can vary from year to year and season to season, these values represent the maximum area open under the driest conditions.

Analysis Factor	Existing condition	
	Potential Watersheds	Critical Habitat
Motor vehicle use for big game retrieval (acres)	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	0.00
Personal use fuelwood gathering (acres)	5,426	132.68

Table 102. Alternative A – Existing Conditions in Potential Gila Topminnow Watersheds

Analysis Factor	Existing Condition
Routes designated for motor vehicle use (miles)	391.90
Density of designated routes (miles per square mile)	0.80
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	13,286
Motor vehicle use for big game retrieval (acres)	13,286
Motor vehicle use for dispersed camping (acres)	13,286
Personal use fuelwood gathering (acres)	57,237

Table 103. Alternative A – Existing Conditions in Potential Loach Minnow Watersheds

Analysis Factor	Existing Condition
Routes designated for motor vehicle use (miles)	12.99
Density of designated routes (miles per square mile)	0.87
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	6,315
Motor vehicle use for big game retrieval (acres)	6,315
Motor vehicle use for dispersed camping (acres)	6,315
Personal use fuelwood gathering (acres)	2,984

Table 104. Alternative A – Existing Conditions in Critical Habitat and Potential Chub Watersheds for Razorback Sucker

Analysis Factor	Existing condition	
	Potential Watersheds	Critical Habitat
Routes designated for motor vehicle use (miles)	25.89	0.06
Density of designated routes (miles per square mile)	0.25	0.01
Decommissioned and closed routes (miles)	0.00	0.00
Areas open to motorized vehicle use (acres)	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	0.00
Personal use fuelwood gathering (acres)	0.00	0.00

Table 105. Alternative A – Existing Conditions in Critical Habitat and Potential Chub Watersheds for Spikedace

Analysis Factor	Existing condition	
	Potential Watersheds	Critical Habitat
Routes designated for motor vehicle use (miles)	144.77	16
Density of designated routes (miles per square mile)	1.16	N/A
Decommissioned and closed routes (miles)	0.00	0
Areas open to motorized vehicle use (acres)	70,266	17.44
Motor vehicle use for big game retrieval (acres)	70,266	17.44
Motor vehicle use for dispersed camping (acres)	70,266	17.44
Personal use fuelwood gathering (acres)	63,247	22.56

Alternative B and C—Direct and Indirect Effects

The effects on a forestwide basis for Alternatives B and C for five of the listed fish species occurring on the Tonto National Forest—Gila chub, Gila topminnow, loach minnow, razorback sucker and spikedace—is overall beneficial (Table 106 through Table 113). Alternatives B and C benefit the species the most in reducing the potential habitat degradation by improving water quality (temperature and silt loads) streamflow, stream morphology and access to spawning areas, and reducing motorized access which in turn reduces the chance of the introduction of nonnative competitors and predators. Designation of system roads and associated activities under the seven analysis factors would continue to result in minor sedimentation, but overall sedimentation would be reduced from the current condition. No building of additional motorized routes or trails is proposed. Habitat improvement would be expected under Alternatives B and C by reducing potential habitat degradation from the removal of fuelwood (associated with motorized access to dispersed campsites) which provides shade cover in streams.

Table 106. Alternative B – Effect Changes from Existing Conditions in Potential Watersheds and Critical Habitat for Gila Chub by Analysis Factor

Analysis Factor	Potential Watersheds			Critical Habitat		
	Existing Condition	Alternative B	Changes in Effects	Existing Condition	Alternative B	Changes in Effects
Routes designated for motor vehicle use (miles)	73.78	44.67	-29.11	0.53	0.53	0.00
Density of designated routes (miles per square mile)	2.75	1.66	-1.09	0.98	0.98	0.00
Decommissioned and closed routes (miles)	0.00	26.53	+26.53	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	0.18	+0.18	0.00	0.00	0.00
Personal use fuelwood gathering (acres)	5,426	1,460.87	-3,965.13	132.68	12.05	-120.63

Table 107. Alternative C – Effect Changes from Existing Conditions in Potential Watersheds and Critical Habitat for Gila Chub by Analysis Factor

Analysis Factor	Potential Watersheds			Critical Habitat		
	Existing Condition	Alternative C	Changes in Effects	Existing Condition	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	73.78	44.87	-28.91	0.53	0.53	0.00
Density of designated routes (miles per square mile)	2.75	1.67	-1.08	0.98	0.98	0.00
Decommissioned and closed routes (miles)	0.00	26.32	+26.32	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	6,922.36	+6,922.36	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	16	+16	0.00	0.00	0.00
Personal use fuelwood gathering (acres)	5,426	1,461.19	-3,964.81	132.68	12.05	-120.63

Table 108. Alternatives B and C – Effect Changes from Existing Conditions in Potential Gila Topminnow Watersheds by Analysis Factor

Analysis Factor	Existing Condition	Alternative B	Changes in Effects	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	391.90	261.17	-130.73	348.42	-43.48
Density of designated routes (miles per square mile)	0.80	0.53	-0.27	0.71	-0.09
Decommissioned and closed routes (miles)	0.00	168.32	+168.32	77.18	+77.18
Areas open to motorized vehicle use (acres)	13,286	0.00	-13,286	17.89	-13,268.11
Motor vehicle use for big game retrieval (acres)	13,286	0.00	-13,286	85,113.94	+71,827.94
Motor vehicle use for dispersed camping (acres)	13,286	3.68	-13,282.32	235	+235
Personal use fuelwood gathering (acres)	57,237	7,532.88	-49,704.12	8,666.54	-48,570.46

Table 109. Alternatives B and C – Effect Changes from Existing Conditions in Potential Loach Minnow Watersheds by Analysis Factor

Analysis Factor	Existing Condition	Alternative B	Changes in Effects	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	12.99	1.10	-11.89	12.99	0.00
Density of designated routes (miles per square mile)	0.87	0.07	-0.80	0.87	0.00
Decommissioned and closed routes (miles)	0.00	11.89	+11.89	0.00	0.00
Areas open to motorized vehicle use (acres)	6,315	0.00	-6,315	0.00	0.00
Motor vehicle use for big game retrieval (acres)	6,315	0.00	-6,315	5,018.89	-1,296.11
Motor vehicle use for dispersed camping (acres)	6,315	0.00	-6,315	2	+2
Personal use fuelwood gathering (acres)	2,984	56.46	-2,927.54	443.68	-2,540.32

Table 110. Alternative B – Effect Changes from Existing Conditions in Potential Watersheds and Critical Habitat for Razorback Sucker by Analysis Factor

Analysis Factor	Potential Watersheds			Critical Habitat		
	Existing Condition	Alternative B	Changes in Effects	Existing Condition	Alternative B	Changes in Effects
Routes designated for motor vehicle use (miles)	25.89	7.79	-18.10	0.06	0.03	-0.03
Density of designated routes (miles per square mile)	0.25	0.08	-0.17	0.01	0.01	0.00
Decommissioned and closed routes (miles)	0.00	18.12	+18.12	0.00	0.35	+0.35
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	0.36	+0.36	0.00	0.00	0.00
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	1.83	+1.83

Table 111. Alternative C – Effect Changes from Existing Conditions in Potential Watersheds and Critical Habitat for Razorback Sucker by Analysis Factor

Analysis Factor	Potential Watersheds			Critical Habitat		
	Existing Condition	Alternative C	Changes in Effects	Existing Condition	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	25.89	23.02	-2.87	0.06	0.03	-0.03
Density of designated routes (miles per square mile)	0.25	0.22	-0.03	0.01	0.01	0.00
Decommissioned and closed routes (miles)	0.00	2.88	+2.88	0.00	0.35	+0.35
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	3,913.31	+3,913.31	0.00	35.08	+35.08
Motor vehicle use for dispersed camping (acres)	0.00	8	+8	0.00	0.00	0.00
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	1.83	+1.83

Table 112. Alternative B – Effect Changes from Existing Conditions in Potential Watersheds and Critical Habitat for Spikedace by Analysis Factor

Analysis Factor	Potential Watersheds			Critical Habitat		
	Existing Condition	Alternative B	Changes in Effects	Existing Condition	Alternative B	Changes in Effects
Routes designated for motor vehicle use (miles)	144.77	71.71	-73.06	16	7	-9
Density of designated routes (miles per square mile)	1.16	0.58	-0.58	N/A	N/A	N/A
Decommissioned and closed routes (miles)	0.00	79.13	+79.13	0	7	-7
Areas open to motorized vehicle use (acres)	70,266	0.00	-70,266	17.44	0.00	-17.44
Motor vehicle use for big game retrieval (acres)	70,266	0.00	-70,266	17.44*	0.00	-17.44
Motor vehicle use for dispersed camping (acres)	70,266	1.14	-70,264.9	17.44	0.00	-17.44
Personal use fuelwood gathering (acres)	63,247	4,398.21	-58,848.8	22.56	0.00	-22.56

Table 113. Alternative C – Effect Changes from Existing Conditions in Potential Watersheds and Critical Habitat for Spikedace by Analysis Factor

Analysis Factor	Potential Watersheds			Critical Habitat		
	Existing Condition	Alternative C	Changes in Effects	Existing Condition	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	144.77	118.69	-26.08	16	8	-8
Density of designated routes (miles per square mile)	1.16	0.96	-0.20	N/A	N/A	N/A
Decommissioned and closed routes (miles)	0.00	32.15	+32.15	0	5	+5
Areas open to motorized vehicle use (acres)	70,266	0.00	-70,266	17.44	0.00	-17.44
Motor vehicle use for big game retrieval (acres)	70,266	63,326.30	6,939.70	17.44*	18.54	+1.10
Motor vehicle use for dispersed camping (acres)	0.00	83	+83	0.00	0.00	0.00
Personal use fuelwood gathering (acres)	63,247	6,746.58	-56,500.4	22.56	0.48	-22.08

For the seven analysis factors, the effects of Alternative B and C would have slight reductions for route reduction and road density for five of the listed fish species occurring on the Tonto National Forest; Gila chub, Gila topminnow, loach minnow, razorback sucker and spikedace . Substantial reductions of motorized dispersed campsites, and substantial (Alternative B) to slight-moderate (Alternative C) reduction in personal use fuelwood gathering (often associated with motorized dispersed campsites) would occur within the five aforementioned fish species habitat in those fish species habitat in which these two analysis factors affect. This reduction in roads and motorized trails would result in a moderate to substantial reduction (depending on the specific fish species) eliminating the potential for noise disturbance and habitat alteration in potential habitat.

Alternative B and C would benefit Gila chub, Gila topminnow, loach minnow, razorback sucker and spikedace by:

- Overall reducing motorized use in fish habitat that results in reduced habitat degradation.
- Reducing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain, stock tanks or adjacent upland areas and can benefit the species by reducing levels of sediment and other pollutants in these rivers and creeks in fish habitat.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving the fishery base and improve growth and regeneration of riparian vegetation.
- Reducing the potential for introduced aquatic organisms and diseases.

Overall, Alternatives B and C would benefit the five aforementioned fish species by reducing access to and activity near dispersal and occupied sites by reducing motorized dispersed campsites which would then reduce disturbances to individuals and their habitat.

Though increased recreation and habitat degradation resulting from urbanization, as well as from non-forest road networks and grazing on private land is expected cumulatively, the amount of sedimentation delivered from roads on the Tonto and adjoining forests (the Coconino and Apache-Sitgreaves National Forests are already implementing travel management) would greatly decrease, counteracting the amount of sediment being produced by other activities. Overall, less Gila chub, Gila topminnow, loach minnow, razorback sucker, and spikedace habitat would affected for the long term (ten or more years.). These alternatives would reduce the level of motorized recreation activities within potential habitat the most by reducing the level of use closer to that which was occurring prior to the Gila chub, Gila topminnow, loach minnow, razorback sucker, and spikedace being listed.

Cumulative beneficial effects would be similar for Alternative B and Alternative C. Any differences in cumulative effects between the two alternatives would be expected to be slight.

Alternative D—Direct and Indirect Effects

The effects on a forestwide basis for Alternative D for five of the listed fish species occurring on the Tonto National Forest—Gila chub, Gila topminnow, loach minnow, razorback sucker and spikedace—is overall negative (Table 114 through Table 118). Under Alternative D, the least amount of decommissioned roads and the largest increases for motorized big game retrieval and motorized personal use fuelwood gathering would occur for five aforementioned fish species. Alternative D would have a negative impact on the species by overall increasing habitat

degradation, reducing water quality (temperature, silt loads), further altering streamflow, stream morphology and access to spawning areas, and increasing motorized access which in turn increases the chance of the introduction of nonnative competitors and predators. Designation of system roads under Alternative D and associated activities under the seven analysis factors would result in increased sedimentation and habitat degradation. Additionally, this alternative would increase potential habitat degradation from the removal of fuelwood (associated with motorized access to motorized dispersed campsites) providing shade cover in streams. Alternative D, would have the most affect to the species the by increase in disturbance and potential habitat degradation.

Table 114. Alternative D – Effect Changes from Existing Conditions in Potential Watersheds and Critical Habitat for Gila Chub by Analysis Factor

	Potential Watersheds			Critical Habitat		
Analysis Factor	Existing Condition	Alternative D	Changes in Effects	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	73.78	71.19	-2.59	0.53	0.53	0.00
Density of designated routes (miles per square mile)	2.75	2.65	-0.10	0.98	0.98	0.00
Decommissioned and closed routes (miles)	0.00	0.00	0.00	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	16,868.16	+16,868.16	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	4,457.76	+4,457.76	0.00	346.05	+346.05
Personal use fuelwood gathering (acres)	5,426	5,426.49	+0.49	0.00	44.81	+44.81

Table 115. Alternative D – Effect Changes from Existing Conditions in Potential Gila Topminnow Watersheds by Analysis Factor

Analysis Factor	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	391.90	410.95	+19.05
Density of designated routes (miles per square mile)	0.80	0.84	+0.04
Decommissioned and closed routes (miles)	0.00	12.07	+12.07
Areas open to motorized vehicle use (acres)	13,286	65.35	-13,220.65
Motor vehicle use for big game retrieval (acres)	13,286	162,044.16	+148,758.16
Motor vehicle use for dispersed camping (acres)	13,286	24,451.32	+11,165.32
Personal use fuelwood gathering (acres)	57,237	57,327	0.00

Table 116. Alternative D – Effect Changes from Existing Conditions in Potential Loach Minnow Watersheds by Analysis Factor

Analysis Factor	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	12.99	12.99	0.00
Density of designated routes (miles per square mile)	0.87	0.87	0.00
Decommissioned and closed routes (miles)	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	6,315	0.00	-6,315
Motor vehicle use for big game retrieval (acres)	6,315	5,792.24	-522.76
Motor vehicle use for dispersed camping (acres)	6,315	858.26	-5,456.74
Personal use fuelwood gathering (acres)	2,984	2,984	0.00

Table 117. Alternative D – Effect Changes from Existing Conditions in Potential Watersheds and Critical Habitat for Razorback Sucker by Analysis Factor

	Potential Watersheds			Critical Habitat		
Analysis Factor	Existing Condition	Alternative D	Changes in Effects	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	25.89	25.90	+0.01	0.06	0.38	+0.32
Density of designated routes (miles per square mile)	0.25	0.25	0.00	0.01	0.9	+0.89
Decommissioned and closed routes (miles)	0.00	0.00	0.00	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	16,523.11	+16,523.51	0.00	1,311.57	+1,311.57
Motor vehicle use for dispersed camping (acres)	0.00	1,530.51	+1,530.51	0.00	39.23	+39.23
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	101.84	+101.84

Table 118. Alternative D – Effect Changes from Existing Conditions in Potential Watersheds and Critical Habitat for Spikedace by Analysis Factor

Analysis Factor	Potential Watersheds			Critical Habitat		
	Existing Condition	Alternative D	Changes in Effects	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	144.77	149.27	+4.5	16	12	-4
Density of designated routes (miles per square mile)	1.16	1.20	+0.04	N/A	N/A	N/A
Decommissioned and closed routes (miles)	0.00	1.57	+1.57	0	1	+1
Areas open to motorized vehicle use (acres)	70,266	0.00	-70,266	17.44	0.00	-17.44
Motor vehicle use for big game retrieval (acres)	70,266	65,177.76	-5,088.24	17.44*	46.59	-29.15
Motor vehicle use for dispersed camping (acres)	70,266	9,853.71	-60,412.3	17.44	4.78	-12.66
Personal use fuelwood gathering (acres)	63,247	63,247	0.00	22.56	22.56	0.00

For the seven analysis factors, the effects of Alternative D would have slight increases for miles of routes and road density effecting the Gila chub, Gila topminnow, and razorback sucker and slight decreases for the loach minnow and spikedace. Slight to moderate increases of effects would occur for the Gila chub, Gila topminnow, and razorback sucker under Alternative D. Changes in effects for the seven analysis factors between existing conditions and the proposed action in potential spikedace watersheds include motorized dispersed campsites, and personal use fuelwood gathering (often associated with motorized dispersed campsites), and substantial decreases for the loach minnow and spikedace in those fish species habitat in which these two analysis factors affect. This reduction in roads and motorized trails would result in a moderate to substantial reduction (depending on the specific fish species) eliminating the potential for noise disturbance and habitat alteration in potential habitat.

Alternative D would have no impact to a slightly negative effect to Gila chub, Gila topminnow, loach minnow, razorback sucker, and spikedace by:

- Slightly increasing motorized use in fish habitat that results in reduction of habitat degradation.
- Reducing dispersed camping for loach minnow and spikedace, but increasing for razorback sucker and Gila topminnow and associated activities of these analysis factors within the river or creek channel, floodplain, stock tanks or adjacent upland areas and can contribute to levels of sediment and other pollutants in these rivers and creeks in fish habitat.
- Slightly increasing levels of sediment and pollutants could improve water quality and lower water temperature, thus maintain or slightly reducing the fishery base and growth and regeneration of riparian.
- Slightly increasing the potential for introduced aquatic organisms and diseases.

Overall, Alternative D would either maintain or have a minimal negative effect on the five aforementioned fish species by reducing access to and activity near dispersal and occupied sites by reducing motorized dispersed campsites which would then reduce disturbances to individuals and their habitat.

Though increased recreation and habitat degradation resulting from urbanization, as well as non-forest road networks and grazing on private land is expected cumulatively, the amount of sedimentation delivered from roads on the Tonto and adjoining forests (the Coconino and Apache-Sitgreaves National Forests are already implementing travel management) would greatly decrease, counteracting the amount of sediment being produced by other activities. Less Gila chub, Gila topminnow, loach minnow, razorback sucker, and spikedace habitat would be affected for the long term (ten or more years.). Overall, this alternative would reduce the level of motorized recreation activities within potential and critical habitat reducing the level of use closer to that which was occurring prior to the Gila chub, Gila topminnow, loach minnow, razorback sucker and spikedace being listed, but to a lesser degree than Alternatives B and C.

Cumulative beneficial effects of Alternative D would be considered to be slightly higher than Alternatives B and C. Any differences in cumulative effects would be expected to be greater under Alternative D would be expected to be slight to moderate in comparison to Alternatives B and C.

Headwater Chub

Headwater chub have been documented on the Cave Creek, Payson, Pleasant Valley, and Tonto Basin Ranger Districts. Individuals have been observed in areas including Fossil, Rock, Spring, Tonto, and Turkey Creeks. On October 6, 2015, the US Fish and Wildlife Service proposed to list the headwater chub as threatened under the Endangered Species Act. Threats to the species have been determined to be predominantly predation by non-native fishes and habitat destruction.

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition (Table 119)[124]. The 910.98 miles of routes designated for motorized vehicle use in potential headwater chub habitat has the potential to continue to influence behavior, survival, reproduction, and distribution of, headwater chub as well as to alter habitat. To account for the potential impacts of sedimentation and other concerns from the miles and densities of routes and acres of uses such as OHV areas and motorized dispersed campsites, the analysis of effects between existing conditions and the proposed action involves the 6th code watershed hydrologic unit codes (HUCs) that include all potential habitat. These are Bull Tank Canyon-Tonto Creek, Buzzard Roost Canyon, Cocomunga Canyon-Tonto Creek, Deadman Creek, Haigler Creek, Hardt Creek-Tonto Creek, Houston Creek, Lambing Creek-Tonto Creek, Lower Fossil Creek, Lower Rye Creek, Lower Spring Creek, Marsh Creek, Middle East Verde Creek, Middle Spring Creek, Packard Wash-Tonto Creek, Rock Creek, Upper East Verde River, Upper Rye Creek, Upper Spring Creek, and Wet Bottom Creek. This area will be referred to as “potential headwater chub watersheds” for the remainder of this section. Approximately 20 percent of potential headwater chub watersheds are located in the Hellsgate and Mazatzal wilderness areas. Roads have effects on hydrologic processes that could affect the headwater chub by concentrating flow and diverting or rerouting water from paths the water would otherwise take

[124] The values calculated for retrieval under the proposed action include areas that have perennial water and would not be accessible by motorized vehicle. Since the amount of water can vary from year to year and season to season, these values represent the maximum area open under the driest conditions.

were the road not present. Roads can also add to sediment delivery into a stream or river system. Road ditches that drain water and sediment from roads on nearby hill slopes often develop swales and ephemeral channels. The formation of these channels increases erosion and fine sediment delivery to streams. Road crossings can act as barriers to migration and lead to water temperature changes. Fish passage can be limited to poorly designed channel crossings of roads. This alternative would result in negative effects by continuing to contribute a high level of sediment that would combine with increased sediment from short-term sediment pulses associated with impacts of high recreational use from motorized travel. The present rate of sediment delivery, which is expected to continue under Alternative A, could result in increased impacts on this species.

Table 119. Alternative A – Existing Conditions in Potential Headwater Chub Watersheds

Analysis Factor	Existing Condition
Routes designated for motor vehicle use (miles)	910.18
Density of designated routes (miles per square mile)	1.31
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	253,178
Motor vehicle use for big game retrieval (acres)	253,178
Motor vehicle use for dispersed camping (acres)	253,178
Personal use fuelwood gathering (acres)	299,780

Alternatives B and C —Direct and Indirect Effects

The effect of these alternatives on a forest wide basis would be a moderate reduction of motor vehicle use miles and road density, and a substantial reduction of areas open to motorized vehicle use, motorized big game retrieval, and motorized personal use fuelwood acres within potential headwater chub habitat on the Forest (Table 120). Alternatives B and C would have similar benefits to the species by reducing the potential for noise disturbance from motorized vehicles, disturbance due to human presence, and habitat degradation. Nearly 90 percent of user-created routes in potential watersheds are located on the Payson and Pleasant Valley Ranger Districts where motorized cross-country travel is unrestricted under existing conditions and only one of these routes crosses a perennial stream. Some routes designated in potential headwater chub watersheds under Alternatives B and C are located within drainages, creek floodplains or adjacent upland areas and, while there will be no effects from creation of routes since they already exist, these routes can contribute to levels of sediment and other pollutants in these waterways. Increased levels could result in potential effects to headwater chub and their habitats through changes in water quality and temperature, fine sediments in waterways, and growth and regeneration of aquatic and riparian vegetation. Additionally, the potential of introducing invasive and non-native organisms into waterways at stream crossings would increase. Less than half of the perennial stream crossings would be located on occupied headwater chub waterways, two crossings would be on administrative use only roads, and all but one route are current system routes, reducing the potential for such effects. While routes designated under Alternatives B and C could have effects on headwater chub and their habitats, nearly 20 percent of potential headwater chub watersheds are located in wilderness where no routes would be designated and the 20 percent decrease in the miles of routes from existing conditions would reduce the magnitude of potential effects on the species. Additionally, as those areas where routes would not be designated recover, habitat conditions for this species and their habitats would be expected to improve.

Table 120. Alternatives B and C – Effect Changes from Existing Conditions in Potential Headwater Chub Watersheds by Analysis Factor

Analysis Factor	Existing Condition	Alternative B	Changes in Effects	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	910.18	601.48	-308.7	798.90	-111.28
Density of designated routes (miles per square mile)	1.31	0.86	-0.45	1.15	-0.16
Decommissioned and closed routes (miles)	0.00	375.32	+375.32	177.91	+177.91
Areas open to motorized vehicle use (acres)	253,178	0.00	-253,178	0.00	-253,178
Motor vehicle use for big game retrieval (acres)	253,178	0.00	-253,178	249,091.51	-4,086.49
Motor vehicle use for dispersed camping (acres) and Alternative C campsites (count)	253,178	9.28	-253,168.72	479	479
Personal use fuelwood gathering (acres)	299,780	32,556.15	-267,223.85	41,843.85	-279,936.15

For the seven analysis factors, the effects of Alternative B and C would have moderate reductions for route reduction and road density for the proposed listed Headwater chub on the Tonto National Forest; Substantial reductions of motorized dispersed campsites and in personal use fuelwood gathering (often associated with motorized dispersed campsites) would occur within proposed Headwater chub habitat. This reduction in roads and motorized trails would result in eliminating the potential for noise disturbance and reducing sedimentation and habitat alteration in potential habitat.

Alternative B and C would benefit the Headwater chub by:

- Overall reducing motorized use in fish habitat which would reduce habitat degradation.
- Reducing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain, stock tanks, or adjacent upland areas which would reduce levels of sediment contribution and other pollutants in these rivers and creeks in fish habitat.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving the fishery base and improve growth and regeneration of riparian.
- Reducing the potential for introduced aquatic organisms and diseases.

Overall, Alternatives B and C would benefit the Headwater chub by reducing access to and activity near dispersal and occupied sites by reducing motorized dispersed campsites, reducing disturbances to individuals and their habitat.

Though increased recreation and habitat degradation resulting from urbanization, as well as non-forest road networks and grazing on private land is expected cumulatively, the amount of sedimentation delivered from roads on the Tonto and adjoining forests (the Coconino and Apache-Sitgreaves National Forests are already implementing travel management) would greatly

decrease, counteracting the amount of sediment being produced by other activities. Overall, less Headwater chub potential habitat would be affected for the long term (ten or more years). This alternative would reduce the level of motorized recreation activities within potential habitat reducing the level of use closer to that which was occurring prior to the proposed listing of the Headwater chub. Cumulative beneficial effects would be similar for Alternative B and Alternative C. Any differences in cumulative effects between the two alternatives would be expected to be slight.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a slight increase in motor vehicle use miles and road density within headwater chub habitat on the Forest (Table 121). A substantial reduction of areas open to motorized use and motorized dispersed camping would occur. A moderate increase in acres of motor vehicle use for big game retrieval would be authorized under Alternative D. Motorized big game retrieval is limited from August to December and hunters are required to only cross streams at hardened surfaces, thus impacts from motorized big game retrieval would be minimal. Alternative D would benefit the species the least with minimal reduction of the potential for human disturbance associated with motorized vehicles and disturbance, as well as habitat degradation.

Table 121. Alternative D – Effect Changes from Existing Conditions in Potential Headwater Chub Watersheds by Analysis Factor

Analysis Factor	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	910.18	960.84	+50.66
Density of designated routes (miles per square mile)	1.31	1.38	+0.07
Decommissioned and closed routes (miles)	0.00	14.83	+14.83
Areas open to motorized vehicle use (acres)	253,178	0.00	-253,178
Motor vehicle use for big game retrieval (acres)	253,178	333,731.23	+80,553.23
Motor vehicle use for dispersed camping (acres)	253,178	60,699.22	-192,478.78
Personal use fuelwood gathering (acres)	299,780	299,780	0.00

For the seven analysis factors, the effects of Alternative D would have slight increases in motorized routes and road density for the proposed listed Headwater chub on the Tonto National Forest. Moderate increase in motor vehicle use for big game retrieval and substantial reductions of motorized dispersed campsites within proposed Headwater chub habitat would occur under Alternative D. This increase in roads and motorized trails would result in increased potential for noise disturbance, increased sedimentation, and habitat alteration in potential habitat.

Alternative D would have a minimal negative effect on the Headwater chub by:

- Overall increasing motorized use in fish habitat that results in increased habitat degradation.
- Reducing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain, stock tanks, or adjacent upland areas which would reduce sediment and other pollutants in these rivers and creeks in fish habitat.

- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving the fishery base and improve growth and regeneration of riparian.
- Reducing the potential for introduced aquatic organisms and diseases, by minimizing motorized dispersed camping often associated with riparian areas.

Though increased recreation and habitat degradation resulting from urbanization, as well as non-forest road networks and grazing on private land is expected cumulatively, the amount of sedimentation delivered from roads on the Tonto and adjoining forests (the Coconino and Apache-Sitgreaves National Forests are already implementing travel management) would greatly decrease, counteracting the amount of sediment being produced by other activities. Overall, less Headwater chub potential habitat would be affected for the long term (ten or more years) over the species range. This alternative would reduce the level of motorized recreation activities within potential habitat reducing the level of use closer to that which was occurring prior to the proposed listing.

Roundtail Chub

On October 6, 2015, the roundtail chub, considered a distinct population in the Lower Colorado River Basin, was proposed for listing as a threatened species under the Endangered Species Act. Threats to the species are primarily predation by non-native fishes and habitat destruction due to dewatering, impoundment construction, and channelization as well as the effects of mining, livestock overgrazing, roads, water pollution, groundwater pumping, and climate change.

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition (Table 122)[125]. The 714.90 miles of routes designated for motorized vehicle use in roundtail chub habitat have the potential to continue to influence behavior, survival, reproduction, and distribution of roundtail chub, as well as to alter habitat. While routes under the existing condition could have effects on roundtail chub and their habitats, nearly 29 percent of potential roundtail chub watersheds are located in wilderness where no routes would be designated. Roads have effects on hydrologic processes that could affect the headwater chub by concentrating flow and diverting or rerouting water from paths the water would otherwise would take were the road not present. Roads can add to sediment delivery into a stream or river system. Road ditches that drain water and sediment from roads on nearby hill slopes often develop swales an ephemeral channels. The formation of these channels increases erosion and fine sediment delivery to streams. Road crossings can act as barriers to migration and lead to water temperature changes. Fish passage can be limited to poorly designed channel crossings of roads. This alternative would result in negative effects by continuing to contribute a high level of sediment that would combine with increased sediment from short-term sediment pulses associated with impacts of high recreational use from motorized travel. The present rate of sediment delivery under, which would be expected to continue under Alternative A, could result in increased impacts on this species.

[125] The values calculated for retrieval under the proposed action include areas that have perennial water and would not be accessible by motorized vehicle. Since the amount of water can vary from year to year and season to season, these values represent the maximum area open under the driest conditions.

Table 122. Alternative A – Existing Conditions in Potential Roundtail Chub Watersheds

Analysis Factor	Existing Condition
Routes designated for motor vehicle use (miles)	719.40
Density of designated routes (miles per square mile)	0.97
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	100,536
Motor vehicle use for big game retrieval (acres)	100,536
Motor vehicle use for dispersed camping (acres)	100,536
Personal use fuelwood gathering (acres)	214,190

Alternative B and C—Direct and Indirect Effects

The effect of these alternatives on a forest wide basis would be a moderate reduction of road density and a substantial reduction of motor vehicle use miles, areas open to motorized vehicle use, motorized big game retrieval, motorized dispersed camping, and motorized personal use fuelwood acres within potential roundtail chub habitat on the Forest (Table 123). Alternatives B and C would have similar benefit to the species by reducing the potential for noise disturbance from motorized vehicles, disturbance due to humans, and habitat degradation. Approximately 453 miles for Alternative B and 569 miles of routes under Alternative C would be designated in potential roundtail chub watersheds with thirteen perennial stream crossings (two on Cherry Creek, seven on the East Verde River, two in Mud Springs Wash, one on PB Creek, and one on the Verde River). None of these user-created routes would cross a perennial stream. Some routes designated in potential roundtail chub watersheds under the proposed action are located within drainages, creek floodplains or adjacent upland areas and, while there will be no effects from creation of routes since they already exist, these routes can contribute to levels of sediment and other pollutants in these waterways. Increased levels could result in potential effects to roundtail chub and their habitats through changes in water quality and temperature, fine sediments in waterways, and growth and regeneration of aquatic and riparian vegetation. Additionally, there would be an increase in the potential of introducing invasive and non-native organisms into waterways at stream crossings. Only one quarter of the perennial stream crossings would be located on occupied roundtail chub waterways, one crossing would be on an administrative use only road, and all but one route are current system routes, reducing the potential for such effects. While routes designated under Alternatives B and C could have effects on roundtail chub and their habitats, nearly 29 percent of potential roundtail chub watersheds are located in wilderness where no routes would be designated and the 28 percent decrease in the miles of routes from existing conditions would reduce the magnitude of potential effects on the species. Additionally, as those areas where routes would not be designated recover, habitat conditions for this species and their habitats would be expected to improve.

Table 123. Alternatives B and C – Effect Changes from Existing Conditions in Potential Roundtail Chub Watersheds by Analysis Factor

Analysis Factor	Existing Condition	Alternative B	Changes in Effects	Alternative C	Changes in Effects
Routes designated for motor vehicle use (miles)	719.40	453.87	-434.47	569.27	-150.13
Density of designated routes (miles per square mile)	0.97	0.61	-0.36	0.77	-0.20
Decommissioned and closed routes (miles)	0.00	307.89	+307.89	204.37	+204.37
Areas open to motorized vehicle use (acres)	100,536	0.00	-100,536	35.21	-100,500.79
Motor vehicle use for big game retrieval (acres)	100,536	0.00	-100,536	178,257.85	+77,721.85
Motor vehicle use for dispersed camping (acres) Alternative C campsites (count)	100,536	13.60	-100,522.4	368	+368
Personal use fuelwood gathering (acres)	214,190	18,700.76	-195,489.24	23,443.99	-190,746.01

For the seven analysis factors, the effects of Alternative B and C would have moderate reductions for miles of route reduction and road density for the proposed listed roundtail chub on the Tonto National Forest; Substantial reductions of motorized dispersed campsites, and in personal use fuelwood gathering (often associated with motorized dispersed campsites) would occur within proposed roundtail chub habitat fish in which these two analysis factors affect. This reduction in roads and motorized trails would result in a moderate to substantial reduction, eliminating the potential for noise disturbance and reducing sedimentation and habitat alteration in potential habitat.

Alternative B and C would benefit the roundtail chub by:

- Overall reducing motorized use in fish habitat which would reduce habitat degradation.
- Reducing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain, stock tanks, or adjacent upland areas which can reduce sediment contribution and other pollutants in these rivers and creeks in fish habitat.
- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving the fishery base and improve growth and regeneration of riparian vegetation.
- Reducing the potential for introduced aquatic organisms and diseases.

Overall, Alternatives B and C would benefit the roundtail chub by reducing access to and activity near dispersal and occupied sites in reducing motorized dispersed campsites, reducing disturbances to individuals and their habitat.

Though increased recreation and habitat degradation resulting from urbanization, as well as non-forest road networks and grazing on private land is expected cumulatively, the amount of sedimentation delivered from roads on the Tonto and adjoining forests (the Coconino and

Apache-Sitgreaves National Forests are already implementing travel management) would greatly decrease, counteracting the amount of sediment being produced by other activities. Overall, less roundtail chub potential habitat would be affected for the long term (ten or more years.). This alternative would reduce the level of motorized recreation activities within potential habitat reducing the level of use closer to that which was occurring prior to the proposed listing of the roundtail chub. Cumulative beneficial effects would be similar for Alternative B and Alternative C. Any differences in cumulative effects between the two alternatives would be expected to be slight.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a slight decrease in motor vehicle use miles and road density within roundtail chub habitat on the Forest (Table 124). A substantial reduction of areas open to motorized use and motorized dispersed camping would occur under Alternative D. A substantial increase in acres of motor vehicle use for big game retrieval would also occur. Alternative D would have a minimal negative effect on the species by minimal reduction the potential for disturbance due to human presence, as well as habitat degradation.

Table 124. Alternative D – Effect Changes from Existing Conditions in Potential Roundtail Chub Watersheds by Analysis Factor

Analysis Factor	Existing Condition	Alternative D	Changes in Effects
Routes designated for motor vehicle use (miles)	719.40	707.19	-12.21
Density of designated routes (miles per square mile)	0.97	0.96	-0.01
Decommissioned and closed routes (miles)	0.00	52.18	+52.18
Areas open to motorized vehicle use (acres)	100,536	1,346.22	-99,189.78
Motor vehicle use for big game retrieval (acres)	100,536	297,779.45	+197,243.45
Motor vehicle use for dispersed camping (acres)	100,536	43,198.18	-57,337.82
Personal use fuelwood gathering (acres)	214,190	214,1890	0.00

For the seven analysis factors, the effects of Alternative D would have slight reduction in routes and road density for the proposed listed roundtail chub on the Tonto National Forest. There would be a substantial increase in motor vehicle use for big game retrieval and substantial reductions of dispersed campsites, within proposed roundtail chub habitat in which these two analysis factors affect. This slight decrease in roads and motorized trails would result decreased potential for noise disturbance, sedimentation and habitat alteration in potential habitat, but the gain would be partially offset by the substantial increases in motorized use for big game retrieval during honing season.

Alternative D would have a minimal negative effect on the roundtail chub by:

- Overall increasing motorized use in fish habitat that results in increased habitat degradation.
- Reducing motorized dispersed camping and associated activities of these analysis factors within the river or creek channel, floodplain, stock tanks, or adjacent upland areas which would reduce sediment contribution and other pollutants in these rivers and creeks in fish habitat.

- Reducing levels of sediment and pollutants could improve water quality and lower water temperature, thus improving the fishery base and improve growth and regeneration of riparian vegetation during most of the year.
- Reducing the potential for introduced aquatic organisms and diseases, by minimizing motorized dispersed camping often associated with riparian areas, during most of the year but slightly increasing this potential during hunting season.

Though increased recreation and habitat degradation resulting from urbanization, as well as non-forest road networks and grazing on private land is expected cumulatively, the amount of sedimentation delivered from roads on the Tonto and adjoining forests (the Coconino and Apache-Sitgreaves National Forests are already implementing travel management) would greatly decrease, counteracting the amount of sediment being produced by other activities. Overall, less roundtail chub potential habitat would be affected for the long term (ten or more years) over the species range. This alternative would reduce the level of motorized recreation activities within potential habitat reducing the level of use closer to that which was occurring prior to the proposed listing.

Table 125. Alternative A – Existing Conditions in Potential Foraging Habitat for Lesser Long-Nosed Bat

Analysis Factors	Existing Condition
Routes designated for motor vehicle use (miles)	1,442.52
Density of designated routes (miles per square mile)	1.20
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	1,235
Motor vehicle use for big game retrieval (acres)	1,235
Motor vehicle use for dispersed camping (acres)	1,235
Personal use fuelwood gathering (acres)	210,556

Alternatives B and C—Direct and Indirect Effects

The effect of these alternatives on a forest wide basis would be a moderate decrease in routes designated for motorized vehicle use and road density within lesser long-nosed bat potential foraging habitat (Table 126). There would be a substantial reduction in areas open to motorized use, motor vehicle use for big game retrieval, acres of motorized dispersed camping, and of motorized personal fuelwood gathering within lesser long-nosed bat potential foraging habitat under Alternative B. Under Alternative C, there would be a slight decrease in routes designated for motorized vehicle use, road density, and a moderate reduction in areas open to motorized use within lesser long-nosed bat potential foraging habitat. There would be a substantial increase in motor vehicle use for big game retrieval, and motorized dispersed camping sites. Alternatives B and C would benefit the species by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence, as well as habitat degradation. These alternatives would have the potential to positively influence survival, reproduction, and distribution of the lesser long-nosed bat as well as to benefit foraging habitat. There would be no effects from creation of routes since they already exist, but routes can increase the potential of forest users collecting, crushing, or damaging preferred cacti species for foraging and reduce habitat quality through increasing the risk of introduction and spread of invasive plant species. While routes designated under the Alternative B could have effects on bats and their habitats, nearly nineteen percent of potential habitat is located in wilderness where no routes would be

designated and a 60 percent decrease in the miles of routes in potential habitat from existing conditions would reduce the magnitude of potential effects on the species. Foraging habitat conditions for bat would be expected to improve.

Table 126. Alternatives B and C – Effect Changes from Existing Conditions in Potential Foraging Habitat for Lesser Long-Nosed Bat by Analysis Factor

Analysis Factors	Existing Condition	Alternative B	Change in Effects	Alternative C	Changes in Effect
Routes designated for motor vehicle use (miles)	1,442.52	867.26	-575.26	1,221.00	-221.52
Density of designated routes (miles per square mile)	1.20	0.72	-0.48	1.02	-0.18
Decommissioned and closed routes (miles)	0.00	712.19	+712.19	382.67	+382.67
Areas open to motorized vehicle use (acres)	1,235	0.00	-1,235	738.21	-496.79
Motor vehicle use for big game retrieval (acres)	1,235	0.00	0.00	85,174.18	+83,939.18
Motor vehicle use for dispersed camping (acres) Alternative C (count)	1,235	16.71	-1,218.29	596	+596
Personal use fuelwood gathering (acres)	210,556	24,046.48	-186,509.52	27,954.02	-182,601.98

For the seven analysis factors, the effects of Alternatives B and C would moderately reduce miles of routes and road density for the lesser long-nosed bat in potential foraging habitat on the Tonto National Forest. Substantial reductions of motorized dispersed campsites and in personal use fuelwood gathering (often associated with motorized dispersed campsites) would occur within potential foraging habitat for the long-nosed. This reduction in roads and motorized trails would result in reduced potential for noise disturbance and reduced sedimentation and habitat alteration in potential habitat.

Alternative B and C would benefit the lesser long-nosed bat for the following reasons:

- Approximately nineteen percent of potential foraging habitat is located in wilderness areas and would not be affected by Alternatives B and C.
- Acres of potential foraging habitat inside permit zones (Alternative C) could benefit from slight improvement in soil and vegetation conditions since users are more likely to stay on designated routes in these areas.
- Potential foraging habitat that would be designated as OHV areas is already heavily disturbed by unauthorized OHV use and provides limited to no foraging habitat.
- Potential foraging habitat is located below 4,500 feet in elevation and is limited to desert communities; motorized big game retrieval would likely be limited to bear only, since elk are normally found in forested habitats above 5,500 feet in Arizona.
- Motorized big game retrieval would most likely occur during daylight, limiting potential effects to foraging bats.

- Acres and number of motorized dispersed campsites that would have spur roads designated to them already exist and represent less than 0.001 percent of potential foraging habitat. Reduction in motorized dispersed campsites within foraging habitat would likely improve foraging habitat.

Overall, Alternatives B and C would benefit the long lesser-nosed bat by reducing access to and activity in foraging habitat and by reducing motorized dispersed campsites which can reduce disturbances to individuals and their habitat.

These alternatives would reduce disturbance and habitat degradation from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Less bat foraging habitat would be affected for the long term (ten or more years.) under Alternatives B and C. These alternatives would reduce the level of motorized recreation activities within foraging habitat reducing the level of use closer to that which was occurring prior to the lesser-long nosed bat being listed. Cumulative beneficial effects would be similar to Alternative B for Alternative C. Any differences in cumulative effects between the two alternatives would be discountable.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be expected to be a minimal negative effect or no change from the current condition (Table 127). A slight increase of routes designated for motorized vehicle use and road density within lesser long-nosed bat potential foraging habitat. There would be a moderate increase in designated motor vehicle use and substantial increase of motor vehicle use for big game retrieval and motorized dispersed camping, if Alternative D is implemented. Big game retrieval would be limited from mid-August to December and retrieval would occur during daylight when the bats are not actively foraging. Alternative D would be a minimal benefit to the species by reducing the potential for noise disturbance from motorized vehicles, habitat degradation would remain the same and human disturbance would increase due to increased motorized dispersed camping opportunities.

Table 127. Alternative D – Effect Changes from Existing Conditions in Potential Foraging Habitat for Lesser Long-Nosed Bat by Analysis Factor

Analysis Factors	Existing Condition	Alternative D	Change in Effects
Routes designated for motor vehicle use (miles)	1,442.52	1,470.44	+27.92
Density of designated routes (miles per square mile)	1.20	1.23	+0.03
Decommissioned and closed routes (miles)	0.00	93.25	+93.25
Areas open to motorized vehicle use (acres)	1,235	1,817.12	+582.12
Motor vehicle use for big game retrieval (acres)	1,235	509,810.11	+508,575.11
Motor vehicle use for dispersed camping (acres)	1,235	88,721.22	+87,486.22
Personal use fuelwood gathering (acres)	210,556	210,556	0.00

For the seven analysis factors, the effects of Alternatives D would have slight increases in motorized routes and road density for the lesser long-nosed bat in potential foraging habitat on the Tonto National Forest. Substantial increase in motorized dispersed campsites, and no change in personal use fuelwood gathering (often associated with motorized dispersed campsites) acres would occur within potential foraging habitat for the long-nosed bat. This reduction in roads and motorized trails would result in eliminating the potential for noise disturbance and reducing

sedimentation and habitat alteration in potential habitat. However, the benefits would be countered by the substantial increase in dispersed campsites.

Alternative D would have limited negative effects on the lesser long-nosed bat foraging habitat for the following reasons:

- Approximately nineteen percent of potential foraging habitat is located in wilderness areas and would not be affected by Alternatives D.
- Acres of potential foraging habitat inside permit zones could benefit from slight improvement in soil and vegetation conditions since users are more likely to stay on designated routes in these areas.
- Potential foraging habitat that would be designated as OHV areas is already heavily disturbed by unauthorized OHV use and provides limited to no foraging habitat.
- Potential foraging habitat is located below 4,500 feet in elevation and is limited to desert communities; motorized big game retrieval would likely be limited to bear and deer only, since elk are normally found in forested habitats above 5,500 feet in Arizona, minimizing overall effects on foraging areas.
- Motorized big game retrieval would most likely occur during daylight, limiting potential effects to foraging bats.
- Acres and number of motorized dispersed campsites would increase in potential foraging habitat. Substantial increases motorized dispersed campsites within foraging habitat would likely degrade foraging habitat.

Mexican Gray Wolf

Currently, the Interagency Field team (IFT) is working on establishing release sites on the Tonto National Forest. The IFT is working with forest service personnel and permittees and following release site restrictions where no release sites will be within five miles of a town, or within three miles of a year round residence (personnel communication, Vicente Ordonez, Forest Service Liaison for Mexican Wolf Recovery 2015). No pack activity is currently known to occur on the Tonto. Approximately 1,145,142 acres of primary potential habitat occurs on portions of the six ranger districts. The rest of the Tonto National Forest is considered secondary potential habitat (approximately 1,781,664 acres). Approximately 20 percent of both primary and secondary potential habitat for the species is in portions of the Four Peaks, Hellsgate, Mazatzal, Pine Mountain, Salome, Salt River Canyon, Sierra Ancha, and Superstition wilderness areas. Potential habitat for Mexican gray wolf was refined in coordination with the USFWS in March 2015. Potential habitat for the species is split into two categories based on the revised geographic boundaries for the Mexican wolf experimental population area (MWEPA) (80 FR 2512, January 16, 2015). Primary habitats are those acres of mixed conifer with aspen, pinyon-juniper live oak woodland, ponderosa pine forest potential vegetation types (PNVT) on the portion of Zone 1 of the MWEPA on the Tonto National Forest. Secondary habitat is all remaining acres of PNVTs except mines and water in Zone 2 of the MWEPA on the Tonto National Forest.

Last year (2014) the Interagency Field team photographed a wolf on a trail camera in the northeastern part of the Tonto National Forest. A wolf was detected during flights conducted in late summer of 2015 on the Tonto National Forest. As the wolf population grows the IFT predicts wolves will disperse into the Payson area. These wolves may establish packs and home ranges. At this time no future translocations are planned in Zone 2 (personnel communication, USFWS, John Oakleaf 2105).

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition (Table 128). Any human presence, including use of motorized vehicles, can increase the potential for noise disturbance from motorized vehicles, habitat degradation, and human wolf interactions. The 2,053.84 miles of routes designated for motorized vehicle use in primary Mexican gray wolf habitat and 5,456.66 miles in secondary habitat have the potential to continue to influence survival, reproduction, and distribution of, Mexican gray wolf as well as to alter habitat. Human wolf interactions are the greatest direct threat to the Mexican wolf in the case of wolf mortality as a result of illegal shooting. Continued habitat degradation would indirectly affect the Mexican wolf's prey base, by causing a decrease in wolf prey, (mainly elk and deer) by habitat degradation and a potential increase in human motorized big game hunting success due to increased motorized use.

Table 128. Alternative A – Existing Conditions in Potential Primary and Secondary Habitats for Mexican Gray Wolves

Analysis Factors	Existing Condition	
	Primary	Secondary
Routes designated for motor vehicle use (miles)	2,053.84	5,456.66
Density of designated routes (miles per square mile)	1.15	1.96
Decommissioned and closed routes (miles)	0.00	0.00
Areas open to motorized vehicle use (acres)	564,827	138,790
Motor vehicle use for big game retrieval (acres)	564,827	138,790
Motor vehicle use for dispersed camping (acres)	564,827	138,790
Personal use fuelwood gathering (acres)	641,419	703,966

Alternatives B and C —Direct and Indirect Effects

The effect of Alternatives B and C on a forest wide basis would be a decrease in primary and secondary habitat in miles of routes designated for motorized vehicle use and road density (Table 129 and Table 130). There would be a substantial reduction in areas open to motorized use, motor vehicle use for big game retrieval, acres of motorized dispersed camping and of motorized personal fuelwood gathering within Mexican gray wolf habitat. Under Alternative C, motorized big game retrieval would be limited from mid-August to December; however, wolf mortality is often increased during hunting periods from human interaction. Nearly two-thirds of primary potential wolf habitat that would be open to motorized big game retrieval is located within the range of elk, the primary prey species for wolves. There would be no effects from creation of routes since they already exist, but routes can increase the potential of disturbance of individuals and prey and reduce habitat quality through changes in soil and vegetation conditions, increasing the risk of introduction and spread of invasive plant species. While routes designated under Alternatives B and C could have effects on wolves and their primary and secondary habitats, nearly twenty percent of primary and secondary potential habitat is located in wilderness where no routes would be designated and a 24 percent decrease in the miles of routes in primary potential habitat from existing conditions which would reduce the magnitude of potential effects on the species. Wolf human interactions would be expected to decrease, and habitat degradation for prey species as well as disturbance to prey species would be improve under Alternatives B and C.

Table 129. Alternative B – Effect Changes from Existing Conditions in Potential Primary and Secondary Habitats for Mexican Gray Wolves by Analysis Factor

Analysis Factors	Existing Condition		Alternative B		Change in Effects	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Routes designated for motor vehicle use (miles)	2,053.84	5,456.66	1,304.31	2,145.86	-749.53	-3,310.80
Density of designated routes (miles per square mile)	1.15	1.96	0.73	0.77	-0.42	-1.19
Decommissioned and closed routes (miles)	0.00	0.00	881.74	1,479.06	+881.74	+1,479.06
Areas open to motorized vehicle use (acres)	564,827	138,790	0.00	0.00	-564,827	-138,790
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	564,827	138,790	23.00	42.00	-564,804	-138,747
Personal use fuelwood gathering (acres)	641,419	703,966	56,862	76,634	-584,557	-627,332

Table 130. Alternative C – Effect Changes from Existing Conditions in Potential Primary and Secondary Habitats for Mexican Gray Wolves by Analysis Factor

Analysis Factors	Existing Condition		Alternative C		Change in Effects	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Routes designated for motor vehicle use (miles)	2,053.84	5,456.66	1,700.26	2,145.86	-353.58	-2,585.23
Density of designated routes (miles per square mile)	1.15	1.96	0.95	0.77	-0.2	-0.93
Decommissioned and closed routes (miles)	0.00	0.00	488.55	1,479.06	+488.55	+781.93
Areas open to motorized vehicle use (acres)	564,827	138,790	0.00	0.00	-564,827	-137,392.9
Motor vehicle use for big game retrieval (acres)	0.00	0.00	767,795	0.00	+202,968	+386,591
Motor vehicle use for dispersed camping (acres)	564,827	138,790	1,115	42.00	+1,115	+1,746
Personal use fuelwood gathering (acres)	641,419	703,966	70,298.13	76,634	-571,121	-612,555

Under Alternative B, there are no permit zones within 0.25 miles of primary or secondary potential wolf habitat. As a result, this element of the proposed action would have no effect on wolves or its primary or secondary habitats.

Approximately 1,397 acres of secondary potential wolf habitat would be included in all or portions of the permit zones that would exist under the Alternative C (which approximately seven percent of secondary potential wolf habitat is on the Tonto National Forest). This includes 34,595 acres of the existing Bulldog Canyon Permit Zone and an additional 81,805 acres of the Desert Vista (100 percent of acres), St. Clair (99 percent of acres), and The Rolls (99 percent of acres). This would be 2.4 times the number of acres of permit zones under existing conditions and represents 99 percent of the acres that would be designated under the proposed action. Since cross-country travel is currently restricted in these areas and would continue to be when designated as permit zones, there would be no difference in the potential effects of designating permit zones and designating the approximately 320.69 miles routes inside of them. Permit zones could be beneficial to those acres of secondary potential wolf habitat inside of them. In order to access a permit zone, users are required to obtain a gate combination and a free permit from the Tonto National Forest. This tends to make permit zone users more aware of restrictions and therefore, more likely to stay on designated routes. As a result, soil and vegetation conditions may be slightly better inside permit zones than outside of them.

Approximately 2,145 miles under Alternative B and 2,871 miles under Alternative C of routes would be designated in secondary potential wolf habitat. As described for primary potential habitat, routes already exist so there would be no effects from creation of routes, but designation can increase the risk of disturbance of individuals and prey and reduce habitat quality. The magnitude of potential effects on the species and their habitats would be minimized since twenty percent of secondary potential habitat is located in wilderness where no routes would be designated and a 23 percent decrease in the miles of routes in secondary potential habitat would occur from existing conditions. Alternative B would benefit the species the most by reducing the potential human wolf interactions presence, as well as habitat degradation for wolf prey base, but to a similar degree as Alternative C.

For the seven analysis factors, the effects of Alternatives B and C would have moderate reductions for route reduction and road density for the Mexican wolf in potential primary and substantial in secondary for Alternative B and moderate in primary and secondary habitat for Alternative C on the Tonto National Forest; Substantial reductions of motorized dispersed campsites, and in personal use fuelwood gathering (often associated with motorized dispersed campsites) would occur within potential primary and secondary habitat for the Mexican wolf in which these two analysis factors affect. This reduction in roads and motorized trails would result in reductions eliminating the potential wolf human interactions and degradation of prey base habitat.

- Alternative B and C would benefit Mexican wolf for the following reasons:
- The magnitude of potential effects on the species and their habitats would be minimized since twenty percent of secondary potential habitat is located in wilderness where no routes would be designated.
- Acres of motorized dispersed campsites under Alternative B are reduced, likely reducing wolf human interactions.
- Number of motorized dispersed campsites under Alternative C that would have spur roads designated to them already exist and represent less than 0.001 percent of potential foraging habitat. Reduction in motorized dispersed campsites within primary and secondary habitat would likely reduce wolf human interactions.
- With reduced roads, habitat degradation for prey base would be expected to be reduced.

- There would be no additive effects from designating approximately 1,397 acres of permit zones in secondary potential habitat to those associated with designating the approximately 320.69 miles of routes inside them under Alternative C.
- Acres of secondary potential habitat inside permit zones could benefit from slight improvement in soil and vegetation conditions since users are more likely to stay on designated routes in these areas.
- Year round unrestricted cross-country travel for uses not related to motorized big game retrieval occurring under the existing condition would not occur under Alternatives B or C or on the Payson and Pleasant Valley Ranger districts.

Overall, Alternatives B and C would benefit the Mexican wolf by reducing access to and activity in primary and secondary habitat and in reducing motorized dispersed campsites, reducing human wolf interactions and degradation of habitat for prey base.

These alternatives would reduce human wolf interactions and habitat degradation for prey from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Less Mexican wolf primary and secondary habitat would be affected for the long term (ten or more years.) under Alternatives B and C. The biggest difference in effects between the two alternatives is under Alternative C where motorized use for big game retrieval would be allowed which likely would increase the risk of mortality to wolfs from human interactions. These alternatives would reduce the level of motorized recreation activities within primary and secondary habitat reducing the level of use closer to that which was occurring prior to the Mexican wolf being listed. Cumulative beneficial effects would be similar to Alternative B and Alternative C. Any differences in cumulative effects between the two alternatives would be minimal.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a slight increase of routes designated for motorized vehicle use and road density in primary Mexican gray wolf habitat and a moderate decrease in secondary habitat (Table 131). There would be a substantial decrease in designated motor vehicle use for primary and secondary habitat. For motor vehicle use for big game retrieval, there would be a moderate increase in primary and a substantial increase in secondary habitat. There would also be a substantial decrease in primary and substantial increase in secondary habitat in areas available for motorized dispersed camping, if Alternative D is implemented. Motorized big game retrieval would be limited from mid-August to December. Wolf mortality is often increased during hunting periods due to human interaction, and under Alternative D motorized big game retrieval would be expanded to include deer, an important prey species for wolves, only secondary to elk. Overall, Alternative D would negatively affect the Mexican gray wolf due the potential for increased human activity by increasing the potential for noise disturbance from motorized vehicles, habitat degradation, and human wolf interactions.

Table 131. Alternative D – Effect Changes from Existing Conditions in Potential Primary and Secondary Habitats for Mexican Gray Wolves by Analysis Factor

Analysis Factors	Existing Condition		Alternative D		Change in Effects	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Routes designated for motor vehicle use (miles)	2,053.84	5,456.66	2,121.20	3,468.99	+67.36	-1,987.67
Density of designated routes (miles per square mile)	1.15	1.96	1.19	1.25	+0.04	-0.71
Decommissioned and closed routes (miles)	0.00	0.00	64.27	136.95	+64.27	+136.95
Areas open to motorized vehicle use (acres)	564,827	138,790	0.00	2,591	-564,827	-136,199
Motor vehicle use for big game retrieval (acres)	0.00	0.00	840,271	1,202,788	+275,444	+1,063,998
Motor vehicle use for dispersed camping (acres)	564,827	138,790	130,826	204,122	-434,001	+65,332
Personal use fuelwood gathering (acres)	641,419	703,966	641,419	703,966	0.00	0.00

Nearly two-thirds of primary potential wolf habitat that would be open to motorized big game retrieval is located within the range of elk, the primary prey species for wolves.

For the seven analysis factors, the effects of Alternative D would have slight increase primary and a moderate increase in secondary potential habitat for routes and road density for the Mexican wolf on the Tonto National Forest; Increase in acres of dispersed campsites, and in personal use fuelwood gathering (often associated with dispersed campsites) would occur within potential primary and secondary habitat for the Mexican wolf in which these two analysis factors affect. This increase in roads and motorized trails would result in increasing the potential wolf human interactions and degradation of prey base habitat.

Alternative D would negatively affect the Mexican wolf for the following reasons:

- The magnitude of potential effects on the species and their habitats would be minimized since twenty percent of secondary potential habitat is located in wilderness where no routes would be designated.
- Acres of motorized dispersed campsites under Alternative D are reduced in primary habitat and increased in secondary habitat likely only slightly reducing wolf human interactions from the current condition.
- With increased roads in primary habitat and decreased roads in secondary habitat improvements to habitat degradation for prey base would be expected to increase.
- There would be no additive effects from designating approximately 1,397 acres of permit zones in secondary potential habitat to those associated with designating the approximately 320.69 miles of routes inside them under Alternative D.

- Acres of secondary potential habitat inside permit zones could benefit from slight improvement in soil and vegetation conditions since users are more likely to stay on designated routes in these areas.
- Increased motorized use for big game retrieval in primary and secondary habitat is expected to increase the likelihood of human wolf interactions.

Overall, Alternatives D would have a negative effect on the Mexican wolf by increasing access to and activity in primary and secondary habitat and in increasing motorized dispersed campsites in secondary habitat, increasing human wolf interactions and degradation of habitat for prey base.

Overall, Alternatives D would reduce human wolf interactions and habitat degradation for prey from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Slightly more Mexican wolf primary and secondary habitat would be affected for the long term (ten or more years) under Alternative D. This alternative would increase the level of motorized recreation activities within primary and secondary habitat increasing the level of use closer to that which was occurring prior to the Mexican wolf being listed, however to a lesser degree than the current condition which allows year round motorized use on the Payson and Pleasant Valley Ranger Districts.

Ocelot

Approximately 226,242 acres of potential habitat for ocelot occurs on the Globe Ranger District. Approximately eleven percent of potential habitat for the species is in the Salt River Canyon and Superstition wilderness areas. Potential habitat for ocelot was refined in coordination with the USFWS in March 2015 and is based around the location on U.S. Highway 60 where a young adult male ocelot was killed by a vehicle in April 2010. Potential habitat for ocelot is defined as acres of interior chaparral, Madrean encinal woodlands, and semi-desert grasslands potential natural vegetation types on the Globe Ranger District.

No surveys have occurred for ocelot on the Tonto National Forest.

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition (Table 132). The 480.7 miles of routes designated for motorized vehicle use, within potential ocelot habitat, have the potential to continue to influence survival, reproduction, and distribution of ocelot, as well as, to alter habitat through human presence from motorized personal fuelwood gathering and disturbance from motor vehicles. Approximately 480 miles of routes would be designated in potential ocelot habitat. There would be no effects from creation of routes since they already exist, but routes can increase the potential of disturbance of individuals and prey and reduce habitat quality through changes in soil and vegetation conditions and increasing the risk of introduction and spread of invasive plant species. While routes designated under the proposed action could have effects on ocelots and their habitats, nearly eleven percent of potential habitat is located in wilderness where no routes would be designated and a 22 percent decrease in the miles of routes in potential habitat from existing conditions would reduce the magnitude of potential effects on the species. Habitat conditions for ocelots would be expected to have a slightly negative effect under Alternative A, as no improvement would be expected from the current condition.

Table 132. Alternative A – Existing Conditions in Potential Habitat for Ocelot

Analysis Factors	Existing Condition
Routes designated for motor vehicle use (miles)	480.79
Density of designated routes (miles per square mile)	1.36
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	0.00
Motor vehicle use for big game retrieval (acres)	0.00
Motor vehicle use for dispersed camping (acres)	0.00
Personal use fuelwood gathering (acres)	178,293

Alternatives B and C—Direct and Indirect Effects

The effect of Alternatives B and C on a forest wide basis would be a moderate decrease in routes designated for motorized vehicle use and in road density within potential ocelot habitat (Table 133). There would be no change in areas open to motorized use, motor vehicle use for big game retrieval, or in acres of motorized dispersed camping within potential ocelot habitat under Alternative B. There would be a substantial increase in motorized big game retrieval from the current condition under Alternative C. Motorized big game would be limited from mid-August to December. However, ocelot mortality could increase during hunting periods from human interaction. A substantial reduction in motor vehicle use for fuelwood gathering would occur under Alternatives B and C. Alternative B and C would benefit the species by reducing the potential for noise disturbance from motorized vehicles and disturbance due to human presence. These alternatives would also prevent habitat degradation and negative influence on reproduction and distribution of ocelots. However, Alternative B would benefit the species the most by not providing for motorized big game retrieval which would be allowed under Alternative C.

Table 133. Alternatives B and C – Effect Changes from Existing Conditions in Potential Habitat for Ocelot by Analysis Factor

Analysis Factors	Existing Condition	Alternative B	Change in Effects	Alternative C	Changes in Effect
Routes designated for motor vehicle use (miles)	480.79	357.01	-123.78	409.39	-71.4
Density of designated routes (miles per square mile)	1.36	1.01	-0.35	1.16	-0.2
Decommissioned and closed routes (miles)	0.00	157.26	+157.26	104.89	+104.89
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00	102,299.77	+102,299.77
Motor vehicle use for dispersed camping (acres) Alternative C (count)	0.00	0.00	0.00	166	+166
Personal use fuelwood gathering (acres)	178,293	16,858.51	-161,434.49	18,886.42	-159,406.58

While routes designated under the proposed action could have effects on ocelots and their habitats, nearly eleven percent of potential habitat is located in wilderness where no routes would be designated and a 22 percent decrease in the miles of routes in potential habitat from existing conditions would reduce the magnitude of potential effects on the species. Additionally, as those areas where routes would not be designated recover, habitat conditions for ocelots would be expected to improve.

Approximately 357 miles under Alternative B and 409 miles under Alternative C of routes would be designated in potential ocelot habitat. There would be no effects from creation of routes since they already exist, but routes can increase the potential of disturbance of individuals and prey and reduce habitat quality through changes in soil and vegetation conditions and increasing the risk of introduction and spread of invasive plant species. While routes designated under the proposed action could have effects on ocelots and their habitats, nearly eleven percent of potential habitat is located in wilderness where no routes would be designated and a 22 percent decrease in the miles of routes in potential habitat from existing conditions would reduce the magnitude of potential effects on the species.

Under Alternatives B and C, there are no permit zones within fifteen miles of potential ocelot habitat. As a result, this element of the proposed action would have no effect on ocelots or its habitats.

For the seven analysis factors, the effects of Alternatives B and C would have moderate reductions of miles of routes and road density in potential ocelot habitat on the Tonto National Forest. Substantial reductions of motorized dispersed campsites and in personal use fuelwood gathering (often associated with motorized dispersed campsites) would occur within potential habitat for the ocelot. This reduction in roads and motorized trails would eliminate potential ocelot human interactions and degradation of prey base habitat.

Alternative B and C would benefit the ocelot for the following reasons:

- The magnitude of potential effects on the species and their habitats would be minimized since eleven percent of potential habitat is located in wilderness where no routes would be designated.
- Acres of motorized dispersed campsites under Alternative B are reduced, likely reducing ocelot human interactions.
- Number of motorized dispersed campsites under Alternative C that would have spur roads designated to them already exist and represent less than 0.001 percent of potential foraging habitat. Reduction in motorized dispersed campsites within primary and secondary habitat would likely reduce ocelot human interactions.
- With reduced roads, habitat degradation for prey base would be expected to be reduced.
- Year round unrestricted cross-country travel for uses not related to motorized big game retrieval, occurring under the existing condition, would not occur under Alternatives B or C or on the Payson and Pleasant Valley Ranger districts.

Overall, Alternatives B and C would benefit the ocelot by reducing access to and activity in potential habitat and in reducing motorized dispersed campsites, reducing human ocelot interactions and degradation of habitat for prey base.

These alternatives would reduce human ocelot interactions and habitat degradation for prey from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Less ocelot potential habitat would be affected for the long term (ten or more years) under Alternatives B and C. The biggest difference in effects between the two alternatives is under Alternative C where motorized use for big game retrieval would be allowed which likely would increase the risk of mortality to ocelot from human interactions. Both alternatives, overall, would reduce the level of motorized recreation activities within potential habitat, reducing the level of use closer to that which was occurring prior to the ocelot being listed. Cumulative beneficial effects would be similar to Alternative B and Alternative C. Any differences in cumulative effects between the two alternatives would be minimal.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a slight increase of routes designated for motorized vehicle use and road density within potential ocelot habitat (Table 134). There would be substantial increase in motorized dispersed camping and motorized big game retrieval acres under this alternative. Motorized big game retrieval would be limited from mid-August to December. However, ocelot mortality could increase during hunting periods from human interaction. Alternative D would have limited benefit to the species by decommissioning a few miles of routes. Alternative D, if implemented, would have an overall negative effect due to the potential to increases noise disturbance from motorized vehicles, disturbance due to human presence, and as well as habitat degradation. This alternative would also negatively influence survival, reproduction, and distribution of ocelots.

Table 134. Alternative D – Effect Changes from Existing Conditions in Potential Habitat for Ocelot by Analysis Factor

Analysis Factors	Existing Condition	Alternative D	Change in Effects
Routes designated for motor vehicle use (miles)	480.79	510.26	+29.47
Density of designated routes (miles per square mile)	1.36	1.44	+0.08
Decommissioned and closed routes (miles)	0.00	2.35	+2.35
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	180,069.88	+180,069.88
Motor vehicle use for dispersed camping (acres)	0.00	28,488.70	+28,488.70
Personal use fuelwood gathering (acres)	178,293	178,293	0.00

For the seven analysis factors, the effects of Alternative D would have slight increase potential habitat for routes and road density for the ocelot on the Tonto National Forest. Increase in acres of motorized dispersed campsites and in personal use fuelwood gathering (often associated with motorized dispersed campsites) would occur within potential habitat for the ocelot. This increase in roads and motorized trails would result in increasing the potential ocelot human interactions and degradation of prey base habitat.

Alternative D would negatively affect the ocelot for the following reasons:

- The magnitude of potential effects on the species and their habitats would be minimized since eleven percent of potential habitat is located in wilderness where no routes would be designated.

- Acres of motorized dispersed campsites, under Alternative D, are increased in potential habitat, increasing ocelot human interactions from the current condition.
- With increased roads in potential habitat, habitat degradation for prey base would be expected to increase.
- There would be no additive effects from designating approximately 1,397 acres of permit zones in secondary potential habitat to those associated with designating the approximately 320.69 miles of routes inside them under Alternative D.
- Increased motorized use for big game retrieval in potential habitat is expected to increase the likelihood of human ocelot interactions.

Overall, Alternatives D would have a negative effect on the ocelot by increasing access to and activity in primary and secondary habitat and in increasing motorized dispersed campsites in secondary habitat, increasing human ocelot interactions and degradation of habitat for prey base.

This alternative would increase human ocelot interactions and habitat degradation for prey from motorized use and access which would counteract the long-term impacts of activities concentrated in isolated areas. Overall, slightly more ocelot potential habitat would be affected for the long term (ten or more years.) under Alternative D. This alternative would increase the level of motorized recreation activities within potential habitat increasing the level of use closer to that which was occurring prior to the ocelot being listed.

Plants: Affected Environment and Environmental Consequences

Arizona Cliffrose

The Arizona cliffrose (cliffrose) only occurs in Tertiary limestone lakebed deposits found around Horseshoe Lake on the Cave Creek Ranger District. No portion of potential cliffrose habitat is within a designated wilderness area.

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition (Table 135). Motor vehicle use can affect the species directly by crushing plants and indirectly through soil compaction. The 5.25 miles of routes designated for motorized vehicle use in Arizona cliffrose potential habitat has the potential to continue to influence survival, reproduction, and distribution of Arizona cliffrose, as well as to continue to alter habitat. As no areas designated for motor vehicle use, motorized use for big game retrieval, motorized dispersed camping, or motorized personal fuelwood gathering currently occur within species potential habitat, no effects would be expected from these activities.

Table 135. Alternative A – Existing Conditions in Potential Habitat for Arizona Cliffrose

Analysis Factors	Existing Condition
Routes designated for motor vehicle use (miles)	5.25
Density of designated routes (miles per square mile)	0.99
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	0.00
Motor vehicle use for big game retrieval (acres)	0.00
Motor vehicle use for dispersed camping (acres)	0.00
Personal use fuelwood gathering (acres)	0.00

Alternative B and C—Direct and Indirect Effects

The effect of Alternatives B and C on a forest wide basis would be a decrease of 4.77 miles of routes under Alternative B and 0.66 under Alternative C designated for motorized vehicle use, and a slight reduction in road density within Arizona cliffrose potential habitat (Table 136). This has the potential to influence survival, reproduction, and distribution of Arizona cliffrose, as well as to alter habitat. This alternative would provide a minimal reduction of miles for motor vehicle use and an increase of decommissioned roads within potential habitat on the Forest. However, as limited potential habitat is affected by the seven analysis factors, these effects would also be minimal. As no areas designated for motor vehicle use, motorized use for big game retrieval, motorized dispersed camping, or motorized personal fuelwood gathering currently occur, or are proposed, within species potential habitat, no effects would be expected from these activities.

Table 136. Alternatives B and C – Effect Changes from Existing Conditions in Potential Habitat for Arizona Cliffrose by Analysis Factor

Analysis Factors	Existing Condition	Alternative B	Change in Effects	Alternative C	Change in Effects
Routes designated for motor vehicle use (miles)	5.25	0.48	-4.77	4.59	-0.66
Density of designated routes (miles per square mile)	0.99	0.09	-0.90	0.87	-0.12
Decommissioned and closed routes (miles)	0.00	4.77	+4.77	0.65	+0.65
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for dispersed camping (acres)	0.00	0.00	0.00	0.00	0.00
Personal use fuelwood gathering (acres)	0.00	0.00	0.00	0.00	0.00

Under Alternatives B and C, there are no permit zones within 2.5 miles of potential cliffrose habitat. As a result, this element of the proposed action would have no effect on cliffrose or its habitats.

Under Alternative B, route densities would decrease 90 percent and by twelve percent, under Alternative C, in potential cliffrose habitat. Such decreases would reduce potential effects from motor vehicles such as damaging or crushing individuals as well as improve habitat conditions

for cliffrose through an increase in contiguous habitat as soil and vegetation conditions recover. Under Alternative B, over four miles of routes and under Alternative C approximately 0.66 miles of routes would be decommissioned in potential cliffrose habitat. Decommissioning these routes would benefit cliffrose and its habitats by decreasing the potential of forest users damaging or crushing individuals and reducing the risk of infestation and spread of invasive plants species. Also, as soil and vegetation conditions recover, habitat quality would be expected to improve in these areas.

For the seven analysis factors, the effects of Alternatives B and C would have moderate reductions of route miles and road density for the Arizona cliffrose in potential habitat on the Tonto National Forest. Under the remaining analysis factors under Alternatives B and C no habitat for Arizona cliffrose is affected by motor vehicle use areas, motorized dispersed camping, motorized big game retrieval, and motorized personal issue firewood gathering. This reduction in roads and motorized trails would result in eliminating the potential degradation of habitat from crushing and soil compaction. Alternatives B and C are expected to slightly benefit Arizona cliffrose, but due to the limited habitat on the forest and the habitat the plant grows in, effects to the species would also be limited.

Alternatives B and C would benefit the Arizona cliffrose for the following reasons:

- Reducing miles of routes and road density which would reduce the chance of crushing plants.
- Reducing overall road density would also reduce soil compaction.

Cumulative effects under Alternatives B and C would be limited due to the limited habitat likely to be effected by motorized use. Motorized use would need to occur on limestone lakebed deposits and motorized use is minimal in this type of habitat.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a substantial increase in acres of motor vehicle use for big game retrieval and dispersed camping (Table 137). There would be no change in routes designated for motorized vehicle use, road density and routes closed within Arizona cliffrose potential habitat. Alternative D has the potential to minimally influence survival, reproduction, and distribution of Arizona cliffrose as well as to alter habitat. The two analysis factors with substantial increase would have limited effect on the plant. Arizona cliffrose grows on rock outcrops and is limited only to Horseshoe Lake on the Cave Creek Ranger District, where there is likely to be limited impact from motorized big game retrieval and motorized dispersed camping.

Table 137. Alternative D – Effect Changes from Existing Conditions in Potential Habitat for Arizona Cliffrose by Analysis Factor

Analysis Factors	Existing Condition	Alternative D	Change in Effects
Routes designated for motor vehicle use (miles)	5.25	5.25	0.00
Density of designated routes (miles per square mile)	0.99	0.99	0.00
Decommissioned and closed routes (miles)	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	2,867.58	+2,867.58
Motor vehicle use for dispersed camping (acres)	0.00	337.32	+337.32
Personal use fuelwood gathering (acres)	0.00	0.00	0.00

Alternative D would be similar to the existing condition in motorized dispersed camping which would increase under both alternatives. Motorized big game retrieval, under Alternative D, would be the difference in the potential increase for plants being crushed or soil compaction. However, due to the habitat the plant grows in there is a minimal expected affect from motorized big game retrieval.

For the seven analysis factors, the effects of Alternative D would be no reductions of miles of routes and road density in potential Arizona cliffrose habitat on the Tonto National Forest. Under two of the analysis factors, under Alternative D, no habitat for Arizona cliffrose is affected by motor vehicle use areas, and motorized personal use firewood gathering. No reduction in roads and motorized trails and increased motorized big game retrieval and motorized dispersed camping would result in slightly negative increases in limited habitat in rocky soils. Overall, there would be a slight increase in the potential degradation of habitat from crushing and soil compaction. Alternative D is expected to have a slightly negative effect on Arizona cliffrose, but due to the limited habitat on the forest and the habitat the plant grows in, routes are limited.

Alternative D would have a negative effect on the Arizona cliffrose for the following reason:

- No reduction in routes and road density would occur, so the chance of crushing plants is expected to continue at the current rate.
- An increase in motorized dispersed camping acres increases the risk of plants being crushed by campers
- An increase in motorized big game retrieval could lead to additional crushing of plants and soil compaction. However, this effect would be limited due to the nature of the habitat the plants grow in.

Cumulative effects under Alternative D would be limited due to the limited habitat likely to be effected by motorized use. Motorized use would need to occur on limestone lakebed deposits and motorized use is minimal in this type of habitat.

Arizona Hedgehog Cactus

The Arizona hedgehog cactus has been documented on the Globe Ranger District in Copper Springs Canyon and from Top of the World and Oak Flat campground northwest into the Superstition Wilderness. Plants are found on dacite or granite bedrock, open slopes, in narrow cracks between boulders, and in the understory of shrubs in the ecotone between Madrean

evergreen woodland and interior chaparral habitats. Approximately 27 percent of potential habitat is located in the Superstition Wilderness Area.

Alternative A—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition (Table 138). Motor vehicles have the potential to directly crush plants and seeds or indirectly affect habitat by compacting soil or crushing cover plants which provide shade to developing seedlings. Disturbance from human presence my also divert potential pollinators. The 5.25 miles of routes designated for motorized vehicle use in potential Arizona hedgehog habitat have the potential to continue to influence survival, reproduction, and distribution of Arizona hedgehog, as well as to alter habitat.

Table 138. Alternative A – Existing Conditions in Potential Habitat for Arizona Hedgehog Cactus

Analysis Factors	Existing Condition
Routes designated for motor vehicle use (miles)	55.25
Density of designated routes (miles per square mile)	1.19
Decommissioned and closed routes (miles)	0.00
Areas open to motorized vehicle use (acres)	0.00
Motor vehicle use for big game retrieval (acres)	0.00
Motor vehicle use for dispersed camping (acres)	0.00
Personal use fuelwood gathering	19,283

Alternative B and C—Direct and Indirect Effects

The effect of Alternatives B and C on a forest wide basis would be a decrease of 4.18 miles of routes designated for motorized vehicle use under Alternative B and an increase of 0.9 miles under Alternative C, and a slight reduction in road density within Arizona hedgehog potential habitat (Table 139). This has the potential to influence survival, reproduction, and distribution of Arizona hedgehog, as well as to alter habitat. This alternative would provide a minimal reduction of miles for motor vehicle use and an increase of decommissioned roads within potential habitat on the Forest. However, as limited potential habitat is affected by the seven analysis factors, these effects would also be minimal. As no areas designated for motor vehicle use, and reduced areas of motorized use for motorized personal fuelwood gathering occur, or are proposed, within species potential habitat, no effects would be expected from these activities.

Table 139. Alternatives B and C – Effect Changes from Existing Conditions in Potential Habitat for Arizona Hedgehog Cactus by Analysis Factor

Analysis Factors	Existing Condition	Alternative B	Change in Effects	Alternative C	Change in Effects
Routes designated for motor vehicle use (miles)	55.25	51.07	-4.18	56.15	+0.9
Density of designated routes (miles per square mile)	1.19	1.10	-0.09	1.20	+0.01
Decommissioned and closed routes (miles)	0.00	13.50	+13.50	8.42	+8.42
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	0.00	0.00	13,399.98	+13,399.98
Motor vehicle use for dispersed camping (acres)	0.00	0.00	0.00	53	+53
Personal use fuelwood gathering (acres)	19,283	1,878.57	-17,404.43	1,991.74	-17,291.26

Under Alternative C, a substantial increase in area available for motorized big game retrieval would occur. Under Alternatives B and C the species would benefit from the substantial decrease in area available for motorized personal fuelwood gathering. Alternatives B and C have the potential to protect habitat and increase survival, reproduction and distribution of, Arizona hedgehog compared to the current condition.

Under Alternatives B and C, there are no permit zones within 2.5 miles of potential cliffrose habitat. As a result, this element of the proposed action would have no effect on cliffrose or its habitats.

Under Alternative B, routes densities would decrease 90 percent and by twelve percent under Alternative C in potential cliffrose habitat. Such decreases would reduce potential effects from motor vehicles such as damaging or crushing individuals as well as improve habitat conditions for cliffrose through an increase in contiguous habitat as soil and vegetation conditions recover. Under Alternative B, over four miles of routes and under Alternative C approximately 0.66 miles of routes would be decommissioned in potential cliffrose habitat. Decommissioning these routes would benefit cliffrose and its habitats by decreasing the potential of forest users damaging or crushing individuals and reducing the risk of infestation and spread of invasive plants species. Also, as soil and vegetation conditions recover, habitat quality would be expected to improve in these areas.

For the seven analysis factors, the effects of Alternatives B and C would both have moderate reductions of route miles and road density in potential Arizona hedgehog habitat on the Tonto National Forest. Under the remaining four analysis factors under Alternatives B and C, no habitat for Arizona hedgehog is affected by motor vehicle use areas, motorized dispersed camping, motorized big game retrieval and motorized personal use firewood gathering. This reduction in roads and motorized trails would result in eliminating the potential degradation of habitat from crushing and soil compaction. Alternatives B and C are expected to slightly benefit Arizona cliffrose, but due to the limited habitat on the forest and the habitat the plant grows in, effects are limited.

Alternatives B and C would benefit the Arizona hedgehog for the following reasons:

- Reducing miles of routes and road density, reducing the chance of crushing plants.
- Reducing overall road density also reduces soil compaction.
- Motorized vehicle use for big game retrieval would be limited in potential hedgehog habitat, also reducing the potential of crushing plants or compacting soil.

Cumulative effects under Alternatives B and C would be limited due to the limited habitat likely to be effected by motorized use. Motorized use would need to occur on limestone lakebed deposits and motorized use is minimal in this type of habitat.

Alternative D—Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be a slight increase of routes designated for motorized vehicle use and road density in potential Arizona hedgehog habitat (Table 140). There would be a substantial increase of motor vehicle use for big game retrieval and motorized dispersed camping, if Alternative D is implemented. Under Alternative D, routes densities would increase by fifteen percent in potential habitat. Such increases would increase potential effects from motor vehicles such as damaging or crushing individuals as well as further degrading habitat conditions for hedgehogs through an increase in contiguous habitat. Under Alternative D, no roads would be decommissioned and there would be an additional nine miles of roads designated in potential hedgehog habitat. Increasing the number of miles of motorized routes and trails would have a negative impact on hedgehog and its habitats by increasing the potential of forest users damaging or crushing individuals and increasing the risk of infestation and spread of invasive plant species. Soil and vegetation conditions would be expected to further degrade over time in potential hedgehog habitat.

Alternative D has the potential to influence survival, reproduction, and distribution of Arizona hedgehog as well as to alter habitat more than Alternatives A, B, or C.

Table 140. Alternative D – Effect Changes from Existing Conditions in Potential Habitat for Arizona Hedgehog Cactus by Analysis Factor

Analysis Factors	Existing Condition	Alternative D	Change in Effects
Routes designated for motor vehicle use (miles)	55.25	64.57	+9.32
Density of designated routes (miles per square mile)	1.19	1.39	+0.20
Decommissioned and closed routes (miles)	0.00	0.00	0.00
Areas open to motorized vehicle use (acres)	0.00	0.00	0.00
Motor vehicle use for big game retrieval (acres)	0.00	17,765.60	+17,765.60
Motor vehicle use for dispersed camping (acres)	0.00	2,917.31	+2,917.31
Personal use fuelwood gathering	19,283	19,283	00.0

The effect of Alternative D on a forest wide basis would be a moderate increase in routes designated for motorized vehicle use and road density and a substantial increase in acres of motorized personal use fuelwood gathering within Arizona hedgehog potential habitat. Under Alternative D, miles of closed routes would slightly increase and there would be a substantial increase in motorized dispersed camping acres and motorized big game retrieval. Under Alternative D, the species would be negatively impacted by motorized dispersed camping and

motorized personal fuelwood gathering. Alternative D would also have a negative impact on habitat and reduce survival, reproduction, and distribution of Arizona hedgehog. These increases would result in increasing the potential degradation of habitat from crushing and soil compaction. Alternative D are expected to negatively impact Arizona Hedgehog, to a greater degree than Alternative A.

Under Alternative D, there are no permit zones within 2.5 miles of potential cliffrose habitat. As a result, this element of the proposed action would have no effect on cliffrose or its habitats.

Alternatives D would have a negative the Arizona hedgehog for the following reasons:

- Increasing routes and road density increases the chance of crushing plants.
- Increasing overall road density also increases soil compaction.
- Motorized big game retrieval in habitat increases the risk of additional soil compaction and crushing of plants.
- Increased motorized personal use fuelwood gathering increases the chance of plants being crushed and removal of micro habitat such as cover plants, Arizona hedgehog seedlings may need to survive.

Cumulative effects under Alternative D would be limited to the Tonto National Forest and private lands as other forests in potential hedgehog habitat have already begun implementation of travel management where overall roads are reduced in potential hedgehog habitat.

Management Indicator Species

The Forest Service is required to maintain viable populations of native and desired non-native species by evaluating a project's effects on selected management indicator species (MIS) as set forth in the National Forest Management Act (NFMA). Management indicator species are defined as: "Plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent" (FSM 2620.5).

In order to meet the NFMA requirement to maintain viable populations of native and desired non-native species, MIS were selected based on a variety of criteria. In general, MIS were selected to serve as barometers of management effects on other species with similar habitat requirements. The Tonto National Forest has 30 MIS, which consist mostly of birds, to represent 30 habitat features (Table 141[126]). This section is a Forest level analysis composed of a description of current habitat and population trends of each MIS population, an interpretation of changes in populations and habitat trends since implementation of the 1985 Tonto National Forest Plan (Forest Plan) for potential effects to MIS from implementation of the designated system of roads and trails. A forestwide assessment entitled Management Indicator Species Status Report (Klein et al., 2005) summarizes current knowledge of population and habitat trends for MIS on the Tonto National Forest.

[126] If there is no data for a particular PNVT for either an element or an alternative then there is no action occurring within that area. This is labeled in the table as N/A.

Table 141. Habitat Types and Trends for Management Indicator Species on the Tonto National Forest

Species	Indicator of
Ponderosa Pine Forest (Mild), Mixed Conifer (with Aspen)	
Elk (*Cervus elaphus*)	General forest conditions
Turkey (*Meleagris gallopavo*)	Vertical diversity – forest mix
Pygmy Nuthatch(*Sitta pygmaea*)	Old growth pine
Violet-green Swallow (*Tachycineta thalassina*)	Cavity-nesting habitat
Western Bluebird (*Sialia mexicana*)	Forest openings
Hairy Woodpecker (*Picoides villosus*)	Snags
Northern Goshawk (*Accipiter gentilis*)	Vertical diversity
Abert's Squirrel (*Sciurus arizonensis*)	Successional stages of pine
PJ Chaparral, PJ Grassland, Madrean Encinal Woodland, Interior Chaparral	
Ash-throated Flycatcher (*Myiarchus tyrannulus*)	Ground cover
Gray Vireo (*Vireo vicinior*)	Tree density
Townsend's Solitaire (*Myadestes townsendi*)	Juniper berry production
Juniper (Plain) Titmouse (*Beaolophus ridgwayi*)	General woodland conditions
Northern (Common) Flicker (*Colaptes auratus*)	Snags
Spotted Towhee (*Pipilo maculates*)	Successional stages of pinyon-juniper; Shrub density
Black-chinned Sparrow (*Spizella atrogularis*)	Shrub diversity
Semidesert Grassland	
Savannah Sparrow (*Passerculus sandwichen-sis*)	Grass species diversity
Horned Lark (*Eremophila alpestris*)	Vegetation aspect
Desert Communities	
Black-throated Sparrow (*Amphispiza bilineata*)	Shrub diversity
Canyon Towhee (*Pipilo fuscus*)	Ground cover
Cottonwood Willow Riparian Forest	
Bald Eagle (*Halaeetus leucocepha-lus*)	General riparian
Bell's Vireo (*Vireo bellii*)	Well-developed understory
Summer Tanager (*Piranga rubra*)	Tall, mature trees
Hooded Oriole (*Icterus cucullatus*)	Medium-sized Trees
Mixed Broadleaf Deciduous Riparian Forest	
Hairy Woodpecker (*Picoides villosus*)	Snags, cavities
Arizona Gray Squirrel (*Sciurus arizonensis*)	General riparian
Warbling Vireo (*Vireo gilvus*)	Tall overstory
Western Wood Pewee (*Contopus sordidulus*)	Medium overstory

Species	Indicator of
Common Black Hawk (*Buteogallus anthracinus*)	Riparian streamside
Water	
Macro-invertebrates	Water quality

Affected Environment

Because there is currently no geographically based vegetation data from the original 1985 Forest Plan, it is difficult to compare the project's impact to the vegetation layer developed for implementation of the Forest Plan. Consequently, the most recent potential natural vegetation type (PNVT) GIS layer was utilized to determine the project's impact on MIS. Potential natural vegetation type categories are coarse-scale groupings of ecosystem types that share similar geography, vegetation, and historic ecosystem disturbances such as fire, drought, and native herbivory.

Table 141 includes all 30 MIS, the habitat features they represent, the relationship between the vegetation types used in the Forest Plan and PNVT[127], and the current habitat and population trends on the Tonto National Forest (Klein et al., 2005). The potential natural vegetation type GIS layer is considered the best available layer to reflect both the current wildlife habitat conditions and the expected vegetation cover type for the life of this project. Although there may be areas that have burned to alter the potential natural vegetation layer, most of the potential natural vegetation layer accurately reflects the current vegetation conditions.

Environmental Consequences

Analysis of project effects for MIS focuses on habitat changes within potential natural vegetation types (PNVT), which are MIS associated habitats. Achievement of the future expected habitat conditions would be indicated by the maintenance or increased occurrence and density of MIS across the forest.

The PNVT analysis was originally conducted in 2010 in preparation of an Environmental Assessment. During the continuing analyses there may have been assumptions made that are not fully documented and embedded in all analyses in the PNVT and species data layers. For instance, in not all locations do the boundaries of the PNVT layer match the forest boundary data layer. Additionally, during the analysis timeline, riparian areas, water bodies, and perennial stream layers have been updated. As the acreage and boundaries of these vegetation types shifted, ecotones between adjacent upland vegetation types may not accurately reflect this realignment in all cases. As an example, the ponderosa pine/mixed conifer PNVT was estimated to be 283,204 acres in 1985 for implementation of the Forest Plan. During data analyses conducted for the 2005 Management Indicator Status Report, the 1985 ponderosa pine/mixed conifer PNVT was revised to approximately 423,000 acres, depicting a stable trend. During the 2010 revision of the PNVT data base, the ponderosa pine/mixed conifer PNVT was estimated at approximately 308,000 acres. Analyses estimated acres of ponderosa pine/mixed conifer PNVT in Alternative A that would be designated open to motorized cross country travel is at 515, 985.69 acres or 167 percent larger than the estimated forest wide ponderosa pine/mixed conifer PNVT acres. These data inconsistencies make direct comparison of habitat changes since

[127] PNVT acres analyzed do not include private lands located within the Tonto National Forest boundary but do include designated roadless and wilderness areas.

implementation of the Forest Plan inseparable from enhancements in GIS and other data collection mechanisms.

For the purposes of determining effects to MIS resources from implementation of the Tonto National Forest Travel Management Plan, the 2005 revised MIS Status Report is assumed to be the most current knowledge of population and habitat trends for MIS resources. For comparison of alternatives, it is assumed that the 2010 forest wide PNVT data to be most current. All alternatives considered in this analysis are compared to the forest wide PNVT acre estimates. In instances where the acres analyzed for an alternative is greater than forest wide acres, a reduction in acres proposed for each analysis factor, and therefore percent of forest wide acres, is considered to have beneficial effect to MIS resources.

Direct and Indirect Effects Common to All Alternatives

Some level of impact is occurring to MIS resources wherever motorized vehicle travel is allowed. Factors such as habitat and species presence, density of species, location of travel in relation to important habitats, time of year or even time of day, amount of vehicle travel, and a myriad of other factors could apply in determining what and to what extent impacts are occurring. For all alternatives, including the no action alternative, there is likely to be either no impact to the species (in situations where the habitat would not be affected by the proposed activities) or there may be effects to individuals of the species, but is not likely to result in a trend toward federal listing or loss of viability[128].

Miles of Routes and Road Density

Vehicle use can affect MIS species through: 1) loss of habitat due to conversion of native vegetation to a particular road/trail surface (paved, gravel, dirt); 2) fragmentation of habitats due to road and trail system development; 3) interruption in migratory patterns of MIS species to reach breeding habitat or winter range habitat; and 4) lack of habitat use by MIS species due to disturbance caused by vehicle use (Gucinski et al., 2000).

Under any alternative the direct loss of habitat from the conversion of native vegetation to roads and trails would generally be considered minor. Currently, the Tonto National Forest has management jurisdiction for approximately 5,000 miles of system roads spread across the approximate 4,632 square miles of forest system lands. Currently, road density is approximately 1.07 miles of forest roads per square mile[129] of forest system lands. While the totals of direct habitat loss are considered to be relatively low and overall watersheds and hydrologic regimes would be considered as substantially intact (Potyondy and Geier, 2011), MIS species may avoid using the undisturbed habitat adjacent to the road due to disturbance while the road is in use (Rowland et al., 2005).

Permit Zones

In a permit zone, cross-country travel is not allowed. Instead, motorized vehicle users are required to obtain a permit to access the area, which would have locked gates and barriers restricting non-permitted access. The potential effects to MIS species are assessed by the addition or decommissioning of roads within each PNVT, within each permit zone. As such,

[128] For a more detailed account of the effects to each species and their habitat, see the Biological Evaluation Report in the project record.
[129] For a detailed discussion of route densities and their effects to watershed, see the Final Water Resources Report in the project record.

there is no need to analyze permit zones separately. Instead, the routes within them will be part of the routes and road density analysis.

Motor Vehicle Use for Personal Fuelwood Gathering

Each alternative would allow for some degree of motor vehicle use for fuelwood gathering for personal use. The Tonto National Forest generates 400,000 to 500,000 cubic feet of available dead and down fuelwood annually. The forest allows for the harvest of dead standing juniper and cypress up to 18 inches in diameter at the base and dead standing pine up to 12 inches in diameter at 4.5 feet above the ground annually. It is expected that snags and dead and downed wood would be found mostly in the forested PNVTs.

Available fuelwood is the result of both natural occurring events and Tonto National Forest management activities. Natural events or disturbances that result in the creation of fuelwood include but are not limited to wildfire, insect outbreaks, droughts, and heavy snowfalls. These typically occur to varying degrees across the forest in an extremely random pattern. Areas affected can range from small scattered patches to large landscape scales. Resulting fuel loads are also extremely variable, ranging from high concentrations of mortality and breakage to very light and scattered accumulations.

Management activities that generate available fuelwood include prescribed fire, range improvement cuttings, timber stand improvement cuttings, and other restoration activities. After these treatments are completed, slash and associated breakage becomes available for fuelwood gathering. Treatment areas range in size from 50 to 1,000 acres. Treatments are usually followed several years later by prescribed fire to reduce the increased fuel load to more manageable levels reducing the intensity of the prescribed fire and making it easier to manage. Access to fuelwood gathering areas is currently provided by both system and non-system roads and often extends for great distances away from roads and trails.

Fuelwood gathering during the spring and summer is concentrated near system roads where concentrations of fuelwood can be seen from the vehicle. Available fuelwood in these areas can quickly become depleted requiring fuelwood gatherers to scout the surrounding terrain to find wood. As areas where disturbances have occurred are located, fuelwood gatherers begin to move off roads and trails to take advantage of these concentrations.

Under all alternatives, motorized fuelwood gathering would continue, allowing personal use fuelwood gatherers to spread out across the permitted areas to obtain their wood. Alternatives A and D allow personal use fuelwood gathering in designated woodcutting areas. Alternatives B and C would restrict the use of motorized vehicles for fuelwood gathering to within 300 feet on both sides of designated roads and trails. This can lead to concentrated use in some areas, effectively removing all available dead and down and dead standing fuelwood. In areas further away from the roads and trails, concentrations of dead and down fuelwood would start to accumulate over time, increasing the risk of uncharacteristically intense fire behavior. Historically, forest system roadsides are mostly cleared of dead and down fuelwood each year by late August, five months into the nine month season, coinciding with the primary nesting season of neotropical birds. This analysis assumes that wood cutters will rarely physically haul wood over 100 feet from a vehicle and frequently use old skid trails or gaps in the forest to work their vehicles into the forest a considerable distance where they can load wood directly into their vehicles. While most of the wood cutters that receive a fuelwood permit would stay within 300 feet of designated routes, the more experienced cutters rarely cut near the road, and regularly

venture beyond 300 feet. A conservative estimate of these wood cutters would be 30 percent of regular permit holders or approximately 300 individuals.

Motor Vehicle Use for Dispersed Camping

All alternatives would include some allowances for the use of motorized vehicle for dispersed camping. Use of motor vehicles off forest system roads to access campsites is a popular activity on the Tonto National Forest. In some instances, forest visitors park their vehicles at trailheads or roadside locations and hike to their camping spots. Others will drive cross-country to their desired camping spot, often with a recreational vehicle or camping trailer. Frequently-used dispersed campsites, where evidence of past use exists, are located along both forest system roads and unauthorized routes throughout the Tonto National Forest.

Currently, the distance traveled from existing roads to frequently-used dispersed campsites can vary depending on the terrain and proximity to water and shade trees. Based on knowledge from Forest Service law enforcement officers and Arizona Game and Fish Department Wildlife Managers, most of these dispersed campsites are within 300 feet of an existing road, including sites on the four ranger districts where cross-country travel is currently prohibited. On the northern two ranger districts (Payson and Pleasant Valley), driving cross-country has been permitted regardless of the distance from an existing road. On the four southern ranger districts (Cave Creek, Globe, Mesa, and Tonto Basin), driving off road is prohibited unless posted open. Fuelwood gathered for campfires within the immediate areas of dispersed campsites may reduce logs and snags. Prolonged and persistent pedestrian and vehicle presence at dispersed campsite could reduce grass and shrub understory vegetation and prevent natural vegetation regeneration.

Motor Vehicle Use for Big Game Retrieval

Alternatives A and D would include motorized vehicle use for big game retrieval for elk, bear, mule deer and whitetail deer, while Alternative C would limit motorized use to elk and bear retrieval. Alternative B would not allow motorized vehicle use for big game retrieval. Within motorized big game retrieval corridors, hunters who have legally killed particular game species are allowed to travel off-road from a designated public route to retrieve their harvest. Several considerations determine where and how many acres are potentially impacted by motorized big game retrieval: 1) where hunters are allowed to hunt (game management units); 2) proposed and existing public roads; 3) the distance hunters would be allowed to drive cross-country to pick-up their harvest; and 4) elk, bear, mule deer and whitetail deer habitat within game management units where big game hunts are authorized. There are portions of seven game management units totaling 2,883,758 acres within the Tonto National Forest. Elk hunts are permitted in four game management units with open hunting seasons beginning in August with various specific hunts occurring through December. These game management units are comprised of 2,242,458 acres with elk habitat located primarily in the northern portions of the game management units. Mule deer and whitetail deer hunts occur in all seven game management units with archery hunts authorized in August and December and firearms seasons occurring in late October through portions of November and December. It is assumed that deer hunters would hunt in essentially all habitats within the game management units. Bear hunts are permitted in five game management units comprised of 2,844,394 acres with black bear habitat located primarily in the northern portions of the game management units. Bear hunts could occur in August through December of each year.

Arizona Game and Fish Department has estimated the number of annual, motorized harvests for these four big game animals under consideration for motorized big game retrieval for each action alternative. These estimates rely on the assumption that 30 percent of successful hunters would

use their motor vehicle to retrieve their harvest. Arizona Game and Fish Department estimates the total number of trips annually would be 193 for elk and 15 for bear, 135 for mule deer and 206 for whitetail deer. The general hunting season for elk, bear, mule deer, and whitetail deer occurs from August to December. Consequently, motorized big game retrieval is not anticipated to measurably disturb breeding birds, which generally nest from April through August each year. It is also anticipated that a hunter would make one to two passes through a route to retrieve big game. One to two passes is not expected to destroy many annual plants. Webb (1983) found that after a single pass, annual plants on an OHV route remained intact, but most were destroyed after ten passes. It is expected that perennial plants are more robust and are likely to also sustain the one to two passes that a hunter would make to retrieve their harvest. The habitat will likely recover from one to two passes from a motorized vehicle.

Cumulative Effects Common to All Alternatives

Past, present and reasonably foreseeable actions that are relevant to MIS resources are described below for all alternatives. The cumulative effects analysis area for MIS resources is the Forest boundary.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past and present actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that are difficult to quantify that have affected the environment and might contribute to cumulative effects. Existing conditions are a result of past and present impacts to wildlife resources.

This analysis focuses on the cumulative impact of those reasonably foreseeable actions that are relevant in assessing the impacts of designating a system of motorized use on MIS and their habitats. Although almost all forest and private or other governmental actions may have some relevancy, this analysis specifically considers those that are most relevant toward resulting in a cumulative impact to MIS and their habitats.

Reasonably foreseeable actions that could affect MIS resources are land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, fuels reduction projects, forest thinning, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, special use permits (maintenance of existing structures, approval of group organization camps), personal use activities, and new road construction. While these activities can directly and indirectly affect MIS species as well as cause destruction or modification to MIS habitats, these actions are planned to minimize (and when possible, to eliminate) effects to MIS species and their habitat above current conditions and have mitigation measures and Best Management Practices designed to mitigate disturbances that may occur from project implementation.

Some projects may be considered cumulative actions because they may result in impacts to PNVT and thus to MIS associated with a primary constituent element within a PNVT, such as renewal of livestock grazing permits that would reduce herbaceous ground cover. Other projects that may be considered as cumulative actions have not resulted or are not expected to result in a measureable impact to MIS resources as they have been designed to completely avoid or minimize impacts to MIS resources by including design criteria or mitigations such as timing restrictions.

Projects involving forest thinning and prescribed fire treatments likely contribute to effects to MIS resources. Although the effects of fuels reduction and thinning projects are mitigated to reduce the effects on MIS resources, they still result in modification of vegetation which can affect foraging, nesting, roosting, hiding and thermal cover, and daily and seasonal movements. Recently completed or ongoing planning for restoration and fuels management projects include: Salt River Allotments Vegetative Management project, Mesa vegetation regeneration and habitat improvement project, and the Haigler fuels analysis. Fuels reduction projects may have short-term impacts on wildlife from disturbance (during implementation) and habitat degradation (up to 3 years after treatment), but generally improve MIS resources over the long-term (from one to ten or more years after project implementation) by decreasing the potential for high-intensity wildfire (Strom and Fulé, 2007) and improving the productivity and biodiversity of vegetation on which MIS depend (Griffis et al., 2001).

Unauthorized and unmanaged dispersed recreation, while not continuous across the Tonto National Forest like grazing or across large areas like fuels reduction and thinning projects, can result in adverse impacts to MIS resources. Roads, trails, dispersed camping areas, and the use of these by forest users could denude vegetation and compact soils; disturb vegetation to which some species may be attached; crush eggs and insects; and collapse burrows which can crush individuals; alter and fragment habitat; increase sedimentation into aquatic systems; visually and aurally disturb animals during critical periods such as breeding, and harass individuals through collection or handling.

Legal and illegal personal use activities, particularly fuelwood harvesting, affects wildlife and their habitat. The removal of dead and down wood can result in the loss of habitat for invertebrates, small mammals, and reptiles; all of which are important prey items for some MIS. The removal of snags not only can affect prey species like invertebrates and reptiles; it also results in the loss of bat roosting habitat and bird nesting and roosting habitat. Fuelwood harvesting could result in the removal of large, Gambel oak trees which are important for MIS species that nest in their natural cavities and could be tied to the presence of roads. Studies have shown there is an observable decrease in standing and downed large dead trees within near open roads (Wisdom and Bate, 2008).

All action alternatives would reduce adverse impacts to MIS resources forest-wide by reducing motorized cross-country travel outside of camping, wood gathering and motorized big game retrieval corridors. The miles of open roads will decrease in almost all PNVTs. Although all action alternatives would reduce overall motorized vehicle disturbance, they may increase the intensity of effects to MIS resources within dispersed camping and wood gathering corridors.

Effects to Management Indicator Species by Potential Natural Vegetation Type

Indicators of Ponderosa Pine Forest Mild and Mixed Conifer with Aspen

Ponderosa pine forest mild and mixed conifer with aspen vegetation types are indicators for elk, turkey, pygmy nuthatch, violet-green swallow, western bluebird, hairy woodpecker, northern goshawk, and Abert's squirrel. Table 142 identifies the amount of habitat of ponderosa pine forest mild and mixed conifer with aspen that is impacted by each of the five elements under each alternative[130].

[130] The percent numbers in parentheses are the percent of the Alternative in relationship to the forestwide number. For percentages in the table that are greater than 100 percent, see the information in Data Limitations and Inaccuracies in this section for more information.

Table 142. Total Acres of Ponderosa Pine Forest Mild and Mixed Conifer with Aspen Habitat

Elements	Forestwide	Alternative A	Alternative B	Alternative C	Alternative D
Roads and trails open to public use (miles)	2,604.54	2,050.81 (79%)	995.16 (38%)	751.12 (29%)	1,982.48 (76%)
Road density (miles per square mile)		4.4	2.2	1.28	4.2
OHV areas open to motorized use (acres)	308,606.67	515,985.69 (167%)	0 (0%)	0 (0%)	0 (0%)
Motor vehicle use for big game retrieval (acres)	308,606.67	515,985.69 (167%)	0 (0%)	248,816.57 (80%)	520,641.51 (169%)
Motor vehicle use for dispersed camping (acres)	308,606.67	515,985.69 (167%)	25.22 (<1%)	706 (NA)	119,656.3 (39%)
Personal use fuelwood gathering (acres)	308,606.67	242,457.33 (79%)	31,856.3 (10%)	22,766.92 (7%)	242,457.33 (79%)

Direct and Indirect Effects to Indicator Species of Ponderosa Pine Forest Mild and Mixed Conifer with Aspen

The impact of roads and trails designated for public use on wildlife can be pervasive and long lasting. When the disruption from motorized vehicle travel is severe, wildlife populations may be reduced below the natural carrying capacity of the land (Webb and Wilshire, 1883). The effects of roads and trails designated for public use is the conversion of native habitat to non-vegetated road ways and is a linear direct loss of ponderosa pine forest and mixed conifer with aspen PNVT to total miles of roadways within species habitat which would affect the various indicators of these species, such as general forest conditions, vertical diversity, and variable understory.

The elk is an indicator species for general forest conditions in this PNVT. The primary effect of roads to elk is habitat fragmentation and reduction in forest cover to a level that no longer functions effectively as elk habitat. Direct and indirect loss of habitat from routes will vary across the landscape. However a rough overall estimate of habitat loss of five acres per linear mile of road is often applied for elk (Rowland et al., 2005).

The pygmy nuthatch is an indicator species for old growth pine, and the western blue bird is an indicator species for forest openings. Both are primarily affected by disturbance from noise from motor vehicle use, motorized dispersed camping, motorized fuel wood gathering, and motorized big game retrieval. Other species which may be affected by these elements include the violet-green swallow, an indicator species for cavity nesting habitat and the hairy woodpecker, an indicator for snags. These elements would have a direct effect to cavity nesting habitat and snags from noise disturbance and harvest of snags for fuelwood and campfires if removal occurred during the breeding season directly impacting nesting birds.

Effects to species habitat quality include disturbance from noise from motor vehicle use, including motor vehicle use for dispersed camping, fuel wood gathering, and big game retrieval. Effects to species habitat from motorized vehicle use would increase with increased miles of designated roadways and authorized use adjacent to designed roads.

Both large trees, variable understory, and large downed trees are important elements to vertical diversity of ponderosa pine indicator habitat for species such as the northern goshawk providing nesting, perching, and prey species habitat. Turkeys are another indicator of vertical diversity, and may be affected by destruction of nesting, feeding and roosting habitat, and by creation of barriers to movement and in influencing patterns of population dispersal.

Diversity of forest structural stages include variable tree maturity and understory with litter that are important elements to vertical diversity of ponderosa pine, indicator habitat for the Abert's squirrel, providing nesting, and foraging habitat.

Alternative A. Alternative A would designate 4.4 miles of road per square mile of ponderosa pine forest mild and mixed conifer with aspen PNVT, the highest permitted road density of all alternatives. However, Alternative A is not anticipated to have measurable effects to current old growth pine and conifer forest and therefore habitat quality for species populations. Alternative A would permit continued unrestricted off-road motorized travel (on Payson and Pleasant Valley Ranger Districts), and use of roads and motorized trails, motorized dispersed camping, motorized big game retrieval and motorized fuelwood gathering throughout the ponderosa pine forest mild and mixed conifer with aspen PNVT. However, roads and trails designated for public use in Alternative A is not anticipated to have measurable effects to current cavity nesting habitat and therefore habitat quality for these species populations.

Snag dependent species may be affected by snag removal for motorized camping and motorized fuelwood gathering. The primary effect of Alternative A to hairy woodpecker habitat quality would be continued destruction of snag habitat due harvest of standing dead wood for campfire use and personal fuelwood gathering in proximity to roadways designated for motorized public use with the PNVT. Alternative A may reduce snag density below Forest Plan objectives of 2 to 3 snags per acre within areas designated for motorized vehicle use, but is not anticipated to reduce snag density below Forest Plan objectives of 180 snags per 100 acres across the PNVT.

The primary effects of roads to northern goshawk habitat quality would be destruction of prey species habitat due to harvest of down logs and wood for campfire use and motorized personal fuelwood gathering in proximity to roadways designated for motorized public use with the PNVT.

The primary indirect effect of roads to Abert's squirrel habitat quality would be destruction of understory and litter habitat due to harvest of down logs and wood for campfire use, motorized personal fuelwood gathering, and potential hunter harvest of Abert's squirrel throughout the PNVT in proximity to designated routs within the PNVT.

Alternative A would designate 2,051 miles of roads and trails open to public use which could negatively affect species trend due to habitat loss or degradation. This alternative could also reduce elk habitat effectiveness by 10,255 acres.

Alternative B. Under this alternative, direct and indirect effects of roads and trails open to motorized public use would be reduced to 2.2 miles of roads per square mile of ponderosa pine forest mild and mixed conifer with aspen PNVT, a 50 percent reduction in road density from Alternative A. Alternative B is not anticipated to have measurable effects to current old growth pine and conifer forest or forest structure, and therefore habitat quality for species populations. Alternative B would not designate motorized cross country travel or motorized big game retrieval and would limit motorized dispersed camping to less than one percent of ponderosa pine forest mild and mixed conifer with aspen PNVT. Alternative B would designate 995 miles

of roads and trails open to public use which could reduce elk habitat effectiveness by 3,980 acres. Alternative B would result in a 61 percent decrease in potential effects to species habitats from Alternative A.

Effects to species due to disturbance from noise from motor vehicle use would be reduced under this alternative and would have beneficial effects to species populations as compared to Alternative A. There would be impacts on habitat elements in localized areas (where motorized dispersed camping and motorized fire wood gathering is permitted), but this impact would be reduced due to limited amount of roads within the PNVT. Alternative B increases species habitat quality over Alternative A.

Alternative B would result in reduced removal of snags that may pose a hazard to roadways and camping sites. Alternative B is not anticipated to have measurable effects to current snag habitat and therefore habitat quality for hairy woodpecker populations. Alternative B may reduce snag density below Forest Plan objectives of 2 to 3 snags per acre within limited motorized campsites and motorized fuelwood gathering areas but is not anticipated to reduce snag density below Forest Plan objectives of 180 snags per 100 acres across the PNVT. Effects to species habitat quality would include destruction of snag habitat in proximity to motorized dispersed campsites and fuelwood gathering adjacent to designated roads.

Effects to northern goshawk habitat quality would include harvest of down logs and destruction of understory habitat for prey species in proximity to motorized dispersed campsites and motorized fuelwood gathering areas adjacent to designated roads. The destruction of understory and litter habitat due harvest of downlogs and wood would also affect Abert's squirrel.

Alternative C. Under this alternative, direct and indirect effects of roads and motorized trails open to public use would be reduced to 1.28 miles of roads per square mile in ponderosa pine forest mild and mixed conifer with aspen PNVT, a 70 percent reduction in road density from Alternative A and a 42 percent decrease in road density compared to Alternative B. Alternative C is not anticipated to have measurable effects to this PNVT and therefore habitat quality for species populations. Alternative C would not authorize motorized cross country travel, but would permit motorized big game retrieval for elk and bear, and would limit motorized dispersed camping to less than 706 campsites in ponderosa pine forest mild and mixed conifer with aspen PNVT. Alternative C would permit motorized fuelwood gathering on seven percent of forest wide ponderosa pine forest mild and mixed conifer with aspen PNVT compared to 79 percent in Alternative A and ten percent in Alternative B. Alternative C would improve species habitat quality more than Alternative A and D.

Alternative C would designate 751 miles of roads and trails open to public use which could reduce elk habitat effectiveness by 3,755 acres, a 37 percent decrease in potential effects to elk habitat from Alternative A and a 26 percent decrease from Alternative B.

Effects to species due to disturbance from noise from motor vehicle use would be reduced under this alternative compared to Alternative A and would be similar to Alternative B. Alternative C is expected to have slight to moderate beneficial effects overall for species habitat quality over Alternative A and B, by reducing human disturbance, due to reduced road density and motorized personal fuelwood gathering areas.

For snag dependent species, effects to hairy woodpecker habitat quality would include destruction of snag habitat in proximity to motorized dispersed campsites and motorized fuelwood gathering areas adjacent to designated routes. Alternative C may reduce snag density

below Forest Plan objectives of 2 to 3 snags per acre within limited motorized dispersed campsites and motorized fuelwood gathering areas, but is not anticipated to reduce snag density below Forest Plan objectives of 180 snags per 100 acres across the PNVT. Alternative C would reduce the need for removal of snags that pose a hazard to roadways and camping areas.

Effects to northern goshawk habitat quality would include harvest of down logs and destruction of understory habitat for prey species in proximity to motorized dispersed campsites and motorized fuelwood gathering areas adjacent to designated roads. The destruction of understory and litter habitat due harvest of downlogs and wood would also affect Abert's squirrel.

Alternative D. Under this alternative, direct and indirect effects of roads and trails open to motorized public use would be similar to Alternative A, designating 4.2 miles of roads per square mile of ponderosa pine forest mild and mixed conifer with aspen PNVT, a 90 percent increase in road density from Alternative B, and a 35 percent increase in road density compared to Alternative C. Alternative D would designate 1,982 miles of roads and trails open to public use which affect general forest conditions and could reduce elk habitat effectiveness by 7,928 acres, a 23 percent decrease in potential effects to elk habitat from Alternative A, a 100 percent increase from Alternative B, and a 35 percent increase from Alternative C.

Alternative D would designate motorized dispersed camping on approximately 39 percent of forest wide ponderosa pine forest mild and mixed conifer with aspen PNVT as compared to 167 percent in Alternative A and would designate greater areas for motorized dispersed camping than Alternative B and Alternative C. Alternative D would be similar to Alternative A for permitted motorized fuelwood gathering on 79 percent of forest wide ponderosa pine forest mild and mixed conifer with aspen PNVT compared to ten percent in Alternative B and twelve percent in Alternative C

Alternative D is not anticipated to have measurable effects to species indicators and forest structure, and therefore habitat quality for species populations. Alternative D would not authorize motorized cross country travel, but would permit motorized big game retrieval and motorized fuelwood gathering, and would limit motorized dispersed camping to less than 39 percent of ponderosa pine forest mild and mixed conifer with aspen PNVT. Direct effects to species due to disturbance from noise from motor vehicle use would be reduced under this alternative due to designated motorized dispersed camping and would increase effects compared to Alternative B and Alternative C. There would be impacts on habitat elements in localized areas (where motorized dispersed camping and fire wood gathering is permitted), but would be reduced due to limited amount of roads within the PNVT. Alternative D would increases species habitat quality over Alternative A, but would improve species habitat quality less than Alternative B and Alternative C.

Alternative D would increase the need for removal of snags that pose a hazard to roadways and camping areas. Alternative D is not anticipated to have measurable direct effect to snag habitat and therefore habitat quality for these species populations. Alternative D may reduce snag density below Forest Plan objectives of 2 to 3 snags per acre within dispersed camping areas and fuelwood gathering areas but is not anticipated to reduce snag density below Forest Plan objectives of 180 snags per 100 acres across the PNVT. Effects to hairy woodpecker habitat quality would include destruction of snag habitat in proximity to motorized dispersed camp sites and fuelwood gathering adjacent to designated roads.

Effects to northern goshawk habitat quality would include harvest of down logs and destruction of understory habitat for prey species in proximity to dispersed camp sites and fuelwood

gathering adjacent to designated roads. The destruction of understory and litter habitat due harvest of downlogs and wood would also affect Abert's squirrel.

Cumulative Effects to Indicator Species of Ponderosa Pine Forest Mild and Mixed Conifer with Aspen Species

The ponderosa pine forest mild and mixed conifer with aspen vegetation types provide habitat for elk, turkey, pygmy nuthatch, violet-green swallow, western bluebird, hairy woodpecker, northern goshawk, and Abert's squirrel.

Alternative A. Alternative A would potentially result in a long-term cumulative decrease in forest structural stages, snags, and large downed woody debris. This alternative would cumulatively contribute to a decrease in key habitat components such as snags and large woody debris, old growth forests, cavity nesting habitat, forest opening, and general forest conditions that are expected to be at risk from increased future demand for use of forest resources. Alternative A would continue personal use fuelwood harvesting, motorized dispersed camping, motorized cross-country travel, and unlimited motorized big game retrieval within the ponderosa pine forest mild and mixed conifer with aspen PNVT. Motorized use of roads and trails may result in cumulative effects to the PNVT when added to other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, fuels reduction projects, forest thinning, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, other personal use activities, and new road construction. Non-motorized use of roads and motorized trails, non-motorized cross-country travel, and non- motorized dispersed camping could also cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. The cumulative effects of Tonto National Forest activities are expected to maintain designated roads at an approximate overall density of 4.4 miles of roads per square mile of ponderosa pine forest mild and mixed conifer with aspen PNVT. Road densities in excess of 2.4 miles of roads per square mile of forest habitat may have a higher probability of impaired watershed function (Potyondy and Geier, 2011) but is not anticipated to have a measurable and detectible effect on habitat quality of the ponderosa pine forest mild and mixed conifer with aspen PNVT.

Alternative B. There would be no effects to forest structural stage diversity, snags, and large downed woody debris quantity and habitat quality in the ponderosa pine forest mild and mixed conifer with aspen PNVT. While this alternative may result in some improvement to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that forest wide population change would occur. Overall, this alternative is not expected to change forest wide habitat or population trends for ponderosa pine forest mild and mixed conifer with aspen PNVT. The effects of this alternative may combine with other activities to result in a beneficial cumulative effect to ponderosa pine forest mild and mixed conifer with aspen PNVT habitat quality over a much broader area. For example areas open to cross-country motorized travel would be permitted on 167 percent of the forest-wide PNVT, while Alternative would not permit motorized cross country travel. Motorized use of roads and trails may result in cumulative effects to the PNVT when added to other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, fuels reduction projects, forest thinning, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, other personal use activities, and new road construction. Non-motorized use of roads and motorized trails, non- motorized cross-country travel, and non- motorized dispersed camping could also cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS

species. However, the cumulative effects of Alternative B, when added to other Tonto National Forest activities, are expected to maintain designated roads at an approximate overall density of 2.2 miles of road per square mile of ponderosa pine forest mild and mixed conifer with aspen PNVT. Road densities in excess of one mile to 2.4 miles of roads per square mile of forest habitat may have a higher probability of a functioning at risk watershed or a watershed in fair condition supported by Tonto National Forest Plan or analysis and data (Potyondy and Geier, 2011) and is not anticipated to have a measurable and detectible effect on habitat quality of the ponderosa pine forest mild and mixed conifer with aspen PNVT.

Alternative C. This alternative is expected to result in an overall effect of decreasing impacts to the ponderosa pine forest mild and mixed conifer with aspen PNVT and decreasing disturbance to the species that use it for habitat compared to Alternative A. It would have similar effects to Alternative B. This alternative may result in effects to the quality of this habitat by changing the patterns of habitat available (reduced fragmentation from road use) and potentially affecting the abundance of key habitat elements such as large snags or large downed trees. This alternative‘s reduction of roads to 1.28 miles of road per square miles within the PNVT may have a higher probability of impaired watershed function (Potyondy and Geier, 2011) but is not anticipated to have a measurable and detectible effect on habitat quality within the PNVT. Alternative C would not change the amount or age class distribution of indicator habitat. Habitat quality could improve, given the elimination of motorized cross-country travel and reductions in the amount of open roads, motorized trails, and motorized big game retrieval, all lessening disturbance to MIS. Motorized use of roads and trails may result in cumulative effects to the PNVT when added to other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, fuels reduction projects, forest thinning, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, other personal use activities, and new road construction. Non-motorized use of roads and motorized trails, non- motorized cross-country travel, and non- motorized dispersed camping could also cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. When combined with other Tonto National Forest activities, the cumulative effects of Alternative C may combine with other activities to result in a beneficial cumulative effect to ponderosa pine forest mild and mixed conifer dependent MIS species over a much broader area. The cumulative effects of Alternative C are not anticipated to have a measurable and detectible effect on habitat quality or the species that use the ponderosa pine forest mild and mixed conifer with aspen PNVT for habitat.

Alternative D. Alternative D would not change the amount or vegetation structural stage of MIS habitat in the ponderosa pine forest mild and mixed conifer with aspen PNVT. Factors that would improve habitat quality include the elimination of motorized cross-country travel and reductions in the amount of acres of motorized dispersed camping, lessening disturbance to MIS. Public use roadways would be similar to Alternative A, motorized big game retrieval, and motorized fuelwood gathering would also be similar to Alternative A, providing little improvement in habitat quality compared to the No Action Alternative. Factors that moderate any improvement in habitat quality include maintaining an overall road density of 4.2 miles of open roads per square mile of PNVT, camping, and game retrieval corridors over a large amount of the PNVT. While this alternative may result in some improvements and some negative impacts to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that Forest-wide population change would occur. Overall, this alternative is not expected to change Forest-wide habitat or population trends for ponderosa pine forest mild and mixed conifer with aspen MIS species, but would provide fewer benefits and have greater impacts from disturbance compared to Alternative B and Alternative C. Motorized use of roads

and trails may result in cumulative effects to the PNVT when added to other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, fuels reduction projects, forest thinning, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, other personal use activities, and new road construction. Non-motorized use of roads and motorized trails, non- motorized cross-country travel, and non- motorized dispersed camping could also cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. The effects of this alternative may combine with other activities to result in a beneficial cumulative effect to ponderosa pine dependent MIS species over a similar area as Alternative A. However, the cumulative effects of Alternative D are not anticipated to have a measurable and detectible effect on habitat quality or the species that use the ponderosa pine forest mild and mixed conifer with aspen PNVT for habitat.

Indicators of Pinyon-Juniper Chaparral, Pinyon-Juniper Grassland, Madrean Encinal Woodland, and Interior Chaparral

The pinyon-juniper chaparral, pinyon-juniper grassland, madrean encinal woodland, and interior chaparral vegetation types are indicators for the ash-throated flycatcher, gray vireo, Townsend's solitaire, juniper titmouse, northern flicker, spotted towhee, and black-chinned sparrow. Table 143 identifies the amount of habitat that is impacted by each of the five elements under each alternative.

Table 143. Total Acres of Pinyon-Juniper Chaparral, Pinyon-Juniper Grassland, Madrean Encinal Woodland, and Interior Chaparral Habitat

Elements	Forestwide	Alternative A	Alternative B	Alternative C	Alternative D
Roads and trails open to public use (miles)	1,759.79	1,280.83 (73%)	739.36 (42%)	1,748.36 (1%)	1,252.14 (71%)
Road density (miles per square mile)		0.65	0.39	0.92	0.71
OHV areas open to motorized use (acres)	1,347,859.62	351,083.81 (26%)	0 (0%)	0 (0%)	0 (0%)
Motor vehicle use for big game retrieval (acres)	1,347,859.62	351,083.81 (26%)	0 (0%)	799,902.52 (59%)	582,663.86 (43%)
Motor vehicle use for dispersed camping (acres)	1,347,859.62	351,083.81 (26%)	9.7 (<1%)	854 (NA)	84,377.37 (6%)
Personal use fuelwood gathering (acres)	1,347,859.62	497,903.1 (37%)	40,955.79 (3%)	81,401.51 (6%)	497,903.1 (37%)

Direct and Indirect Effects to Indicator Species of Pinyon-Juniper Chaparral, Pinyon-Juniper Grassland, Madrean Encinal Woodland, and Interior Chaparral

The effects of motorized public use of routes consists of the conversion of native habitat to non-vegetated road ways and is a linear direct loss of pinyon-juniper chaparral grassland, pinyon-juniper madrean encinal woodland and interior chaparral (P-J) PNVT total miles of roadways within ash-throated flycatcher habitat. The pinyon-juniper chaparral, pinyon-juniper grassland, madrean encinal woodland, and juniper chaparral vegetation types provide habitat for the ash-

throated flycatcher, gray vireo, Townsend’s solitaire, juniper titmouse, northern flicker, spotted towhee, and black-chinned sparrow.

The ash-throated flycatcher is an indicator species for ground cover. The Townsend's solitaire is an indicator species for juniper berry production. Diversity of forest structural stages includes variable tree maturity necessary for juniper berry production, cavity nesting habitat, and understory with litter that are important elements to ground cover diversity of P-J PNVT and provide foraging habitat to these species. The primary effect of roads to ground cover quality would be destruction of understory vegetation and ground cover from harvest of down logs and wood for campfire use, motorized fuelwood gathering and motorized dispersed camping throughout the PNVT in proximity to designated routes. The destruction of understory vegetation and ground cover may also limit tree germination and growth and reduce tree density. This could affect the Gray vireo, an indicator species for tree density.

The juniper titmouse is an indicator species for general woodland conditions. General woodland conditions are composed of variable woodland tree species and structural stage with shrub and grass understory habitat that are important element to indicator habitat for the juniper titmouse. Effects to juniper titmouse habitat would include harvest of down logs, reduction of grass and shrub understory from motorized fuelwood harvest and motorized dispersed camping.

General woodland conditions are composed of variable woodland tree species that meet Forest Plan guidelines for snag habitat that is an important element to indicator habitat for the northern flicker. The primary effect to northern flicker habitat quality would be from effects caused by the harvest of snags for motorized personal fuelwood gathering and campfires for motorized dispersed camping.

The spotted towhee is an indicator species for successional stages of this PNVT. Diversity of woodland structural stages includes variable tree maturity necessary for presence of all successional stages and a variable to dense shrub understory with litter that are important elements to P-J PNVT indicator habitat for the spotted towhee. Effects to spotted towhee habitat quality would include reduction or loss of shrub understory habitat from motorized fuelwood gathering and motorized dispersed camping.

The black-chinned sparrow is an indicator species for shrub density. Effects to black-chinned sparrow habitat quality would also include reduction or loss of shrub habitat component from motorized fuelwood gathering and motorized dispersed camping.

Effects to all species habitat quality could include disturbance from noise from motor vehicle use, motorized dispersed camping, motorized fuelwood gathering, and motorized big game retrieval. Effects to species habitat from motorized vehicle use would increase with increased miles of designated roadways and authorized use adjacent to designed routes.

Alternative A. Alternative A would designate 0.65 miles of roads per square mile of P-J PNVT. Road densities of less than one mile per square mile habitat would be an indicator that the watershed is in good condition (Potyondy and Geier, 2011). Alternative A would continue to authorize unrestricted off-road motorized travel, motorized big game retrieval, motorized dispersed camping, and motorized fuelwood harvest on 26 percent of PNVT acres. The effects from cross-country travel to ground cover indicator species habitat quality would include destruction of understory and litter habitat due to harvest of downlogs and wood for campfire use and motorized personal fuelwood gathering in proximity to designated routes within the PNVT. Destruction of understory and litter habitat reducing tree germination, and ultimately tree density

could affect species which depend on tree density like the gray vireo. Effects to juniper titmouse habitat would include harvest of down logs, reduction of grass and shrub understory from fuelwood harvest and dispersed camping. The northern flicker may be affected if snag density is lowered below Forest Plan objectives of 2 to 3 snags per acre. This may currently occur in localized areas, but does not reduce snag density below Forest Plan objectives of 180 snags per 100 acres across the PNVT.

Alternative A has 1,281 miles of roads open to public use within this PNVT which would continue current effects to species habitat. This is not anticipated to have a measurable and detectible effect on habitat quality in the P-J PNVT.

Alternative B. Under this alternative, effects of roads and trails open to motorized public use would be reduced to 0.39 miles of roads per square mile of P-J PNVT, a 40 percent reduction in road density from Alternative A. This would benefit P-J structural stages, including ground cover and juniper berry production. This alternative would maintain road densities of less than one mile per square mile habitat, an indicator of good watershed condition (Potyondy and Geier, 2011). Alternative B would designate 739 miles of roads and trails open to public use within this PNVT which could affect species habitat. With a reduction of 42 percent in motorized roads and trails from Alternative A, this alternative will have a lower measurable and detectible effect on habitat quality of the P-J PNVT than the current condition.

Alternative B is not anticipated to have measurable effects to current P-J structure, including ground cover and juniper berry production, shrub understory diversity, shrub density, and therefore habitat quality for indicator species populations. Alternative B would not designate motorized cross country travel, or motorized big game retrieval and would limit motorized dispersed camping to less than one percent of P-J PNVT and motorized fuelwood gathering to three percent of P-J PNVT. Effects to ground cover indicator species habitat quality would decrease in this alternative. Destruction of understory and litter habitat will also decrease. Effects to juniper titmouse habitat will decrease from the current condition. Alternative B is also not anticipated to have measurable effects to current P-J structure and snag density, which would intern affect habitat quality for northern flicker populations. Alternative B is not anticipated to lower snag density below Forest Plan objectives of 2 to 3 snags per acre, and would not reduce snag density below Forest Plan objectives of 180 snags per 100 acres across the PNVT.

Effects to habitat due to noise disturbance from motor vehicle use for dispersed camping and fuelwood gathering would be reduced under this alternative and would have beneficial effects to species habitat quality as compared to Alternative A. There would be impacts on habitat elements in localized areas (where camping and fire wood gathering is permitted), but would be reduced due to a limited amount of roads within the PNVT. Alternative B would improve habitat quality over Alternative A, but is not anticipated to have a measurable and detectible effect on habitat quality of the P-J PNVT.

Alternative C. Under this alternative, effects of roads and trails open to motorized public use would be reduced to 0.92 miles of roads per square mile of P-J PNVT, a seven percent reduction in road density from Alternative A, and a 58 percent increase in road density from Alternative B. Alternative C would benefit P-J structural stages including ground cover, juniper berry production, grass and shrub habitat, and dense shrub understories compared to Alternative A, but would increase effects to habitat quality compared to Alternative B. Road densities would remain less than one mile per square mile within the PNVT, an indicator of good watershed condition (Potyondy and Geier, 2011). Alternative C is not anticipated to have measurable effects to current P-J structure, and therefore habitat quality for species populations.

Alternative C would not designate motorized cross country travel, and would limit motorized dispersed camping to approximately 854 campsites in P-J PNVT and motorized fuelwood gathering to six percent of P-J PNVT. It would also limit motorized big game retrieval to 59 percent of P-J PNVT.

Effects to ground cover dependent species habitat quality would decrease from the current condition within the PNVT. Destruction of shrub and grass habitat, as well as understory and litter habitat reducing tree germination, and ultimately tree density would also be reduced. Alternative C is not anticipated to lower snag density below Forest Plan objectives of 2 to 3 snags per acre, and not reduce snag density below Forest Plan objectives of 180 snags per 100 acres across the PNVT. Therefore, there would not be a measurable effect to northern flicker. Alternative C is not anticipated to have measurable effects to elements of this PNVT, and therefore habitat quality for species populations.

Effects to all species due to noise disturbance from motor vehicle use, motorized dispersed camping and motorized fuelwood gathering would be reduced under this alternative, and would have beneficial effects to habitat quality as compared to Alternative A, but would increase effects compared to Alternative B. There would be impacts on habitat elements in localized areas (where motorized camping and fire wood gathering is permitted), but would be reduced due to the limited amount of roads within the PNVT.

Alternative D. Under this alternative, effects of roads and trails open to motorized public use would be increased to 0.71 miles of roads per square mile of P-J PNVT, a nine percent increase in road density from Alternative A, a 82 percent increase in road density from Alternative B, and a 36 percent increase in road density from Alternative C. Alternative D would result in increased effects to P-J structural stages including ground cover compared to Alternative A, Alternative B and Alternative C. Road densities would be maintained less than one mile per square mile within the PNVT, an indicator of good watershed condition (Potyondy and Geier, 2011).

Alternative D is not anticipated to have measurable effects to current P-J structure, including ground cover, juniper berry production, grass and shrub production, or shrub density and diversity, and therefore habitat quality for species populations which depend on them. Alternative D would not designate motorized cross country travel, and would increase motorized big game retrieval over all alternatives, not change designated areas for motorized fuelwood gathering from Alternative A, would increase motorized fuelwood gathering areas from Alternative B and Alternative C, and would limit motorized dispersed camping to six percent of P-J PNVT. Alternative D is also not anticipated to lower snag density below Forest Plan objectives of 2 to 3 snags per acre, and not reduce snag density below Forest Plan objectives of 180 snags per 100 acres across the PNVT, and therefore would not reduce habitat quality for northern flicker populations.

Effects to ground cover habitat quality, including destruction of understory and litter habitat would be reduced. Destruction of shrub and grass habitat, along with understory and litter habitat would be slightly reduced from the current condition. . Effects to species habitat due to noise disturbance from motorized vehicles would be reduced compared to Alternative A, and increased compared to Alternative B and Alternative C. Effects to species habitat from fuelwood gathering would not change from Alternative A, but would be greater than Alternative B and Alternative C. Effects from motorized big game retrieval would be greater than all other alternatives. There would be impacts on habitat elements in localized areas (where camping and fire wood gathering is permitted), but would be reduced due to limited amount of roads within the PNVT. Alternative D decreases habitat quality over Alternative A, Alternative B and Alternative C. However,

Alternative D is not anticipated to have a measurable and detectible effect on habitat quality of the P-J PNVT.

Cumulative Effects to Indicator Species of Pinyon-Juniper Chaparral, Pinypon-Juniper Grassland, Madrean Encinal Woodland, and Juniper Chaparral Species

The pinyon-juniper chaparral, pinyon-juniper grassland, madrean encinal woodland, and juniper chaparral vegetation types provide habitat for the ash-throated flycatcher, gray vireo, Townsend's solitaire, juniper titmouse, northern flicker, spotted towhee, and black-chinned sparrow.

Alternative A. Alternative A would potentially result in a long-term cumulative decrease in Pinyon-Juniper Chaparral, Pinypon-Juniper Grassland, Madrean Encinal Woodland, and Juniper Chaparral (P-J) PNVT structural stages, ground cover, shrubs, snags, and large downed woody debris. This alternative would cumulatively contribute to a decrease in key habitat components such as snags and large woody debris, cavity nesting habitat, shrub diversity and density, and general woodland conditions that are expected to be at risk from increased future demand for use of forest resources. Alternative A would continue motorized fuelwood harvesting, motorized dispersed camping, motorized cross-country travel, and unlimited motorized big game retrieval within the P-J PNVT. Motorized use of roads and trails may result in cumulative effects to the PNVT when added to other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, fuels reduction projects, forest thinning, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, other personal use activities, and new road construction. Non-motorized use of roads and motorized trails, non-motorized cross-country travel and non-motorized dispersed camping could cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. Cumulatively, effects of Tonto National Forest travel management activities are expected to maintain designated roads at an approximate overall density of 0.65 miles of roads per square mile in the P-J PNVT. Road densities of less than one mile per square mile habitat would be an indicator of good watershed condition (Potyondy and Geier, 2011), and therefore is not anticipated to have a measurable and detectible effect on habitat quality of the P-J PNVT.

Alternative B. There would be no effects to forest structural stage diversity, ground cover, shrubs, snags, and large downed woody debris and habitat quality in the P-J PNVT. While this alternative may result in some improvement to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that forest wide population change would occur. Overall, this alternative is not expected to change forest wide habitat or population trends for the P-J PNVT, even as increased demand for forest resources and human population increases. The effects of this alternative may combine with other activities to result in a beneficial cumulative effect to P-J PNVT habitat quality over a much broader area. For example, in areas currently open to cross-country motorized travel (167 percent of the forest wide PNVT) effects would be reduced, as Alternative B would not permit motorized cross country travel. Non-motorized use of roads and motorized trails, non-motorized cross-country travel and non-motorized dispersed camping could cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. The cumulative effects of Alternative B in addition to other Tonto National Forest activities are expected to maintain designated roads at an approximate overall density of 0.39 miles of road per square mile of P-J PNVT. Road densities of less than one mile per square mile habitat would be an indicator of good watershed condition (Potyondy and Geier, 2011), and therefore is not anticipated to have a measurable and detectible effect on habitat quality of the P-J PNVT.

Alternative C. This alternative is expected to result in an overall effect of decreasing impacts to P-J PNVT and decreasing disturbance to the species that use it for habitat even as increased demand for forest resources and human population increases. This alternative may result in effects to the quality of this habitat by changing the patterns of habitat available (reduced fragmentation from road use) and potentially affecting the abundance of key habitat elements such as snags and large woody debris, cavity nesting habitat, shrub diversity and density, and general woodland conditions. This alternative reduces road density to 0.92 miles of road per square miles of the P-J PNVT. Road densities of less than one mile per square mile habitat would be an indicator of good watershed condition (Potyondy and Geier, 2011), and therefore is not anticipated to have a measurable and detectible effect on habitat quality of the P-J PNVT. Alternative C would not change the amount or age class distribution of indicator habitat over the P-J PNVT, even as increased demand for forest resources and human population increases. Habitat quality could improve, given the elimination of cross-country travel and reductions in the amount of open roads, motorized trails, and motorized big game retrieval, lessening disturbance to MIS. Non-motorized use of roads and motorized trails, non-motorized cross-country travel and non-motorized dispersed camping could cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. When combined with other Tonto National Forest activities, the cumulative effects of Alternative C may result in a beneficial cumulative effect to P-J PNVT dependent MIS species over a much broader area. The cumulative effects of Alternative C are not anticipated to have a measurable and detectible effect on habitat quality or the species that use P-J PNVT for habitat.

Alternative D. Alternative D would not change the amount or vegetation structural stage, ground cover, shrubs, snags, and large downed woody debris of MIS habitat in the P-J PNVT, even as increased demand for forest resources and human population increases. Factors that would improve habitat quality include the elimination of motorized cross-country travel and reductions in the amount of acres of motorized dispersed camping, lessening disturbance to MIS from the current condition. Motorized vehicle use of roads and trails would be increased to 0.71 miles of roads per mile in the P-J PNVT, a nine percent increase from Alternative A, an 82 percent increase from Alternative B, and a 36 percent increase from Alternative C. Motorized fuelwood gathering would be similar to Alternative A and motorized big game retrieval would be increased above all alternatives providing little improvement in habitat quality from current baseline conditions. Factors that moderate any improvement in habitat quality include maintaining an overall road density of 0.71 miles of open roads per square mile of PNVT, motorized fuelwood gathering and motorized big game retrieval corridors over a large amount of the PNVT. While this alternative may result in some improvements and some negative impacts to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that woodland-wide MIS species population change would occur. Overall, this alternative is not expected to change forest wide habitat or population trends, but would provide fewer benefits and have greater impacts from disturbance compared to Alternative B and Alternative C. Non-motorized use of roads and motorized trails, non-motorized cross-country travel and non-motorized dispersed camping could cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. The effects of this alternative may combine with other activities on the Tonto National Forest to result in a beneficial cumulative effect to woodland dependent MIS species over a similar area as Alternative A through eliminating motorized cross-country travel on the Payson and Pleasant Valley Ranger Districts. The cumulative effects of Alternative D are not anticipated to have a measurable and detectible effect on habitat quality or the species that use the ponderosa pine forest mild and mixed conifer with aspen PNVT for habitat.

Indicators of Semidesert Grassland

The semidesert grassland vegetation types are indicators for savannah sparrow and horned lark. Table 144 identifies the amount of habitat of semidesert grassland that is impacted by each of the five elements under each alternative.

Table 144. Total Acres of Semidesert Grassland Habitat

Elements	Forestwide	Alternative A	Alternative B	Alternative C	Alternative D
Roads and trails open to public use (miles)	376.91	277 (73%)	169.77 (45%)	540.28 (>30%)	274.63 (73%)
Road density (miles per square mile)		0.46	0.29	0.86	0.46
OHV areas open to motorized use (acres)	394,195.66	9,353.35 (2%)	0 (0%)	0 (0%)	0 (0%)
Motor vehicle use for big game retrieval (acres)	394,195.66	9,353.35 (2%)	0 (0%)	142,247.36 (36%)	94,612.74 (24%)
Motor vehicle use for dispersed camping (acres)	394,195.66	9,353.35 (2%)	4.86 (<1%)	291 (NA)	17,154.51 (4%)
Personal use fuelwood gathering (acres)	394,195.66	63,352.21 (16%)	8,093 (2%)	22,371.99 (6%)	63,352.21 (16%)

Direct and Indirect Effects to Indicator Species of Semidesert Grassland

The savannah sparrow is an indicator species for grass species diversity. The effects of motorized public use of roadways and continued maintenance consists of the conversion of native habitat to non-vegetated road ways and is a linear direct loss of semidesert grassland PNVT total miles of roadways within savannah sparrow habitat. Diversity of grassland habitats includes a grass understory with diverse species composition with litter that is an important element to diversity of grass species in the semidesert grassland PNVT, indicator habitat for the savannah sparrow. The horned lark is an indicator species for vegetation aspect, and also depends on diversity of grassland habitat, as well as bare ground.

The primary direct effect of roads to these species' habitat quality would be destruction of grass understory and ground cover from harvest of down logs and wood for campfire use, motorized fuelwood gathering and motorized dispersed camping throughout the PNVT in proximity to roadways. Effects to species habitat from motorized vehicle use would increase with increased miles of designated roadways and authorized use adjacent to designed roads for motorized public use.

Alternative A. Alternative A would maintain a road density of 0.46 miles of roads per mile of semidesert grassland PNVT. Road densities of less than one mile per square mile habitat would be an indicator of good watershed condition (Potyondy and Geier, 2011). Alternative A would continue to authorize motorized cross-country travel, motorized big game retrieval and motorized dispersed camping on two percent of the semidesert grassland PNVT and motorized fuelwood harvest on sixteen percent of the PNVT. Disturbance from noise from motor vehicle use, motorized dispersed camping, motorized fuelwood gathering, and motorized big game retrieval would continue. Alternative A would designate 277 miles of roads open to public use, which could have direct and indirect effects to species habitat but is not anticipated to have a measurable and detectible effect on habitat quality of the semidesert grassland PNVT.

Alternative B. Alternative B would designate 170 miles of roads as open to motorized public use, a reduction of 38 percent from Alternative A, and would designate a road density of 0.0.29 miles of roads per mile of semidesert grassland PNVT. Road densities of less than one mile per square mile would be maintained, an indicator of good watershed condition (Potyondy and Geier, 2011). Alternative B would authorize motorized dispersed camping on less than one percent of the semidesert grassland PNVT and motorized fuelwood harvest on two percent of the PNVT. Alternative B would not authorize motorized big game retrieval or motorized cross-country travel.

Effects to savannah sparrow and horned lark habitat from motorized vehicle use would decrease with decreased miles of designated roadways and authorized use adjacent to designed roads for motorized public use. Alternative B would designate 170 miles of roads and trails open to public use which could affect species habitat but is not anticipated to have a measurable and detectible effect on habitat quality in the semi-desert grassland PNVT.

Alternative C. Alternative C would designate 540 miles of roads and trails as open to motorized public use, an increase of 30 percent from Alternative A, and a 75 percent increase in miles of designated road and trails from Alternative B. Alternative C would have a road density of 0.86 miles of roads per mile in semidesert grassland PNVT. Road density would remain less than one mile per square mile within the PNVT, an indicator of good watershed condition (Potyondy and Geier, 2011). Alternative C would authorize motorized dispersed camping on approximately 291 campsites in the semidesert grassland PNVT and motorized fuelwood harvest on six percent of PNVT acres. Motorized big game retrieval would be authorized on 142,247 acres of semidesert PNVT, a 36 percent decrease from Alternative A. Motorized big game retrieval would greatly increase motorized use during a limited period of time and outside of nesting season for both species.

Alternative C would not authorize motorized cross-country travel. Therefore, effects to species habitat quality would be reduced from the current condition. Effects from noise disturbance from motor vehicle use would also be reduced primarily from not permitting year round motorized cross-country travel, reducing OHV motorized acres, and the motorized big game retrieval use period occurring outside of nesting season for the savannah sparrow. Alternative C would increase effects to species habitat from Alternative B. Alternative C would designate 540 miles of roads and trails open to public use which could have direct and indirect effects to species habitat, but is not anticipated to have a measurable and detectible effect on habitat quality.

Alternative D. Alternative D would designate 275 miles of roads as open to motorized public use, similar to Alternative A, a 62 percent increase from Alternative B, and a 21 percent increase in miles of designated road and trails from Alternative C. Alternative D would designate a road density of 0.46 miles of roads per square mile of semidesert grassland PNVT, similar to Alternative A. Road density would remain less than one mile per square mile within the PNVT, an indicator of good watershed condition (Potyondy and Geier, 2011). Alternative D would authorize motorized dispersed camping on four percent of the semidesert grassland PNVT, a greater percentage than any alternative. It would also authorize motorized fuelwood harvest on sixteen percent of PNVT acres, the same as Alternative A. Motorized big game retrieval would be authorized on 24 percent of semidesert PNVT. Motorized big game retrieval would greatly increase motorized use during a limited period of time and outside of nesting season for both species. Alternative D would not authorize motorized cross-country travel.

Effects of roads on habitat quality would not change from the current condition. Effects to species habitat quality could increase from disturbance from motorized dispersed camping and

motorized fuelwood gathering. Alternative D would decrease effects to savannah sparrow habitat from Alternative A, primarily by not permitting motorized cross-country travel, but would increase effects to savannah sparrow habitat from Alternative B and Alternative C. Alternative D would designate 275 miles of roads and trails open to public use which could have direct and indirect effects to species habitat but is not anticipated to have a measurable and detectible effect on habitat quality in the PNVT.

Cumulative Effects to Indicator Species of Semidesert Grassland

Alternative A. Alternative A would potentially result in a long-term cumulative decrease in the semidesert grassland PNVT structural stages, shrub and grass understory ground cover with some bare ground. This alternative would cumulatively contribute to a decrease in key habitat components such as, shrub and grass understory ground cover with some bare ground, and general semidesert grassland habitat conditions that are expected to be at risk from increased future demand for use of forest resources. Alternative A would continue motorized fuelwood gathering, motorized dispersed camping, motorized cross-country travel, and unlimited motorized big game retrieval within the semidesert grassland PNVT. Motorized use of roads and trails may result in cumulative effects to the PNVT when added to other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, personal use activities, and new road construction. These activities could cumulatively contribute to noise disturbance within all structural stages of the PNVT, and could result in cumulative effects to habitat quality to MIS species.

In terms of road densities, the cumulative effects of all reasonably foreseeable Tonto National Forest activities are expected to maintain designated roads at an approximate overall density of 0.46 miles of road per square mile of the semidesert grassland PNVT. Road densities of less than one mile per square mile habitat would be an indicator of good watershed condition (Potyondy and Geier, 2011) and therefore is not anticipated to have a measurable and detectible effect on habitat quality of the semidesert grassland PNVT.

Alternative B. There would be no direct effects to semidesert grassland structural stage diversity, perennial grass ground cover, shrubs, and habitat quality in the semidesert grassland PNVT. While this alternative may result in some improvement to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that forest wide population change would occur. Overall, this alternative is not expected to change forest wide habitat or population trends for the semidesert grassland PNVT. The effects of this alternative may combine with other activities on the Forest to result in a beneficial cumulative effect to semidesert grassland PNVT habitat quality over a much of the PNVT through elimination of motorized cross country travel, reduced motorized dispersed camping, motorized big game retrieval and motorized fuelwood gathering. The cumulative effects of Alternative B in relation to all reasonably foreseeable Tonto National Forest activities are expected to maintain designated roads at an approximate overall density of 0.29 miles of road per square mile of semidesert grassland PNVT. Road densities of less than one mile per square mile habitat would be an indicator of good watershed condition (Potyondy and Geier, 2011) and therefore is not anticipated to have a measurable and detectible effect on habitat quality of the semidesert grassland PNVT

Alternative C. This alternative is expected to result in an overall effect of decreasing impacts to semidesert grassland PNVT and decreasing disturbance to the species that use it for habitat compared to Alternative A, but increase potential habitat quality effects when compared to

Alternative B. This alternative may result in effects to the quality of this habitat by potentially affecting the abundance of key habitat elements such as structural stage, shrub and grass understory ground cover with some bare ground and general semidesert grassland conditions. This alternative‘s increase of roads to 0.86 miles of road per square miles of the semidesert grassland PNVT would increase potential effects to semidesert grassland PVNT from Alternative A and B. Road densities of less than one mile per square mile habitat would be an indicator of good watershed condition (Potyondy and Geier, 2011), and therefore is not anticipated to have a measurable and detectible effect on habitat quality of the semidesert grassland PNVT. Alternative C would not change the amount or distribution of indicator habitat over the semidesert grassland PNVT. Habitat quality could improve, given the elimination of year round cross-country lessening disturbance to MIS. Factors that moderate any improvements in habitat quality include an increase of 30 percent in road miles from Alternative A of the semidesert grassland PNVT. When combined with other Tonto National Forest activities, the effects of Alternative C may result in a beneficial cumulative effect to semidesert grassland PNVT dependent MIS species over a much broader area. The cumulative effects of Alternative C are not anticipated to have a measurable and detectible effect on habitat quality or the species that use semidesert grassland PNVT for habitat.

Alternative D. Alternative D would not change the amount or vegetation structural stage, shrub and grass understory ground cover with some bare ground and general semidesert grassland PNVT. Factors that would improve habitat quality include the elimination of cross-country travel, lessening disturbance to MIS. Motorized vehicle use of roads and trails would be increased to 0.46 miles of road per mile of semidesert grassland PNVT, similar to Alternative A, a 59 percent increase from Alternative B, and a 21 percent increase from Alternative C. Motorized fuelwood gathering would be similar to Alternative A and motorized big game retrieval would be increased above all alternatives providing little improvement in habitat quality from current baseline conditions. Factors that moderate any improvement in habitat quality include maintaining an overall road density of 0.46 miles of open roads per square mile of PNVT, motorized fuelwood gathering and motorized big game retrieval corridors over a large amount of the PNVT. While this alternative may result in some improvements and some negative impacts to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that woodland-wide MIS species population change would occur. Overall, this alternative is not expected to change forest wide habitat or population trends but would provide fewer benefits and have greater impacts from disturbance compared to Alternative B and Alternative C. The effects of this alternative may combine with other reasonably foreseeable activities on the Tonto National Forest to result in a beneficial cumulative effect to semidesert grassland dependent MIS species over a similar area as Alternative A, through eliminating motorized cross-country travel. The cumulative effects of Alternative D are not anticipated to have a measurable and detectible effect on habitat quality or the species that use the semidesert grassland PNVT for habitat.

Indicators of Desert Communities

The desert community vegetation type is an indicator for the black-throated sparrow and canyon towhee. Table 145 identifies the amount of habitat of Desert Communities that is impacted by each of the five elements under each alternative.

Table 145. Total Acres of Desert Communities Habitat Impacted

Elements	Forestwide	Alternative A	Alternative B	Alternative C	Alternative D
Roads and trails open to public use (miles)	810.23	581.57 (72%)	246.49 (30%)	1,221.01 (>34%)	520.48 (64%)
Road density (miles per square mile)		0.58	0.29	1.02	0.53
OHV areas open to motorized use (acres)	725,990.92	1,316.76 (<1%)	0 (0%)	738.21 (99%)	1,403.92 (0%)
Motor vehicle use for big game retrieval (acres)	725,990.92	1,316.76 (<1%)	0 (0%)	85,174.18 (88%)	240,445.02 (33%)
Motor vehicle use for dispersed camping (acres)	725,990.92	1,316.76 (<1%)	10.65 (<1%)	596 (NA)	36,880.42 (5%)
Personal use fuelwood gathering (acres)	725,990.92	71,843.67 (10%)	7,057.36 (1%)	27,954.02 (96%)	71,843.67 (1%)

Direct and Indirect Effects to Indicator Species of Desert Communities

The desert community vegetation type is an indicator for the black-throated sparrow and canyon towhee. The effects of motorized public use of routes consists of the conversion of native habitat to non-vegetated road ways and is a linear direct loss of desert communities PNVT total miles of roadways within species habitat.

The black-throated sparrow is an indicator species for shrub density within this PNVT. Diversity of desert community habitats includes shrublands with diverse species composition with grass-forb understory with litter that is an important element to diversity of desert communities PNVT indicator habitat for the black-throated sparrow. This same understory litter provides the ground cover important for the canyon towhee. The canyon towhee is an indicator species for ground cover within the desert communities PNVT.

The primary direct effect of roads to both species' habitat quality would be destruction of shrublands and ground cover from harvest of down logs and wood for campfire use from motorized fuelwood gathering and motorized dispersed camping throughout the PNVT in proximity to routes. Effects to species habitat quality could also include disturbance from noise from motor vehicle use, motorized dispersed camping, motorized fuelwood gathering, and motorized big game retrieval. Effects to black-throated sparrow habitat from motorized vehicle use would increase with increased miles of designated roadways and authorized use adjacent to designed roads for motorized public use.

Alternative A. Alternative A would have a road density of 0.58 miles of roads per mile of desert communities PNVT. Road densities of less than one mile per square mile habitat are an indicator of good watershed condition (Potyondy and Geier, 2011). Alternative A would continue to authorize motorized cross-country travel, and would allow motor vehicle use for big game retrieval and dispersed camping on less than one percent of the desert communities PNVT and motorized fuelwood harvest on ten percent of the PNVT. These activities would continue to effect species through noise disturbance within all structural stages of the PNVT and through the motorized collection of down logs and wood within species habitat.

Alternative A would designate 582 miles of roads and trails open to public use which could have direct and indirect effects to species habitat. Alternative A could potentially result in a long-term decrease in the desert communities PNVT shrubs structural stages, and grass understory ground cover, but is not anticipated to have a measurable and detectible effect on habitat quality of the P-J PNVT.

Alternative B. Alternative B would designate 246 miles of roads as open to motorized public use, a reduction of 58 percent reduction from Alternative A. It would designate a road density of 0.29 miles of roads per mile in desert communities PNVT, a reduction in road density of 50 percent from Alternative A. Road densities of less than one mile per square mile habitat are an indicator of good watershed condition (Potyondy and Geier, 2011). Alternative B would not authorize motorized cross-country travel or motorized big game retrieval, reducing noise disturbance from these activities. Alternative B would authorize motor vehicle use for dispersed camping and fuelwood gathering on one percent of the desert communities PNVT, reducing impacts of noise disturbance and motorized wood collection within habitat. As such, Alternative B would increase species habitat quality over Alternative A. Alternative B have could have direct and indirect effects to species habitat but is not anticipated to have a measurable and detectible effect on desert communities structural stage diversity, perennial grass ground cover, shrubs, and habitat quality to desert communities PNVT MIS. While this alternative may result in some improvement to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that forest wide population change would occur. Overall, this alternative is not expected to change forest wide habitat or population trends for the desert communities PNVT MIS.

Alternative C. Alternative C would designate 1,221 miles of roads as open to motorized public use, an increase of 34 percent from Alternative A and a 80 percent increase from Alternative B. Alternative C would designate a road density of 1.02 miles of roads per square mile of desert communities PNVT, an increase in road density of 44 percent from Alternative A, and an increase road density by 71 percent from Alternative B. Road densities of less than one mile per square mile habitat would be an indicator of watershed in good condition (Potyondy and Geier, 2011). Alternative C would authorize OHV areas, dispersed camping sites, and fuelwood gathering on four percent of the PNVT. It would authorize motorized big game retrieval on twelve percent of desert communities, but this would be limited to hunting season (September to December) as opposed to currently allowed cross-country travel.

Alternative C would designate 1,221 miles of roads and trails open to public use and would have similar effects to habitat quality to Alternative A. The similar effects would be due to increases in open roads and trails, increases in motorized big game retrieval, and reductions in personnel fuelwood gathering and OHV Areas. Alternative C, overall, would increase species habitat quality from Alternative A, but would have less beneficial effects than Alternative B. Alternative C could have direct and indirect effects to species habitat by potentially affecting the abundance of key habitat elements such as structural stage, shrub and grass understory, ground cover and general desert communities conditions but is not anticipated to have a measurable and detectible effect on habitat quality of the PNVT.

Alternative D. Alternative D would designate 520 miles of roads as open to motorized public use, a reduction of eleven percent from Alternative A, a 111 percent increase in roads and trails open to public use from Alternative B, and an increase of 31 percent from Alternative C. Alternative D would designate a road density of 0.53 miles of roads per mile of desert communities PNVT a reduction in road density of eight percent from Alternative A would

increase road density by 83 percent from Alternative B and a 26 percent increase in road density from Alternative C. However, road densities of less than one mile per square mile habitat would be maintained, an indicator of good watershed condition (Potyondy and Geier, 2011).

Alternative D would authorize areas for motorized use on one percent of the PNVT and authorize motorized big game retrieval on 33 percent of the PNVT, greater than any alternative. Motorized dispersed camping would be authorized on five percent of PNVT acres, also greater than any alternative. Motorized fuelwood gathering would be allowed on ten percent of the PNVT, similar to Alternative A. Where these activities are increased from the current condition, effects from noise disturbance and destruction of shrublands and ground cover from harvest of down logs and wood for campfire use, motorized fuelwood gathering, and motorized dispersed camping would also increase.

Alternative D would designate 520 miles of roads and trails open to public use and would decrease species habitat quality over all alternatives. Alternative D could have direct and indirect effects to species habitat but is not anticipated to have a measurable and detectible effect on habitat quality of the PNVT.

Cumulative Effects to Indicator Species of Desert Communities

Alternative A. Alternative A would potentially result in a long-term cumulative decrease in the desert communities PNVT shrubs structural stages, and grass understory ground cover. This alternative would cumulatively contribute to a decrease in key habitat components such as, shrub and grass understory and ground cover, and general semidesert grassland habitat conditions that are expected to be at risk from increased future demand for use of forest resources. Alternative A would continue motorized fuelwood gathering, motorized dispersed camping, motorized cross-country travel, and unlimited motorized big game retrieval within the desert communities PNVT. Motorized use may result in cumulative effects to the PNVT when added to the effects of other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, personal use activities, and new road construction. Non-motorized use of routes, non-motorized cross-country travel, and non-motorized dispersed camping could increase noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species.

In terms of road densities, the cumulative effects of Tonto National Forest activities are expected to maintain designated roads at an approximate overall density of 0.58 miles of road per square mile of the desert communities PNVT. This would maintain road density less than one mile per square mile within the PNVT, an indicator of good watersheds condition (Potyondy and Geier, 2011). Therefore there is not anticipated to have a measurable and detectible effect on habitat quality of the desert communities PNVT.

Alternative B. There would be no direct effects to desert communities' structural stage diversity, perennial grass ground cover, shrubs, and habitat quality to desert communities PNVT MIS. While this alternative may result in some improvement to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that forest wide population change would occur. Overall, this alternative is not expected to change forest wide habitat or population trends for the desert communities PNVT MIS. The effects of this alternative may combine with other reasonably foreseeable Tonto National Forest activities to result in a beneficial cumulative effect to desert communities PNVT habitat quality over a much of the PNVT. This would occur through elimination of motorized cross country travel, motorized big game retrieval and reduced motorized dispersed camping and motorized fuelwood gathering.

The cumulative effects of Alternative B in relation to Tonto National Forest activities are expected to maintain designated roads at an approximate overall density of 0.29 miles of road per square mile of desert grassland PNVT. Road densities of less than one mile per square mile habitat would be an indicator of good watersheds condition (Potyondy and Geier, 2011), and therefore is not anticipated to have a measurable and detectible effect on habitat quality of the desert communities PNVT.

Alternative C. This alternative is expected to result in an overall effect of a slight decrease in impacts to desert communities PNVT and decrease disturbance to the species that use it for habitat compared to Alternative A, but increase potential habitat quality effects when compared to Alternative B. This alternative may result in effects to the quality of this habitat by potentially affecting the abundance of key habitat elements such as structural stage, shrub and grass understory ground cover and general desert communities conditions. Alternative C would designate 1,221 miles of roads as open to motorized public use, an increase of 34 percent from Alternative A and a 80 percent increase from Alternative B. Alternative C would designate a road density of 1.02 miles of roads per mile of desert communities PNVT, an increase in road density of 44 percent from Alternative A, and an increase road density by 71 percent from Alternative B. Road densities of less than one mile per square mile habitat would be an indicator of good watershed condition (Potyondy and Geier, 2011). Therefore, this alternative is not anticipated to have a measurable and detectible effect on habitat quality of the desert communities PNVT. Alternative C would authorize OHV areas, motorized dispersed camping sites, and motorized fuelwood gathering on four percent of the PNVT and would authorize motorized big game retrieval on twelve percent of the PNVT. Alternative C would not change the amount or distribution of indicator habitat over the desert communities PNVT. Habitat quality could improve, given the reduction in the amount of open roads and motorized trails, and maintaining cross-country travel, dispersed camping, and fuel wood gathering comparable to Alternative A, but increased over Alternative B. Factors that moderate any improvements in habitat quality include increasing motorized big game retrieval to twelve percent of the desert communities PNVT. When combined with other Tonto National Forest activities the cumulative effects of Alternative C may result in a beneficial cumulative effect to desert communities PNVT dependent MIS species over a much broader area. Alternative C would increase road density to 1.02 miles of road per square miles within this PNVT and decrease motorized big game retrieval, motorized personnel fuelwood gathering and OHV use areas. Overall this alternative would decrease potential effects to desert communities PNVT from Alternative A and increase effects to the PNVT from Alternative B. The cumulative effects of Alternative C are not anticipated to have a measurable and detectible effect on habitat quality or the species that use desert communities PNVT for habitat.

Alternative D. Alternative D would not change the amount or vegetation structural stage, shrub, and grass understory ground cover with some bare ground and general desert communities PNVT from the current condition. Alternative D would authorize motorized big game retrieval and motorized dispersed camping on greater habitat acres than any alternative and would maintain motorized fuelwood gathering similar to Alternative A, and on more habitat than Alternative B and Alternative C. Motorized vehicle use of roads and trails would be increased to 0.53 miles of road per mile of desert communities PNVT, similar to Alternative A, an 83 percent increase from Alternative B, and a 26 percent increase from Alternative C. Motorized fuelwood gathering would be similar to Alternative A and motorized big game retrieval would be increased above all alternatives providing little improvement in habitat quality from current baseline conditions. Factors that moderate any decrease in habitat quality include maintaining an overall road density of 0.53 miles per square mile within the PNVT, motorized fuelwood gathering and

motorized big game retrieval corridors over a large amount of the PNVT. While this alternative may result in negative impacts to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that woodland-wide MIS species population change would occur. Overall, this alternative is not expected to change forest wide habitat or population trends but would provide fewer benefits and have greater impacts from disturbance compared to Alternative A, Alternative B and Alternative C. The cumulative effects of Alternative D are not anticipated to have a measurable and detectible effect on habitat quality or the species that use the semidesert grassland PNVT for habitat.

Indicators of Cottonwood Willow Riparian Forest

The Cottonwood Willow Riparian vegetation type is an indicator for the bald eagle, bell's vireo, summer tanager, and hooded oriole. Table 146 identifies the amount of habitat of Cottonwood Willow Riparian Forest that is impacted by each of the five elements under each alternative[131].

Table 146. Total Acres of Cottonwood Willow Riparian Forest Habitat

Elements	Forestwide	Alternative A	Alternative B	Alternative C	Alternative D
Roads and trails open to public use (miles)	488.95	444.29 (91%)	197.48 (40%)	213.95 (44%)	393.59 (80%)
Road density (miles per square mile)		7.09	3.26	2.90	6.30
OHV areas open to motorized use (acres)	41,228.82	361.68 (1%)	0 (0%)	658.89 (2%)	1,203.52 (3%)
Motor vehicle use for big game retrieval (acres)	41,228.82	361.68 (1%)	0 (0%)	5,715.58 (14%)	83,545.95 (203%)
Motor vehicle use for dispersed camping (acres)	41,228.82	361.68 (1%)	24.38 (<1%)	226 (NA)	20,150.43 (49%)
Personal use fuelwood gathering (acres)	41,228.82	15,232.85 (37%)	3,074.44 (7%)	4,074.92 (10%)	15,232.85 (37%)

Direct and Indirect Effects to Indicator Species of Cottonwood Willow Riparian Forest

The effects of motorized public use of routes consist of the conversion of native habitat to non-vegetated road ways, and are a linear direct loss of cottonwood willow riparian forest PNVT total miles of roadways within species habitats. Effects to these indicator species' habitat quality from motorized vehicle use would increase with increased miles of designated roadways and authorized use adjacent to designed roads.

The bald eagle is an indicator species for general riparian habitat within the cottonwood willow riparian forest PNVT. Diversity of cottonwood willow riparian forest habitats includes a variety of riparian tree species with varying structural stages, height diversity, and diverse grass-forb understory with litter, providing ground cover, which is an important element to indicator habitat for the bald eagle.

[131] For percentages in the table that are greater than 100 percent, see the information in Data Limitations and Inaccuracies in this section for more information.

The Bell's vireo is an indicator species for well-developed understory within this PNVT. Diversity of cottonwood willow riparian forest habitats includes a variety of riparian tree species with varying structural stages, height diversity, and diverse grass-forb understory with litter, providing well developed understory, which is an important habitat indicator for the Bell's vireo.

The summer tanager is an indicator species for tall, mature trees within the cottonwood willow riparian forest PNVT. Diversity of cottonwood willow riparian forest habitats includes a variety of riparian tree species with varying structural stages and height diversity including tall, mature trees that are an important element to the indicator habitat for the summer tanager.

The Hooded Oriole is an indicator species for medium sized trees within the same habitat in the PNVT. Diversity of cottonwood willow riparian forest habitats includes a variety of riparian tree species with varying structural stages and height diversity including medium size trees that are an important element to diversity of cottonwood willow PNVT indicator habitat for the hooded oriole.

Alternative A. Alternative A would designate 444 miles of roads as open to motorized public use, a reduction of 91 percent of current public use routes. In this alternative, road density would remain at 7.1 miles of roads per square mile of cottonwood willow riparian forest PNVT. Road densities in excess of 2.4 miles per square mile habitat would be an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011).

Alternative A would continue to authorize motorized cross-country travel, motorized big game retrieval, and motorized dispersed camping on one percent of the PNVT and continue to allow motorized fuelwood harvest on 37 percent of PNVT acres.

The primary effects to indicator species habitat quality could include noise disturbance from motor vehicle use of routes, motorized cross-country travel, motorized dispersed camping, motorized fuel wood gathering and motorized big game retrieval. Additional effects to cottonwood willow riparian forest would be from destruction or removal of shrub and understory vegetation from motorized dispersed camping and motorized fuelwood gathering.

Alternative A would designate 444 miles of routes open to public use. This could have effects to species habitat, but is not anticipated to have a measurable and detectible effect on habitat quality of the cottonwood willow riparian forest PNVT.

Alternative B. Alternative B would designate 197 miles of roads as open to motorized public use, a reduction of 55 percent reduction from Alternative A and would designate a road density of 3.26 miles of roads per square mile of cottonwood willow riparian forest PNVT a reduction in road density of 54 percent from Alternative A. Road densities in excess of 2.4 miles per square mile habitat would be an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011).

Alternative B would not authorize motorized cross-country travel, or motorized big game retrieval. Alternative B would authorize motorized dispersed camping on less than one percent of PNVT acres and motorized fuelwood gathering on seven percent of the cottonwood willow riparian forest PNVT.

Effects to cottonwood willow riparian forest from destruction or removal of shrub and understory vegetation from dispersed camping and fuelwood gathering would be reduced.

Effects to species habitat quality would also be reduced due to a decrease in disturbance from noise from motor vehicle use of routes, motorized dispersed camping, and motorized fuelwood gathering.

Alternative B would designate 197 miles of roads and trails open to public use, and would increase species habitat quality over Alternative A. While this alternative may result in some improvement to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that forest wide population change would occur. Overall, this alternative is not expected to change forest wide habitat or population trends for the cottonwood willow riparian forest PNVT MIS. Therefore, Alternative B could have effects to indicator species habitat, but is not anticipated to have a measurable and detectible effect on habitat quality of the cottonwood willow riparian forest PNVT.

Alternative C. Alternative C would designate 213 miles of roads as open to motorized public use, a decrease of 44 percent from Alternative A, and an eight percent increase in roads and trails open to public use from Alternative B. Alternative C would designate a road density of 2.90 miles of roads per mile of cottonwood willow riparian forest PNVT an decrease in road density of 51 percent from Alternative A and a decrease of twelve percent from Alternative B. However, road densities would still be in excess of one mile per square mile habitat. One mile per square mile habitat would be an indicator of good watershed condition (Potyondy and Geier, 2011). Road densities in excess of 2.4 miles per square mile habitat would be an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011).

Alternative C would authorize motorized big game retrieval on fourteen percent of the PNVT acres, motorized dispersed camping on approximately 226 campsites on PNVT acres and motorized fuelwood gathering on ten percent of the PNVT. Effects from destruction or removal of shrub and understory vegetation from motorized dispersed camping and motorized fuelwood gathering would be reduced from the current condition. Effects to species habitat quality from noise disturbance from motor vehicle use of roads and trails, motorized dispersed camping, and motorized fuel wood gathering would also be reduced.

Alternative C would designate 213 miles of roads and trails open to public use, similar to Alternative B, and would improve species habitat from Alternative A. Many of the bald eagle nesting areas are currently under a closure order during nesting season, further mitigating disturbance to the birds during the critical nesting period. Alternative C have could have effects to species habitat quality, but is not anticipated to have a measurable and detectible effect on habitat quality of the cottonwood willow riparian forest PNVT.

Alternative D. Alternative D would designate 394 miles of roads as open to motorized public use, a reduction of eleven percent from Alternative A, a 99 percent increase in roads and trails open to public use from Alternative B, and an increase of 41 percent from Alternative C. Alternative D would designate a road density of 6.30 miles of roads per square mile of cottonwood willow riparian forest PNVT, a reduction in road density of eleven percent from Alternative A, an increase in road density by 93 percent from Alternative B, and a 39 percent increase in road density from Alternative C. Road densities would be maintained in excess of 2.4 miles per square mile habitat, an indicator of a watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011).

Alternative D would designate OHV areas on 3 percent of the PNVT, and authorize motorized big game retrieval on 203 percent of PNVT acres, greater than any alternative, and motorized

dispersed camping 49 percent of PNVT acres, also greater than any alternative. Motorized fuelwood gathering would be authorized on 37 percent of PNVT acres, similar to Alternative A.

Effects to cottonwood willow riparian forest would increase due to destruction or removal of shrub and understory vegetation from motorized dispersed camping and motorized fuelwood gathering. This alternative would also increase effects to species habitat quality from noise disturbance from motor vehicle use of roads and trails, motorized dispersed camping, and motorized fuelwood gathering.

Alternative D would designate 394 miles of roads and trails open to public use, similar to Alternative A, and would decrease species habitat quality from Alternative B and Alternative C. While this alternative may result in negative impacts to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that cottonwood willow riparian forest MIS species population change would occur. Overall, this alternative is not expected to change forest wide habitat or population trends but would provide fewer benefits and have greater impacts from disturbance compared to Alternative A, Alternative B and Alternative C. Alternative D could affect species habitat quality, but is not anticipated to have a measurable and detectible effect on habitat quality of the cottonwood willow riparian forest PNVT.

Cumulative Effects to Indicator Species of Cottonwood Willow Riparian Forest Species

Alternative A. Alternative A would potentially result in a long-term cumulative decrease in the cottonwood willow riparian forest PNVT structural stages, tree heights and a well-developed understory. This alternative would cumulatively contribute to a decrease in key habitat components such as a well-developed understory, and general cottonwood willow riparian forest habitat conditions that are expected to be at risk from increased future demand for use of forest resources. Alternative A would continue motorized fuelwood harvesting, motorized dispersed camping, motorized cross-country travel and unlimited motorized big game retrieval within the cottonwood willow riparian forest PNVT. Motorized use of roads and trails may result in cumulative effects to the PNVT when added to the effects of other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, personal use activities, and new road construction. Non-motorized use of roads and motorized trails, non-motorized cross-country travel and non-motorized dispersed camping could also cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species.

In term of road densities, the cumulative effects of Tonto National Forest activities are expected to maintain designated roads at an approximate overall density of 7.09 miles of road per square mile of the cottonwood willow riparian forest PNVT. Road densities in excess of 2.4 miles per square mile habitat would be an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011). Alternative A is not anticipated to have a measurable and detectible effect on habitat quality of the cottonwood willow riparian forest PNVT.

Alternative B. There would have no direct effects to cottonwood willow riparian forest structural stage diversity, tree height, well developed understory, and habitat quality to cottonwood willow riparian forest PNVT MIS. While this alternative may result in some improvement to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that forestwide population change would occur. Overall, this alternative is not expected to change forestwide habitat or population trends for the cottonwood willow riparian forest PNVT MIS. The effects of this alternative may combine with other

activities to result in a beneficial cumulative effect to cottonwood willow riparian forest PNVT habitat quality over a much of the PNVT through elimination of motorized cross country travel, motorized big game retrieval and reduced motorized dispersed camping and motorized fuelwood gathering. Motorized use of roads and trails may result in cumulative effects to the PNVT when added to the effects of other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, personal use activities, and new road construction. Non-motorized use of roads and motorized trails, non-motorized cross-country travel and non-motorized dispersed camping could also cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. The cumulative effects of Alternative B, when added to other Tonto National Forest activities are expected to maintain designated roads at an approximate overall density of 3.26 miles of road per square mile of cottonwood willow riparian forest PNVT. Road densities in excess of 2.4 miles per square mile habitat would be an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011). Alternative B, including cumulative effects, would have a beneficial effect to cottonwood willow riparian forest compared to Alternative A, however it is not anticipated to have a measurable and detectible effect on habitat quality of the cottonwood willow riparian forest PNVT.

Alternative C. This alternative is expected to result in an overall effect of decreasing impacts to the cottonwood willow riparian forest PNVT and decreasing disturbance to the species that use it for habitat compared to Alternative A, but increase potential habitat quality effects when compared to Alternative B. This alternative may result in effects to the quality of this habitat by potentially affecting the abundance of key habitat elements such a well-developed understory and general the cottonwood willow riparian forest conditions. This alternative‘s reduction of roads to 2.90 miles of road per square miles of the cottonwood willow riparian forest PNVT would decrease potential effects to the cottonwood willow riparian forest PNVT from Alternative A and B. Road densities in excess of 2.4 miles per square mile habitat would be an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011). Alternative C would not change the amount or distribution of indicator habitat over the cottonwood willow riparian forest PNVT. Habitat quality could improve, given the reduction in the amount of open roads and motorized trails, OHV area acres, motorized dispersed camping, and motorized fuelwood gathering, comparable to Alternative A, but increased over Alternative B.

Factors that moderate any improvements in habitat quality include increasing motorized big game retrieval to fourteen percent of the cottonwood willow riparian forest PNVT. Motorized use of roads and trails may result in cumulative effects to the PNVT when added to the effects of other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, personal use activities, and new road construction. Non-motorized use of roads and motorized trails, non-motorized cross-country travel and non-motorized dispersed camping could also cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. When combined with the effects from other Tonto National Forest activities, the cumulative effects of Alternative C may result in a beneficial cumulative effect to cottonwood willow riparian forest PNVT dependent MIS species over a much broader area. Alternative C would increase motorized big game retrieval and eliminate year round cross country travel, increase OHV use acres and reduce motorized fuelwood gathering from

Alternative A, and would reduce road density and increase motorized fuelwood gathering areas, OHV acres, and motorized big game retrieval from Alternative B. However, the cumulative effects of Alternative C are still not anticipated to have a measurable and detectible effect on habitat quality or the species that use cottonwood willow riparian forest PNVT for habitat.

Alternative D. Alternative D would not change the amount or vegetation structural stage, tree heights and a well-developed understory in the cottonwood willow riparian forest PNVT. Alternative D would authorize motorized big game retrieval and motorized dispersed camping on greater habitat acres than any alternative and would maintain motorized fuelwood gathering similar to Alternative A and on more habitat than Alternative B and Alternative C. Motorized vehicle use of roads and trails would be increased to 6.30 miles of road per mile of this PNVT, similar to Alternative A, an eleven percent decrease from Alternative A, a 38 percent increase from Alternative B, and a 39 percent increase from Alternative C. Motorized fuelwood gathering would be similar to Alternative A, and motorized big game retrieval would be increased above all alternatives providing little improvement in habitat quality from current baseline conditions. Factors that moderate any improvement in habitat quality include maintaining an overall road density of 6.30 miles of open roads per square mile of PNVT, fuelwood gathering and motorized big game retrieval corridors over a large amount of the PNVT. While this alternative may result in negative impacts to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that cottonwood willow riparian forest MIS species population change would occur.

Overall, this alternative is not expected to change forest wide habitat or population trends but would provide fewer benefits and have greater impacts from disturbance compared to Alternative A, Alternative B and Alternative C. Motorized use of roads and trails may result in cumulative effects to the PNVT when added to the effects of other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, personal use activities, and new road construction. Non-motorized use of roads and motorized trails, non-motorized cross-country travel and non-motorized dispersed camping could also cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. When these effects are added to the effects of other reasonably foreseeable actions on the Tonto National Forest, the cumulative effects of Alternative D are not anticipated to have a measurable and detectible effect on habitat quality or the species that use the cottonwood willow riparian forest PNVT for habitat.

Indicators of Mixed Broadleaf Deciduous Riparian Forest

The mixed broadleaf deciduous riparian forest vegetation type is an indicator for the hairy woodpecker, Arizona gray squirrel, warbling vireo, western wood pewee, and common black hawk. Table 147 identifies the amount of habitat of mixed broadleaf deciduous riparian forest that is impacted by each of the five elements under each alternative[132].

[132] For percentages in the table that are greater than 100 percent, see the information in Data Limitations and Inaccuracies in this section for more information.

Table 147. Total Acres of Mixed Broadleaf Deciduous Riparian Forest Habitat

Elements	Forestwide	Alternative A	Alternative B	Alternative C	Alternative D
Roads and trails open to public use (miles)	337.82	262.74 (78%)	166.51 (49%)	97.07 (29%)	256.91 (76%)
Road density (miles per square mile)		9.84	6.35	2.71	9.61
OHV areas open to motorized use (acres)	17,731.10	33,825.25 (191%)	0 (0%)	0 (0%)	0 (0%)
Motor vehicle use for big game retrieval (acres)	17,731.10	33,825.25 (191%)	0 (0%)	11,319.83 (64%)	43,281.9 (244%)
Motor vehicle use for dispersed camping (acres)	17,731.10	33,825.25 (191%)	3.74 (<1%)	187 (NA)	14,381.01 (81%)
Personal use fuelwood gathering (acres)	17,731.10	25,846.11 (146%)	5,777.2 (33%)	3,139.67 (18%)	25,846.11 (146%)

Direct and Indirect Effects to Indicators Species of Mixed Broadleaf Deciduous Riparian Forest

The effects of motorized public use of roadways and continued maintenance consists of the conversion of native habitat to non-vegetated road ways and is a linear direct loss of mixed broadleaf deciduous riparian forest PNVT total miles of roadways within species habitat. Effects to species habitat quality from motorized vehicle use would increase with increased miles of designated roadways and authorized use adjacent to designed roads for motorized public use.

The hairy woodpecker is an indicator species for snags and cavities within the mixed broadleaf deciduous riparian forest PNVT. For all alternatives, effects to the hairy woodpecker for this vegetation type are the same as those found under indicators of ponderosa pine and mixed conifer with aspen vegetation type found earlier in this report.

The Arizona gray squirrel is an indicator species for general riparian habitat within the mixed broadleaf deciduous riparian forest PNVT. Diversity of habitats within this PNVT include a variety of riparian tree species with varying structural stages and height diversity and diverse grass-forb understory with litter, providing ground cover, that is an important element to the indicator habitat for the Arizona gray squirrel.

The warbling vireo is an indicator species for tall overstory within this PNVT. Diversity of mixed broadleaf deciduous riparian forest habitats includes a variety of riparian tree species with varying structural stages and height diversity with tall overstory component that is an important element of the indicator habitat for the warbling vireo.

The western wood pewee is an indicator species for medium overstory within the mixed broadleaf deciduous riparian forest PNVT. Diversity of mixed broadleaf deciduous riparian forest habitats includes a variety of riparian tree species with varying structural stages and height diversity with a mixed overstory component is an important element to the indicator habitat of the western wood pewee.

The common black hawk is an indicator species for riparian streamside within the mixed broadleaf deciduous riparian forest PNVT. Diversity of mixed broadleaf deciduous riparian

forest habitats include a variety of riparian tree species with varying structural stages and height diversity with a mixed overstory streamside habitat component that is an important element to the indicator habitat for the common black hawk within this PNVT.

Alternative A. Alternative A would have a road density of 9.84 miles of roads per square mile of mixed broadleaf deciduous riparian PNVT. Road densities in excess of 2.4 miles per square mile habitat would be an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011).

Alternative A would continue to authorize motorized cross-country travel, motorized big game retrieval, and motorized dispersed camping on 191 percent of this PNVT. Motorized fuelwood harvest would be allowed on 146 percent of PNVT acres. Effects to this PNVT would be due to destruction and disturbance of shrub understory and ground cover vegetation from motorized dispersed camping and motorized fuelwood gathering. Alternative A would have direct effects to stream side habitat component from motorized dispersed camping, motorized cross country travel, and motorized fuelwood gathering, potentially affecting common black hawk.

Alternative A is not anticipated to affect the tall overstory habitat component of the mixed broadleaf riparian forest PNVT, an indicator for the warbling vireo. Alternative A is also not anticipated to affect the medium overstory habitat component of the mixed broadleaf riparian forest PNVT, an indicator for the western wood pewee.

The primary effects to Arizona gray squirrel, warbling vireo, western wood pewee, and common black hawk habitat quality could include disturbance from noise from continued motor vehicle use of routes, motorized cross-country travel, motorized dispersed camping, motorized fuel wood gathering and motorized big game retrieval.

Alternative A would have 263 miles of routes open to public use which could have direct and indirect effects to species habitat, but is not anticipated to have a measurable and detectible effect on habitat quality of the mixed broadleaf deciduous riparian forest PNVT.

Alternative B. Alternative B would designate 167 miles of routes as open to motorized public use, a reduction of 36 percent reduction from Alternative A. It would also designate a road density of 6.35 miles of roads per mile of cottonwood mixed broadleaf deciduous riparian forest PNVT, a reduction in road density of 35 percent from Alternative A. However, road densities would still be in excess of 2.4 miles per square mile habitat, an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011).

Alternative B would not authorize motorized cross-country travel or motorized big game retrieval. Alternative B would continue to authorize motorized dispersed camping on less than one percent of PNVT acres and motorized fuelwood gathering on 33 percent of the mixed broadleaf deciduous riparian forest PNVT. Effects to the PNVT from destruction and disturbance of shrub understory and ground cover vegetation from motorized dispersed camping and motorized fuelwood gathering would be reduced. Alternative B would reduce direct effects to the stream side habitat component from motorized dispersed camping, motorized cross country travel and motorized fuelwood gathering, potentially benefiting the common black hawk.

Alternative B is not anticipated to affect the tall overstory habitat component of the mixed broadleaf riparian forest PNVT, an indicator for the warbling vireo. Alternative B is also not

anticipated to affect the medium overstory habitat component of the mixed broadleaf riparian forest PNVT, an indicator for the western wood pewee.

Effects to species habitat quality from disturbance from noise from motor vehicle use of roads and trails, motorized cross-country travel, motorized dispersed camping, motorized fuel wood gathering and motorized big game retrieval would be reduced.

Alternative B would designate 167 miles of roads and trails open to public use and would increase species habitat quality over Alternative A. While this alternative may result in some improvement to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that forestwide population change would occur. Therefore, Alternative B could have direct and indirect effects to species' habitats, but is not anticipated to have a measurable and detectible effect on habitat quality of the cottonwood willow riparian forest PNVT.

Alternative C. Alternative C would designate 97 miles of roads and trails as open to motorized public use, a reduction of 37 percent reduction from Alternative A, and a 42 percent decrease in roads and trails open to public use from Alternative B. Alternative C would designate a road density of 2.71 miles of roads per mile of mixed broadleaf deciduous riparian forest habitats PNVT a reduction in road density of 73 percent from Alternative A, and would decrease road density by 43 percent from Alternative B. Road densities would continue to be in excess of 2.4 miles per square mile habitat, an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011). Alternative C would not authorize motorized cross-country travel. Alternative C would reduce effects from the current condition to the stream side habitat component from dispersed camping, motorized cross country travel and fuelwood gathering, potentially benefiting the common black hawk.

Alternative C would authorize motorized big game retrieval on 64 percent of PNVT acres and motorized fuelwood gathering on 18 percent of the PNVT. Effects to this PNVT from destruction and disturbance of shrub understory and ground cover vegetation from motorized dispersed camping and motorized fuelwood gathering would be reduced from the current condition. Effects to species habitat quality from disturbance from noise from motor vehicle use of roads and trails, motorized cross-country travel, motorized dispersed camping, motorized fuel wood gathering and motorized big game retrieval would also be reduced.

Alternative C would designate 97 miles of roads and trails open to public use and would increase species habitat quality over Alternative A, primarily from not authorizing motorized cross-country travel and would decrease species habitat quality from Alternative B. Effects to warbling vireo, western wood pewee, and common black hawk habitat quality from motorized vehicle use would decrease with decreased miles of designated roadways and authorized use adjacent to designed roads.

This alternative is expected to result in an overall beneficial effect by decreasing impacts to the mixed broadleaf deciduous riparian forest PNVT and decreasing disturbance to the species that use it for habitat compared to Alternative A, but increase potential habitat quality effects when compared to Alternative B. This alternative may result in effects to the quality of this habitat by potentially affecting the abundance of key habitat elements such a well-developed understory and general the cottonwood willow riparian forest conditions. Therefore, Alternative C could have direct and indirect effects to species habitat quality, but is not anticipated to have a measurable and detectible effect on habitat quality of the mixed broadleaf deciduous riparian forest PNVT.

Alternative D. Alternative D would designate 257 miles of roads as open to motorized public use, a reduction of two percent from Alternative A, a 54 percent increase in roads and trails open to public use from Alternative B and an increase of 19 percent increase from Alternative C. Alternative D would designate a road density of 9.61 miles of roads per mile within the PNVT, a reduction in road density of two percent from Alternative A, an increase road density by 51 percent from Alternative B, and a nineteen percent increase from Alternative C. Road densities would remain in excess of 2.4 miles per square mile habitat, an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011).

Alternative D would not authorize motorized cross-country travel. Alternative D would authorize motorized big game retrieval on 244 percent of PNVT acres, greater than any alternative, and dispersed camping 49 percent of PNVT acres, greater than any alternative. Alternative A would authorize motorized dispersed camping on 81 percent of PNVT acres, a 57 percent reduction from Alternative A, but would increase motorized dispersed camping over Alternative B and Alternative C. Alternative D would authorize fuelwood gathering on 146 percent of PNVT acres, similar to Alternative A. Effects to this PNVT from destruction and disturbance of shrub understory and ground cover vegetation from motorized dispersed camping and motorized fuelwood gathering would remain virtually the same. Alternative D would continue to affect the stream side habitat component from motorized dispersed camping, motorized cross country travel and motorized fuelwood gathering, potentially affecting the common black hawk.

Alternative D is not anticipated to affect the tall overstory habitat component of the mixed broadleaf riparian forest PNVT, an indicator for the warbling vireo. Alternative D is also not anticipated to affect the medium overstory habitat component of the mixed broadleaf riparian forest PNVT, an indicator for the western wood pewee.

Effects to species habitat quality from disturbance from noise from motor vehicle use of roads and trails, motorized cross-country travel, motorized dispersed camping, motorized fuel wood gathering and motorized big game retrieval would be similar to the effects from Alternative A. Effects to species habitat quality from motorized vehicle use would increase with increased miles of designated roadways and authorized use adjacent to designed roads for motorized public use.

Alternative D would designate 257 miles of roads and trails open to public use and would be similar to effects as Alternative A, and would decrease species quality from Alternative B and Alternative C. While this alternative may result in negative impacts to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that mixed broadleaf deciduous riparian forest MIS species population change would occur. Therefore, Alternative D could have direct and indirect effects to species habitat quality, but it is not anticipated to have a measurable and detectible effect on habitat quality of the cottonwood willow riparian forest PNVT.

Cumulative Effects to Indicators Species of Mixed Broadleaf Deciduous Riparian Forest

Alternative A. Alternative A would potentially result in a long-term cumulative decrease in the mixed broadleaf deciduous riparian forest PNVT structural stages, tree heights and a well-developed understory. This alternative would cumulatively contribute to a decrease in key habitat components such as a well-developed overstory composed of tall and medium height tress, snags, well developed understory, and general mixed broadleaf deciduous riparian forest habitat conditions that are expected to be at risk from increased future demand for use of forest resources. Alternative A would continue motorized fuelwood gathering, motorized dispersed camping, motorized cross-country travel, and unlimited motorized big game retrieval within the

mixed broadleaf deciduous riparian forest PNVT. Motorized use of routes may result in cumulative effects to the PNVT when added to other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, personal use activities, and new road construction. Non-motorized use of routes, non-motorized cross-country travel, and non-motorized dispersed camping could cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. Other Tonto National Forest activities, when combined with Alternative A, are expected to maintain designated roads at an approximate overall density of 9.84 miles of road per square mile of the cottonwood willow riparian forest PNVT. Road densities in excess of 2.4 miles per square mile habitat would be an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011). Alternative A is not anticipated to have a measurable and detectible effect on habitat quality of the mixed broadleaf deciduous riparian forest PNVT.

Alternative B. Alternative B is not anticipated to have a measurable and detectible effect on the mixed broadleaf deciduous riparian forest structural stage diversity, tree height, well developed understory, and habitat quality to mixed broadleaf deciduous riparian forest PNVT MIS. While this alternative may result in some improvement to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that forest wide population change would occur. Overall, this alternative is not expected to change forest wide habitat or population trends for the mixed broadleaf deciduous riparian forest PNVT MIS. The effects of this alternative may combine with other activities to result in a beneficial cumulative effect to mixed broadleaf deciduous riparian forest PNVT habitat quality over a much of the PNVT through elimination of motorized cross country travel and motorized big game retrieval, and reduced motorized dispersed camping and motorized fuelwood gathering.

Motorized use of routes may result in cumulative effects to the PNVT when added to other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, personal use activities, and new road construction. Non-motorized use of routes, non-motorized cross-country travel, and non-motorized dispersed camping could cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. The cumulative effects of Alternative B when added to other Tonto National Forest activities are expected to maintain designated roads at an approximate overall density of 6.35 miles of road per square mile of mixed broadleaf deciduous riparian forest PNVT. Road densities in excess of 2.4 miles per square mile habitat would be an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011). Alternative B would have a beneficial effect to mixed broadleaf deciduous riparian forest compared to Alternative A. However it is not anticipated to have a measurable and detectible effect on habitat quality of the mixed broadleaf deciduous riparian forest PNVT.

Alternative C. This alternative is expected to result in an overall beneficial effect by decreasing impacts to the mixed broadleaf deciduous riparian forest PNVT and decreasing disturbance to the species that use it for habitat compared to Alternative A but increase potential habitat quality effects when compared to Alternative B. This alternative may result in effects to the quality of this habitat by potentially affecting the abundance of key habitat elements such a well-developed understory and general the cottonwood willow riparian forest conditions. This alternative's reduction of roads to 2.71 miles of road per square miles of the mixed broadleaf deciduous

riparian forest PNVT would decrease potential effects to the mixed broadleaf deciduous riparian forest PVNT from Alternative A and B. Road densities in excess of 2.4 miles per square mile habitat would be an indicator of watershed with higher probability that hydrologic regime is altered and could be in poor condition (Potyondy and Geier, 2011).

Alternative C would not change the amount or distribution of indicator habitat over the mixed broadleaf deciduous riparian forest PNVT. Habitat quality could improve, given the elimination of cross-country travel and the reduction in the amount of open roads and motorized trails, motorized dispersed camping, and motorized fuel wood gathering compared to Alternative A. However, these factors would increase compared to Alternative B. Factors that moderate any improvements in habitat quality include increasing motorized big game retrieval to four percent of the mixed broadleaf deciduous riparian forest PNVT. When the effects of these activities are added to other Tonto National Forest activities, the cumulative effects of Alternative C may result in a beneficial cumulative effect to mixed broadleaf deciduous riparian forest PNVT dependent MIS species over a much broader area. Motorized use of routes may result in cumulative effects to the PNVT when added to other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, personal use activities, and new road construction. Non-motorized use of routes, non-motorized cross-country travel and non-motorized dispersed camping could cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. However, the cumulative effects of Alternative C are not anticipated to have a measurable and detectible effect on habitat quality or the species that use mixed broadleaf deciduous riparian forest PNVT for habitat.

Alternative D. Alternative D would not change the amount or vegetation structural stage, tree heights and a well-developed understory in the mixed broadleaf deciduous riparian forest PNVT. Alternative D would authorize motorized big game retrieval and motorized dispersed camping on greater areas of habitat than any other alternative. This alternative would also maintain motorized fuelwood gathering similar to Alternative A and on more habitat than Alternative B and Alternative C. Motorized vehicle use of routes would be increased to 9.61 miles of road per mile of mixed broadleaf deciduous riparian forest PNVT similar to Alternative A, an eleven percent decrease from Alternative A, a 38 percent increase from Alternative B, and a 39 percent increase from Alternative C. Motorized fuelwood gathering would be similar to Alternative A and motorized big game retrieval would be increased above all alternatives providing little improvement in habitat quality from current baseline conditions. Factors that moderate any improvement in habitat quality include maintaining an overall road density of 9.61 miles of open roads per square mile within the PNVT, and maintaining motorized fuelwood gathering and motorized big game retrieval corridors over a large amount of the PNVT. While this alternative may result in negative impacts to habitat quality, it would be unlikely that these changes would impact reproductive success to the degree that mixed broadleaf deciduous riparian forest MIS species population change would occur. Motorized use of routes may result in cumulative effects to the PNVT when added to other Tonto National Forest activities such as land exchanges, reauthorization of livestock grazing allotments, mining and exploratory drilling, watershed/vegetation regeneration and habitat improvement, roadway material source pits, recreation management, personal use activities, and new road construction. Non-motorized use of routes, non-motorized cross-country travel and non-motorized dispersed camping could cause noise disturbance within all structural stages of the PNVT and could result in cumulative effects to habitat quality to MIS species. Overall, this alternative is not expected to change forest wide habitat or population trends but would provide fewer benefits and have greater impacts from

disturbance compared to Alternative A, Alternative B, and Alternative C. The cumulative effects of Alternative D are not anticipated to have a measurable and detectible effect on habitat quality or the species that use the mixed broadleaf deciduous riparian forest PNVT for habitat.

Indicators of Water – Macro-invertebrates

Direct, Indirect and Cumulative Effects to Water-Macro-invertebrates

Macro-invertebrates are an indicator species of "water" habitat within the Tonto National Forest. The Forest has classified 28,989 acres of "water" as a vegetation type and PNVT to be analyzed as to potential effects to macro-invertebrate habitat and trends and a determination of effects to population and habitat trend from the selection of any action alternative. Currently, no motorized roads and trails open to public use are identified as occurring in the "water" PNVT. Similarly no roads and trails open to public use have been identified as occurring in the "water" PNVT in any alternative. No direct or indirect effects to the "water" PNVT or macro-invertebrates are anticipated from any alternative since no motorized roads or trails are anticipated to occur within this PNVT. As such, no cumulative effects to this PNVT would occur.

Migratory Birds

Executive Order 13186 (January 10, 2001) requires federal agencies to consider management impacts to migratory birds to further the purposes of the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and other laws. Federal agencies need to identify whether unintentional take will occur, and if so, whether such take would have a measurable negative effect on migratory bird populations. Take is defined to mean "… to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR 10.12). Removal or destruction of vegetation is not considered a taking. Executive Order 13186 imposes procedural requirements on project level analyses for migratory birds. The Tonto National Forest is required to:

- Evaluate the effects of agency actions and plans on migratory birds, with emphasis on species of concern; and
- Identify where unintentional take, reasonably attributable to agency action, is having, or is likely to have, a measurable negative effect on migratory bird populations.
- The Tonto National Forest will fulfill these requirements by:
- Analyzing and disclosing the project's effects on Tonto National Forest migratory bird species of concern;
- Identifying any Important Bird Areas (IBA) or overwintering areas that exist within or in proximity to the project area and analyzing and disclosing effects as appropriate;
- Identifying opportunities to restore or enhance migratory bird habitat or mitigate negative project effects and include these activities in the project plan; and
- Retaining adequate levels of snags and dead & downed wood.

The following is a list of the migratory birds covered in this analysis:

Beardless-tyrannulet, northern;
Black-hawk, common;
Cuckoo, western yellow-billed;
Eagle, bald;
Eagle, golden;
Falcon, peregrine;
Falcon, prairie;
Flicker, gilded;
Flycatcher, Cordilleran;
Flycatcher, gray;
Flycatcher, olive-sided;
Flycatcher, southwestern willow;
Goshawk, northern;
Hawk, swainson's;
Hummingbird, costa's;
Jay, pinyon;
Kinglet, golden-crowned;
Martin, purple;
Owl, elf;
Owl, flammulated;
Owl, Mexican spotted;
Phainopepla;
Pigeon, band-tailed;
Rail, Yuma clapper;
Sapsucker, red-naped
Sparrow, black-chinned;
Thrasher, bendire's;
Titmouse, juniper;
Towhee, canyon;
Vireo, Bell's;
Vireo, gray;
Warbler, black-throated gray;
Warbler, Grace's;
Warbler, lucy's;
Warbler, MacGillivray's;
Warbler, olive;
Warbler, red-faced;
Warbler, yellow;
Woodpecker, gila; and
Woodpecker, Lewis's.

In addition, there are three important bird areas (IBA) located within Tonto National Forest: Cave Creek IBA, Salt and Verde Riparian Ecosystem IBA, and Boyce Thompson Arboretum and Arnett-Queen Creeks IBA. There is also a designated overwintering area at Roosevelt Lake.

Environmental Consequences

To determine the species of concern within Tonto National Forest, migratory bird species were compiled from two sources: Arizona Partners in Flight (Latta et al., 1999) and U.S. Fish and Wildlife Service (2008b). Those bird species were selected from three Biological Conservation Regions: 33 (Sonoran and Mojave Desert), 34 (Sierra Madre Occidental), and 16 (Southern Rockies and Colorado Plateau). Species of concern were finally determined from those species that occurred on the forest based on the Tonto National Forest bird checklist (U.S. Forest Service, 2009c).

To evaluate the effects of the agency action on particular migratory bird species, the species habitat was used as a basis for the analysis. Migratory bird species of concern were analyzed if their habitat is within the action area. Corman and Wise-Gervais's (2005) habitat classifications were used, and a determination was made, for a species associated habitat by its most common occurrence in one to four habitat types. Because certain species were found in more than one type of habitat, many bird species were classified in multiple habitat types.

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act, originally passed in 1940 and expanded in 1962 to include golden eagles. Bald eagles are also a sensitive species on the Tonto National Forest and for analysis see MIS section. Golden eagles are known to nest on the forest in various locations. For analysis purposes the largest threat to the golden eagle in regards to travel management is disturbance from human activity using a motor vehicle during the nesting period or intentional take from humans (shooting) due to access to nesting areas.

Most of the golden eagle nest sites are inaccessible in cliff areas, usually removed from current human activity, including motorized routes. All alternatives could result in some degree of take or harassment of golden eagles. The direct, indirect, and cumulative effects of all alternatives are not anticipated to have a measurable and detectible effect on habitat quality or incidents of take for golden eagles.

Alternative A – Direct and Indirect Effects

Unintentional take (bird, eggs, nest) is highly unlikely to occur at a level that would have a measurable effect on migratory bird populations or habitat quality. Alternative A is considered as the baseline for comparison to all action alternatives. Across all PNVTs, Alternative A would have an average road density of 1.16 miles of roads per square mile open to public motorized travel within MBTA habitat. The relatively low density of open public roads to MIS habitats suggest that although some level of impact occurs to migratory birds and habitats wherever motorized vehicle travel is allowed, Alternative A would have no measurable negative effect on migratory bird species of concern populations or habitat quality above current baseline conditions.

Under Alternative A, roads and trails open to public use would remain unchanged from current baseline conditions. Road densities with the IBAs vary from 0.47 miles of road per square mile of IBA habitat in the Boyce-Thompson Arboretum/Arnett IBA, to 2.62 miles in the Cave Creek Ecosystem IBA, and 4.29 in the Salt and Verde River Riparian System IBA. Motorized big game retrieval, motorized dispersed camping, and motorized cross country travel is not permitted in any IBA. Motorized fuelwood gathering would be permitted in the Boyce-Thompson Arboretum/Arnett Creek IBA. Alternative A would have no measurable negative effect on IBAs above current baseline conditions.

No new effects would occur to snags and dead and downed wood under Alternative A, and it is considered as the baseline for comparison to all action alternatives. Under Alternative A, motorized personal fuelwood gathering and routes open to public use would remain unchanged. Alternative A would have no measurable negative effect on snags and dead and down wood above current baseline conditions.

Alternative B – Direct and Indirect Effects

Unintentional take (bird, eggs, nest) is highly unlikely to occur at a level that would have a measurable effect on migratory bird populations or habitat quality. Although some level of impact occurs to migratory birds wherever motorized vehicle travel is allowed, across all PNVTs, Alternative B reduces areas of potential affects by reducing road density in all PNVTs to 0.63 miles per square mile of MBTA habitats open public road. Similar to Alternative A, Alternative B would not allow for motorized big game retrieval, or motorized cross-county travel. Alternative B would reduce acres of areas available to motorized dispersed camping and motorized fuelwood gathering from current baseline conditions. Consequently, this alternative would have a beneficial effect on migratory bird species of concern populations and habitat quality compared to the current baseline conditions.

Alternative B would have a beneficial effect to IBAs because it reduces miles of routes open to public use in all IBAs. Alternative B would reduce road density within the IBAs to 0.39 miles of road per square mile of IBA habitat in the Boyce-Thompson Arboretum/Arnett IBA, to 0.38 miles in the Cave Creek Ecosystem IBA, and 1.75 miles in the Salt and Verde River Riparian System IBA. Alternative B would not permit motorized big game retrieval, and motorized cross country travel in any IBA. Alternative B would permit motorized dispersed access for camping

within a 0.18 mile of the Salt and Verde River Riparian System IBA. Alternative B would have a beneficial effect on migratory bird species of concern populations and habitat quality compared to the current baseline conditions.

Alternative B would have a positive effect to snags and dead & downed wood because in all PNVTs it would reduce motorized personal use fuelwood gathering an average of 88 percent across all PNVTs. Alternative B would reduce the likelihood of potential impacts to cavity and snag nesting birds, as permitted access to these areas would be reduced. Alternative B would have a beneficial effect on snags and down logs forest wide in all PNVTs compared to the current baseline conditions.

Alternative C – Direct and Indirect Effects

Unintentional take (bird, eggs, nest) is highly unlikely to occur that would have a measurable effects on migratory bird populations or habitat quality. Although some level of impact occurs to migratory birds wherever motorized vehicle travel is allowed, across all PNVTs, Alternative C reduces areas of potential effects by reducing road density in all PNVTs to 0.86 miles per square mile in MBTA habitats and reducing motorized fuelwood gathering areas by 90 percent. Alternative C would increase motorized big game retrieval by 83 percent, however, no year round travel would be allowed and motorized big game retrieval is limted from August through December, outside of most nesting and early fledging periods of migratory birds. Consequently, this alternative would have a beneficial effect on migratory bird species of concern populations and habitat quality compared to the current baseline conditions.

Some effects would occur to IBAs if Alternative C is implemented. Alternative C does reduce miles of roads and trails open to public use in all IBAs. Alternative C would reduce road densities within the IBAs to 0.39 miles of road per square mile of IBA habitat in the Boyce-Thompson Arboretum/Arnett IBA, to 0.38 miles in the Cave Creek Ecosystem IBA and 1.96 miles in the Salt and Verde River Riparian System IBA. Alternative C would not permit motorized cross-country travel in any IBA. Alternative C would permit motorized dispersed camping and motorized big game retrieval, in the Boyce-Thompson Arboretum/Arnett Creek IBA, and limit motorized fuelwood gathering to 140 acres of the 2,583 acre Boyce-Thompson Arboretum/Arnett Creek IBA available for fuelwood gathering under Alternative A. Alternative C would result in an 89 percent reduction in these elements from current baseline conditions in the Boyce-Thompson Arboretum/Arnett Creek IBA. Alternative C would permit motorized big game retrieval and motorized dispersed camping in the Cave Creek and Salt and Verde River System IBAs. Areas open to motorized big game retrieval and motorized dispersed camping is currently not permitted. Alternative C would permit motorized big game retrieval on 328 acres (24 percent) of Cave Creek IBA acres and 281 acres (21 percent) of the Salt and Verde River Riparian System IBA acres. Alternative C would not permit motorized fuelwood gathering in the Cave Creek and Salt and Verde River Riparian System IBAs. Areas open to motorized dispersed camping, motorized big game retrieval, and motorized fuelwood gathering are less than ten percent of the Boyce-Thompson Arboretum/Arnett Creek IBA, 24 percent of the Cave Creek Ecosystem IBA and 21 percent of the Salt and Verde River Riparian System IBA. Some unintentional take could occur in each IBA, and may have a measurable negative effect on migratory bird populations and habitat quality within the Cave Creek Ecosystem and Salt and Verde River Riparian System IBAs.

Alternative C would have a positive effect to snags and dead and downed wood because it would not permit personal use fuelwood gathering in the Cave Creek Ecosystem and Salt and Verde River Riparian System IBAs and would decrease areas permitted for motorized fuelwood

gathering by 95 percent from current baseline conditions in the Boyce-Thompson Arboretum/Arnett Creek IBA. Alternative C would reduce the likelihood of potential impacts to cavity and snag nesting birds, as permitted motorized vehicle access to these areas would be reduced. Alternative C would have a beneficial effect on snags and down logs forest wide in all PNVTs compared to the current baseline conditions.

Alternative D Direct and Indirect Effects

Unintentional take (bird, eggs, nest) may occur at a level that would have a measurable effect on migratory bird populations or habitat. Some level of impact occurs to migratory birds wherever motorized vehicle travel is allowed. Across all PNVTs Alternative D would not increase potential effects from roads and trails designated for motorized vehicle use due to all PNVTs permitting 1.11 miles of open public road per square mile of migratory bird habitats, similar to current forest wide baseline conditions. Within all PNVTs, Alternative D would permit 2,068,208 acres (194 percent increase) to motorized big game retrieval, a near threefold increase over current baseline conditions, and would reduce habitat quality for migratory birds. Alternative D would decease motorized dispersed camping by 52 percent from current baseline conditions and would be the same as Alternative A in permitted motorized personal fuelwood gathering areas. Consequently, this alternative would have a negative effect on migratory bird species of concern populations and habitat quality compared to the current baseline conditions.

Some effects would occur to migratory birds and habitat quality in IBAs if Alternative D is implemented. The density of roads and trails permitted for public use are similar to Alternative A in the Boyce-Thompson Arboretum/Arnett IBA and Cave Creek Ecosystem IBAs, and reduced from 103 miles of open roads under current baseline conditions to 71.68 (reduction of 30 percent) in the Salt and Verde River Riparian IBA. Alternative D would not permit motorized cross-country travel in any IBA consistent with current baseline conditions.

Alternative D would permit 16,114 acres of motorized big game retrieval and motorized dispersed camping in all IBAs, which is not permitted under current baseline conditions. Alternative D would be similar to Alternative A, permitting 1,345,998 acres available for motorized personal fuelwood gathering, of which part of this area overlaps with the Boyce-Thompson Arboretum/Arnett IBA. Alternative D would not permit motorized personal fuelwood gathering in the Cave Creek Ecosystem or the Salt and Verde River Riparian System IBAs. Alternative D would increase areas available for motorized big game retrieval and motorized dispersed camping. Some unintentional take could occur in each IBA, and may have a measurable negative effect on migratory bird populations within all IBAs.

Alternative D would not affect snags and dead and down wood because it would be the same as Alternative A for permitted motorized personal fuelwood gathering at the current baseline area and acres. Alternative D would not have a measurable effect to snags and down logs forest wide in all PNVTs compared to the current baseline conditions.

Cumulative Effects for All Alternatives

The Tonto National Forest generates 400,000 to 500,000 cubic feet of available dead and down fuelwood. The Forest allows for the harvest of dead standing juniper and cypress up to 18 inch diameter at the base and dead standing pine up to 12 inch diameter at 4.5 feet above the ground annually. It is expected that snags and dead and downed wood would be found mostly in the forested PNVTs.

Available fuelwood is the result of both natural occurring events and Tonto NF management activities. Natural events or disturbances that result in the creation of fuelwood include but are not limited to wildfire, insect outbreaks, droughts, and heavy snowfalls. These typically occur to varying degrees across the forest in an extremely random pattern. Areas affected can range from small scattered patches to large landscape scales. Resulting fuel loads are also extremely variable, ranging from high concentrations of mortality and breakage to very light and scattered accumulations.

Management activities that generate available fuelwood include prescribed fire, range improvement cuttings, timber stand improvement cuttings, and restoration activities. After these treatments are completed, slash and associated breakage becomes available for fuelwood gathering. Treatment areas range in size from 50 to 1,000 acres or more in size. Treatments are usually followed several years later by prescribed fire to reduce the increased fuel load to more manageable levels reducing the intensity of the prescribed fire making it easier to manage.

Where down and dead wood is gathered or burned, the effect can lead to concentrated use in some areas, effectively removing all available dead and down and dead standing fuelwood. In areas further away from the roads and trails, concentrations of dead and down fuel would start to accumulate over time, increasing the risk of uncharacteristically intense fire behavior.

In addition, small amount fuelwood gathered for campfires within the immediate areas of dispersed campsites is permitted and can reduce logs and snags. Prolonged and persistent pedestrian and vehicle presence at dispersed campsite could reduce grass and shrub understories and prevent natural vegetation regeneration.

Disturbances that are largely a result of human intrusion and modification of existing habitats effect wildlife species. Disturbance may be in the form of noise, human presence, or anything that causes displacement, avoidance, stress or other behavioral responses such as chainsaw noise, gunshots that create a startle response, consistent intrusions that alter foraging patterns, temporary intrusions that cause avoidance. It can also include disturbance to habitat features or loss of habitat for some species, such as occurs when rutting in wet meadows changes hydrology, compacts soils or injures or kills individual plants or animals.

As previously indicated, the measurement of disturbance impacts to migratory birds resulting from human intrusion is driven by the frequency and location of human activity. The presence of roads and trails does not necessarily correspond to the level of recreational human use.

Forest Sensitive Species

Wildlife Species

Forest sensitive species are those species that are not federally-listed under the Endangered Species Act as threatened or endangered. However, the Forest Service monitors and analyzes for the viability of these species to ensure that federal actions are not causing a trend towards federal listing. Those species are approved by the regional forester. Table 148 identifies forest sensitive species on the Tonto National Forest[133].

[133] The northern goshawk is both a sensitive species and a management indicator species for the Tonto National Forest. The analysis for this species is handled in the management indicator species section of this report.

Table 148. Species Considered Sensitive on the Tonto National Forest for 2015.

Common Name	Scientific Name
Mammals (4)	
Bat, Allen's lappet-browned	*Idionycteris phyllotis*
Bat, pale townsend's big-eared	*Corynorhinus townsendii pallescens*
Bat, spotted	*Euderma maculatum*
Bat, western red	*Lasiurus blossevillii*
Birds (4)	
Falcon, American peregrine	*Falco peregrinus anatum*
Flycatcher, sulphur-bellied	*Myiodynastes luteiventris*
Goshawk, northern	*Accipiter gentilis*
Junco, yellow-eyed	*Junco phaeonotus*
Reptiles (1)	
Lizard, Bezy's night	*Xantusia bezyi*
Amphibians (3)	
Frog, lowland leopard	*Lithobates [Rana] yavapaiensis*
Frog, western barking	*Eleutherodactylus augusti cactorum*
Frog, northern leopard	*Lithobates [Rana] pipiens*
Fish (2)	
Sucker, desert	*Catostomus clarki*
Sucker, Sonora	*Catostomus insignis*
Invertebrates (5)	
Beetle, Parker's cylloepus riffle	*Cylloepus parkeri*
Caddisfly, A	*Wormaldia planae*
Mayfly, A	*Fallceon eatoni*
Midge, netwing	*Agathon arizonicus*
Springsnail, fossil	*Pyrgulopsis simplex*

Allen's Lappet- Browed Bat and Pale Townsend Big-eared Bat

Allen's Lappet-browed Bat Affected Environment

Allen's lappet-browed bats have been found in a variety of habitats in Arizona, including ponderosa pine, pinyon-juniper, Mexican woodland, white fir forests, Mohave desert scrub, and riparian areas of sycamores, cottonwoods and willows. This species is often associated with water, whether for feeding or drinking, or both is unclear. Hoffmeister (1986) documents Allen's lappet-browed bats occupying mine shafts or rocky areas and cliffs for roosts. Suitable habitat for roosting includes large snags while foraging habitat includes areas with water and insects. These bats forage in riparian areas with bank vegetation. Habitat components include the presence and regeneration of snags and/or dead and dying trees with loose bark, dispersion of habitat types and structure within habitat including openings, montane meadows, or openings with wet soils having diverse vegetative herbaceous ground cover and species composition to support prey items. Pools, tanks, and openings with wet ground also support prey. This bat is found at elevations of 1,320–9,800 feet. On Tonto National Forest, Allen's lappet-browed bat was been documented in the Sierra Anchas in the 1990s in Pleasant Valley and Tonto Basin ranger districts.

A total of 15.45 acres of Allen's lappet-browed bat occupied habitat has been identified on the Tonto National Forest according to data compiled from Forest Service survey efforts and the most recent data from Arizona Game and Fish Department.

Townsend's Big-eared Bat Affected Environment

In Arizona, pale Townsend's big-eared bat summer-day roosts are found in caves and mines from desertscrub up to woodlands and coniferous forests. Night roosts may often be in abandoned buildings. In winter, this species hibernates in cold caves, lava tubes and mines mostly in uplands and mountains from the vicinity of the Grand Canyon to the southeastern part of the state. Habitat used is ponderosa pine with presence and regeneration of large snags and/or dead and dying trees with loose bark; cavity-forming rock; dispersion and size of openings and meadows within ponderosa pine, mixed-conifer, and pinyon-juniper with diverse vegetative herbaceous ground cover and species composition to support prey items. Forest edges, pools, tanks, and openings with wet ground also support prey. The pale Townsend's big-eared bat is found at elevations of 550 up to 7,520 feet.

On Tonto National Forest, pale Townsend's big-eared bats occur within the Globe, Mesa, Payson, Pleasant Valley, and Tonto Basin Ranger Districts. Documented records include Sorghum Hill within Payson Ranger District, 1 mile southeast of Tejano Spring within Mesa Ranger District, Middle Water Spring within Tonto Basin Ranger District, the Sierra Ancha Wilderness, and near Wolf Spring within Pleasant Valley Ranger District.

A total of 114.06 acres of pale Townsend's big-eared bat occupied habitat has been identified on the Tonto National Forest according to data compiled from Forest Service survey efforts and the most recent data from Arizona Game and Fish Department.

Environmental Consequences

Alternatives A and D– Direct, Indirect, and Cumulative Effects

Under Alternatives A and D, unrestricted cross-country travel would continue to potentially provide access to caves and old mines for motor vehicles that provide roosting habitat for Allen's Lappet-browed bat and Pale Townsend's big-eared bats. This alternative provides access for increased visitation during stressful periods for bats increasing the potential for population declines and abandonment.

Roads, trails, and cross-country OHV travel in Allen's Lappet-browed bat and Pale Townsend's big-eared bat habitat would continue to degrade habitat. Loss of vegetative cover removes food and shelter for insects that provide food for this bat.

This alternative would result in cumulative effects to Allen's Lappet-Browed bat and Pale Townsend's big-eared bat populations by continuing direct disturbance by facilitating motorized access to roost sites and facilitating indirect impacts by removing key habitat features such as snags (Wisdom and Bate, 2008). This alternative would also result in a cumulative decline of habitat features including snags over the long-term (more than 10 years) throughout the forested areas of the Tonto National Forest. Other activities such as high-severity wildfire, construction and maintenance of utility corridors, maintenance of snags along non-Forest roads, and private land development will also reduce the number of snags available for potential roost sites. This alternative would also allow for the highest potential for the spread of white-nosed syndrome by continuing providing motorized access to known bat hibernating sites (Elliott, 2011).

Alternatives B and C – Direct, Indirect, and Cumulative Effects:

Alternatives B and C would designate 0.79 miles under Alternative B and 1.00 miles under Alternative C within Allen's Lappet-browed bat and pale Townsend's habitat. Over time pinyon–juniper would heal and herbaceous vegetation would increase improving habitat for insects that provide food for bats.

This alternative would reduce access to caves used by the Townsend's big-eared bat lowering the potential for visitation during stressful periods for bats (i.e., hibernation or rearing of young) reducing potential for population declines and roost abandonment. Reducing access to caves would also reduce the risk of the spread of white-nosed syndrome (Elliott, 2011).

Spotted Bat

Affected Environment

The spotted bat is found in a variety of habitats from low desert to high desert, riparian areas, and conifer forests at elevation range of 110 to 8,670 feet. In Arizona, this species is mostly collected in dry, rough desertscrub with a few captured or heard with acoustic detection equipment in ponderosa pine forest. Roost characteristics and site localities are poorly known, but limited observations suggest this bat prefers to roost in crevices and cracks in cliff faces.

There are no records of spotted bat occurring on Tonto National Forest.

Environmental Consequences

Alternative A – Direct, Indirect, and Cumulative Effects

Under the No Action alternative there is low probability that crevices in cliffs used by the spotted bat for roosting or hibernation are directly impacted by roads, motorized trails, or off-road travel. Roads could affect the spotted bat by providing access to roost locations for recreation activities such as rock climbing that may disturb roosting bats. Isolated occurrences of disturbance may impact individuals but because this bat roosts singly would not have an impact on an entire colony of spotted bats.

The spotted bat is associated with multiple potential natural vegetation types and could forage anywhere on the Forest. Roads could provide travel corridors and are not expected to have an adverse effect on these canopy foraging bats. Since there is no effect expected to result from this alternative, there is no cumulative effect.

Alternative B, C, and D – Direct, Indirect, and Cumulative Effects

Alternatives B and C would have no direct effects to the spotted bat but may have a slight effect of reducing access to and activity near potential habitat, reducing potential disturbance to individuals. This effect would likely be very slight considering there are no known roost locations on the Tonto National Forest, and would likely not result in a cumulative impact.

Western Red Bat

Affected Environment

The western red bat occurs statewide, except in desert areas, but primarily along riparian corridors among oaks, sycamores, and cottonwoods at elevations between 2,400 and 7,200 feet. Red bats typically roost in dense clumps of foliage in riparian or other wooded areas (primarily in cottonwoods) but forage in adjacent uplands. The western red bat is also found often in trees of fruit orchards. The western red bat may roost in saguaro boots and occasionally in cave-like

situations, although this species generally avoids caves and buildings during both summer and winter. In Arizona, this species is thought to be a summer resident only. On Tonto National Forest, the western red bat is found in Cave Creek, Globe, Mesa, and Pleasant Valley ranger districts.

Environmental Consequences

Alternative A – Direct, Indirect, and Cumulative Effects
Under the No Action alternative unrestricted access to riparian areas would continue and red bats would be directly impacted by roads, motorized trails, or off-road travel. Roads could affect the red bats by providing access to roost locations for recreation activities such as rock climbing that may disturb roosting bats. Isolated occurrences of disturbance may impact individuals but because this bat roosts singly would not have an impact on an entire colony of red bats.

The red bat is associated with multiple potential natural vegetation types and could forage anywhere on the Forest. Roads could provide travel corridors and are not expected to have an adverse effect on these canopy foraging bats. Since there is no effect expected to result from this alternative, there is no cumulative effect.

Alternatives B, C, and D – Direct, Indirect, and Cumulative Effects
Alternatives B and C would have no direct effects to the red bats but may have a slight effect of reducing access to and activity near potential habitat, reducing potential disturbance to individuals. This effect would likely be very slight considering there is limited habitat (46.97 acres) on the Tonto National Forest, and would likely not result in a cumulative impact.

American Peregrine Falcon

Affected Environment

Optimum American peregrine falcon habitat is generally considered to be steep, sheer cliffs overlooking woodlands, riparian areas or other habitats supporting avian prey species in abundance at elevations of 400 to 9,000 feet. Suitable nesting sites on rock cliffs have an average height of 200 to 300 feet. Peregrine falcons prey mainly on birds found in wetlands, riparian areas, meadows, parklands, croplands, mountain valleys, and lakes within a 10 to 20 mile radius from the nest site.

The American peregrine falcon is found worldwide except Antarctica. It breeds in Arizona wherever sufficient prey is available near cliffs. Areas of spectacular cliffs such as the Mogollon Rim, Grand Canyon, and Colorado Plateau contain most of Arizona's breeding peregrines.

On Tonto National Forest, the American peregrine falcon is found in all districts. This species has been documented along the Mogollon Rim, in the Sierra Ancha Mountains, and the Mazatzal Mountains.

Environmental Consequences

Alternative A – Direct, Indirect, and Cumulative Effects
Peregrines are vulnerable to disturbance and displacement caused by human activities on rock faces. Rock-climbing is an example of recreation that could reduce population fitness of peregrines in nesting areas. Such activities may be facilitated by road access. Unrestricted cross-country travel, use of roads and motorized trails, and camping can affect the peregrine falcon by increasing access near cliffs, increasing noise disturbance near eyries, and increasing activities

within line of site of peregrines, which may cause flushing, premature fledging, or abandonment (Richardson and Miller, 1997).

This alternative would result in cumulative impacts to peregrine falcons by continuing to provide motorized access year round on the Payson and Pleasant Valley Ranger districts and use of road within ¼ mile of nest sites in addition to potential disturbance from unrestricted off-road motorized use. This would result in potential frequent disturbances that may combine with other activities, including recreational use and short-term impacts from vegetation management to potentially disturb one or more peregrine falcon nest sites.

Alternative B and C – Direct, Indirect, and Cumulative Effects

Under these alternatives there would be no motorized cross-country travel except for motorized use authorized under permit, and for big game retrieval under Alternative C. The actions under Alternatives B and C would all benefit the falcon by reducing access near cliffs, reducing noise disturbance near eyries, and reducing activities within line of site of peregrines, which may cause flushing, premature fledging, or abandonment. Because these alternatives allow for less cross-country travel for big game retrieval than Alternative D, there is slightly more benefit to species and their habitat.

Under Alternatives B and C, there would be no year round cross-country travel that currently occurs on the Payson and Pleasant Valley Ranger Districts within a quarter mile of peregrine falcon eyries, which would have the same benefits as described for road closure and prohibition of unauthorized cross-country travel, above. All of these changes would beneficially affect the peregrine falcon by reducing visual and aural disturbance to individuals.

Alternative B and C would reduce disturbance to these nest sites primarily caused by recreational use by reducing access to the nest sites and reducing the amount of disturbance from motorized use. Combined with similar management changes to restrict motor vehicle use on public lands throughout the southwest, this alternative would result in a cumulative benefit of reduced human disturbance to nesting peregrine falcons within northern Arizona over the next decade.

Alternative D – Direct, Indirect, and Cumulative Effects

This alternative has similar effects as Alternatives B and C, and would reduce disturbance to nest sites primarily caused by recreational use by reducing access to the nest sites and reducing the amount of disturbance from motorized use. Motorized big game retrieval that occurs outside of the nesting season could impact a larger area in regards to peregrine foraging habitat. However, as peregrines occur in metropolitan areas on buildings in some cases this impact is expected to be discountable.

Sulphur-bellied Flycatcher and Yellow-eyed Junco

Sulphur-bellied Flycatcher Affected Environment

The sulphur-bellied flycatcher nests in drainages with tall, broadleaf riparian woodlands with Arizona sycamore. This species also occurs in cool canyons with Arizona alder, Gambel's oak, box elder, and very scattered conifers. The elevation range for this species is 4,500 to 6,000 feet.

The sulphur-bellied flycatcher breeds in southeastern Arizona and northeastern Mexico south to northern Costa Rica. This species winters in northern South America. On the Tonto National Forest, the sulphur-bellied flycatcher has been documented on the Payson and Pleasant Valley Ranger Districts. Species records include Sierra Ancha, an individual observed investigating tree

cavities near the base of the Mogollon Rim along Christopher Creek, and a calling bird along Fossil Creek west of Strawberry.

No data are available for sulphur-bellied flycatcher occurrences on the Tonto National Forest. Therefore, the following analysis by alternative is based on availability of suitable habitat using PNVT (i.e., mixed broadleaf deciduous riparian forest) to determine where suitable habitat is present. A total of 17,731.10 acres of sulphur-bellied flycatcher suitable habitat is present on the Tonto National Forest.

Yellow-eyed Junco Affected Environment

The yellow-eyed junco occupies cool, wet, shaded forest with scattered grass clumps, small shrubs, forbs, ferns, downed trees, and an abundance of leaf litter in which to forage. This species occurs in Madrean pine-oak forests with ponderosa pine, evergreen oaks, alligator juniper, and Arizona madrone. Other habitat includes cool shaded canyons with Douglas fir, white fir, ponderosa pine, and aspen. This species is found at elevations from 5,900 to 10,000 feet. The yellow-eyed junco is regularly encountered nesting near heavily used sites such as campgrounds, picnic areas, and trailhead parking areas; it is relatively tame and approachable.

The yellow-eyed junco is resident from southeastern Arizona and southwestern New Mexico, south through the higher elevations of Mexico to central Oaxaca and locally to Guatemala.

On Tonto National Forest, the yellow-eyed junco is found in the Pinal Mountains in the Globe Ranger District. No data are available for yellow-eyed junco occurrences on the Tonto National Forest. Therefore, the following analysis by alternative is based on availability of suitable habitat using PNVT (i.e., mixed conifer with aspen) to determine where suitable habitat is present.

Environmental Consequences

Alternative A – Direct, Indirect, and Cumulative Effects

Under the No Action alternative unrestricted access to habitat would continue for the sulphur-bellied junco and yellow-eyed junco would be directly impacted by roads, motorized trails, or off-road travel. Roads could affect the Sulphur-bellied junco and yellow-eyed junco by providing access to nesting and foraging habitat for recreation activities such as dispersed camping, fuelwood gathering, and that may disturb birds during nesting season. Isolated occurrences of disturbance may impact nesting pairs.

Alternative B and C – Direct, Indirect, and Cumulative Effects

Alternatives B and C is expected to result in an overall beneficial effect by decreasing impacts to the mixed broadleaf deciduous riparian forest, ponderosa pine, evergreen oak etc. and decreasing disturbance to the species that use it for habitat compared to Alternative A. This alternative may result in effects to the quality of this habitat by potentially affecting the abundance of key habitat elements such a well-developed understory and general the cottonwood willow riparian forest conditions.

Under Alternatives B and C, there would be no year-round cross-country travel that currently occurs on the Payson and Pleasant Valley ranger districts, which would have the same benefits as described for road closure and prohibition of unauthorized cross-country travel, above. All of these changes would beneficially affect the sulphur-bellied junco and yellow-eyed junco by reducing visual and aural disturbance to individuals.

Alternative D – Direct, Indirect, and Cumulative Effects

This alternative has similar effects as Alternatives B and C, and would reduce disturbance to nest sites primarily caused by recreational use by reducing access to the nest sites and reducing the amount of disturbance from motorized use.

Bezy's Night Lizard

Affected Environment

The Bezy's night lizard inhabits rugged, rocky slopes and boulder fields within the Arizona upland Sonoran desertscrub and interior chaparral communities. This crevice-dweller frequents large outcroppings and large boulder clusters and is occasionally encountered in and under plant debris such as dead Dasylirion at elevations of 2,400 to 5,800 feet.

Bezy's night lizard is endemic to Arizona, found in a small chain of mountain ranges in central Arizona. On the Tonto National Forest, the Bezy's night lizard is found in the Cave Creek, Globe, Mesa, and Tonto Basin Ranger Districts. This species has been found in Queen Creek Canyon (Globe Ranger District), one mile east of Sugarloaf Mountain, Sycamore Creek, and one mile south of the BLM National Monument.

A total of 66.26 acres of Bezy's night lizard occupied habitat has been identified on the Tonto National Forest according to data compiled from Forest Service survey efforts and the most recent data from Arizona Game and Fish Department.

Environmental Consequences

Alternative A, B, C and D and Cumulative Impacts

Limited habitat would be affected under all alternatives by motorized use activities for the Bezy's night lizard due the nature of the rugged, rocky slopes and boulder fields inhabited by the lizard. There would be a slight chance of lizards run over on roads while crossing and lizards captured and handled by disperse campers, however overall impacts associated with motorized use would be considered discountable. As there are minimal impacts expected from motorized use and other forests have implemented travel management plans reducing the miles of roads in Bezy's night lizard habitat an overall beneficial impact is expected for the lizards from any of the Alternatives.

Lowland Leopard Frog and Western Barking Frog

Lowland Leopard Frog Affected Environment

Found in or near permanent waters with aquatic and herbaceous vegetation at elevations ranging from 480 to 3,500 feet. Found on all ranger districts. A total of 4,499.37 acres of lowland leopard frog occupied habitat has been identified on the Tonto National Forest according to data compiled from Arizona Game and Fish Department amphibian surveys and other data from the Department.

Western Barking Frog Affected Environment

The western barking frog is found on limestone, rhyolite, granite, and other rock outcrops on hillsides of canyons within Madrean evergreen woodlands and woodland-grassland ecotones in yucca-covered hills, brushy woodlands, open pine forests, juniper-live oak woodland, and low dense clumps of cactus. It prefers areas with some moisture, though permanent water is not

necessary. The elevation range for this species is 4,200 through 6,200 feet. On the Tonto National Forest, this species is found in the Pleasant Valley and Tonto Basin ranger districts.

No data are available for western barking frog occurrences on the Tonto National Forest. Therefore, the following analysis by alternative is based on availability of suitable habitat using PNVT (i.e., Madrean encinal woodland) to determine where suitable habitat is present. A total of 48,181.76 acres of western barking frog potential habitat is present on the Tonto National Forest.

Environmental Consequences

Alternative A – Direct, Indirect, and Cumulative Effects

Unrestricted cross-country travel on the Payson and Pleasant Valley Ranger Districts, use of roads and motorized trails, and camping can affect lowland leopard frogs by increasing access near riparian zones, increasing sedimentation into streams, causing damage to riparian vegetation, increasing the potential for spreading nonnative aquatic organisms and diseases, and increasing the potential for forest users to handle/collect frogs.

This alternative would continue to contribute direct and indirect impacts from roads in lowland frog habitat and disturbance to habitat from motorized access to riparian areas and sedimentation from upstream loss of vegetative cover. These effects would result in a continued cumulative loss and fragmentation of riparian habitat in addition to the loss and fragmentation caused by high-impact recreational uses. This alternative would also contribute to sediment from upstream loss of vegetative cover from unrestricted cross-country use and travel on unmaintained roads, which would combine cumulatively with activities such as continued development of private lands.

Alternatives B and C – Direct, Indirect, and Cumulative Effects

Under Alternatives B and C there would be 16 and 21 miles, respectively, within one mile of lowland leopard frog sites (no known sites occur for the western barking frog). In addition, there would be no motorized off-road travel except for permitted uses and big game retrieval would only occur under Alternative C during August through December. These actions would benefit frogs by reducing access near riparian zones, reducing sedimentation into streams, reducing damage to riparian vegetation by vehicles, reducing the potential spread of nonnative aquatic organisms and diseases, reducing the potential for forest users to handle/collect frogs, and reducing disturbance to dispersal habitat and dispersing frogs. Because this Alternative B allows for no off-road travel for game retrieval in lowland leopard frog habitat, there is more benefit to species and their habitat than Alternative C.

Under both alternatives, a total of 0.54 miles under Alternative B and 286 acres under Alternative C acres of motorized access for dispersed camping would occur in of lowland leopard frog habitat.

Although Alternatives B and C doesn’t eliminate potential effects to the lowland leopard frog, motorized access to lowland leopard frog habitat is substantially decreased particularly from the current allowed year round cross country motorized use allowed on the Payson and Pleasant Valley Ranger Districts. This would result in a cumulative impact of decreasing the frequency and intensity of impacts over a large extent of lowland leopard frog and western barking frog habitat when combined with the beneficial impacts of other Travel Management planning efforts on nearby National Forests and BLM lands.

Alternative D – Direct, Indirect, and Cumulative Effects

Effects from this alternative would be similar to those for Alternative A, although under this alternative, year round cross country motorized use would no longer be allowed.

Northern Leopard Frog

Affected Environment

The northern leopard frog currently is not known to occur on the Tonto NF though habitat exists for the species. The species occurs in a variety of aquatic habitat that include slow-moving or still water along streams and rivers, wetlands, permanent or temporary pools , beaver ponds, and human-constructed habitats such as earthen stool tanks and borrow pits. This species is currently limited to Stoneman Lake and Apache Maid Mountain on the Coconino and has disappeared from previously occupied sites on the Coconino National Forest. The reason for this population decline is not known. Yearly surveys and monitoring conducted for Chiricahua leopard frogs on the Payson and Pleasant Valley Ranger Districts on the Tonto National Forest overlaps with the northern leopard frog's habitat and have yet to detect the species.

Environmental Consequences

If Northern leopard frogs were detected on the Tonto affects would be similar for the Northern Leopard frog as other amphibian species.

Alternatives A and D – Direct, Indirect, and Cumulative Effects

In addition to potential impacts on northern leopard frogs and their habitat from unrestricted cross-country use, use of roads and motorized trails, and camping can affect the increasing access to occupied sites, increasing disturbance to dispersal habitat and dispersing frogs, causing damage to shoreline and aquatic habitat, increasing the potential for spreading nonnative aquatic organisms and diseases, and increasing the potential for forest users to handle and collect frogs.

Alternatives B and C – Direct, Indirect, and Cumulative Effects

Alternative B and C would overall reduce sedimentation and the spread of nonnative organism and the potential for forest users to handle and collect frogs, thus overall benefiting the frogs. As there are no known populations on the Forest, no cumulative impacts are expected to the species at this time.

Desert Sucker and Sonoran Sucker

Desert Sucker Affected Environment

The desert sucker occurs in desert streams at elevations of 1,000 feet up to streams at 6,800 feet. During the daytime, desert suckers use pools and in the evening they move into riffles to feed. The desert sucker is found within all ranger districts.

A total of 16,493.43 acres of desert sucker occupied habitat has been identified on the Tonto National Forest according to data compiled from Forest Service survey efforts and the most recent data from Arizona Game and Fish Department.

Sonora Sucker Affected Environment

The Sonoran sucker occurs in the Salt and Verde River systems below 6,500 feet. The Sonora sucker uses pools and slow moving runs. Adults move into riffles and margins at night to feed.

On the Tonto National Forest, this species is found within the Cave Creek, Mesa, Tonto Basin, and Globe Ranger Districts. A total of 4,248.80 acres of Sonora sucker occupied habitat has been identified on the Tonto National Forest according to data compiled from Forest Service survey efforts and the most recent data from Arizona Game and Fish Department.

Environmental Consequences

Alternative A – Direct, Indirect and Cumulative Effects

Alternative A would result in a negative cumulative effect to the species listed above by continuing to contribute a high level of sediment that would combine with increased sediment from short-term sediment pulses resulting from the following ongoing and future activities:

- Fuels reduction projects;
- Wildfires and wildfire suppression;
- Development of recreational facilities and hiking trails;
- •Road maintenance activities on Forest roads;
- Private land development;
- Facilities repair and maintenance in floodplain areas;
- Livestock grazing; and
- High recreational use along Fossil Creek, Verde River, and other waterways.

Should additional temperature stresses, increased periods of drought, or increased sedimentation (from loss of vegetation) result from changes in climate, the present rate of sediment delivery under this alternative could result in a greater cumulative impact on these species from multiple stressors and/or a cumulative degradation of aquatic habitat (Regier and Meisner, 1990). In addition, the potential introductions of nonnative species would combine with the effects of climate change to enhance invasive species' competitive and predatory effects on native species and may increase the virulence of some diseases (Rahel and Olden, 2008).

Alternatives B and C – Direct, Indirect, and Cumulative Effects

Under Alternatives B and C, off-road use would be substantially decreased from the existing condition, which would result in a decrease in sediment delivered from off-road travel to habitat for the Desert and Sonora sucker. In addition, motorized big game retrieval would not occur under Alternative B either be discountable under Alternative C as most big game retrieval would occur outside of Desert or Sonora sucker habitat. These changes would therefore be generally beneficial to these aquatic species.

This alternative would also not allow any off-road vehicular travel for big game retrieval under Alternative B. However, motorized big game retrieval would be allowed under Alternative C. Off-road use would be substantially decreased from the existing condition under both alternatives. Therefore, alternatives B and C would thus result in a decrease in sediment delivered from off-road travel to sensitive and candidate species habitat.

By reducing road-derived sedimentation and increasing vegetation coverage, Alternatives B and C would combine cumulatively with restoration-based efforts such as fuels reduction activities and projects. These alternatives would also counteract continued and increased sediment from short-term sediment pulses resulting from ongoing and future activities.

Alternative D – Direct, Indirect, and Cumulative Effects

This alternative would have similar effects to those described for Alternatives B and C. Alternative D would prevent motorized cross-country travel on the Payson and Pleasant Valley Ranger Districts, increasing the amount of vegetation coverage and reducing the amount of road-derived sediments entering streams. These changes would be generally beneficial to desert sucker and Sonora sucker.

Alternative D would substantially reduce current levels of off-road motorized use since off-road use for game retrieval would be limited to only those who have successfully killed a bear, elk, white tail deer, or mule deer. The reduction in motorized big game retrieval within desert sucker and Sonora sucker habitat would benefit the species by reducing access to sites, reducing damage to shoreline and aquatic habitat by vehicles, reducing the potential spread of nonnative aquatic organisms and diseases, and reducing the potential for forest users to handle/collect these species.

Parker's Cylloepus Riffle Beetle, A Caddisfly, and Netwing Midge

Parker's Cylloepus Riffle Beetle Affected Environment

The Parker's Cylloepus riffle beetle prefers permanent, clean, slow moving small streams, with loose gravelly substrate and very little sand at elevations of 2,850 to 4,000 feet.

The range for this species includes Yavapai County, Arizona, in spring-fed Roundtree Canyon in Bloody Basin within the Tonto National Forest. It also occurs in Tangle Creek, which is also located in Bloody Basin, and on the Cave Creek Ranger District near Roundtree Canyon. A total of 53.53 acres of Parker's cylloepus riffle beetle occupied habitat has been identified on the Tonto National Forest according to data compiled from Forest Service survey efforts and the most recent data from Arizona Game and Fish Department.

A Caddisfly Affected Environment

This species is restricted to the cooler spring-fed streams in mountainous regions. On the Tonto National Forest, this species is found in the Payson Ranger District. No data are available for caddisfly occurrences on the Tonto National Forest. Therefore, the following analysis by alternative is based on availability of suitable habitat using PNVT (i.e., mixed broadleaf deciduous riparian forest) to determine where suitable habitat is present.

Netwing Midge Affected Environment

The netwing midge is confined to areas in the immediate vicinity of rapidly flowing streams. Larvae and pupae occur on smoothed-faced rocks and boulders in swiftly moving torrential waters, often in waterfalls at elevations greater than 6,000 feet. On the Tonto National Forest this species is thought to occur in the Sierra Ancha Mountains reoccurring disjointedly in the highlands of southeastern Arizona. A total of 7.72 acres of netwing midge occupied habitat has been identified on the Tonto National Forest according to data compiled from Forest Service survey efforts and the most recent data from Arizona Game and Fish Department.

Environmental Consequences

Alternative A – Direct, Indirect, and Cumulative Effects

Alternative A would result in a negative cumulative effect to the riffle beetle, caddisfly, and midge by continuing to contribute a high level of sediment that would combine with increased

sediment from short-term sediment pulses resulting from the following ongoing and future activities:

- Fuels reduction projects;
- Wildfires and wildfire suppression;
- Development of recreational facilities and hiking trails;
- Road maintenance activities on Forest roads;
- Private land development;
- Facilities repair and maintenance in floodplain areas; and
- Livestock grazing.

Should additional temperature stresses, increased periods of drought, or increased sedimentation (from loss of vegetation) result from changes in climate, the present rate of sediment delivery under this alternative could result in a greater cumulative impact on these species from multiple stressors and/or a cumulative degradation of aquatic habitat (Regier and Meisner, 1990). In addition, the potential introductions of nonnative species would combine with the effects of climate change to enhance invasive species' competitive and predatory effects on native species and may increase the virulence of some diseases (Rahel and Olden, 2008).

Alternatives B, C, and D – Direct, Indirect, and Cumulative Effects

Under Alternatives B, C, and D off-road use would be substantially decreased from the existing condition, which would result in a decrease in sediment delivered from off-road travel to habitat for the riffle beetle, caddisfly, or midge. In addition, motorized big game retrieval would not occur under Alternative B and would be discountable under Alternative C as most big game retrieval would occur outside of riffle beetle habitat. Alternatives D would still substantially reduce current levels of off-road motorized use since off-road use for game retrieval would be limited to only those who have successfully killed a bear, elk, white tail deer, or mule deer. These changes would therefore be generally beneficial to these aquatic species.

Off-road use would be substantially decreased from the existing condition for all three alternatives. Therefore, all three of these alternatives would result in a decrease in sediment delivered from off-road travel to riffle beetle, caddisfly, or midge habitat.

By reducing road-derived sedimentation and increasing vegetation coverage, Alternatives B, C, and D would combine cumulatively with restoration-based efforts such as fuels reduction activities and projects. These alternatives would also counteract continued and increased sediment from short-term sediment pulses resulting from ongoing and future activities.

A Mayfly

Affected Environment

This mayfly is a Mexican species that was rediscovered in 2005 on the Tonto National Forest for the first time since 1892 in Sonora Mexico in 1892. On the Forest, this species is found in the Globe Ranger District and within the Salt River Canyon.

No data are available for mayfly occurrences on the Tonto National Forest. Therefore, the following analysis by alternative is based on availability of suitable habitat using PNVT (i.e.,

mixed broadleaf deciduous riparian forest) to determine where suitable habitat is present. The mayfly is associated with silt, fine sand, gravel, and woody material.

Environmental Consequences

All Alternatives – Direct, Indirect, and Cumulative Effects
It is not thought that road-derived sediment impairs this species or its habitat and there is no clear understanding as to why this species' range has declined. Therefore, all alternatives are expected to have no effect on the mayfly. Since there would be no direct or indirect effects to this species for Alternatives A, B, C, and D, this alternative would not contribute to cumulative effects for the mayfly.

Fossil Springsnail

Affected Environment

The Fossil springsnail prefers headspring and upper sections of the outflow. The genus Pyrgulopsis is generally found on rock or aquatic macrophytes in moderate current at elevations of 4,140 to 4,310 feet. On the Tonto National Forest, the Fossil springsnail is found on the Payson Ranger District.

A total of 17.13 acres of Fossil springsnail occupied habitat has been identified on the Tonto NF according to data compiled from Forest Service survey efforts and the most recent data from Arizona Game and Fish Department.

Environmental Consequences

All Alternatives – Direct, Indirect, and Cumulative Effects
Half of the watershed for Fossil Creek is on the Tonto National Forest and the other half on the Coconino. The Coconino National Forest has been delegated the authority for the management of the entire Fossil Creek watershed, by the Tonto National Forest. Under the Coconino travel management plan has already decreased a small number of roads relevant to the Fossil springsnail including National Forest System (NFS) Roads 154, 30599, and 30621. The decrease of motorized use on these roads may have a large beneficial effect on the springsnail by decreasing one of the main sources of habitat degradation. Under the Coconino Travel Management plan no off-road vehicular travel for big game retrieval in the Fossil Creek-Verde River watershed is allowed.

By reducing motorized use on the roads that may contribute sediment to Fossil springsnail habitat, determined under the Coconino National Forest travel Management Plan would counteract the sediment delivery resulting from cumulative activities including trail development and high impact recreational use in the Fossil Creek corridor, and road maintenance activities and motor vehicle use on NFS Road 708. This reduction in motorized use would also help maintain key headwater habitat on which the Fossil springsnail depends, making the population more resilient to potential impacts from climate change such as from increased drought and increased water temperatures.

Plant Species

This section addresses the potential impacts to sensitive plant species associated with the implementation of the Travel Management Rule.

Affected Environment

There are currently 23 sensitive plant species on the Tonto National Forest according to the 2015 Southwestern Region Sensitive Plants list (Table 149).

Table 149. Sensitive plant species on the Tonto National Forest

Common Name	Scientific Name
Aravaipa Woodfern	*Thelypteris puberula* var. *sonorensis*
Arizona Bugbane	*Actaea arizonica*
Arizona Phlox	*Phlox amabilis*
Blumer's Dock	*Rumex orthonuerus*
Catalina Mountain Sage	*Salvia amissa*
Chihuahuan Sedge	*Carex chihuahuensis*
Chiricahua Mountain Alum-root	*Heuchera glomerulata*
Cochise Sedge	*Carex ultra*
Fish Creek Fleabane	*Erigeron piscaticus*
Fish Creek Rock Daisy	*Perityle saxicola*
Gila Rockdaisy	*Perityle gilensis* var. *salensis*
Maple-leaf Snapdragon	*Mabrya acerifolia*
Horseshoe Deer Vetch	*Lotus mearnsii* var. *equisolensis*
Mt. Dellenbaugh Sandwort	*Eremogone aberrans*
Murphey Agave	*Agave murpheyi*
Parish's Abutilon	*Abutilon parishii*
Ripley's Buckwheat	*Eriogonum ripleyi*
Hualapai Milkwort	*Polygala rusbyi*
Senator Mine Alumroot	*Heuchera eastwoodiae*
Sierra Ancha Fleabane	*Erigeron anchana*
Tonto Basin Agave	*Agave delamateri*
Toumey's Groundsel	*Packera neomexicana* var. *toumeyi*
Verde Breadroot	*Pediomelum verdiensis*

Of these 23 sensitive species, there are 13 species on the forest that would not be affected by the designation of motor vehicle use:

Chihuahuan Sedge
Cochise Sedge
Fish Creek Fleabane
Maple-leaf Snapdragon
Verde Breadroot
Gila Rockdaisy
Aravaipa Woodfern
Arizona Bugbane
Sierra Ancha Fleabane
Chiricahua Mountain Alum-root
Fish Creek Rock Daisy
Blumer's Dock
Catalina Mountain Sage

These species will not be discussed further because they occur in areas that are currently inaccessible to motorized travel, such as rock cliff faces or stream beds. This report focuses on species that may be affected by the actions (Table 150).

Table 150. Sensitive plant species potentially affected by motorized travel on the Tonto National Forest

Scientific Name	Common Name	Habitat Association	Reported Occurrences
Abutilon parishii	Parish's Abutilon	Steep rocky slopes and canyon bottoms.	Globe and Mesa Ranger Districts. Superstition mountains.
Agave delamateri	Tonto Basin Agave	Sonoran desert scrub, ocassionally Interior chaparral, Pinyon-juniper and juniper-grassland	Mesa, Pleasant Valley and Tonto Basin Ranger Districts. Foothills of Mazatzal and Sierra Ancha mountains. Tonto Creek near Roosevelt lake.
Agave murpheyi	Hohokam Agave	Sonoran desert and Interior chaparral	Cave Creek, Globe, Mesa and Tonto Basin Ranger Districts.
Eremogone aberrans	Mt. Dellenbaugh Sandwort	Oak woodlands on steep slopes, open pine and pine-pinyon woodlands	Payson and Tonto Basin Ranger Districts. Tonto National Monument, Deadman Canyon.
Eriogonum ripleyi	Ripley's Buckwheat	Sonoran desert scrub, pinyon-juniper woodland.	Cave Creek Ranger District. Horseshoe Reservoir and Chalk Mountain.
Heuchera eastwoodiae	Senator Mine Alumroot	Moist slopes in ponderosa pine forests and canyons.	Cave Creek, Mesa, Payson and Pleasant Valley Ranger Districts. Christopher Creek, Four Peaks Wilderness, Mazatzal Mountains, Reynolds Creek (Sierra Anchas) and Seven Springs.
Lotus mearnsii var. *equisolensis*	Horseshoe Deer Vetch	Sonoran desert scrub	Cave Creek Ranger District. Horseshoe Lake and Lime Creek.
Packera neomexicana var. *toumeyi*	Toumey's Groundsel	Loose rocky soils in coniferous woodlands.	Cave Creek, Globe and Payson Ranger Districts. Pinal Mountains.
Phlox amabilis	Arizona Phlox	Pinyon-juniper woodland, Ponderosa pine evergreen oak. Limestone-rocky slopes	Cave Creek Ranger District. Christopher Creek.
Polygala rusbyi	Hualapai Milkwort	Found at deposits of soft white talclike rock on slopes. Desertscrub. Pine-juniper woodlands, semi-desert shrub	Cave Creek Ranger District. Horseshoe Dam and Reservoir.

Environmental Consequences

Habitat fragmentation from motorized travel can negatively impact sensitive plant species dispersal and survivorship. This can lead to isolated populations that are less resilient to natural or human-induced disturbances, increasing the risk of extirpation for some species. Effects from motorized vehicle use include crushing and uprooting plants and reducing the plant's ability to reproduce or store food for growth (Cole and Landers, 1995).

Motorized vehicle use can result in soil compaction and erosion, significantly reducing soil health and plant growth (Adams et al., 1982). Soil compaction affects plant growth by inhibiting plant roots ability to penetrate to deep soil levels with adequate moisture (Ouren et al., 2007). Not all plant species respond equally to disturbance from motorized travel. For example, plants such as Mediterranean grass, with large taproots (one thick root) have lower cover than those

with fibrous roots (many smaller roots) following disturbance from OHV use (Adams et al., 1982).

Effects of invasive species on sensitive plant species and their habitat include increased wildfire risk (e.g., production of fine fuels from exotic grasses), soil erosion, altered soil chemistry, altered nutrient cycling, and habitat degradation or loss. Ground disturbance from motorized travel can influence exotic and invasive species establishment and spread. Soil compaction from motorized travel can lead to increased surface water within tracks that may contribute to rapid germination and growth of exotic or invasive annuals (Adams et al., 1982). Edge habitat, created from motorized vehicle use, can also increase establishment and spread. Cool season annual brome grasses pose significant threats to the Arizona-upland subdivision of the Sonoran Desert by increasing the risk of fires and displacing native species not adapted to fire (D'Antonio and Vitousek, 1992). A number of sensitive plant species such as Tonto Basin agave, Hohokam agave, Pima Indian mallow are found in Sonoran desert scrub vegetation where past fires, such as the Cave Creek Complex fire in 2005, fueled by red brome has killed significant proportions of vegetation (USDA Forest Service, 2012).

Dust from motorized travel can negatively impact sensitive plant species up to 32 feet from the roadside (Walker and Everett, 1987). Heavy dust loads can inhibit a plant's ability to exchange gases with the environment and therefore impair photosynthesis, respiration, and transpiration. These effects can directly lower plant productivity, growth, and survivorship (Spellerberg and Morrison, 1998).

Methodology

Comprehensive surveys on sensitive plant species are lacking, therefore the analysis was based on the best available scientific information. Errors, such as misidentifications and incorrect geo-reference, are not uncommon in biological datasets. Therefore, individual records were manually checked. Obvious outliers were removed from the analysis, however, others with questionable status (e.g., potentially extirpated) were carried forward – assuming "worst case scenario" on impacts to habitat from motorized travel. Point location accuracy can vary substantially from a meter to township and range descriptions (especially among older records). Additionally, some point data may represent a few individuals or more than a hundred. For the purposes of this analysis, point data for each sensitive species are assumed to represent equal populations with the same number of individuals. To account for the inherent inaccuracies and to derive delineated population boundaries, each point was buffered 80 meters or 262 feet out resulting in a 4.96 acre circular polygon for each population. Duplicate records and overlapping polygons were merged to represent population boundaries. This method was used to best approximate current and potential habitat for sensitive species. In 2013, the Phoenix Desert Botanical Garden published a report on endemic and sensitive plant distributions in Arizona (Hodgson et al., 2013). They conducted a GIS-based analysis using occurrence data along with climate data to map current and predicted habitat. This report was referenced to fill in any information gaps and aid in assessing current and potential habitat.

Overall, species viability or habitat effectiveness was assessed for each sensitive plant species for all proposed actions. Habitat effectiveness describes the quality or condition of the habitat and its ability to support associated sensitive plant species. When ecological conditions or function are compromised (such as severe soil erosion or altered fire regimes) to the point where they may no longer support a species, then habitat effectiveness would be described as decreasing or declining. Increased habitat effectiveness may occur when an action alleviates a significant stressor, thereby reducing negative impacts and allowing a system to recover over

time. Habitat effectiveness may remain stable when an action has little to no effect (e.g., plants generally located in areas inaccessible to motorized travel) or the severity of the proposed action is low for a particular species and associated habitat. Negative impacts to sensitive plant species distribution (habitat fragmentation) can occur when effects are widespread and common throughout their range. Also, negative impacts to the distribution can occur where effects are aggregated or concentrated, potentially resulting in extirpation of some populations.

Every analysis factor is assessed for each species for each proposed action (alternative). There are two conditions where there is no change from existing condition:

1. The population is located outside of the area where actions are being proposed for both current condition and the other alternatives. One example is when the species habitat is within a designated wilderness where motorized travel is prohibited; or

2. The actions being proposed are identical to those that are currently permitted. One example is the motorized fuelwood gathering areas in Alternative D are the same as those in the Alternative A, the current condition.

Pima Indian Mallow

Pima Indian mallow (*Abutilon parishii*) occurs in full sun within higher elevation Sonoran desertscrub, desert grassland, and Sonoran deciduous riparian forest. Typical localities are on rocky hillsides, cliff bases, lower side slopes, and ledges of canyons among rocks and boulders. Habitable slopes can exceed 45 degrees. In riparian zones, it can occur on flat secondary terraces but typically not in canyon bottoms.

Pima Indian mallow habitat consists of 34.70 acres, of which 19.83 acres are located within the Superstition Wilderness resulting in 14.87 acres of habitat potentially affected by motorized travel. For the purposes of assessing overall species viability forest-wide, habitat affected (percentage) will include all habitat of 37.40 acres (Table 151).

Table 151. Pima Indian Mallow Habitat Affected by Each Analysis Factor under Each Alternative

Analysis Factors	Existing Condition (Alternative A)			Alternative B			Alternative C			Alternative D		
	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]
Motorized Routes (miles)	0.39	57%	4	0.20	29%	2	0.29	43%	3	0.39	57%	4
Areas Designated for Motor Vehicle Use (acres)	0.00	0%	0	---[4]	---[4]	0	0.00	0%	0	0.00	0%	0
Motorized Dispersed Camping (acres)	0.00	0%	0	0.00	0%	0	---[4]	---[4]	0	9.81	28%	2
Motorized Fuelwood Gathering (acres)	4.96	13%	1	0	0%	0	0	0%	0	4.96	13%	1

[1] The area or length that overlaps with the analysis factor.

[2] The acres affected (percent) out of total habitat acres for each analysis factor.

[3] The number of populations affected by each analysis factor.

[4] Not proposed under alternative.

Alternative A – Direct and Indirect Effects

The effect of this alternative on a forest-wide basis would be no change from the current condition. Currently there are 0.39 miles of routes for motorized vehicle use in Pima Indian mallow habitat, potentially affecting 57 percent of habitat. There are no populations or suitable habitat in areas currently open to cross-country travel (Payson and Pleasant Valley) or motorized dispersed camping. Motorized fuelwood gathering is currently permitted in 4.96 acres of Pima Indian mallow habitat, potentially affecting thirteen percent of habitat.

The effects to Pima Indian mallow habitat from motorized use for fuelwood gathering are minimal as fuelwood sources are scarce in desert communities and 87 percent of populations are outside current fuelwood gathering areas. Most fuelwood is gathered at the eastern portions of the forest at higher elevations. While there is a significant proportion of Pima Indian mallow habitat potentially affected by current routes, direct threats (crushing of plants) from this activity are relatively low as the majority of populations are generally located in areas (southeast facing cliff sides, steep rocky hillsides) inaccessible to motorized travel. However, motorized routes can cause ground disturbance which degrade soils and increase the establishment and spread of exotic and invasive species[134]. Introduction of buffelgrass is a particular concern among Sonoran desert communities in which Pima Indian mallow is found because buffelgrass contributes to fine fuels that are easily ignited. Currently, the abundance of buffelgrass on the Tonto is relatively low and the majority of infestations occur in southeast Arizona.

The no action alternative would likely decrease habitat effectiveness by increasing habitat fragmentation, and from degradation and loss from direct and indirect effects from motorized travel. Negative impacts to Pima Indian mallow distribution from motor vehicle use are low as a majority of known and potential habitat is located in the Superstitions Wilderness where motorized travel is not permitted. For this reason it is assumed that none of the proposed actions will significantly impact the distribution.

Alternative B– Direct and Indirect Effects

This alternative provides less motorized access than the existing condition. Routes for motorized travel would be reduced to 0.20 miles that intersect with Pima Indian mallow habitat, potentially affecting 29 percent of the overall habitat. Motorized use for fuelwood gathering would be reduced to zero acres within Pima Indian mallow habitat. Designated OHV areas are not proposed under this alternative, resulting in no change from existing conditions. Designated camping sites in this alternative are not within the habitat, resulting in no effect to the species.

The reduction of motorized use for fuelwood gathering would have minimal benefits to Pima Indian mallow habitat as the magnitude of change (a decrease of 13 percent from existing) only reduces effects to one population and the effects of this motorized activity is not as significant as other motorized uses. Effects to the entire Pima Indian mallow habitat will decrease by 28 percent (this includes those habitats within the designated wilderness). However, those habitats outside of the wilderness, the decrease will be 50 percent.

This alternative would result in an increase in habitat effectiveness for Pima Indian mallow. The reduction of routes for motorized travel would reduce potential habitat fragmentation, degradation, and loss.

[134] For more information about invasive species and the effect of motor vehicle designation related to invasive species, see the Invasive Weeds Report in the project record.

Alternative C– Direct and Indirect Effects

Routes for motorized travel would be reduced to 0.29 miles that intersect with Pima Indian mallow habitat, potentially affecting 43 percent of the habitat. There would be no motorized use for fuelwood gathering within Pima Indian mallow habitat, reducing habitat affected by thirteen percent. There would be no change from existing conditions (no effect to Pima Indian mallow habitat) for designated OHV areas and motorized use for big game retrieval. Dispersed camping using a motor vehicle is restricted to designated routes and is addressed in the route analysis.

The reduction of fuelwood gathering for motorized use would have minimal benefits to Pima Indian mallow habitat as the magnitude of change (decrease of 13 percent from existing) only reduces effects to one population and the effects of this motorized activity is not as significant as other motorized uses. Effects to the entire Pima Indian mallow habitat will decrease by 14 percent (this includes those habitats within the designated wilderness). However, those habitats outside of the wilderness, the decrease will be 25 percent.

This alternative would likely increase habitat effectiveness for Pima Indian mallow. While the reduction of routes for motorized travel are not as large as they are in Alternative B, benefits to Pima Indian mallow are moderate from the reduction of routes – reducing potential habitat fragmentation, degradation, and loss.

Alternative D– Direct and Indirect Effects

This alternative provides more motorized access than the existing condition. There would be no change from existing conditions for routes designated for motorized use within Pima Indian mallow habitat (potentially affecting 57 percent of habitat). Motor vehicle use for dispersed camping would increase to 9.81 acres, potentially affecting 28 percent of the habitat. Fuelwood gathering areas are the same as the current condition and would have minimal negative impacts to Pima Indian mallow habitat.

Motorized areas for dispersed camping have similar effects to motorized routes, such as increasing ground disturbance, decreasing retention and development of soil, and encouraging exotic and invasive species establishment. This alternative would result in a decrease in habitat effectiveness for Pima Indian mallow. The number of populations affected is the same as the existing condition; however, both routes for motorized travel and dispersed camping could have compounding effects to species habitat by increasing habitat fragmentation, degradation, and loss.

Tonto Basin Agave

Tonto Basin agave (*Agave delamateri*) is a large suckering agave with a very tall, open, unfruited flower stalk and a dense rosette. It is usually found on south and southwest facing slope edges and atop benches, occasionally on northeast facing gentle slopes. It occupies cobbly and gravelly, deep and well-drained soils at elevations from 2,300 to 5,100 feet, and is often associated with prehistoric sites.

Tonto Basin Agave habitat consists of 247.81 acres, of which 9.92 acres are located on private lands resulting in 237.89 acres of habitat potentially affected by motorized travel. For the purposes of assessing overall species viability forest-wide, habitat affected (percentage) will include all habitat of 247.81 acres (Table 152).

Table 152. Tonto Basin Agave Habitat Affected by Each Analysis Factor under Each Alternative

Analysis Factors	Existing Condition (Alternative A)			Alternative B			Alternative C			Alternative D		
	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]
Motorized Routes (miles)	0.83	24%	11	0.62	18%	8	0.74	22%	10	0.74	22%	10
Areas Designated for Motor Vehicle Use (acres)	19.82	8%	4	---4	---4	0	0.00	0%	0	0.00	0%	0
Motorized Dispersed Camping (acres)	19.82	8%	4	0.00	0%	0	---4	---4	0	50.68	20%	18
Motorized Fuelwood Gathering (acres)	186.87	75%	37	34.97	14%	10	42.78	17%	12	186.87	75%	38

[1] The area or length that overlaps with the analysis factor.

[2] The acres affected (percent) out of total habitat acres for each analysis factor.

[3] The number of populations affected by each analysis factor.

[4] Not proposed under alternative.

Alternative A – Direct and Indirect Effects

The effect of this alternative on a forest-wide basis would be no change from the current condition. Currently there are 0.83 miles of routes for motorized vehicle use in Tonto Basin agave habitat, potentially affecting 24 percent of habitat. There are 19.82 acres of cross-country travel (Payson and Pleasant Valley) and dispersed camping within Tonto Basin agave habitat, potentially affecting eight percent of the habitat. Fuelwood gathering is currently permitted in 186.87 acres of Tonto Basin agave habitat, potentially affecting 75 percent of habitat.

The effects to Tonto Basin agave habitat from motorized use for fuelwood gathering are minimal as fuelwood sources are scarce (the majority of habitat is in desert scrub) and most fuelwood is gathered at the eastern portions of the forest at higher elevations. Motorized routes can cause ground disturbance which degrade soils and increase the establishment and spread of exotic and invasive species[135]. Although Tonto Basin agave is typically located in areas with sparse vegetation, the introduction of buffelgrass is a particular concern among Sonoran desert communities in which Tonto Basin agave is found because buffelgrass contributes to fine fuels that are easily ignited. Currently, the abundance of buffelgrass on the Tonto is relatively low and the majority of infestations occur in southeast Arizona.

The no action alternative would likely decrease habitat effectiveness by increasing habitat fragmentation degradation and loss from direct and indirect effects from motorized travel. Negative impacts to Tonto Basin agave distribution from motor vehicle use are moderate, as effects dispersed throughout habitat.

Alternative B – Direct and Indirect Effects

This alternative provides less motorized access than the existing condition. Routes for motorized travel would be reduced to 0.62 miles that intersect with Tonto Basin agave habitat, potentially affecting eighteen percent of the overall habitat. Motorized use for fuelwood gathering within Pima Indian mallow habitat would be reduced to 34.97 acres, potentially affecting fourteen percent of habitat. Designated OHV areas are not proposed under this alternative, resulting in an eight percent reduction from existing conditions. Motorized designated camping sites in this alternative are not within the habitat.

The reduction of motorized use for fuelwood gathering would have minimal benefits as fuelwood sources are scarce (majority of habitat is in desert scrub) and most fuelwood is gathered at the eastern portions of the forest at higher elevations. The reduction of routes for motorized travel would benefit Tonto Basin agave by reducing potential habitat fragmentation, loss, and degradation. However, the effect is not large as the magnitude of change (decrease of six percent from existing) is small and reduces effects to only three populations.

Although the reduction of routes for motorized travel is beneficial to Tonto Basin habitat – the effect forest-wide is small as the majority of populations are still affected by routes for motorized travel. Other motorized uses are unlikely to have significant effects on Tonto Basin agave due to few acres of habitat affected and because these activities have little effect on habitat effectiveness (discussed under Alternative A). Therefore this alternative would likely result in a similar trend to existing conditions – decreased habitat effectiveness from potential habitat fragmentation, degradation and loss from motorized travel. Negative impacts to Tonto Basin

[135] For more information about invasive species and the effect of motor vehicle designation related to invasive species, see the Invasive Weeds Report in the project record.

agave distribution from motor vehicle use are moderate, as effects are dispersed throughout habitat.

Alternative C – Direct and Indirect Effects

Routes for motorized travel would be reduced to 0.74 miles that intersect with Tonto Basin agave habitat, potentially affecting 22 percent of the habitat. Motorized use for fuelwood gathering within Tonto Basin agave habitat would be reduced to 42.78 acres, potentially affecting seventeen percent of habitat. There would be no designated OHV areas within Tonto Basin agave habitat and no change from existing conditions (no effect to Pima Indian mallow habitat). Dispersed camping using a motor vehicle is restricted to designated routes and is addressed in the route analysis.

The reduction of motorized use for fuelwood gathering would have minimal benefits as fuelwood sources are scarce (majority of habitat is in desert scrub) and most fuelwood is gathered at the eastern portions of the forest at higher elevations. The reduction of routes for motorized travel would benefit Tonto Basin agave by reducing potential habitat fragmentation, loss, and degradation. However, the effect is not large, as the magnitude of change (decrease of two percent from existing) is small and reduces effects to only one population.

Although the reduction of routes for motorized travel are beneficial to Tonto Basin habitat, the effect forest-wide is small as the majority of populations are still affected by routes for motorized travel. Therefore, similar to Alternative B, this alternative would likely result in a similar trend to existing conditions – decreased habitat effectiveness from potential habitat fragmentation, degradation and loss from motorized travel. Negative impacts to Tonto Basin agave distribution from motor vehicle use are moderate, as effects are dispersed throughout habitat.

Alternative D – Direct and Indirect Effects

This alternative provides more motorized access than the existing condition. Routes for motorized travel would be reduced to 0.74 miles that intersect with Tonto Basin agave habitat, potentially affecting 22 percent of the habitat. There would be no areas for motorized travel within Tonto Basin agave habitat resulting in an eight percent reduction from the existing conditions. Motor vehicle use for dispersed camping within Tonto Basin agave habitat would increase to 50.68 acres, potentially affecting twenty percent of habitat. Motorized fuelwood gathering areas are the same as the current condition (186.67 acres) and would have minimal negative impacts to Pima Indian mallow habitat.

Similar to routes for motorized travel, motorized areas for dispersed camping can increasing ground disturbance, decreasing retention and development of soil, and encourage exotic and invasive species establishment and spread. This alternative would result in a decrease in habitat effectiveness for Pima Indian mallow, primarily from the increase in motorized dispersed camping areas within Tonto Basin agave habitat. Both routes for motorized travel and motorized dispersed camping could have compounding effects to species habitat by increasing habitat fragmentation, degradation, and loss. Negative impacts to Tonto Basin agave distribution from motor vehicle use are moderate, as effects are dispersed throughout habitat.

Hohokam Agave

Hohokam agave (*Agave murpheyi*) is found in south-central Arizona in Sonoran Desert. It is found on gentle bajada slopes, benches, or terraces above major drainages with prehistoric habitations and/or agricultural sites, typically between 1,300-2,400 feet elevation. It requires well-drained soil. There are about 60 known sites in Arizona.

Hohokam agave habitat consists of 89.22 acres, of which 4.96 acres are located on private lands resulting in 84.26 acres of habitat potentially affected by motorized travel. For the purposes of assessing overall species viability forest-wide, habitat affected (percentage) will include all habitat of 89.22 acres (Table 153).

Table 153. Hohokam Agave Habitat Affected by Each Analysis Factor under Each Alternative

Analysis Factors	Existing Condition (Alternative A)			Alternative B			Alternative C			Alternative D		
	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]
Motorized Routes (miles)	0.29	11%	2	0.00	0%	0	0.00	0%	0	0.29	11%	2
Areas Designated for Motor Vehicle Use (acres)	0.00	0%	0	---4	---4	0	0.00	0%	0	0.62	1%	1
Motorized Dispersed Camping (acres)	0.00	0%	0	0.00	0%	0	---4	---4	0	16.67	21%	7
Motorized Fuelwood Gathering (acres)	9.91	11%	2	0.00	0%	0	0.00	0%	0	9.91	11%	2

[1] The area or length that overlaps with the analysis factor

[2] The acres affected (percent) out of total habitat acres for each analysis factor.

[3] The number of populations affected by each analysis factor.

[4] Not proposed under alternative

Alternative A– Direct and Indirect Effects

The effect of this alternative on a forest-wide basis would be no change from the current condition. Currently there are 0.29 miles of routes for motorized vehicle use in Hohokam agave habitat, potentially affecting eleven percent of habitat. There are no populations or suitable habitat in areas currently open to cross-country travel or dispersed camping (Payson and Pleasant Valley). Fuelwood gathering is currently permitted in 9.91 acres of Hohokam agave habitat, potentially affecting eleven percent of habitat.

The effects to Hohokam agave habitat from motorized use for fuelwood gathering are minimal as fuelwood sources are scarce in desert communities and 89 percent of habitat is outside fuelwood gathering areas (most fuelwood is gathered at the eastern portions of the forest at higher elevations). Motorized routes can cause ground disturbance which degrade soils and increase the establishment and spread of exotic and invasive species[136]. The introduction of buffelgrass is a particular concern among Sonoran desert communities in which Hohokam agave is found because buffelgrass contributes to fine fuels that are easily ignited. Currently, the abundance of buffelgrass on the Tonto is relatively low and the majority of infestations occur in southeast Arizona.

Although the effects are not large, the no action alternative could decrease habitat effectiveness by increasing habitat fragmentation, degradation, and loss primarily from indirect effects from motorized routes. Negative impacts to Tonto Basin agave distribution from motor vehicle use are low, as effects isolated to few locations.

Alternative B– Direct and Indirect Effects

This alternative provides less motorized access than the existing condition. No miles of routes for motorized travel would be in Hohokam agave habitat, reducing habitat affected by eleven percent. No areas designated for motorized use for fuelwood gathering would be in Hohokam agave habitat, reducing habitat affected by the same eleven percent. Designated OHV areas are not proposed under this alternative, resulting in no change from existing conditions. Designated motorized dispersed camping sites in this alternative are not within the habitat.

The reduction of motorized fuelwood gathering would have minimal benefits as fuelwood sources are scarce (majority of habitat is in desert scrub) and most fuelwood is gathered at the eastern portions of the forest at higher elevations. The reduction of routes for motorized travel would benefit Tonto Basin agave by reducing potential habitat fragmentation, loss, and degradation.

Although the change from existing conditions for routes for motorized use and motorized fuelwood gathering areas is not large (eleven percent) – all known populations would be unaffected under this alternative. Therefore, this alternative would likely result in a stable or increasing trend in habitat effectiveness by reducing habitat fragmentation, degradation, and loss. Tonto Basin agave distribution would be unaffected.

Alternative C– Direct and Indirect Effects

No miles of routes for motorized travel would be in Hohokam agave habitat, reducing habitat affected by eleven percent. No areas designated for motorized use for fuelwood gathering would be in Hohokam agave habitat, reducing habitat affected by eleven percent. There would be no designated OHV areas within Hohokam agave habitat and no change from existing conditions

[136] Ibid.

(no effect to Hohokam habitat). Dispersed camping using a motor vehicle is restricted to designated routes and is addressed in the route analysis.

The reduction of motorized fuelwood gathering would have minimal benefits as fuelwood sources are scarce (majority of habitat is in desert scrub) and most fuelwood is gathered at the eastern portions of the forest at higher elevations. The primary benefit to Hohokam agave habitat under this alternative would be from the reduction of routes for motorized travel. This would reduce potential habitat fragmentation, loss, and degradation.

Similar to Alternative B, the change from existing conditions for routes for motorized use and motorized fuelwood gathering areas is not large (eleven percent). However all known populations would be unaffected under this alternative. Therefore, this alternative would likely result in a stable or increasing trend in habitat effectiveness by reducing habitat fragmentation, degradation, and loss. Tonto Basin agave distribution would be unaffected.

Alternative D– Direct and Indirect Effects

This alternative provides more motorized access than the existing condition. There would be no change from existing conditions for routes designated for motorized use within Hohokam agave habitat (potentially affecting eleven percent of habitat). There would be no change from existing conditions for motorized fuelwood gathering areas within Hohokam agave habitat (potentially affecting the same eleven percent of habitat). Areas for motorized use would increase to 0.62 acres, affecting one percent of habitat. Motorized use for dispersed camping would increase to 16.67 acres, affecting 21 percent of habitat.

Areas designated for motor vehicle use within Hohokam agave habitat would have slight to little effect as the area affected represents one percent of habitat. Routes for motorized travel and motorized dispersed camping are likely to have greater impacts to Hohokam agave habitat than other motorized uses. Similar to routes for motorized travel, motorized dispersed camping can increase ground disturbance, decreasing retention and development of soil, and encourage exotic and invasive species establishment and spread.

This alternative would result in a decrease in habitat effectiveness for Hohokam agave habitat, primarily from the increase in motorized dispersed camping areas within Tonto Basin agave habitat. Both routes for motorized travel and motorized dispersed camping could have compounding effects to species habitat by increasing habitat fragmentation, degradation, and loss. Negative impacts to Tonto Basin agave distribution from motor vehicle use are low, as effects isolated to few locations.

Mt. Dellenbaugh Sandwort

Mt. Dellenbaugh sandwort (*Arenaria aberrans*) is a perennial herb found in sandy soils, rich organic soils, and granite substrates at elevations from 5,557 to 7,325 feet. Few localities are documented on the Tonto National Forest (Payson and Tonto Basin) among pinyon oak woodlands.

Mt. Dellenbaugh Sandwort habitat consists of 9.91 acres potentially affected by motorized travel. For the purposes of assessing overall species viability forest-wide, habitat affected (percentage) will include all habitat of 9.91 acres (Table 154).

Table 154. Mt. Dellenbaugh Sandwort Habitat Affected by Each Analysis Factor under Each Alternative

Analysis Factors	Existing Condition (Alternative A)			Alternative B			Alternative C			Alternative D		
	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]
Motorized Routes (miles)	0.00	0%	0	0.00	0%	0	0.00	0%	0	0.00	0%	0
Areas Designated for Motor Vehicle Use (acres)	4.96	50%	1	---4	---4	0	0.00	0%	0	9.91	100%	2
Motorized Dispersed Camping (acres)	4.96	50%	1	0.00	0%	0	---4	---4	0	9.91	100%	2
Motorized Fuelwood Gathering (acres)	4.96	50%	1	0.00	0%	0	0.00	0%	0	4.96	50%	1

[1] The area or length that overlaps with the analysis factor.

[2] The acres affected (percent) out of total habitat acres for each analysis factor.

[3] The number of populations affected by each analysis factor.

[4] Not proposed under alternative.

Alternative A– Direct and Indirect Effects

The effect of this alternative on a forest-wide basis would be no change from the current condition. Motorized routes are not within Mt. Dellenbaugh sandwort habitat under any proposed action, and therefore not discussed in the analysis. Currently there is 4.96 acres of cross-country travel within Mt. Dellenbaugh sandwort habitat (Payson and Pleasant Valley), potentially affecting 50 percent of the habitat. There is 4.96 acres of motorized dispersed camping within Mt. Dellenbaugh sandwort habitat, potentially affecting 50 percent of the habitat. Motorized fuelwood gathering is currently permitted in 4.96 acres of Mt. Dellenbaugh sandwort habitat, potentially affecting 50 percent of habitat.

Very little is known on the biology and taxonomy of Mt. Dellenbaugh sandwort, raising concerns on the accuracy of documented occurrences and habitat. Typical or known habitat (north, northeast, and south-facing slopes in oak woodlands, pine, and chaparral) suggest motorized travel would have little to no affect to habitat. However, given the uncertainty in habitat type and occurrence, motorized travel is assumed to potentially impact Mt. Dellenbaugh sandwort habitat effectiveness. Motorized travel can cause ground disturbance which degrade soils and increase the establishment and spread of exotic and invasive species[137].

The no action alternative would likely decrease habitat effectiveness by increasing habitat fragmentation, degradation, and loss. Not enough information is available on current and potential habitat to assess the effects of motorized travel to Mt. Dellenbaugh sandwort distribution, and is therefore not assessed under any proposed action.

Alternative B– Direct and Indirect Effects

This alternative provides less motorized access than the existing condition. There would be no motorized travel within known Mt. Dellenbaugh sandwort habitat, reducing impacts by 50 percent from existing conditions.

The reduction of all motorized use within known Mt. Dellenbaugh sandwort habitat would provide significant benefits to Mt. Dellenbaugh sandwort habitat. This would increase habitat effectiveness by limiting effects, such as soil compaction and loss, to Mt. Dellenbaugh sandwort habitat from motorized travel.

Alternative C– Direct and Indirect Effects

There would be no motorized travel within known Mt. Dellenbaugh sandwort habitat, reducing impacts by 50 percent from existing conditions. There are no designated OHV areas within Mt. Dellenbaugh sandwort habitat.

The reduction of all motorized use within known Mt. Dellenbaugh sandwort habitat would provide significant benefits to Mt. Dellenbaugh sandwort habitat. This would increase habitat effectiveness by limiting effects, such as soil compaction and loss, to Mt. Dellenbaugh sandwort habitat from motorized travel.

Alternative D– Direct and Indirect Effects

This alternative provides more motorized access than the existing condition. There would be no change from existing conditions in motorized fuelwood gathering areas within Mt. Dellenbaugh sandwort habitat. Areas designated for motorized use and motorized dispersed camping would increase to 9.91 acres, potentially affecting all known habitat.

[137] Ibid.

There would be a significant increase in motorized travel within Mt. Dellenbaugh sandwort habitat, making this species particularly vulnerable to habitat degradation and loss. Therefore, the effect of this alternative on a forest wide basis has the greatest potential to decrease habitat effectiveness for Mt. Dellenbaugh.

Ripley's Wild Buckwheat

Ripley's wild buckwheat (*Eriogonum ripleyi*) is a woody perennial known from central to northwestern Arizona. It is a mat-forming sub-shrub that grows 2 to 8 inches tall with numerous branches. It flowers April through June and occurs at elevations from 2,000 to 6,000 feet. This species inhabits heavily calcareous soils in primarily Sonoran desert scrub.

Ripley's buckwheat habitat consists of 94.18 acres of habitat potentially affected by motorized travel. For the purposes of assessing overall species viability forest-wide, the percentage of habitat affected will include all habitat of 94.18 acres (Table 155).

Table 155. Ripley's Buckwheat Habitat Affected by Each Analysis Factor under Each Alternative

Analysis Factors	Existing Condition (Alternative A)			Alternative B			Alternative C			Alternative D		
	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]
Motorized Routes (miles)	0.54	47%	7	0.00	0%	0	0.38	37%	5	0.54	47%	7
Areas Designated for Motor Vehicle Use (acres)	0.00	0%	0	---4	---4	0	0.00	0%	0	0.00	0%	0
Motorized Dispersed Camping (acres)	0.00	0%	0	0.00	0%	0	---4	---4	0	32.28	34%	8
Motorized Fuelwood Gathering (acres)	0.00	0%	0	0.00	0%	0	0.00	0%	0	0.00	0%	0

[1] The area or length that overlaps with the analysis factor

[2] The acres affected (percent) out of total habitat acres for each analysis factor.

[3] The number of populations affected by each analysis factor.

[4] Not proposed under alternative

Alternative A– Direct and Indirect Effects

The effect of this alternative on a forest-wide basis would be no change from the current condition. Currently there are 0.54 miles of routes for motorized vehicle use in Ripley wild buckwheat habitat, potentially affecting 47 percent of habitat. There are no populations or suitable habitat in areas currently open to cross-country travel (Payson and Pleasant Valley) or dispersed camping. Motorized areas for fuelwood gathering are not within Ripley wild buckwheat habitat under any proposed action, and therefore not discussed in the analysis.

Soil compaction and degradation from motorized use is a particular concern for Ripley wild buckwheat, as it is restricted to very specific soils and substrates. Areas for motorized travel, motorized routes, and motorized dispersed camping are likely to impact Ripley wild buckwheat habitat effectiveness.

The no action alternative would likely decrease habitat effectiveness by continuing to increasing habitat fragmentation, degradation, and loss. Routes for motorized travel pose a significant threat to habitat fragmentation as nearly half of all known populations are potentially affected and species range is very narrowly distributed. For this reason it is assumed that the no action alternative will negatively impact the distribution, as well.

Alternative B– Direct and Indirect Effects

This alternative provides less motorized access than the existing condition. There would be no routes for motorized travel within Ripley wild buckwheat habitat, a 0.54 mile reduction from existing conditions. There would be no areas designated for motorized fuelwood gathering within Ripley wild buckwheat habitat, also representing no change from existing condition. Designated OHV areas are not proposed under this alternative, resulting in no change from existing conditions. Motorized designated camping sites in this alternative are not within the habitat, resulting in no effect to the species.

The reduction of all motorized use within Ripley wild buckwheat habitat would provide significant benefits to Ripley wild buckwheat habitat. This would increase habitat effectiveness by limiting effects, such as soil compaction and loss to Ripley wild buckwheat habitat from motorized travel. Negative impacts to Ripley wild buckwheat distribution would be reduced.

Alternative C– Direct and Indirect Effects

Routes for motorized travel would be reduced to 0.38 miles that intersect with Ripley wild buckwheat habitat, potentially affecting 37 percent of the habitat. There would be no change from existing conditions for designated OHV areas, resulting in no effect to Ripley wild buckwheat habitat. Dispersed camping using a motor vehicle is restricted to designated routes and is addressed in the route analysis.

Although there is a reduction of motorized routes within Ripley wild buckwheat, the magnitude of change is small (eleven percent) and the species range is extremely narrow. Therefore, similar to existing conditions, this alternative is likely to decrease habitat effectiveness for Ripley wild buckwheat. Negative impacts to Ripley wild buckwheat distribution from motor vehicle use are moderate, as effects are dispersed throughout habitat.

Alternative D– Direct and Indirect Effects

This alternative provides more motorized access than the existing condition. There would be no change from existing conditions (0.54 miles) for routes designated for motorized use within Ripley wild buckwheat habitat, potentially affecting 47 percent of Ripley wild buckwheat

habitat. There would be no change in areas for motorized use within habitat, resulting in no effect to Ripley wild buckwheat habitat.

Similar to existing conditions, this alternative would likely decrease habitat effectiveness for Ripley wild buckwheat habitat. The number of populations affected is the same as the existing condition; however, both routes for motorized travel and motorized dispersed camping could have compounding effects to species habitat by increasing habitat fragmentation, degradation, and loss. Negative impacts to Ripley wild buckwheat distribution from motor vehicle use are moderate, as effects are dispersed throughout habitat.

Eastwood Alum Root

Eastwood alum root (*Heuchera eastwoodiae*) is a distinctive perennial herb found only in central Arizona from 5,000 up to about 8,000 feet elevation, occupying moist slopes in ponderosa pine forests and canyons. Five of the ten known localities on the Tonto National forest are located in wilderness areas (Four Peaks, Mazatzal, Salome, and the Superstitions), where motor vehicle use is prohibited.

Eastwood alum root habitat consists of 49.56 acres, of which 4.96 acres are located on private lands and 24.80 acres in wilderness areas (Four Peaks, Mazatzal, Salome and Superstitions), resulting in 19.80 acres of habitat potentially affected by motorized travel. For the purposes of assessing overall species viability forest-wide, the percentage of habitat affected will include all habitat of 49.56 acres (Table 156).

Table 156. Eastwood Alum Root Habitat Affected by Each Analysis Factor under Each Alternative

Analysis Factors	Existing Condition (Alternative A)			Alternative B			Alternative C			Alternative D		
	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]
Motorized Routes (miles)	0.54	47%	7	0.00	0%	0	0.38	37%	5	0.54	47%	7
Areas Designated for Motor Vehicle Use (acres)	0.00	0%	0	---4	---4	0	0.00	0%	0	0.00	0%	0
Motorized Dispersed Camping (acres)	0.00	0%	0	0.00	0%	0	---4	---4	0	32.28	34%	8
Motorized Fuelwood Gathering (acres)	0.00	0%	0	0.00	0%	0	0.00	0%	0	0.00	0%	0

[1] The area or length that overlaps with the analysis factor.

[2] The acres affected (percent) out of total habitat acres for each analysis factor.

[3] The number of populations affected by each analysis factor.

[4] Not proposed under alternative.

Alternative A– Direct and Indirect Effects

The effect of this alternative on a forest-wide basis would be no change from the current condition. Currently, there are 0.10 miles of routes for motorized vehicle use in Eastwood alum root habitat, potentially affecting twenty percent of habitat. There are 4.96 acres of motorized travel within Eastwood alum root habitat, potentially affecting ten percent of habitat. There are 4.96 acres of dispersed camping within Eastwood alum root habitat, potentially affecting ten percent of the habitat. Motorized areas for fuelwood gathering are not within Eastwood alum root habitat under any proposed action, and therefore not discussed in the analysis.

Direct threats (crushing plants) from motorized travel to Eastwood alum root are relatively low as a most habitat occurs in areas where motorized travel would not affect individuals (along slopes and ridges). However indirect effects, such as the establishment and spread of invasive and exotic species, can alter the fire regime in areas where Eastwood alum root is found, resulting in potential habitat loss. Although little is known about the effects of fire on Eastwood alum root, fire is common in many areas where the species is found.

The no action alternative would likely result in a stable or slight decrease in habitat effectiveness primarily from the relatively small amount of motorized use within Eastwood alum root habitat and that half of all known populations are located in wilderness areas. For this reason it is assumed that none of the proposed alternatives will significantly impact the distribution.

Alternative B– Direct and Indirect Effects

This alternative provides less motorized access than the existing condition. There would be no change from existing conditions for routes for motorized travel within Eastwood alum root habitat (0.10 miles). Designated OHV areas are not proposed under this alternative, reducing impacts to ten percent of habitat. Motorized designated camping sites in this alternative are not within the habitat, resulting in no effect to the species.

This alternative would provide slight improvements to Senator mine alumroot habitat, primarily through the reduction of areas designated for motorized travel and lack of motorized dispersed camping within Eastwood alum root habitat. However, on a forest-wide basis this alternative is likely to have similar habitat effectiveness as existing conditions as the magnitude of change is small (ten percent) and overall effects are reduced only by one population.

Alternative C– Direct and Indirect Effects

There would be no change from existing conditions for routes for motorized travel within Eastwood alum root habitat (0.10 miles). There would no designated OHV areas within Eastwood alum root habitat, reducing impacts to ten percent of habitat.

This alternative would provide slight improvements to Eastwood alum root habitat, primarily through the reduction of areas designated for motorized travel and lack of motorized dispersed camping within Eastwood alum root habitat. However, on a forest-wide basis this alternative is likely to have similar habitat effectiveness as existing conditions as the magnitude of change is small (ten percent) and overall effects are reduced only by one population.

Alternative D– Direct and Indirect Effects

This alternative provides more motorized access than the existing condition. There would be no change from existing conditions (0.10 miles) for routes designated for motorized use within Eastwood alum root habitat, potentially affecting twenty percent of Eastwood alum root habitat. There would be no change from existing conditions to areas for motorized travel within Eastwood alum root habitat, resulting in no effect to the species habitat. Motorized dispersed

camping within habitat would increase to 7.29 acres, potentially affecting fifteen percent of the habitat.

Similar to existing conditions, this alternative would likely result in decreased habitat effectiveness for Eastwood alum root, primarily through motorized use of routes and increased motorized dispersed camping. Both of these motorized activities could have compounding effects to species habitat by increasing habitat fragmentation, degradation, and loss.

Horseshoe Deer Vetch

Horseshoe deer vetch (*Lotus mearnsii* var. *equisolensis*) is a spreading multi-stemmed perennial forb found growing on white lacustrine outcrop, limestone, and calcareous substrates in Sonoran desert. This variety is extremely restricted and habitats support a number of other rare and threatened plants such as *Eriogonum ripleyi* and *Purshia subintegra*. All known occurrences are located in the Cave Creek Ranger District.

Horseshoe deer vetch habitat consists of 33.73 acres of habitat potentially affected by motorized travel (Table 157).

Table 157. Horseshoe Deer Vetch Habitat Affected by Each Analysis Factor under Each Alternative

Analysis Factors	Existing Condition (Alternative A)			Alternative B			Alternative C			Alternative D		
	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]
Motorized Routes (miles)	0.16	71%	3	0.00	0%	0	0.16	71%	3	0.16	71%	3
Areas Designated for Motor Vehicle Use (acres)	0.00	0%	0	---[4]	---[4]	0	0.00	0%	0	33.73	100%	5
Motorized Dispersed Camping (acres)	0.00	0%	0	0.00	0%	0	---[4]	---[4]	0	11.84	35%	3
Motorized Fuelwood Gathering (acres)	0.00	0%	0	0.00	0%	0	0.00	0%	0	0.00	0%	0

[1] The area or length that overlaps with the analysis factor.

[2] The acres affected (percent) out of total habitat acres for each analysis factor.

[3] The number of populations affected by each analysis factor.

[4] Not proposed under alternative.

Alternative A– Direct and Indirect Effects

The effect of this alternative on a forest-wide basis would be no change from the current condition. Currently there are 0.16 miles of routes for motorized vehicle use in Horseshoe deer vetch habitat, potentially affecting 71 percent of habitat. There are no populations or suitable habitat in areas currently open to cross-country travel (Payson and Pleasant Valley), or dispersed camping. Motorized areas for fuelwood gathering are not within Horseshoe deer vetch under any proposed action, and therefore are not discussed in the analysis.

Soil compaction and degradation from motorized use is a particular concern for Horseshoe deer vetch, given its high habitat specificity (restricted to specific soils and substrates) and extremely narrow distribution. The no action alternative would likely decrease habitat effectiveness by increasing habitat fragmentation, degradation, and loss. Routes for motorized travel pose a significant threat to habitat fragmentation as 70 percent of all known populations are potentially affected and species range is very narrowly distributed. For this reason, it is assumed that no action alternative will negatively impact the distribution, as well.

Alternative B– Direct and Indirect Effects

This alternative provides less motorized access than the existing condition. There would be no routes for motorized travel within Horseshoe deer vetch habitat, a 23.81 mile reduction, reducing impacts to 71 percent of populations. Designated OHV areas are not proposed under this alternative, resulting in no change from existing conditions. Motorized designated camping sites in this alternative are not within the habitat, resulting in no effect to the species.

The reduction of all motorized use within Horseshoe deer vetch habitat would provide significant benefits to species habitat. This would increase habitat effectiveness by limiting effects, such as soil compaction and loss, to Horseshoe deer vetch habitat from motorized travel. Negative impacts to Horseshoe deer vetch distribution would be reduced.

Alternative C– Direct and Indirect Effects

There would be no change from existing conditions for all motorized vehicle use within Horseshoe deer vetch habitat. There would no designated OHV areas within Horseshoe deer vetch habitat. Therefore, this alternative is expected to have the same trend as existing conditions (decreased habitat effectiveness).

Alternative D– Direct and Indirect Effects

This alternative provides more motorized access than the existing condition. There would be no change from existing conditions (23.81 miles) for routes designated for motorized use within Horseshoe deer vetch habitat, potentially affecting 71 percent of Horseshoe deer vetch habitat. Areas for motorized travel within species habitat would increase to 33.73 acres, potentially affecting 100 percent of the habitat. Motorized dispersed camping within Horseshoe deer vetch habitat would increase to 11.84 acres, potentially affecting 35 percent of the habitat.

Similar to existing conditions, this alternative would likely result in a significant decrease in habitat effectiveness for Horseshoe deer vetch primarily through existing routes and increased motorized dispersed camping, potentially affecting all known populations. Both routes for motorized travel and dispersed camping could have compounding effects to species habitat by increasing habitat fragmentation, degradation, and loss. Negative impacts to Horseshoe deer vetch distribution from motor vehicle use are moderate, as effects dispersed throughout habitat.

Toumey's Groundsel

Toumey's groundsel (*Packera neomexicana* var. *toumeyi*) is a perennial herb distributed from central to southern Arizona from 3,000 up to about 9,000 feet in elevation, occupying loose rocky soils within conifer woodlands. On the Tonto National Forest, over half of known populations are located in the interior chaparral and ponderosa pine forest potential natural vegetation type, with the rest in mixed conifer and oak woodlands.

Toumey's groundsel habitat consists of 54.52 acres of habitat potentially affected by motorized travel (Table 158).

Table 158. Toumey's Groundsel Habitat Affected by Each Analysis Factor under Each Alternative

Analysis Factors	Existing Condition (Alternative A)			Alternative B			Alternative C			Alternative D		
	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]
Motorized Routes (miles)	0.15	27%	3	0.12	18%	2	0.12	18%	2	0.15	27%	3
Areas Designated for Motor Vehicle Use (acres)	9.91	18%	2	---[4]	---[4]	0	0.00	0%	0	54.52	100%	11
Motorized Dispersed Camping (acres)	9.91	18%	2	0.00	0%	0	---[4]	---[4]	0	17.26	32%	5
Motorized Fuelwood Gathering (acres)	19.82	36%	4	13.22	24%	3	13.22	24%	3	19.82	36%	4

[1] The area or length that overlaps with the analysis factor.

[2] The acres affected (percent) out of total habitat acres for each analysis factor.

[3] The number of populations affected by each analysis factor.

[4] Not proposed under alternative.

Alternative A– Direct and Indirect Effects

The effect of this alternative on a forest wide basis would be no change from the current condition. Currently, there are 0.15 miles of routes for motorized vehicle use in Toumey's groundsel habitat, potentially affecting 27 percent of habitat. There are 9.91 acres of cross country travel and dispersed camping within Toumey's groundsel habitat, both potentially affecting 18 percent of the habitat. Motorized fuelwood gathering is currently permitted in 19.82 acres of Toumey's groundsel habitat, potentially affecting 36 percent of habitat.

Motor vehicle use can affect the species directly by crushing plants and indirectly through soil compaction and can result in habitat loss through fragmentation. Motorized use for fuelwood gathering has the potential to negatively impact Toumey's groundsel habitat as the majority of habitat is located in areas where fuelwood gathering occurs (eastern portion of the forest at higher elevations). Plants may also be negatively impacted by areas for motorized use or cross country travel, as populations are often found growing along hillsides and open meadows. Motorized routes and motorized dispersed camping have equal likelihood in negatively impacting Toumey's groundsel habitat, primarily through indirect effects such as habitat loss and habitat alteration through exotic and invasive species establishment and spread[138].

The no action alternative would likely decrease habitat effectiveness by increasing habitat fragmentation, degradation, and loss from direct and indirect effects. Negative impacts to Toumey's groundsel distribution from motor vehicle use are moderate, as effects are dispersed throughout habitat.

Alternative B– Direct and Indirect Effects

This alternative provides less motorized access than the existing condition. Routes for motorized travel would be reduced to 0.12 miles that intersect with Toumey's groundsel habitat, potentially affecting eighteen percent of the overall habitat. Motorized use for fuelwood gathering would be reduced to 13.22 acres within Toumey's groundsel habitat, potentially affecting 24 percent of habitat. Designated OHV areas are not proposed under this alternative, reducing populations impacted by eighteen percent. Motorized designated camping sites in this alternative are not within the habitat, reducing populations impacted by eighteen percent.

This alternative would result in an increase in habitat effectiveness for Pima Indian mallow. The overall reduction of motorized travel within Toumey's groundsel habitat would reduce potential habitat fragmentation, degradation, and loss. Negative impacts to Toumey's groundsel distribution would be reduced.

Alternative C– Direct and Indirect Effects

Routes for motorized travel would be reduced to 0.12 miles that intersect with Toumey's groundsel habitat, potentially affecting eighteen percent of the overall habitat. Motorized use for fuelwood gathering would be reduced to 13.22 acres within Toumey's groundsel habitat, potentially affecting 24 percent of habitat. Designated OHV areas are not within Toumey's groundsel habitat, reducing populations impacted by eighteen percent. Dispersed camping using a motor vehicle is restricted to designated routes and is addressed in the route analysis.

This alternative would result in an increase in habitat effectiveness (same as Alternative B) for Toumey's groundsel. The overall reduction of motorized travel within Toumey's groundsel

[138] Ibid.

habitat would reduce potential habitat fragmentation, degradation, and loss. Negative impacts to Toumey's groundsel distribution would be reduced.

Alternative D– Direct and Indirect Effects

This alternative provides more motorized access than the existing condition. Within Toumey's groundsel habitat, there would be no change from existing conditions (0.15 miles) for routes designated for motorized use, potentially affecting 27 percent of Toumey's groundsel habitat. Motor vehicle use for dispersed camping would increase to 17.26 acres, potentially affecting 32 percent of habitat. Areas for motorized vehicle use within Toumey's groundsel habitat would increase to 54.52 acres, potentially affecting all known populations. Motorized fuelwood gathering areas are the same as the current condition with the potential to affect 36 percent of habitat.

This alternative would result in a decrease in habitat effectiveness for Pima Indian mallow, primarily through the increase in areas for motorized travel and motorized dispersed camping. The increase in areas for motorized use within species habitat has the potential to affect all known populations forest-wide and increase habitat fragmentation, degradation, and loss. Negative impacts to Toumey's groundsel distribution from motor vehicle use are moderate, as effects are dispersed throughout habitat.

Arizona Phlox

Arizona phlox (*Phlox amabilis*) is a perennial low-growing plant found in limestone and granite substrates among north, east, and west-facing slopes. Most populations are found at elevations from 3,500 to 8,970 feet. Growth habits noted for this species include woody subshrub, woody shrub, and herbaceous forb and herb. The locality on the Tonto is in an opening in a ponderosa pine forest on the Payson Ranger District.

Arizona phlox habitat consists of 4.96 acres of habitat potentially affected by motorized travel (Table 159).

Table 159. Arizona Phlox Habitat Affected by Each Analysis Factor under Each Alternative

Analysis Factors	Existing Condition (Alternative A)			Alternative B			Alternative C			Alternative D		
	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]
Motorized Routes (miles)	0.04	100%	1	0.04	100%	1	0.04	100%	1	0.04	100%	1
Areas Designated for Motor Vehicle Use (acres)	0.00	0%	0	---[4]	---[4]	0	0.00	0%	0	4.96	100%	1
Motorized Dispersed Camping (acres)	0.00	0%	0	0.00	0%	0	---[4]	---[4]	0	3.15	64%	1
Motorized Fuelwood Gathering (acres)	0.00	0%	0	0.00	0%	0	0.00	0%	0	0.00	0%	0

[1] The area or length that overlaps with the analysis factor.

[2] The acres affected (percent) out of total habitat acres for each analysis factor.

[3] The number of populations affected by each analysis factor.

[4] Not proposed under alternative.

Alternative A– Direct and Indirect Effects

The effect of this alternative on a forest-wide basis would be no change from the current condition. Currently there are 0.04 miles of routes for motorized vehicle use in Arizona phlox habitat, potentially affecting all known habitats on the Forest. There are no populations or suitable habitat in areas currently open to cross-country travel (Payson and Pleasant Valley) or dispersed camping. Motorized areas for fuelwood gathering are not within Arizona phlox habitat under any proposed action, and therefore not discussed in the analysis.

Little is known about the direct and indirect effects of motorized travel on Arizona phlox; however, it is assumed that all types of motorized travel can negatively impact the species. Motorized routes are the only motorized activity currently within known habitat. Motorized routes can cause ground disturbance which degrade soils and increase the establishment and spread of exotic and invasive species. Currently, known habitat is extremely small; therefore, any number of miles or acres of motorized use within Arizona phlox has the potential to affect all known populations.

The no action alternative would likely decrease habitat effectiveness by increasing habitat fragmentation, degradation, and loss. Not enough information is available on current and potential habitat to assess the effects of motorized travel to Arizona phlox distribution, and is therefore not assessed under any proposed action.

Alternative B– Direct and Indirect Effects

This alternative provides less motorized access than the existing condition. There would be no change from existing conditions for any motorized use within Arizona phlox habitat. There would no designated OHV areas within Arizona phlox habitat. Therefore, this alternative is expected to have the same trend as existing conditions (decreased habitat effectiveness).

Alternative C– Direct and Indirect Effects

There would be no change from existing conditions for any motorized use within Arizona phlox habitat. There would no designated OHV areas within Arizona phlox habitat. Therefore, this alternative is expected to have the same trend as existing conditions (decreased habitat effectiveness).

Alternative D– Direct and Indirect Effects

This alternative provides more motorized access than the existing condition. There would be an increase of 4.96 acres in areas for motorized use within Arizona phlox habitat, potentially affecting all known habitat. Motor vehicle use for dispersed camping would increase to 3.15 acres, potentially affecting 64 percent of habitat. The extremely small habitat along with the significant amount (64 to 100 percent) of areas designated for motorized travel within Arizona phlox habitat, make this species particularly vulnerable to habitat degradation and loss. Therefore, the effect of this alternative on a forest wide basis has the greatest potential to decrease habitat effectiveness for Arizona phlox.

Hualapai Milkwort

Hualapai milkwort (*Polygala rusbyi*) is a low growing perennial subshrub found growing at mesas and ridge tops in limestone substrates. Habitat consists of pinion-juniper woodlands and semi-desert shrub at elevations ranging from 3,280 to 4,921 feet. On the Tonto National forest, all known populations are found in the desert communities potential natural vegetation type on the Cave Creek Ranger District.

Hualapai milkwort habitat consists of 29.74 acres of habitat potentially affected by motorized travel (Table 160).

Table 160. Hualapai Milkwort Habitat Affected by Each Analysis Factor under Each Alternative

Analysis Factors	Existing Condition (Alternative A)			Alternative B			Alternative C			Alternative D		
	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]	Area/ Length[1]	Habitat[2]	Populations[3]
Motorized Routes (miles)	0.02	17%	1	0.00	0%	0	0.02	17%	1	0.02	17%	1
Areas Designated for Motor Vehicle Use (acres)	0.00	0%	0	---[4]	---[4]	0	0.00	0	0	0.00	0	0
Motorized Dispersed Camping (acres)	0.00	0%	0	0.00	0	0	---[4]	---[4]	0	5.94	20%	4
Motorized Fuelwood Gathering (acres)	0.00	0%	0	0.00	0%	0	0.00	0%	0	0.00	0%	0

[1] The area or length that overlaps with the analysis factor.

[2] The acres affected (percent) out of total habitat acres for each analysis factor.

[3] The number of populations affected by each analysis factor.

[4] Not proposed under alternative.

Alternative A– Direct and Indirect Effects

The effect of this alternative on a forest-wide basis would be no change from the current condition. Currently there are 0.02 miles of routes for motorized vehicle use in Hualapai milkwort habitat, potentially affecting seventeen percent of habitat. There are no populations or suitable habitat in areas currently open to cross-country travel (Payson and Pleasant Valley) or dispersed camping. Motorized areas for fuelwood gathering are not within Hualapai milkwort habitat under any proposed action, and therefore not discussed in the analysis.

Soil compaction and degradation from motorized use is a particular concern for Hualapai milkwort, given its high habitat specificity (restricted to specific soils and substrates) and relatively narrow distribution. The no action alternative would likely decrease habitat effectiveness by increasing habitat fragmentation, degradation, and loss. Not enough information is available on current and potential habitat to assess the effects of motorized travel to Hualapai milkwort distribution.

Alternative B– Direct and Indirect Effects

This alternative provides less motorized access than the existing condition. There would be no routes for motorized travel within Hualapai milkwort habitat, a 0.02 mile reduction, reducing impacts to seventeen percent of populations. Designated OHV areas are not proposed under this alternative, resulting in no change from existing conditions. Motorized dispersed camping sites in this alternative are not within the habitat, resulting in no effect to the species.

The reduction of all motorized use within Hualapai milkwort habitat would provide significant benefits to Hualapai milkwort habitat. This would increase habitat effectiveness by limiting effects, such as soil compaction and loss, to Hualapai milkwort habitat from motorized travel.

Alternative C– Direct and Indirect Effects

There would be no change from existing conditions for motorized vehicle use within Hualapai milkwort habitat. There would no designated OHV areas within Hualapai milkwort habitat. Therefore, this alternative is expected to have the same trend as existing conditions (decreased habitat effectiveness).

Alternative D– Direct and Indirect Effects

This alternative provides more motorized access than the existing condition. There would be no change from existing conditions (0.02 miles) for routes designated for motorized use within Hualapai milkwort habitat, potentially affecting seventeen percent of Hualapai milkwort habitat. There would be no change from existing conditions to areas for motorized travel within habitat, resulting in no effect to Hualapai milkwort habitat. Motorized dispersed camping within Hualapai milkwort habitat would increase to 5.94 acres, potentially affecting twenty percent of the habitat.

Similar to existing conditions, this alternative would likely result in decreased habitat effectiveness for Hualapai milkwort primarily through existing routes and increased motorized dispersed camping. Both routes for motorized travel and motorized dispersed camping could have compounding effects to species habitat by increasing habitat fragmentation, degradation, and loss.

Cumulative Effects Common to All Species

This cumulative effects analysis does not attempt to quantify the effects of past actions by adding up all prior actions on an action-by-action basis. In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on

current conditions (as detailed in the description of Alternative A) as a proxy for the impacts of past and present actions. This is because existing conditions reflect the aggregate impact of all prior actions and natural events.

This analysis focuses on the cumulative impact of those reasonably foreseeable actions that are relevant in assessing the impacts of designating a system of motorized use on sensitive plant species. Depending on the habitat of the plant species, along with the life history of the plant, the temporal boundary for this analysis is difficult to summarize as plant system recovery from disturbance is highly variable. More important to sensitive plant species is the spatial component of the cumulative effects analysis. Several of the species are wholly located within the Tonto National Forest, for which the spatial area affected would be the same as the project area. In the case of Pima Indian mallow, Tonto Basin agave, Mt. Dellenbaugh sandwort, Ripley wild buckwheat, Eastwood alum root, Toumey's groundsel, Arizona phlox and Haulapai milkwort, their distribution is also on neighboring national forests (Coconino, Prescott, Kaibab, and Apache-Sitgreaves). There is also the potential that some of these sensitive plant species occur on private land within the forest boundaries, but no data for these populations currently exist.

Cumulative effects to listed plant species include past and ongoing management actions by the Forest Service such as tree and brush thinning, prescribed fire treatments, range management, recreational activities (motorized and nonmotorized), construction, reconstruction, and physical decommissioning of roads and trails, various land use projects including communications facilities, utility corridors and special use areas. While there is a chance that these actions could cumulatively impact the species when taken into consideration for this project, most of these effects are mitigated at a project level to comply with the Forest Plan and other regulations.

Fire Management

Past and current fire suppression (and exclusion) has resulted in large-scale and long-term changes to vegetation structure and composition. As a result tree densities have increased to uncharacteristically high levels, reducing and or eliminating many understory species. These changes have likely negatively impacted current and potential habitat for sensitive plant species.

There have been large severity wildfires within potential habitat of several sensitive plant species. Severe wildfires can result in the loss of productive soils and hydrological function that significantly reduce or eliminate potential habitat for sensitive plant species. The extent and magnitude of alteration of potential habitat by past wildfires over the forest is not quantifiable.

Projects involving forest thinning and prescribed fire treatments likely contribute to effects to sensitive plant species. Although the effects of fuels reduction and thinning projects are mitigated to reduce the effects, these projects still result in modification of vegetation. However, over time, these projects will benefit sensitive plant species by increasing ecological integrity and function of habitat such as improving soils and hydrological function.

Range Management

The management of cattle across the forest could result in the crushing of individual plants and the compaction of soil necessary for germination and plant establishment. Cattle may also introduce invasive species into an established plant population. However many livestock authorization projects attempt to mitigate these effects, either through exclosures or pasture rotation.

Recreation Management

As with range management, recreation activities can be vectors for the spread of invasive species and can result in the crushing of individual plants. Currently, there is no management for hiking and horseback riding off of established trails, nor is there site specific data for where this many be occurring in relation to sensitive plant populations. Cumulatively, the effects from recreation activities could increase the impacts to sensitive plant species from those identified in the direct and indirect effects of this document.

Road Maintenance and Land Use Projects

Maintenance of Forest Service Roads, along with the management of easements for state highways by Arizona Department of Transportation, is heavily mitigated to decrease effects to resources and the spread of invasive species. Projects that are authorized on National Forest System lands are also mitigated to decrease or avoid effects.

Climate Change

Global climate change can have significant implications on plant species productivity and survival. Under current climate models, severe droughts larger than any past drought over the past 1,000 years are predicted to occur by 2050 (Williams et al., 2013). Sensitive plant species are particularly vulnerable as they tend to occupy specialized habitat types (edaphic plants; restricted to specific substrates) or microhabitats sensitive to environmental changes. The ability for these plants to migrate under changing conditions may be limited as required habitats are generally not widely available. Temperature and precipitation regimes play important roles in species composition, productivity, and nutrient availability. Predicting future plant distributions are impossible as many interacting factors such as human influences, ability for plants to migrate, and the presence of suitable habitat components are difficult to quantify. Therefore, specific effects of climate change on sensitive plant species and associated habitat are unknown.

Noxious/Invasive Weeds

Roads and motorized trails are known to be effective vectors for transporting invasive plant seeds. Recreational vehicles, such as two- or four-wheel drive vehicles, ATVs, or motorcycles can bring weed seeds and plant parts onto the Forest from other sources. They can also spread existing infestations into new sites. For example, ATVs are commonly driven in the right-of-way along State Route 188. Much of this right-of-way has had a Malta starthistle infestation for over twenty years. When ATVs move from the right-of-way onto the Forest road network or are driven cross-country, they can spread Malta starthistle throughout the Tonto Basin area. Due to repeated disturbance, road and trailside areas are easily colonized by weedy species.

Affected Environment

There are 52 invasive weeds that are known to occur on the Tonto National Forest[139]. Another 16 are nearby and could be growing on the Tonto National Forest currently or in the future.

Although there are fewer acres of weeds on the Tonto National Forest as compared to many other western forests, weed populations are growing rapidly here. History has repeatedly demonstrated that most invasive weed populations do not remain small for long. Growth rates can be exponential with an apparent lag time between initial infestation and subsequent extensive infestations that are beyond control (Radosevich, 2013).

[139] For a full list of these species, see the Noxious/Invasive Weeds Report in the project record.

As of February 2014, over 26,800 acres of weed infestations are documented and mapped on the Tonto National Forest. Most of this acreage is one large site of weeping lovegrass that was seeded on the entire Dude Fire area in 1990 (21,436 acres). This seeding project was done in an emergency situation after fire had denuded the area of vegetative cover, and impending monsoons could have caused massive soil loss. At that time there was not a source of native seed in sufficient quantity to cover the burned area, and the decision was made to use non-native species for seeding. The remainder is 47 different species of weeds in over one thousand different infestations. The great majority of these infestations are less than 5 acres in size.

Most of the weeds inventoried on the Forest are near highways or main roads, for three reasons: 1) much of the survey effort has been conducted for road projects. There are more remote infestations, but they are harder to find and may not be near projects that require survey; 2) weeds tend to initially establish in disturbed areas such as road shoulders and bar ditches; and 3) Vehicles are a major source of transport of weed propagules (seeds and plant parts that are able to produce new plants).

Opportunities such as post-wildfire long-term rehabilitation funding have been used to complete more extensive surveys and control new infestations. Both long-term and burned area emergency rehabilitation funds have been used to conduct weed surveys in the areas of the Rodeo-Chediski, Picture, Willow, Diamond, Webber, Edge, Mistake Peak, and Cave Creek fires.

Much of the Forest's efforts in the weed management program have been directed toward education and awareness of our own employees, regional Incident Management Teams, special interest groups, and the public. The emphasis of these presentations has been prevention of weed spread and identification of common weeds on the Tonto National Forest. The Forest has developed relationships with surrounding land managers, road management departments, local communities, and other agencies and organizations, to work cooperatively on weed control strategies and projects.

Environmental Consequences

Effects from invasive species would continue to occur under all alternatives, including the proposed action. In general, alternatives with fewer routes open for motor vehicle use, especially those that exclude routes that are currently weed-infested, provide a reduced risk for transport of seeds by motorized vehicles, a reduction in habitats susceptible to weed invasion, and a reduced opportunity for spread of weeds to uninfested areas of the Forest.

Alternative A – Summary of Direct and Indirect Effects

Under this alternative, a total of at least 24,802 acres of noxious weeds would be open to vehicular access. Most of this acreage is on the Payson Ranger District, in the area of the Dude Fire of 1990. An unknown number of weed-infested acres are near unauthorized roads and trails that are currently used.

While the Tonto National Forest Plan does not specifically address invasive plant management, implementation of Alternative 1 (No Action) affects invasive plant populations such that the Forest does not meet Forest Plan goals of management of resources to prevent or reduce serious long-lasting hazards, maintenance, and enhancement of visual resource values, wildlife species diversity, wildlife habitat improvement, and rangeland restoration.

Alternative A carries a moderate risk of continued weed infestation.

Alternative B – Summary of Direct and Indirect Effects

Allowing no motorized big game retrieval and no motorized cross-country travel would be beneficial by reducing the likelihood of weed introduction and spread. The creation of 5 permit zones would allow greater enforcement of travel regulations and greater opportunities for education of drivers about weed risks and prevention practices.

With the reduced miles of open motorized routes, no motorized cross-country travel allowed, 5 permit zones created, and mitigation measures incorporated to reduce weed spread, Alternative B would reduce the current risk of weed expansion from a moderate to a low level. This alternative has the least risk of introduction and spread of weeds.

Alternative C – Summary of Direct and Indirect Effects

Under Alternative C, allowing the specified amounts of motorized cross-country travel for recreation, big game retrieval, dispersed camping, and firewood collection would include inherent opportunities for expansion of weeds, but the risk of spread is considerably reduced by mitigation measures and required prevention practices. The creation of 5 permit zones would allow greater enforcement of travel regulations and greater opportunities for education of drivers about weed risks and prevention practices.

With the reduced miles of open motorized routes, very limited motorized cross-country travel allowed, 5 permit zones created, and mitigation measures incorporated to reduce weed spread, Alternative C would reduce the current risk of weed expansion from a moderate to a low level.

Alternative D – Summary of Direct and Indirect Effects

Under this alternative, a total of 25,803 acres of noxious weeds would be open to vehicular access. Most of this acreage is on the Payson Ranger District, in the area of the Dude Fire of 1990. This alternative allows the greatest motorized access while meeting Forest Plan standards and guidelines for all affected resources. Under Alternative D, allowing the specified amounts of motorized cross-country travel for recreation, big game retrieval, dispersed camping, and firewood collection would include inherent opportunities for expansion of weeds, but the risk of spread is considerably reduced by mitigation measures and required prevention practices. The creation of 5 permit zones would allow greater enforcement of travel regulations and greater opportunities for education of drivers about weed risks and prevention practices.

With the greater miles of open motorized routes, considerably decreased motorized cross-country travel allowed, 5 permit zones created, and mitigation measures incorporated to reduce weed spread, Alternative D would reduce the current risk of weed expansion from a moderate to a moderate-low level.

Cumulative Effects for All Alternatives

The boundary for this cumulative effects analysis is the Tonto National Forest and includes private lands. This discussion includes management actions related to noxious or invasive weeds since 2003. Prior to 2003, occurrences and distribution of noxious or invasive weeds on the Forest were largely unknown. Beginning in 2003, the Tonto National Forest began surveying and documenting noxious or invasive weed occurrences. Weed maps are documented in the Forest's Natural Resource Information System (NRIS) database and on a noxious weed layer in the Forest's GIS system.

In 2003, the Southwestern Region of the Forest Service completed the Environmental Assessment for Management of Noxious Weeds and Hazardous Vegetation on Public Roads on National Forest System Lands in Arizona. The decision which followed in 2004 allows treatment of noxious or invasive weeds along state and federal highway rights-of-way through all National Forests in Arizona, including the Tonto National Forest. Arizona Department of Transportation (ADOT) and their contractors and subcontractors have conducted several herbicide control projects along State Routes 77, 87, 88, 188, 260, and U.S. Highway 60 on the Tonto National Forest in the last five years.

For the last several years, the Tonto National Forest and Arizona Department of Transportation (ADOT) have included weed control and prevention measures in highway construction projects. ADOT contractors now write a Noxious Species Control Plan, and use both herbicide and manual methods to control weeds along rights-of-way inside project limits. There are typically at least two major highway construction projects occurring on the Tonto National Forest at any time. For the next 5 years, construction projects are scheduled for State Routes 87, 88, 177, 260, and U.S. Highway 60.

The Tonto National Forest completed an Environmental Assessment for Integrated Treatment of Noxious or Invasive Plants, and a decision was signed in August 2012. This decision allows the Tonto National Forest to use the full range of tools to manage invasive weed infestations, including manual, mechanical, prescribed fire, biological control, and herbicides.

Of numerous activities occurring on the Forest, both casual and permitted, most have some potential to introduce and spread invasive plants. Such activities include livestock grazing, special use permits involving use of livestock, hiking, fishing, hunting, wildlife watching, mining, horseback riding, and all types of recreational driving. Road management agencies such as county public works departments and departments of transportation, and Arizona Department of Transportation would continue to maintain and upgrade roads and highways through the Tonto National Forest. Highway construction projects would doubtless continue; the Forest works with all of these agencies to prevent introduction and spread of noxious weeds during these activities. The Forest itself conducts activities that have potential to spread weeds: road maintenance, firefighting, and use of prescribed fire, post-fire rehabilitation including revegetation of burned and bladed sites, and creation of new recreation sites. Where permits are involved, the Forest includes permit clauses appropriate to the activity to prevent spread of weeds. The Forest includes Best Management Practices in its own projects for the same purpose. The wildland urban interface, the areas adjacent to private land adjacent to the forest, would continue to be a source of invasive weed infestation for the Tonto National Forest as this is where fuels reduction projects are most often located. The Forest program of public education and awareness of invasive weeds somewhat mitigates this, but this source of weed spread is largely outside of our control.

The spread of invasive plant species on the Tonto National Forest is often based on classification:

- Class A weeds are of limited distribution in Arizona, or unrecorded in the state. They pose a serious threat. Management goal is eradication.
- Class B weeds are of limited distribution in Arizona, common in some places in the state. Management goal is to contain their spread, decrease population size, then eliminate.

- Class C weeds have spread beyond our capability to eradicate them. Management goal is to contain spread to present size, and then decrease the population, if possible.

At current funding levels, it is expected that the Forest would be able to eradicate or control the spread of weeds classified as class A. Weed species classified as Category B would probably be contained or eliminated in some areas, but would continue to spread in many areas. Management goal is to contain their spread, decrease population size, then eliminate. Class C weeds have spread beyond our capability to eradicate them. The management goal is to contain spread to present size and then decrease the population, if possible. As funding levels change, or needs for eradication from other projects increase, there could be a cumulative effect to the spread of weeds from designation of motor vehicles.

Hydrological Resources

Protection of water quantity and quality is an element of the Forest Service mission (Forest Service Strategic Plan for 2007 to 2012, 2007). Management activities on National Forest lands should be planned and implemented to protect hydrologic functions of forest watersheds, including volume, timing, and quality of stream flow. Use of roads, trails, and other areas on national forests by motor vehicles has potential to affect these hydrologic functions by intercepting runoff, compacting soils, damaging vegetation and stream channels, and detaching sediment. Management decisions to eliminate cross-county motorized travel, add new routes and areas to national forest system (NFS) roads and trails, and make changes to existing NFS roads and trails should consider effects on watershed functions.

Affected Environment

The Tonto National Forest lies wholly or partly within seven 4th HUC[140] Watersheds. Within these watersheds there are thirty-six 5th HUC watersheds and 197 6th HUC watersheds that lie wholly or partly within the boundaries of the Tonto National Forest[141]. Greater than 50 percent of the watershed area of 150 6th HUC watersheds lies within the Forest boundaries.

Water Quality

Improvements to the nation's waters over the past three decades are largely due to the control of traditional point sources of water pollution; however, a large number of water bodies remain impaired and the goal of eliminating pollutant discharge and attaining fishable and swimmable waters is still unrealized. Nonpoint sources of pollution such as agriculture, construction, forestry, and mining are responsible for much of the nation's remaining water quality impairment (BLM, 2011). Three of these activities: agriculture (in the form of permitted livestock grazing), forestry, and mining currently occur on NFS lands administered by the Tonto National Forest. In

[140] HUC stands for hydrologic unit code. The United States is divided and sub-divided into successively smaller hydrologic units which are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged or nested within each other, from the largest geographic area (regions) to the smallest geographic area (cataloging units). Each hydrologic unit is identified by a unique HUC consisting of two to eight digits based on the four levels of classification in the hydrologic unit system (https://water.usgs.gov/GIS/huc.html, accessed 11/09/2015).

[141] The percent of watershed area of each 6th HUC watershed within the boundaries of the Forest is displayed in Appendix A, Table 1 of the Final Water Resources Report in the project record.

addition to these activities other sources of nonpoint source pollution on the Tonto National Forest include roads, prescribed fire and wildfire, and recreational uses.[142]

Water quality in the state is assessed by the Arizona Department of Environmental Quality (ADEQ). Water quality has been assessed in major perennial stream reaches and lakes on the Forest. Categories used by ADEQ for describing the status of water quality in the states' rivers, streams and lakes are identified in Table 161.

Table 161. Water Quality Categories

Category	Definition
1	Attaining all designated uses
2	Attaining some designated uses, and no use is threatened or impaired
3	Insufficient or no data and information to determine if any designated use is attained
4	Impaired or threatened for one or more designated uses but a Total Maximum Daily Load (TMDL) analysis is not necessary because:
4A	A TMDL has already been completed
4B	Other pollution control requirements are reasonably expected to result in attainment of the water quality standard
4C	The impairment is caused by pollution but not a pollutant, or
4N	The impairment is solely by natural conditions (an Arizona list only)
5	Impaired or threatened for one or more designated uses by a pollutant, and a TMDL needs to be developed or revised

Streams and water bodies within the Tonto National Forest that are listed on the State of Arizona's draft impaired waters (303d) list for 2012/14 are displayed in Figure 39. Roosevelt Lake is identified as an impaired water body due to mercury found in fish tissue. A fish consumption advisory has been issued for Roosevelt Lake. Mercury found in fish tissue in Tonto Creek has also resulted in a fish consumption advisory for Tonto Creek from Bear Flat to Roosevelt Lake.

[142] This paragraph comes from an EPA report to Congress that states: In 2000, 40 percent of the rivers and streams, 45 percent of the lakes, and 50 percent of the estuaries were impaired. See National Water Quality Inventory Report to Congress (305(b) report), 2000, available at http://www.epa.gov/305b/2000report/. The paragraph is an introductory discussion of the progress of the Clean Water Act on a nationwide basis with a brief discussion of the types of disturbance occurring on the Tonto National Forest that can contribute to nonpoint sources of pollution.

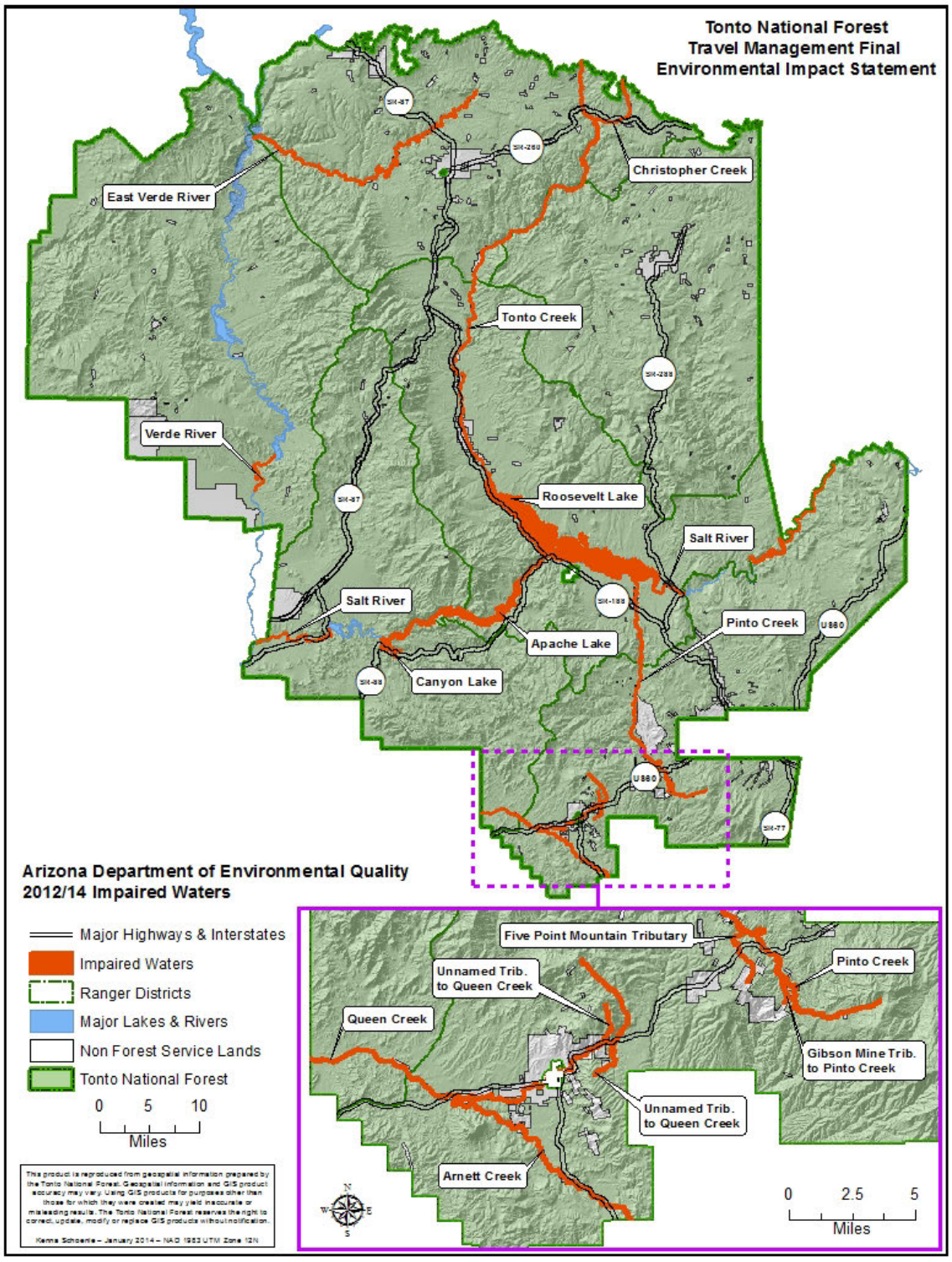

Figure 39. Map of Impaired Streams and Water Bodies within Tonto National Forest

The impaired waters map displays designated impaired water bodies within the Tonto National Forest. Macroinvertebrate data collected by ADEQ identifies a number of additional streams that have aquatic habitat issues that are not formally designated as impaired.

The primary pollutant generated by roads is sediment/turbidity. The Salt River from the confluence with Pinal Creek to Roosevelt Lake is the only water body within the Tonto National Forest that is identified as impaired for suspended sediment. It is also identified as impaired for nitrogen, phosphorous and *E. coli*. bacteria. ADEQ proposes to initiate a Total Maximum Daily Load (TMDL) analysis for this water body in 2015. A completed TMDL means that ADEQ has devised a plan to bring the impaired water body into compliance with the state's' water quality standards and that it is taking steps to implement the plan. Other impaired waters within the Forest are primarily impaired by pollutants such as copper, selenium, low dissolved oxygen, phosphorous, nitrogen, E. coli, mercury in fish tissue, arsenic, and boron. Primary sources of these pollutants include; natural sources, septic systems and poor human waste disposal practices, historic mining, and unknown sources. Roads are not a primary source of these pollutants.

Riparian Areas and Streams

Riparian areas occupy approximately one percent of the area managed by the Southwestern Region of the Forest Service (roughly 22.5 million acres in 11 National Forests and Grasslands in Arizona, New Mexico, and western Oklahoma and Texas) (Lafayette et al. 1996). They have importance disproportionate to their limited extent, especially in the arid Southwest. This importance is a function of their diverse and productive vegetative composition and structure, their linkage between upland and aquatic ecosystems, and their linkage between upper and lower watershed areas. Some of their most important functions include: 1) providing fish and wildlife habitat, 2) improving water quality by filtering and retaining sediment and nutrients transported by runoff from terrestrial uplands, 3) stabilizing stream banks and floodplain surfaces, 4) increasing the volume and duration of base flows by replenishing local alluvial aquifers, and 5) reducing flood flow velocities and filtering sediments and nutrients transported by flood flows during over bank flow events. Brinson et al. (1981) estimates that the percentage of riparian areas that have been altered in the United States range from 70 to 90 percent.

Riparian areas on the Tonto National Forest were mapped during a project completed for the Southwestern Region of the Forest Service in 2011(USDA Forest Service, 2013) known as the Regional Riparian Mapping Project (RMAP). This project mapped riparian areas at a 1:12,000 scale and used valley bottom models, photo interpretation, Terrestrial Ecological Unit Inventory, and other ancillary references to develop the mapping. The project resulted in 24 different riparian mapping units, thirteen of which are found on the Tonto National Forest. This project provides the most current and accurate inventory of riparian areas on the forest. Approximately 75,000 acres of riparian vegetation were mapped, representing approximately 2.5 percent of the land base of the Forest.

The Tonto National Forest stream arc Geographic Information System (GIS) layer identifies approximately 13,250 miles of streams within the boundaries of the Tonto National Forest. Approximately 640 miles (5 percent) are perennial and an estimated 1,530 miles (12 percent) are intermittent (based on miles of streams supporting riparian vegetation after subtracting miles of perennial streams).

The Tonto National Forest has conducted a number of channel stability assessments across the forest to better understand the condition of its streams and to implement measures to improve the

condition of degraded stream reaches. Approximately one percent of the miles of perennial and intermittent streams on the forest have been assessed. Based on assessments completed to date, 19 percent of assessed streams are stable, 49 percent are impaired, and 32 percent are unstable.[143]

Watershed Condition

The Forest Service developed the Watershed Condition Framework (WCF), which is intended to provide a consistent way to evaluate watershed condition at both the national and forest levels (USDA Forest Service, 2011a). Nested within the WCF is the Watershed Condition Classification (WCC) system that establishes a reconnaissance-level approach for classifying watershed condition. The WCC uses a set of 12 indicators composed of variable numbers of attributes to assess watershed condition (Figure 40). The indicators and their attributes are surrogate variables representing the underlying ecological functions and processes that affect soil and hydrologic function (USDA Forest Service, 2011b).

The WCF assessment process involves classification of all 6th-level HUC watersheds on National Forest lands into one of three watershed condition classes: Class 1—Functioning Properly; Class 2—Functioning at Risk; and Class 3—Impaired Function.

One of the indicators for the watershed condition classification process is “roads and trails.” This indicator represents 15 percent of the overall watershed condition assessment. Four attributes are used to assess the contribution of roads and trails to overall watershed condition. The proposed action and alternatives have the potential to impact the “open road density” and “proximity to water” attributes. The impact of the alternatives on these attributes is assessed for all HUC 12 watersheds included in the Forests’ WCC process. Watersheds with less than five percent watershed area within the boundaries of the forest and watersheds where the majority of the watershed area lies within an adjacent forest were not included in the WCC completed on the Tonto National Forest.

The “open road density” attribute is rated good, fair, or poor depending on road density per square mile within a watershed. The road density rating is good if road density is less than 1 mile per square mile, fair if road density ranges from 1 to 2.4 miles per square mile, and poor if road density is greater than 2.4 miles per square mile. This attribute was rated good on 72 watersheds, fair on 91 watersheds, and poor on 15 watersheds in the Tonto National Forest WCC project.

The “proximity to water” attribute rating is rated good, fair, or poor depending on the percent of stream miles within 300 feet of motorized routes. The attribute is rated good if less than 10 percent of streams and water bodies are affected by motorized routes within 300 feet, fair if between 10 to 25 percent of streams are located within 300 feet of motorized routes, and poor if more than 25 percent of streams are within 300 feet of motorized routes. This attribute was rated good on 61 watersheds, fair on 78 watersheds, and poor on 39 watersheds in the Tonto National Forest WCC project.

Motorized routes within the 300-foot buffer distance have a greater potential to be hydrologically connected to streams than those beyond the 300-foot buffer distance. Motorized routes hydrologically connected to stream channels and water bodies can provide greater quantities of sediments and other pollutants directly to these features. Hydrologic connectivity is dependent on a number of factors including slope, soil erodibility, vegetative ground cover, and climatic

[143] For more information, a summary of stream channel assessments within HUC 10 watersheds can be found in the Final Water Resources Report, Appendix A, Table 3, in the project record.

conditions. A 300-foot buffer provides a reasonable distance for identifying the majority of motorized routes that would have direct pathways for delivering road derived pollutants to water bodies.

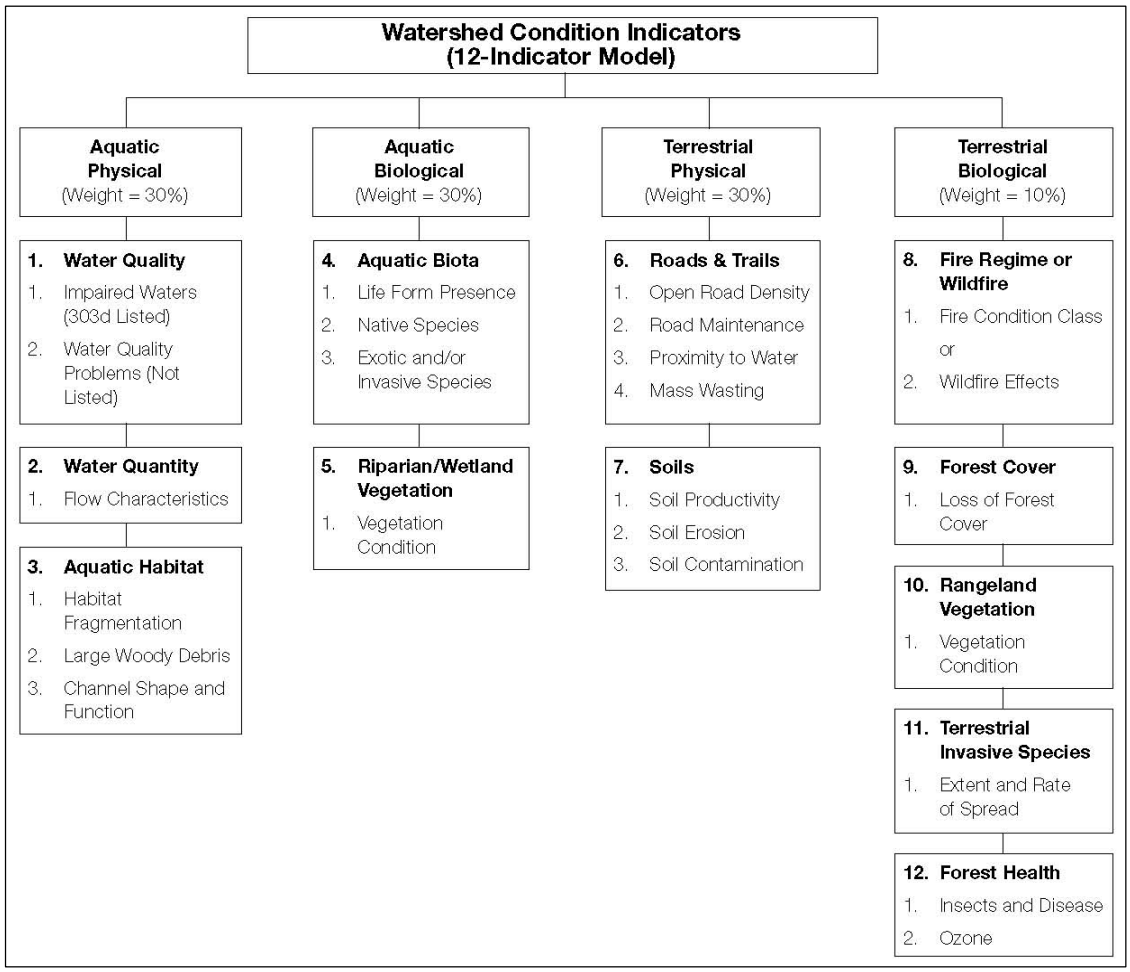

Figure 40. Watershed Condition Indicators and Attributes

Environmental Consequences

Alternative A – Direct and Indirect Effects

Roads and Trails Designated for Motor Vehicle Use

Motorized routes for this alternative include roads in the existing Forest road system (including those identified as closed or decommissioned in the Forests RATM plan), roads operated by other government jurisdictions such as the state or counties, routes on private property, and inventoried but unauthorized motorized routes. A total of approximately 6,050 miles of motorized routes were included within the analysis. A total of 672 miles of unauthorized motorized routes have been inventoried on the Forest. Many miles of additional unauthorized routes also occur on the Forest, but have not been inventoried.

Effects to Water Quality

The only water body impaired for sediment/turbidity is the Salt River from the confluence with Pinal Creek to Roosevelt Lake. This river reach has approximately 3.2 miles of motorized routes within the 300-foot buffer distance of the river: 2.10 miles of these routes are inventoried unauthorized routes; 0.6 miles is State Route 288 (which is a paved road) where it approaches and crosses the Salt River; and 0.5 miles consist of various forest system roads including a rafter takeout ramp for rafters floating the upper Salt River. The impact of these roads on water quality in the Salt River is small in comparison to the watershed area contributing to the impaired reach (4,306 square miles at the US Geological Survey gauge at the Hwy 288 crossing). Small localized impacts to water quality occur from the roads considered in the Travel Management process during periods of rainfall runoff.

The Verde River from West Clear Creek to Fossil Creek was assessed as impaired for sediment/turbidity in the 2006/2008 water quality assessment report, but has a completed Total Maximum Daily Load (TMDL) assessment that is currently being implemented. It is not identified as an impaired water body in the 2012/14 assessment report. Less than 0.1 mile of roads within the Tonto National Forest are within the 300-foot buffer distance of this previously impaired reach of the Verde River. The impact of this road on water quality in the Verde River is negligible due to the short length of the road segment. Small localized impacts to sediment and turbidity occur during rainfall runoff and during cross country vehicle crossings of the Verde River.

Effects to Riparian Areas

Approximately 75,000 acres of riparian vegetation have been mapped on the Tonto National Forest. 423 miles of motorized routes have been mapped within riparian areas and result in a road density in riparian areas of 3.6 miles per square mile. The number of perennial stream crossings results in a crossing density of one crossing for every 1.1 miles. Crossing density of intermittent and ephemeral streams would be one crossing every 1.8 miles.

Effects to Watershed Condition

Table 162 displays density of motorized routes by ranger district. On a forest wide basis route density would be classified as fair in the WCC Technical Guide (U.S. Forest Service, 2011b). Road density would be characterized as fair on all ranger districts. The Cave Creek Ranger District has the lowest road density but has many miles of uninventoried unauthorized routes that if inventoried would likely result in a higher road density rating.

Table 162. Current Road Density by Ranger District

Ranger District	Road (miles)	Area (sq mi)	Road Density (miles/sq miles)
Cave Creek	975.7	955.0	1.02
Globe	1,029.7	736.1	1.40
Mesa	775.0	694.5	1.12
Payson	1,022.1	723.1	1.41
Pleasant Valley	1,183.6	682.6	1.73
Tonto Basin	1,058.1	841.0	1.26
Total	**6,044.2**	**4,632.3**	**1.30**

Under existing conditions, 67 HUC 12 watersheds across the Forest would receive a good rating for the road density attribute, 92 watersheds would receive a fair rating, and 19 watersheds a poor rating.[144]

Proximity of motorized routes to water when considered on a district and forest wide basis would be classified as fair. For this alternative, up to nineteen percent of perennial stream miles and up to seventeen percent of ephemeral and intermittent stream channels could be affected by roads within 300 feet. In addition, 57 HUC 12 watersheds would receive a good rating for this attribute, 81 watersheds a fair rating, and 40 watersheds a poor rating.

Motorized Cross-country Travel

Motorized cross-country travel is permitted on 700,004 acres in the Payson and Pleasant Valley Ranger Districts. Although motorized cross-country travel is not an authorized activity in the four southern ranger districts, this activity occurs in a number of areas in close proximity to the Phoenix Metropolitan Area. Areas of particularly heavy OHV use occur in the lower Sycamore Creek area on Mesa Ranger District and the lower Camp Creek area on Cave Creek Ranger District. The streams most affected by heavy OHV use include Lower Camp Creek in the Cave Creek Ranger District, and Lower Sycamore Creek and Cottonwood Creek in the Mesa Ranger District. These streams support riparian vegetation and Sycamore Creek has reaches of perennial flow. Other ephemeral and intermittent stream channels also occur in the areas of heavy use.

Permit Zones

The Bulldog Canyon Permit Zone is a 54 square mile area that lies within parts of six HUC 12 watersheds. Approximately 90 percent of two HUC 12 watersheds lie within the permit zone. Forty-six miles of motorized routes occur in the permit zone which results in a road density of 0.85 miles per square mile. This density would be rated “good” in the Watershed Condition Classification if it occurred within a single watershed. Continued designation as a Permit Zone in this alternative should prevent an increase in adverse watershed effects associated with OHV uses off of designated roads.

Motor Vehicle Use for Big Game Retrieval

Under the No Action Alternative, continued unrestricted motorized big game retrieval would occur on 700,004 acres open to cross-country travel in the Payson and Pleasant Valley Ranger Districts. Cross-country motorized travel is prohibited in remaining ranger districts except in limited areas that are posted open. It is likely that some motorized big game retrieval occurs in these ranger districts outside of posted open areas. Payson and Pleasant Valley Ranger Districts lie within Game Management Units (GMU’s) 22 and 23. These Game Management Units also include portions of the Cave Creek, Mesa, and Tonto Basin Ranger Districts. Five year average estimates of motorized big game retrieval in GMU’s 22 and 23 are 391 retrievals per year. Most motorized game retrieval involves a single trip with a vehicle (typically an ATV) within 200 yards of a road. Minimal impacts on vegetative ground cover and soil compaction are expected from motorized retrieval of big game. Based on the low number of trips required for big game retrieval, short distance needed for retrieval, and low number of OHV crossings of a site, motorized big game retrieval has minimal effects on water resource conditions.

[144] The difference between these numbers and those in the affected environment is due to differences in the miles of road included in the WCC and this analysis.

Motor Vehicle Use for Dispersed Camping

Dispersed motorized camping would have its greatest impacts at popular dispersed camping sites where short unauthorized routes provide access to the camping site. Impacts would be similar to those described for roads. Riparian areas are often popular dispersed campsites due to shade and access to water. Motorized dispersed camping in these sites impacts riparian areas both through the disturbance created by the route accessing the site and disturbance that occurs onsite from camping. Proximity of riparian areas to stream channels means a greater likelihood that impacts within the riparian area would be expressed in the channel as well. Improper disposal of human waste can also affect water quality.

Although motorized dispersed camping can have moderate impacts to watershed conditions at popular dispersed campsites; the limited extent of dispersed camping on a forest wide basis results in only minor impacts overall.

Motor Vehicle Use for Fuelwood Gathering

Motorized travel would cause localized impacts to soils, and some riparian areas and be most pronounced where motorized traffic occurred on wet soils. Most wood harvesting occurs on upland soils. Impacts to riparian areas would be minimal. Localized soil degradation particularly when soils are wet could include localized soil compaction, rutting, loss of vegetation cover, accelerated soil loss, and loss of soil productivity from cross-country travel. The extent of soil disturbance Forest-wide would be minimal.

Alternative B – Direct and Indirect Effects

Roads and Trails Designated for Motor Vehicle Use

Motorized routes for this alternative include those being proposed for designation (approximately 3,060 miles), roads operated by other government jurisdictions such as the state or counties, and routes on private property. A total of approximately 3,605 miles of motorized routes were included within the analysis.

Effects to Water Quality

All factors used to assess motorized routes in the water resources assessment—road density, routes in close proximity to stream channels, routes in riparian areas, number of stream crossings—and factors used to assess motorized routes in the soils assessment—routes or areas with moderate and high erosion risk, routes and areas with low to moderate soil strength, and routes or areas with impaired or unsatisfactory soils—are reduced in scale from the existing condition in this alternative. The result would likely be a small reduction in overall sediment delivered to stream channels within the forest and a small improvement in water quality.

Effects to Riparian Areas

The effect of this alternative on a forest wide basis is a substantial decrease in miles of roads within riparian areas, in the number of crossings of perennial streams, and in the number of crossings of intermittent and ephemeral channels. On an overall basis these changes represent almost a forty-three percent decrease in road mileage within riparian areas, a forty-seven percent decrease in road crossings of perennial streams, and a forty-two percent decrease in number of crossings of intermittent and ephemeral channels. Road density in riparian areas declines from 3.6 miles per square mile under existing conditions to 2.1 miles per square mile under Alternative B. In terms of the WCC attribute rating for road density the difference in density would improve the rating from poor to fair.

Effects to Watershed Condition

Table 163 displays road density by ranger district, along with changes from existing conditions.

Table 163. Route Density for Alternative B by Ranger District

Ranger District	Road (miles)	Change from Existing	Density (miles/sq miles)	Change from Existing
Cave Creek	449.8	-526.0	0.47	-0.55
Globe	736.3	-293.3	1.00	-0.40
Mesa	386.6	-388.5	0.56	-0.56
Payson	701.9	-320.2	0.97	-0.44
Pleasant Valley	618.5	-565.1	0.91	-0.83
Tonto Basin	711.9	-346.2	0.85	-0.41
Total	**3,605.0**	**-2439.2**	**0.78**	**-0.53**

Road density decreases to less than one mile per square mile on all districts except Globe. On a forest wide basis road density also decreases to less than one mile per square mile. A density of less than one mile would result in a road density attribute rating of good when the WCC Technical guide criteria are applied. Route density in the Globe District remains in the fair category although density nearly achieves a good rating.

The net effect of this alternative on a forest wide basis is a substantial decrease in miles of roads within a 300-foot buffer of intermittent and ephemeral streams, perennial streams, lakes, and impaired water bodies. Changes from existing conditions include a forty-six percent decrease in miles of roads within the buffer distance of perennial streams, a forty-two percent decrease in miles of roads within the 300-foot buffer of intermittent and ephemeral channels, and a thirty-four percent decrease in road mileage within 300 feet of impaired water bodies.

Proximity of routes to water is reduced by nearly forty-two percent from existing conditions in this alternative. On a forest wide basis the proximity to water attribute rating would remain in the fair category. To achieve a good rating for this attribute the percent of streams in close proximity to motorized routes would have to drop below 10 percent. Attribute ratings of good would be achieved in the Cave Creek, Mesa, and Tonto Basin Districts. These ratings would not apply until decommissioning of routes identified for this activity has been completed. In some instances site specific environmental analysis will be required before decommissioning can occur.

Improvement in these attributes ratings would result in improvement in the overall watershed condition rating for six watersheds on the Tonto National Forest once decommissioning of roads identified for this action is physically completed. Watersheds experiencing improvement in overall watershed condition are displayed in Figure 41.

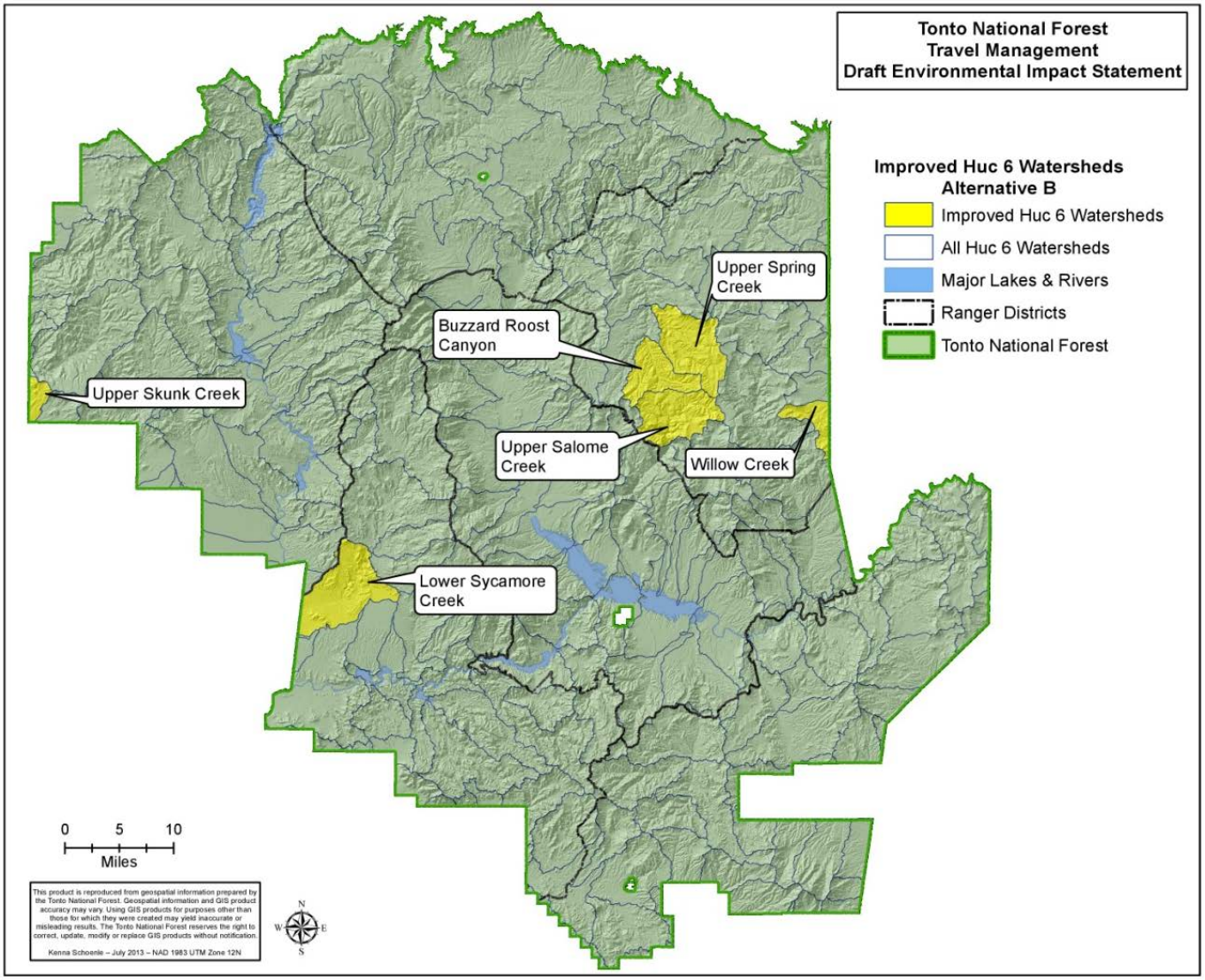

Figure 41. Map of Watersheds Improving a Condition Class Under Alternative B

Areas Designated for Motor Vehicle Use

In this alternative there are no OHV areas being designated. Eliminating motorized cross-country travel in areas where heavy OHV use occurs on the 700,000 acres currently open to cross-country travel on the Payson and Pleasant Valley ranger districts would allow disturbed areas to recover over time. Recovery in particularly fragile areas (areas with sensitive or erodible soils, or slow vegetative recovery such as the Sonoran Desert) may not return watershed conditions to pre-disturbance levels if changes in drainage features, such as gullies, have developed. In some areas active restoration efforts may be needed to reduce watershed impacts. Eliminating motorized cross-country travel would result in reduced impacts to watershed conditions from those under existing conditions.

Permit Zones

Five permit zones including, the existing Bulldog Canyon Permit Zone, encompass about 236 square miles and require users to obtain a special use permit to access about 317 miles of roads and motorized trails in these zones. Vehicles would be required to stay on designated roads and motorized trails.

Unauthorized use of designated roads and trails is currently occurring in these areas. Improved compliance in these areas has the potential to reduce the proliferation of unauthorized routes that is occurring in nearby non permit areas. Designating additional permit zones may also reduce or eliminate the proliferation of new unauthorized routes, which may provide for some recovery of watershed conditions through improved vegetative ground cover and reduced soil compaction.

Motor Vehicle Use for Big Game Retrieval

Motorized cross-country travel for big game retrieval would not be permitted in this alternative. Based on the small number of trips required for big game retrieval, short distance needed for retrieval, and low number of OHV crossings of a site, motorized big game retrieval would have minimal effects on water resource conditions and there would be a negligible improvement from the No Action Alternative.

Motor Vehicle Use for Dispersed Camping

Motorized dispersed camping would be limited to designated dispersed sites that are accessible by a designated road or motorized trail. Approximately 65 acres of these sites have been inventoried within the forest. The small overall area affected by this activity results in negligible impact on watersheds and the net effect would be a negligible reduction in impacts compared to the current condition.

Motor Vehicle Use for Fuelwood Gathering

Fuelwood gathering for personal use would be permitted within 300 feet of a designated road or motorized trail within a woodcutting permit area. Fuelwood gathering would be permitted on 132,568 acres in this alternative. The area open to fuel wood gathering is reduced substantially from the 1,346,000 acres open to fuelwood gathering under the No Action Alternative.

The smaller area available for gathering has the potential for watershed impacts. However, fuelwood gathering is concentrated in a smaller area than is currently permitted. Watershed impacts such as loss of vegetative ground cover and compaction would be greater in the smaller area of concentrated use than in the widespread area open to fuelwood gathering in the No Action Alternative. The net effect would likely be little difference in watershed impacts between the alternatives.

Alternative C – Direct and Indirect Effects

Roads and Trails Designated for Motor Vehicle Use

Motorized routes for this alternative include those being proposed for designation (approximately 4,230 miles), roads operated by other government jurisdictions such as the state or counties, and routes on private property. A total of approximately 4,724 miles of motorized routes were included within the analysis.

Effects to Water Quality

This alternative also results in a reduction in all factors used to assess water resources and soils impacts from those under the existing conditions except for acres open for big game retrieval using a motor vehicle. The scale of reduction is not as great as that under Alternative B. Reduction in sediment yield and improvement in water quality would be less than that likely under Alternative B.

Effects to Riparian Areas

This alternative reduces miles of roads within riparian areas, and the number of road stream crossings. On an overall basis these changes represent a twenty-five percent decrease in road mileage within riparian areas, a thirty-one percent decrease in road crossings of perennial streams, and a twenty-three percent decrease in the number of crossings of intermittent and ephemeral channels. The decrease in miles of roads in riparian areas reduces road density in these areas to 2.7 miles per square mile. If the criteria for the road density attribute from the WCC Technical Guide are applied to road density in riparian areas this density would remain in the poor category.

Effects to Watershed Condition

Table 164 displays road density by ranger district, along with changes from existing conditions.

Table 164. Route Density for Alternative C by Ranger District

Ranger District	Road (miles)	Change From Existing	Density (miles/Sq. mile)	Change from Existing
Cave Creek	694	-282.2	0.73	-0.30
Globe	827	-202.6	1.12	-0.28
Mesa	569	-206.5	0.82	-0.30
Payson	862	-159.9	1.19	-0.22
Pleasant Valley	862	-321.7	1.26	-0.47
Tonto Basin	911	-147.5	1.08	-0.18
Total	**4,724**	**-1,320.2**	**1.02**	**-0.28**

This alternative reduces route density on all ranger districts and reduces route density on a forest wide basis by more than one quarter mile per square mile (22 percent). Route density decreases to less than one mile per square mile on the Cave Creek and Mesa ranger districts in this alternative. Forest wide, road density decreases to slightly more than one mile per square mile. Road densities between 1 to 2.4 miles per square mile result in a rating of fair when the WCC

Technical guide criteria for this attribute are applied. Route densities in the Cave Creek and Mesa districts would achieve a good rating for this attribute.

Proximity of routes to water is reduced from 17.6 percent of stream miles affected by motorized routes under existing conditions to 13.6 percent of stream miles in this alternative. Forest wide, the proximity to water attribute rating from the WCC Technical Guide (U.S Forest Service, 2011) would remain in the fair category because the percent of streams affected by roads is more than 10 percent but not greater than 25 percent. These ratings assume that decommissioning has been accomplished on routes identified for this action. Site specific environmental analysis will be required before decommissioning can occur.

This alternative reduces miles of roads within a 300-foot buffer of perennial streams, ephemeral and intermittent streams, lakes, and impaired water bodies. Changes from existing conditions include a twenty-six percent decrease in miles of roads within the buffer distance of perennial streams, a twenty-three percent decrease in miles of roads within the buffer of intermittent and ephemeral channels, a twenty-three percent decrease in miles of roads within a 300 foot buffer of the six lakes on the forest, and a seventeen percent decrease in road mileage within 300 feet of impaired water bodies.

Improvement in road density and proximity to stream channel attribute ratings in this alternative from the existing conditions would result in an improvement in the overall watershed rating of two HUC 12 watersheds. The improvement is dependent on completing route decommissioning work identified in this alternative. Route decommissioning would require separate environmental analyses. These watersheds are shown in Figure 42.

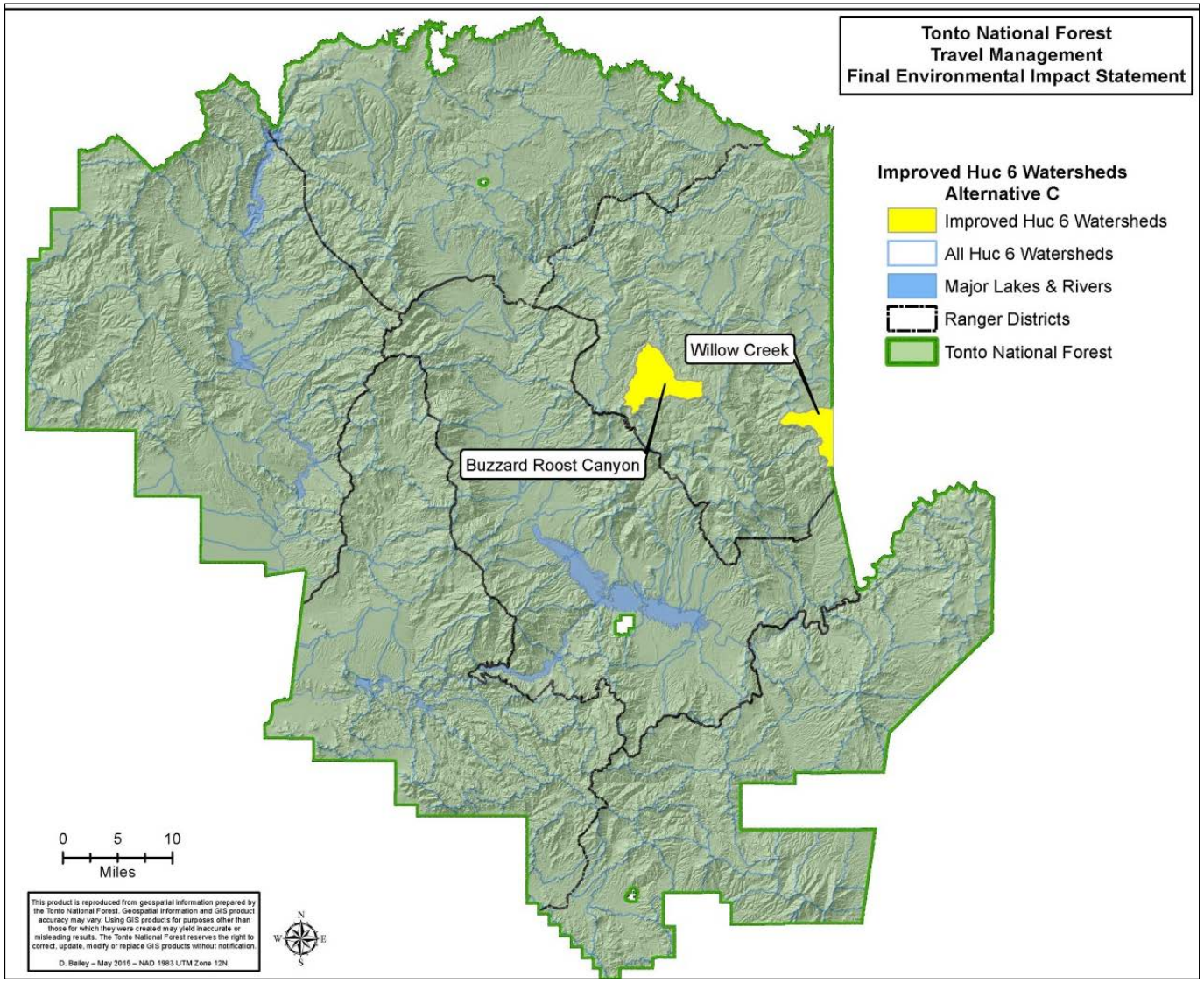

Figure 42. Watersheds Improving a Condition Class Under Alternative C

Areas designated for Motor Vehicle Use

This alternative designates approximately 2,090 acres of areas for motor vehicle use. The Bartlett and Roosevelt Lake OHV areas would permit motorized off route use in sections between portions of the variable water surface and the high water mark of these lakes. These areas are primarily unvegetated or vegetated with annual species that pioneer these areas when water levels drop. The potential for small amounts of contamination from spills of fuels and other vehicle fluids exist due to proximity to these lakes. Disturbance to annual vegetation and compaction of soils would reduce ground cover and increase runoff and erosion. Disturbance to armor layers that protect soil surfaces would make disturbed areas more susceptible to erosion from rainfall and wave action. Although motor vehicle use could cause rutting of the surface, concentrating some runoff and increasing erosion minimally, the overall effect is likely negligible.

The Sycamore OHV Area includes an ephemeral wash that is tributary to Lower Sycamore Creek. Forest Road 403 lies within the wash bottom until it joins Sycamore Creek. Approximately 4.5 miles of the channel of Sycamore Creek, extending upstream from the boundary with Fort McDowell Indian Reservation, are included in the area. This OHV area includes uplands adjacent to the ephemeral wash that is tributary to Sycamore Creek and uplands adjacent to Sycamore Creek. The ephemeral wash is characterized by a multiple channel bed (braided channel) consisting of unconsolidated sand and gravel, and xeric riparian vegetation consisting primarily of mesquite that occupies terrace and floodplain features. Travel in wash bottoms has a small potential to introduce contaminants to ground and surface waters from spills and leaks of fuels and oils. Travel in wash bottoms can also damage riparian vegetation, particularly younger age classes. Sycamore Creek is characterized as an intermittent system that flows following significant winter precipitation. Much of the stream flow that reaches the alluvial basin, which begins near the upper end of the OHV area, infiltrates into the bed of the creek (Thomsen and Schumann, 1968). The channel through the alluvial basin is dry most of the year. OHV impacts in the area include a small potential to introduce contaminants to ground and surface waters from spill of fuels and oils. OHV impacts can also disturb armor layers of channel bottom material that form during periods of high flow making the channel more susceptible to erosion. OHV travel in uplands can remove vegetative ground cover, and cause compaction and rutting of soils. Increased runoff from denuded and compacted soils can increase erosion and sediment delivery to stream channels and wash bottoms.

Golf Course OHV Area is a relatively small flat upland area of 17 acres just south of Superior. Watershed impacts at this site would be small and would consist primarily of increased runoff and erosion from compaction and rutting of soils and reduced vegetative ground cover.

Four tot lots are proposed. One is located in the Rolls Permit Zone (six acres) one in the Sycamore OHV area (three acres) and two small sites (total of less than three acres) in the Desert Vista area of the Cave Creek Ranger District. Due to their small size these areas would have minimal watershed impacts other than local increases in runoff and erosion from compaction of soils and removal of vegetative ground cover at the sites themselves.

Permit Zones

Three permit zones in addition to the existing Bulldog Canyon Permit Zone would be created in this alternative. These would include the Desert Vista, Rolls, and St Claire permit zones. They would encompass about 117,000 acres. Three hundred and twenty-six miles of motorized routes are designated in permit zones under this alternative.

Unauthorized use of designated roads and trails is currently occurring in these areas. Improved compliance in these areas has the potential to reduce the proliferation of unauthorized routes that is occurring in nearby non permit areas. Designating additional permit zones may also reduce or eliminate the proliferation of new unauthorized routes, which may provide for some recovery of watershed conditions through improved vegetative ground cover and reduced soil compaction.

Motor Vehicle Use for Big Game Retrieval

Approximately 1,575,400 acres would be open for motorized retrieval of elk and bear. Data provided by Arizona Game and Fish Department suggests there are approximately 210 motorized retrievals of elk and bear per year on the Tonto National Forest. Most motorized game retrieval also involves a single trip with a vehicle (typically an ATV). Minimal impacts on vegetative ground cover and soil compaction are expected from motorized retrieval of big game. The effect of motorized retrieval of elk and bear is small due to the small number of animals retrieved using a vehicle and the generally short distance of retrievals. There would be a negligible change in impacts compared to the No Action Alternative.

Motor Vehicle Use for Dispersed Camping

This alternative would designate approximately 94 miles of motorized routes to provide access to 2,864 inventoried existing dispersed camping sites on the forest. These routes currently exist and their average length is 137 feet. Approximately 445 camping sites are located within riparian areas. On the basis of an average access route length of 137 feet per site approximately 11.5 miles of motorized routes exist to access these sites. Approximately 180 sites are located within 300 feet of perennial streams and 1100 sites are located within 300 feet of ephemeral and intermittent streams.

Although motorized dispersed camping can have moderate impacts to watershed conditions at popular dispersed campsites; the limited extent of dispersed camping on a forest wide basis results in only minor impacts overall.

Motor Vehicle Use for Fuelwood Gathering

This alternative would permit motorized fuelwood gathering within 300 feet of either side of a designated road or motorized trail within woodcutting permit areas. Approximately 165,000 acres would be open for motorized fuelwood gathering. This area is substantially less than the approximately 1,346,000 open under existing conditions but more than the 132,000 acres open under Alternative B.

The smaller area available for gathering has the potential for watershed impacts. However, fuelwood gathering is concentrated in a smaller area than is currently permitted. Watershed impacts such as loss of vegetative ground cover and compaction would be greater in the smaller area of concentrated use than in the widespread area open to fuelwood gathering in the No Action Alternative. The net effect would likely be little difference in watershed impacts between the alternatives.

Alternative D – Direct and Indirect Effects

Roads and Trails Designated for Motor Vehicle Use

Motorized routes for this alternative include those being proposed for designation (approximately 5,205 miles), roads operated by other government jurisdictions such as the state

or counties, and routes on private property. A total of approximately 5,760 miles of motorized routes were included within the analysis.

Effects to Water Quality

This alternative would result in small reductions in some factors, and small increases in some factors used to assess impacts to water resources and soils from those under existing conditions. There would be no in the area open for motorized dispersed camping, and personal use fuelwood gathering from existing condition and there would be an increase in the area open for big game retrieval using a motor vehicle. This alternative is likely to have little change in water quality from existing conditions.

Effects to Riparian Areas

The effect of this alternative in comparison with existing conditions on a forest wide basis is a seven percent decrease in miles of motorized routes within riparian areas, a nine percent decrease in number of perennial stream crossings, and a six percent decrease in the number of crossings of intermittent and ephemeral streams. In Alternative D road density in riparian areas is 3.4 miles per square mile. This density is slightly less than existing condition but greater than Alternatives B and C. The road density in riparian areas would remain in the poor category if the road density attribute from the Watershed Condition Classification Technical Guide (U.S. Forest Service, 2011) is applied to road density in riparian areas.

Effects to Watershed Condition

Table 165 displays road density by ranger district, along with changes from existing conditions.

Table 165. Route Density for Alternative D by Ranger District

Ranger District	Route (miles)	Change from Existing	Density (miles/sq. mile)	Change from Existing
Cave Creek	856.4	-119.3	0.90	-0.12
Globe	1,024.9	-4.7	1.39	-0.01
Mesa	698.8	-76.3	1.01	-0.11
Payson	1,002.8	-19.3	1.39	-0.03
Pleasant Valley	1,140.5	-43.1	1.67	-0.06
Tonto Basin	1,035.2	-22.9	1.23	-0.03
Total	**5,758.7**	**-285.5**	**1.24**	**-0.06**

Little change in road density occurs in this alternative from existing conditions. Forest wide, road density decreases from 1.25 to 1.24 miles per square mile. Applying the road density attribute rating criteria from the WCC Technical Guide (U.S. Forest Service, 2011) results in a rating of fair which would be unchanged from existing conditions. Small decreases in route density would occur in all districts. The road density attribute rating would improve to good in the Cave Creek district (density is less than 1 mile per square mile) but would remain unchanged from existing conditions in the other districts.

Proximity of routes to water would be reduced by five percent from existing conditions in this alternative. On a forest wide basis the proximity to water attribute rating from the WCC

Technical Guide (U.S. Forest Service, 2011) would remain in the fair category and be unchanged from existing conditions. Attribute ratings of fair would remain unchanged for all districts.

This alternative results in small decreases in motorized routes from existing conditions within a 300-foot buffer of perennial streams (9 percent), intermittent and ephemeral streams (5 percent), lakes (1 percent) and impaired water bodies (2 percent).

Density of motorized routes decreases in seventy-six HUC 12 watersheds but increases in seven watersheds. Although the density of motorized routes declines in 76 watersheds the change in density is sufficient to improve the attribute rating for road density in only five watersheds.

Motorized route mileage in close proximity to water decreases in 65 HUC 12 watersheds but increases in 6 watersheds. Although proximity of roads to streams is reduced from existing conditions in 65 watersheds the change is sufficient to improve the proximity to streams attribute rating in only four watersheds.

Areas Designated for Motor Vehicle Use

The areas designated are similar to those in Alternative C; however, the areas associated with Bartlett and Roosevelt Lakes are larger in this alternative. The effects will be nearly the same.

Permit Zones

The only permitted OHV Zone would be the existing Bulldog Canyon OHV Permit Zone on the Mesa Ranger District. The effects would be the same as in the No Action Alternative.

Motor Vehicle Use for Big Game Retrieval

Motorized retrieval of elk, mule deer, white tail deer, and bear would be limited to areas within one mile of either side of designated motorized routes under this alternative. Approximately 2,068,200 acres would be open for motorized big game retrieval. This area is much greater than the 700,000 acres currently open for retrieval. Data provided by Arizona Game and Fish Department suggests approximately 550 motorized retrievals could be expected for these game species under this alternative. Negligible impacts to watershed conditions would be expected due to the small number of motorized retrievals and the large area available for these retrievals.

Motor Vehicle Use for Dispersed Camping

This alternative would allow motorized dispersed camping up to 300 feet on both sides of designated roads and motorized trails. Approximately 336,000 acres would be available for this activity, which is slightly less than half under the existing condition. Although motorized dispersed camping can have moderate effects to watershed conditions at popular dispersed campsites; the limited extent of dispersed camping on a forest wide basis results in only minor effects overall.

Motor Vehicle Use for Fuelwood Gathering

The area of for fuelwood gathering is the same as the No Action. The effects would be the same.

Summary of Effects for All Alternatives

In summary, Alternative B would result in significant beneficial effects to watershed conditions based on reduced road density, and reduced percent of stream miles in close proximity to roads. Although the attribute rating criteria from the WCC Technical Guide apply to watersheds rather than ranger districts or forests as a whole, the road density rating for the forest in this alternative

would improve to a good rating if the criteria are applied on a forestwide basis. The rating for the proximity to water attribute in this alternative also comes close to receiving a good rating on a forestwide basis. The proximity to water rating does improve to good in three ranger districts. Although Alternative C would have beneficial effects on watershed conditions, these effects would not be significant due to the smaller scale of reduction in motorized route miles. Effects from Alternative D would be little changed from those under existing conditions and would not be significant.

Cumulative Effects for All Alternatives

Vegetation and fuels management are planned to have a net, long-term improvement to soil and water conditions although there may be short-term negative impacts during implementation. Mitigation measures and Best Management Practices are designed to mitigate any short-term impacts that may occur from project implementation. Livestock grazing activities (past and ongoing) have impacted riparian and water resource conditions but re-authorizations of grazing permits are designed to minimize impacts to these resources.

Route realignment, reconstruction, or decommissioning may occur with future projects and access through or required by other land jurisdictions may impact the Forest. The extent of these changes cannot be predicted or quantified. Future changes to routes would be planned and mitigated to reduce impacts.

Urban development and interface growth would continue on private lands. These would not directly affect National Forest land, but runoff from urban development can cause an increase in erosion and affect water quality on downstream NFS lands.

Future mineral exploration and development, land exchanges, and utility construction are either planned or likely to occur. Disturbance can be relatively minor in some cases such as small utility constructions, but in mineral exploration and development disturbance can be extensive.

Visitor access to The Rolls, St. Claire, and Sycamore sites may be restricted in the future. Restrictions may prevent continued proliferation of unauthorized routes and prevent additional impacts to soil and watershed conditions.

In response to air quality concerns, city/town, county, and state restrictions are in place for use of recreational vehicles on unpaved roads and vacant lots in regions of Maricopa and Pinal counties that are failing to attain Federal Air Quality Health Standards set by the Environmental Protection Agency. Measures implemented on NFS lands to reduce air quality impacts such as road paving, hardening of OHV parking areas, enforcing speed limits on unsurfaced roads, and placing limits on user numbers may also reduce watershed impacts.

A number of major road construction projects are planned by other government entities well into the future. Road construction can have short term impacts on water quality, but impacts are minimized through implementation of BMPs. Over the long term, additional paved surfaces can increase runoff, erosion, and introduction of contaminants into waterways. Construction of the Tonto Creek Bridge may result in reduced watershed impacts, if one or more of the current low water crossings are closed and the site is allowed to revegetate.

Soil Resources

Soil resources and their existing conditions will be analyzed Forest-wide by ranger district. Soil erosivity as measured by the Universal Soil Loss Equation (USLE) “K” factor, soil strength, and

road density will be units of measure to analyze effects associated with roads. Soil erosion from roads and motorized trails will be estimated as average annual tons of sediment delivered to stream channels on a forest wide basis using the Water Erosion Prediction Project (WEPP) computer model (U.S. Forest Service, 2000). Soil Condition is not considered in the impact analysis because the subject matter expert who was most familiar with the derivation of the soil condition classes is no longer with the Tonto National Forest. Additional work to model soil erosion has been conducted to improve the analysis of the effects on soils from motorized routes.

Affected Environment

The ecological uniqueness of the Tonto National Forest is displayed from Sonoran Desert (hot, dry) at the lowest elevations to mixed conifer forests (cool, moist) at the highest elevations. Sonoran Desert communities, pinyon-juniper woodlands, chaparral, semidesert grasslands, and ponderosa pine forests occupy the largest extent in the Forest while mixed conifer forests, wetland/cienega, and riparian forests are the least extensive on the Forest (U.S. Forest Service, 2007). These life zones form numerous ecological types.

Due to the wide range of elevations, slope, and geological types, existing soils and vegetation are quite variable. The majority of the soils classified fall into Aridisols, Alfisols, and Inceptisols followed by a fairly large amount of Mollisols where past and present herbaceous vegetative cover developed organic surfaces. Poorly developed Entisols occur along drainages. These riparian areas have some of the highest levels of impacts associated with OHV travel.

Most of the soils on the Forest formed in sedimentary rocks including sandstone, limestone, and conglomerate and are generally medium and fine textured throughout their profiles. Soil depths for these soils are generally shallow and moderately deep in most upland positions, but are deeper in low-lying areas. In areas of the Forest not covered by sedimentary rocks a large number of soils are derived from granite. These soils tend to be medium to coarse textured and highly erosive. Recently developed soils (Entisols) are found in fluvial stream systems and are generally coarse textured and rocky throughout their profile.

Precise acres of soils directly impacted from motorized vehicle use are not known and occur throughout the Forest but have been observed to be especially widespread in Sonoran Desert and riparian areas.

The forces generated by wheeled or tracked vehicles repeatedly traveling over the soil can chew up, destroy, and remove the protective layer of vegetation, duff, and biological crusts, exposing and detaching bare soil susceptible to accelerated erosion.

Erosion Risk

Surface-erosion problems are generally worse in highly erodible terrain (soils with High Erosion Risks); particularly landscapes underlain by granite or highly fractured rocks. Roads located on these soils are also primary sediment sources. Soils with moderate erosion are also at risk for accelerated erosion and sediment delivery but to a lesser magnitude than soils with severe erosion hazard. Approximately 70 percent of the Forest is underlain by soils with moderate to high erosion risk.[145]

[145] Miles of roads not rated for erosion risk are roads on private lands (that were not rated in the TES or TEUI), roads where TEUI interpretation of the Soil Mapping Unit is in progress, and roads on rock outcrops, badlands/rock outcrops, lakes, rivers, riverwashes, mines, etc.

When OHVs travel on steep slopes, they often do so by traveling straight up or down a slope or nearly so to optimize the stability of the vehicle and reduce its chances for rollover. When tires spin and displace soil, tracks are created that may rapidly expand due to the mechanical loosening of the soil and its displacement. These sites are more prone to erosion and sediment delivery from rainfall runoff than adjacent undisturbed sites. Figure 43 displays areas with moderate to high erosion risk on the Forest.

Soil Strength

Soils with low bearing strength are especially subject to compaction and rutting, especially when soils are wet. Soils with moderate strength are subject to compaction but to a lesser degree than those with low strength. Approximately forty-six percent of the forest is covered by soils that have low to moderate bearing strength when wet.[146] Ruts are easily created on these soils and on roads that traverse these soils. Ruts created on the driving surface can concentrate water flow that can create gullies on both the road and adjoining land.

Road Density

Sediment production is positively correlated with road length (Ried and Dunne, 1984). Therefore road density can be used as a measure to assess the impacts of roads on erosion. The Tonto National Forest currently has a road density of 1.16 miles per square mile (1.31 miles per square mile when inventoried unauthorized motorized routes are included) of all roads on all lands within the Forest proclamation boundary (includes roads on private lands, state and county highways, and local roads).

The Forest Service Watershed Condition classification Technical Guide (U.S. Forest Service, 2011b) recommends a density of 1 mile per square mile but stresses that "… increasing road density has been correlated with increasing sediment yield in many studies nationwide. However, the true set of environmental conditions that produce sedimentation are complex, unmeasured, or unknown. Numerous other factors including soils, geology, slope, and road condition also influence sediment yield. The result is that road density is not a perfect predictor of the impacts to sediment yield. While there are no absolute thresholds for acceptable road densities, generally fewer miles of roads/mi2 will have a lighter impact."

Sediment Yield

Sediment Yield was modeled at a broad scale on a forest wide basis. Estimates of the range in sediment delivered to stream channels across buffer distances between roads and stream channels and at road crossings. Total sediment delivered to stream channels currently ranges from 38,270-42,990 tons per year.

Unauthorized Routes

Unauthorized routes present a special problem for soil conditions for several reasons. The roads are not properly engineered, do not have proper drainage and erosion control built into them, often occur on steep, erosive soil, and many are located in sensitive areas such as riparian areas. A large number of routes in the Desert Vista and Lower Sycamore Creek areas have known erosion scars. These routes tend to cause more soil erosion than engineered roads. Assuming an

[146] Ibid.

average width of 12 feet, the 672[147] miles of inventoried unauthorized routes would result in removal of 977 acres of land from the productive land base. This represents 0.03 percent of lands within the Tonto National Forest.

[147] Up to sixty four miles of additional unauthorized routes (primarily single track routes) were recently inventoried by Tonto Recreation Alliance (TRAL). These routes were not included in the analysis except in Alternative C where some of the inventoried routes are incorporated into the proposed motorized route system. These routes are located primarily within the Desert Vista Permit Zone where numerous inventoried and uninventoried unauthorized routes exist. The effect of the recently inventoried routes on the forest wide soils assessment would be negligible.

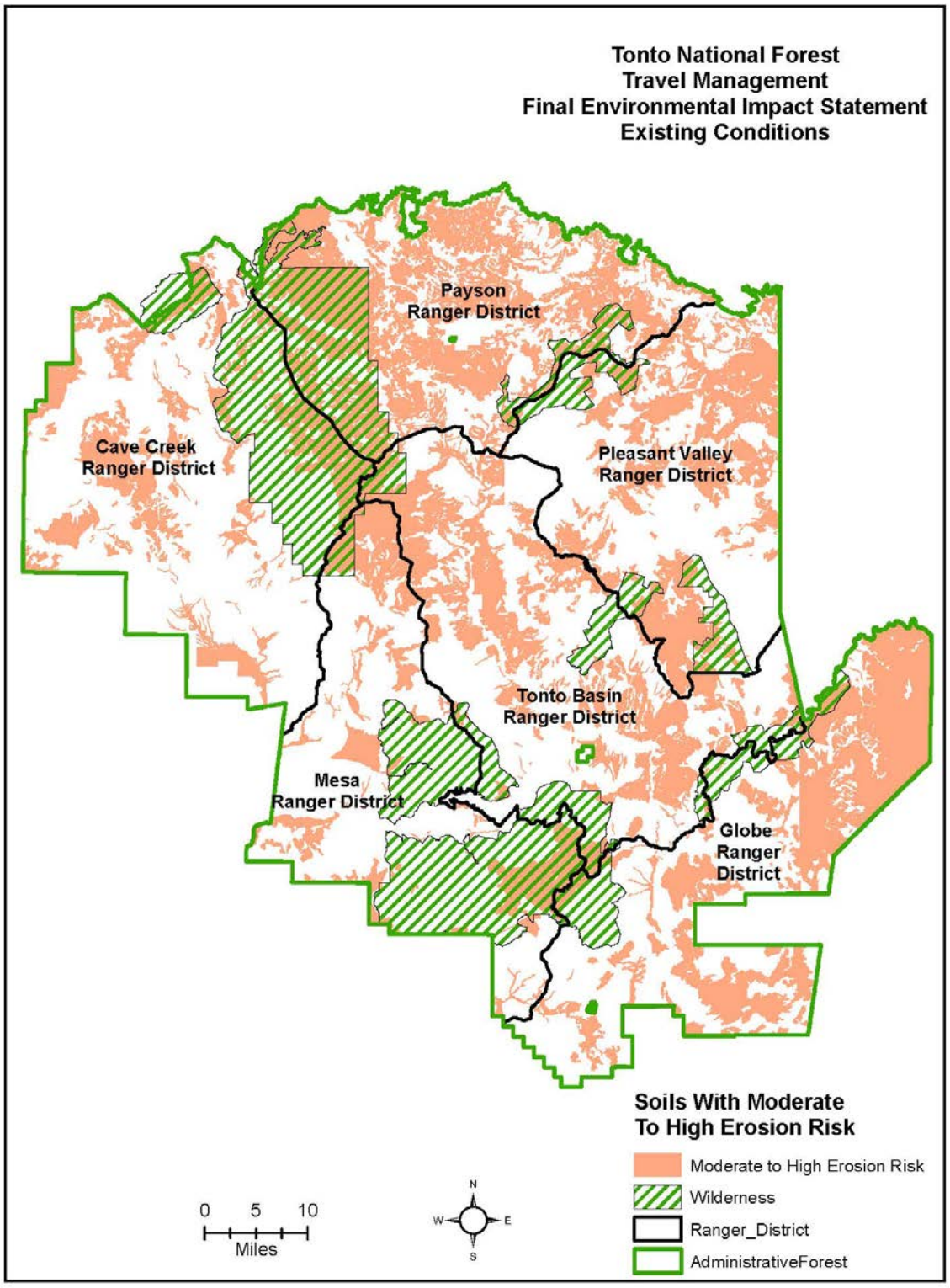

Figure 43. Map of Areas with Moderate to Soil Erosion Risk

Environmental Consequences

Alternative A – Direct and Indirect Effects

Roads and Trails Designated for Motor Vehicle Use

Currently there are no motorized trails. In this alternative, there would 2,307 miles of road maintained for high-clearance vehicles, 645 miles of road maintained for passenger vehicles, 2006 miles of roads open and currently used by the public (maintenance level unknown).

The No Action Alternative presents the environmental effects associated with continued motorized use of unauthorized routes. There are currently 672 inventoried miles. Many additional miles of uninventoried unauthorized routes also exist on the Forest. It is likely that public use of unauthorized routes would continue and that the number and miles of these routes may increase in number. The existence and proliferation of unauthorized routes will have negative effects on soil condition.

Motorized Cross-country Travel

Under the No Action Alternative, unrestricted, cross-country travel could continue to adversely affect soil condition and soil productivity on the 704,000 acres of the Payson and Pleasant Valley ranger districts where cross-country travel is not prohibited by existing closure.

About 52 percent of the portions of the Payson and Pleasant Valley ranger districts that are open to cross-country travel contain soils with moderate and high erosion risks and almost 70 percent of the open areas contain soils with low and moderate strength. These soils are vulnerable to motorized vehicle travel. Motorized vehicle use could result in accelerated soil erosion on areas where repeated OHV use occurs and soils have moderate and high erosion risk.

Soil conditions on the areas open to cross-country travel contain about 25 percent to 30 percent of soils considered to be unsatisfactory or impaired from past disturbances. Continued repeated cross-country motorized travel on these soils would cause accelerated erosion and contribute to reduced long-term soil productivity and vegetative cover.

There are several areas where unauthorized concentrated OHV use is occurring. Approximately 2,500 acres have been disturbed, primarily in the Desert Vista area of the Cave Creek Ranger District and the Lower Sycamore area of the Mesa Ranger District. Resource damage has occurred in these areas including loss of vegetation, rutting of slopes, and gully erosion. If enforcement is not adequate then these areas would likely expand, causing further soil damage.

Permit Zones

The existing Bulldog Canyon OHV Permit Zone would continue to require a gate combination code and a free permit from the Forest. It is likely that there is little difference between soil conditions within and outside of this Permit Zone.

Motor Vehicle Use for Big Game Retrieval

Under the No Action Alternative, continued, unrestricted game retrieval would occur only in the areas of the Payson and Pleasant Valley ranger districts, unless otherwise posted. Minimal impacts on vegetative ground cover and soil compaction are expected from motorized retrieval of big game. Based on the low number of trips required for big game retrieval, short distance

needed for retrieval, and low number of OHV crossings of a site, motorized big game retrieval has minimal effects on soil conditions.

Motor Vehicle Use for Dispersed Camping

For this alternative, continued, unrestricted motorized, dispersed camping would occur on the Payson and Pleasant Valley ranger districts where driving off road is permitted by the Forest Plan and in the very limited areas of the southern four districts where off road driving is posted open. In these areas, motorized travel would continue to cause localized impacts to soils, but would be restricted to areas very minor in extent.

Although very limited in extent, motorized dispersed camping could have adverse effects to soil resources where roads provide access to sensitive soils and riparian areas. On wet soils where repeated cross-country travel continues or even where single passes occur, soil damage has been observed and would continue under this alternative. Dispersed camping has the direct effect of disturbing the vegetative ground cover, exposing bare soil, causing soil compaction and rutting on wet soils and causing accelerated sheet and rill erosion. Although motorized dispersed camping can have moderate impacts to soil conditions at popular dispersed campsites, the limited extent of dispersed camping on a forestwide basis results in only minor impacts overall.

Motor Vehicle Use for Fuelwood Gathering

Personal use fuelwood gathering and gathering of other forest products would continue on approximately 1.35 million acres under this alternative. Approximately 6,000 user days spent gathering fuelwood over this area in 2012 disperse a small number of users over a large area. Permit conditions that require fuelwood gatherers to use the same ingress and egress and to scatter slash over their tracks to reduce soil impacts. Permit conditions that do not authorize fuelwood gathering from January through March when soils are wet also prevent impacts to soils. Overall this activity has minimal effects on soil conditions.

All Action Alternatives – Direct and Indirect Effects

Roads and Trails Designated for Motor Vehicle Use

Under the action alternatives, motorcycle trails and ATV trails would be added to the system either by conversion of an unauthorized route or by changing the status of a system road. Alternative B proposes approximately 1,667 miles of motorized trails, Alternative C proposes approximately 2,341 miles, and Alternative D proposes approximately 1,513 miles. Motorized trails (both ATV and motorcycle) are likely to have slightly less of an impact on soil conditions than roads because of a smaller footprint. However, the differences are not measurable at the scale of this analysis; therefore, for the purpose of this assessment, roads, and motorized trails would be assumed to have similar impacts. Changes in administrative use of roads and restrictions on season of use are expected to have a negligible effect on soil conditions. The setting of roads has a much larger impact on soils than the type of use. Therefore, changes in allowable access (i.e., from a closed or open road to an administrative use road or season of use) were not considered in assessing effects to soils. However, it is acknowledged that seasonal restrictions on roads and motorized trails in the Pleasant Valley and Payson Ranger Districts during winter months when the ground is wet will mitigate some effects of roads on soils.

Soil Parameters

Of the action alternatives (Alternatives B, C, and D), Alternative B has the fewest miles and number of roads occurring on sensitive soils (moderate and high erosion risk, low soil strength,).

Alternative D has the most miles occurring on sensitive soils. Alternative A has more miles of system roads containing sensitive soils than Alternative D when inventoried unauthorized routes are included. Alternative A also has many miles of additional but uninventoried unauthorized routes that impact sensitive soils. Overall Alternative B has the lowest impact on sensitive soils. It is likely that Alternative A has the greatest impact. Alternative D is similar to Alternative A except that improved enforcement should reduce use on uninventoried unauthorized routes. Alternative C is intermediate between Alternatives B and D.

Sediment Delivered to Stream Channels

Alternative A produces the greatest amount of sediment. Alternative B produces approximately 50 percent less sediment than Alternative A, Alternative C produces slightly more than Alternative B, while Alternative D produces approximately 24 percent less than Alternative A. Although the number of road miles and stream crossings remains relatively constant under all Alternatives (when decommissioned, open, and administrative routes are included), sediment delivery differs because decommissioned and administrative use only roads receive no or very limited administrative traffic resulting in less soil disturbance and less sediment delivery into connected streams. Under no-traffic conditions, roadbed and road ditches tend to revegetate resulting in greater protective surface cover that reduces water flow, erosion, and sediment delivery into connected streams. Over time, recovery of vegetation, soils, and channel crossings on roads designated as decommissioned would reduce sediment delivery below the estimates above. Greatest reductions would occur in Alternative B which would decommission the greatest number of roads (2,367 miles), followed by Alternative C (1,276 miles). The smallest reduction in sediment delivery in the long term would be from Alternative D which would decommission 201 miles of roads.

Road Density

The Tonto National Forest currently has a road density of 1.16 miles per square mile of all designated roads within the Forest boundary. When inventoried unauthorized routes (672 miles) are included, motorized route density increases to 1.31 miles per square mile on a forest wide basis. An unknown number and miles of uninventoried unauthorized routes also exist on the forest. The Forest Service Watershed Condition classification Technical Guide (USFS, 2010) recommends a density of less than one mile per square mile but stresses that "… increasing road density has been correlated with increasing sediment yield in many studies nationwide. However, the true set of environmental conditions that produce sedimentation are complex, unmeasured, or unknown. Numerous other factors including soils, geology, slope, and road condition also influence sediment yield. The result is that road density is not a perfect predictor of the impacts to sediment yield. While there are no absolute thresholds for acceptable road densities, generally fewer miles of roads/mi2 will have a lighter impact." Under the various alternatives the total length and density of roads ranges from 3,607 miles (0.78 miles per mile squared) under Alternative B to 6,046 miles (1.31 miles per mile squared) under Alternative A (includes inventoried unauthorized routes). Alternative, B would have a smaller impact on soil resources than the other alternatives because of the lowest density of roads. Alternative D has the greatest density of designated motorized routes at (1.24 miles per mile squared). If the known unauthorized routes that occur under Alternative A (at least 672 miles) are considered, Alternative A would have a greater density of around 1.31 miles per mile squared.

Areas Designated for Motor Vehicle Use

Under Alternative C four areas (OHV areas) would be designated for motorized cross-country travel and four small "tot lots" would be designated on a total of 2,092 acres. The OHV areas

would include areas below the high water line of Bartlett (3 separate locations totaling 177 acres) and Roosevelt (11 separate locations totaling 554 acres) lakes. Two other areas, Sycamore OHV Area (1,332 acres) on the Mesa Ranger District and the Golf Course OHV Area (17.3 acres) on the Globe Ranger District would also be designated. These areas have been heavily impacted by current and past uncontrolled OHV use. The four small tot lots would occupy a total of 11.3 acres and are also in areas that have received heavy OHV use. The direct effect would be continued erosion and loss of vegetation in these areas. The proposed OHV areas at Bartlett and Roosevelt Lakes are within the "bathtub ring" of these reservoirs. Vegetation at these sites is limited to annual species that pioneer this habitat when water levels are below the conservation pool. Approximately one-fourth of the proposed Sycamore OHV area has steep slopes on erosive soil. The other areas are considerably flatter with a lower risk of erosion. An indirect effect may be less off-road vehicle use in other parts of the Forest as OHV users may spend more time in designated areas. The net result of this alternative would likely be heavy impacts to the OHV areas which represent less than 0.1 percent of the Forest.

Alternative D, would designate the same tot lots as Alternative C. The two areas below the high water lines of Bartlett and Roosevelt Lakes would be greater in this alternative (922 acres and 4,503 acres for Bartlett and Roosevelt Lakes respectively) than in Alternative C. The other two areas (Sycamore and Golf Course OHV Areas) are similar in size to the areas designated in Alternative C. Unrestricted cross-country travel would be authorized on 6,783 acres, or less than 0.25 percent of the Forest under this alternative. Impacts would be similar to those in Alternative C except that more acres would be impacted.

Under Alternative B, motorized cross-country travel would be completely eliminated and would not contribute to degradation of erodible, unsatisfactory, or impaired soils. Soil productivity and functions would improve on impacted soils in both the short-term and the long-term. Under Alternative B the designated motorized cross-country areas, heavily impacted in the past, would be allowed to recover. The net result of this alternative would be to greatly reduce impacts to the four designated areas.

Overall, Alternatives C and D would reduce impacts to soils from motorized cross-country traffic forest-wide while allowing heavy impacts to the Designated Areas. Impacts from Alternative C would be less than those from Alternative D due to the reduced size of the designated areas open for cross country travel. Alternative B would reduce impacts both to the designated areas, and on a forest wide basis.

The overall adverse impacts to soil resources would be low to moderate in most places. Alternative B would result in beneficial impacts to soil resources by allowing existing disturbed areas to recover. Alternatives C and D would have negligible differences in impacts from Alternative A since existing unauthorized heavy OHV use areas would be converted into authorized areas. These alternatives should benefit soil resources by preventing proliferation of cross country travel into other unauthorized areas.

Permit Zones

Under Alternative B four permit zones in addition to the existing Bulldog Canyon Permit Zone would be established. Total area included within permit zones would be 150,924 acres. Alternative C would establish three Permit Zones in addition to the existing Bulldog Canyon Permit Zone. Total area included within Permit Zones would be 116,798 acres. Under alternative D only the existing Bulldog Canyon Permit Zone would continue to be managed as a permit zones. Total area in this permit zones is 34,720 acres. These zones restrict motorized public

access to 317 miles of roads and motorized trails in Alternative B, 350 miles of roads and motorized trails in Alternative C, and 47 miles of roads and motorized trails in Alternative D. Motorized users would need to acquire a permit from the Forest to access these zones. The impacts to soils within these areas would be similar to the impacts to soils outside of these permit zones where cross-country travel would be restricted.

Motor Vehicle Use for Big Game Retrieval

Motorized, big game retrieval would not be permitted off designated roads and motorized trails in Alternative B; but could occur within one mile of either side of designated roads and motorized trails under Alternatives C and D. Under Alternative C, motorized cross country retrieval of elk and bear would be allowed within one mile of either side of designated roads and motorized trails and would permit retrieval on approximately 1,575,400 acres. Under Alternative D, motorized cross country retrieval of mule and white tail deer as well as bear and elk would be authorized within one mile of either side of designated roads and motorized trails as well and would permit motorized retrieval on approximately 2,067,000 acres. The effects of game retrieval would be similar under Alternatives C and D except that a larger area would be affected in Alternative D than Alternative C. Both alternatives have a larger area open for retrieval than Alternative A (704,000 acres). Based on the low number of trips required for big game retrieval, short distance needed for retrieval, and low number of OHV crossings of a site, motorized big game retrieval would have minimal effects on soil conditions. Big game retrieval on upland soils under dry conditions would not be expected to appreciably affect vegetation, soil condition, and productivity. Localized impacts would be most pronounced where motorized traffic occurred on wet soils which could cause soil compaction and loss of vegetation. The overall impacts would be small and localized in all alternatives except for Alternative B where measurable effects would not occur.

Motor Vehicle Use for Dispersed Camping

Under these Alternatives, dispersed camping would be permitted only at designated dispersed sites under alternative B, at 2,864 inventoried existing dispersed camping sites that are accessed by approximately 94 miles of currently unauthorized motorized routes under Alternative C, and within 300 feet of designated roads and motorized trails under Alternative D. Alternative B would impact approximately 75 acres, Alternative C would impact approximately 137 acres and Alternative D would impact up to 336,000 acres. All of the action alternatives would limit motorized dispersed camping to fewer acres than the 704,000 acres open to this activity under Alternative A. Impacts to soils would be localized and very minor in extent but could occur if access to dispersed camping sites and parking occurs repeatedly in the same area or if soils are wet. The net effect of the action alternatives would be a negligible reduction in impacts when compared to the No Action Alternative.

Motor Vehicle Use for Fuelwood Gathering

Under these alternatives motorized vehicle access for gathering personal use firewood and other forest products is limited to within 300 feet of designated roads and motorized trails in Alternatives B and C. Alternative D is similar to Alternative A and does not limit motorized vehicle access for persons holding a personal use firewood cutting permit as long as they are within a woodcutting permit area. Approximately 1,346,000 acres would be available for this activity in Alternative D. Areas open to fuelwood cutting would be greater in Alternative C (165,138 acres) than in Alternative B (132,568 acres) because of the greater length of roads and motorized trails open under Alternative C. Conditions attached to the fuelwood gathering permit such as using the same route for entering and leaving a fuelwood gathering site, covering the

route with slash or other debris, and not going off road when soils are wet and rutting may occur, limit the impact of this activity on soil conditions. In addition fuelwood gathering is not authorized from January through March when soils are most likely to be wet. Impacts to soils would be localized and very minor in extent but could occur if access to fuelwood gathering sites occurs repeatedly in the same area or if soils are wet. Approximately 1,500 permits resulting in about 6,000 user days for gathering fuelwood disperse a small number of permit holders over a large area. Impacts on soils from this activity are likely to be negligible. Alternatives B and C result in impacts to smaller areas than Alternatives A and D but would also tend to concentrate use in these smaller areas.

Cumulative Effects for All Alternatives

The cumulative effects analysis area relevant to soil resources includes the entire Tonto National Forest including private and other public lands that lie within the Forest boundary. Cumulative effects are projected for a 10-year timeframe. A partial list of past, present, and reasonably foreseeable actions that are relevant to soil conditions is shown below.

Broad scale activities such as vegetation management, fuels management, and livestock grazing activities have occurred in the past, are occurring, and are reasonably foreseeable actions on the Forest. Vegetation and fuels management are planned to have a net, long-term improvement to soil conditions although there may be short-term negative impacts during implementation. Mitigation measures and Best Management Practices are designed to mitigate any short-term impacts that may occur from project implementation. Livestock grazing activities (past and ongoing) have impacted soil conditions but re-authorizations of grazing permits are designed to minimize these impacts.

Route realignment, reconstruction, or decommissioning may occur with future projects and access through or required by other land jurisdictions may impact the Forest. The extent of these changes cannot be predicted nor quantified. Future changes to routes would be planned and mitigated to reduce impacts.

Urban development and interface growth would continue on private lands. These would not directly affect Forest land but runoff from urban development can cause an increase in erosion on down-gradient Forest lands.

Future mineral exploration, land exchanges, and utility construction are either planned or likely to occur. Disturbance can be relatively minor in some cases such as small utility constructions but in mineral exploration disturbance can be extensive.

Major road projects under construction or planned include State Routes, Forest Roads, and Federal Highways. These projects may add additional miles of roads to the Forest and decrease soil productivity. Although new roads are designed to minimize and mitigate impacts, newly constructed roads have been known to produce significant erosion and to impact soil condition off site. It is not possible to quantify the effects of new road projects but impacts could be substantial.

Various recreation projects are planned or are likely to occur. Implementing these projects may cause localized, short-term soil disturbance but are likely to reduce long-term impacts to soils from uncontrolled recreation.

Air Quality

Tonto National Forest has prepared the Final Environmental Impact Statement (FEIS) to examine environmental impacts associated with its Travel Management Plan. With respect to air quality, at question is whether any of the alternatives outlined in the FEIS will result in a significant increase in PM10 emissions for the Forest's nonattainment and maintenance areas and jeopardize the State of Arizona's ability to attain the National Ambient Air Quality Standards (NAAQS). Before any action occurring within a nonattainment or maintenance area moves forward, the federal agency must apply the applicability requirements to the proposed federal action to determine if a conformity determination is required (General Conformity Guidance, EPA 1994).

To comply with General Conformity Regulations, a General Conformity Applicability Analysis is completed to determine if the net change in PM10 emissions, attributable to each alternative, will not exceed the de minimis levels defined under 40 CFR 93.153(b), in which case provisions defined under the General Conformity Regulations are satisfied and no further review is necessary.

Atmospheric dispersion modeling is used to determine NAAQS compliance, by modeling downwind 24-hour PM10 concentrations at three Phoenix area air quality monitors. Results are then compared with the federal air quality standards. Where the predicted 24-hour PM10 concentration is below the NAAQS, the alternative would not jeopardize the State's ability to attain the NAAQS. Therefore, the objectives of this analysis are summarized as follows:

- Estimate emissions from off-highway vehicles for each alternative;
- Compare net emissions to General Conformity Applicability thresholds; and
- Use dispersion modeling to determine what contribution of PM10 comes from existing and future OHV use on the Forest to ambient air impacts to nonattainment and class I areas.

Affected Environment

This section describes the existing air quality conditions within the forest and areas beyond the forest which may be indirectly impacted by the alternatives.

Air quality within the Forest is largely determined by the rate of emissions released to the air and local topography and winds, which drive the advection and dispersion rates of air pollutants. For example, the surrounding mountains, hills and valleys, may create areas of high pollutant concentrations by hindering dispersion, on the other hand, loose soils lifted by high winds may transport dust away from its origin causing indirect impacts to other areas. However, due to its high relative density to air, PM10 emitted from crustal sources such as unpaved roadways, has a strong tendency for deposition soon after being emitted.

Beyond the forest, emissions resulting from the range of alternatives may be transported into one of the many nonattainment areas surrounding the forest or into Class 1 areas which are afforded the most stringent air quality protection under law.

Study Area and Time Frame of Analysis

The project area includes the geographic boundaries that define the Lower Salt River, beyond which air quality is no longer affected by the range of alternatives (Figure 44), and the geographic areas identified through scoping, which include Superstition Wilderness and the Phoenix PM10 nonattainment area. The timeframe is from 2011 through 2013.

Existing Conditions

Fugitive dust emissions from unpaved roads, windblown dust, and industrial development are the primary contributors to ambient PM10 concentrations within the Forest and the Phoenix 24-hour PM10 nonattainment area. Although a small amount of fugitive dust occurs naturally, EPA lists road dust as the largest single source of particulate matter in the air (2015). Beyond the nonattainment areas and in the higher elevations of the Forest, particulate emissions from smoke due to wood burning and prescribed and wild land fires are the primary contributors to poor air quality.

Particulate emissions from unpaved roads and windblown dust have caused or contributed to numerous violations of federal air quality standards in Maricopa and Pinal Counties, resulting in nonattainment area designations for the 24-hour PM10 NAAQS. According to State air quality managers, numerous air quality exceedances of the National Ambient Air Quality Standards for 24-hour PM10 have been measured over the last decade in the Phoenix Metro Area; reportedly due to thunderstorm activity and blowing dust from desert surfaces. Although, active agricultural tilling, dry riverbeds and abandoned agriculture serve as the more prominent examples of anthropogenic causes of windblown dust sources in Maricopa and Pinal Counties.

The 2011 emissions inventory published by Maricopa County Air Quality Department (MCAQD) is most recent and applicable inventory of emissions and emission sources for the Phoenix 24-hour PM10 and 8-hour ozone nonattainment areas. Figure 45 shows the percentage of PM10 emissions from off-highway vehicles in the PM10 nonattainment area used for the Phoenix 24-hour PM10 five percent plan. Contributions from all off-highway vehicles amount to four percent of the total PM10 emissions. However, this percentage represents the entire Phoenix 24-hour PM10 nonattainment area and is not subset to nonattainment areas within the Tonto National Forest. It is expected that PM10 contributions from the nonattainment areas of the forest to Phoenix air quality would be less than four percent.

In order to determine if the alternatives would result in a violation of either of the NAAQS, an emission inventory database containing the amount of PM10 emissions discharged to the atmosphere by off-highway vehicles was developed for each alternative. Emission rates are presented in tons per year (tpy) emitted by off-highway vehicles traveling on unpaved roads and trails within the Tonto National Forest.

Wind directions are predominately east-west during daylight hours. When winds are from the east, fugitive dust from off-highway vehicle activity is likely to transport beyond the Forest boundaries and into the Phoenix nonattainment area. Similarly, when winds are from the west, pollution from Phoenix likely contributes to air pollution within the Forest. The wind roses show that Phoenix pollution is more likely transported into the Forest during spring and summer seasons due to higher occurrence of winds and faster wind speeds from the west. Autumn and winter seasons show the opposite, where pollution from the Forest show a higher potential for contributing to Phoenix’s air pollution.

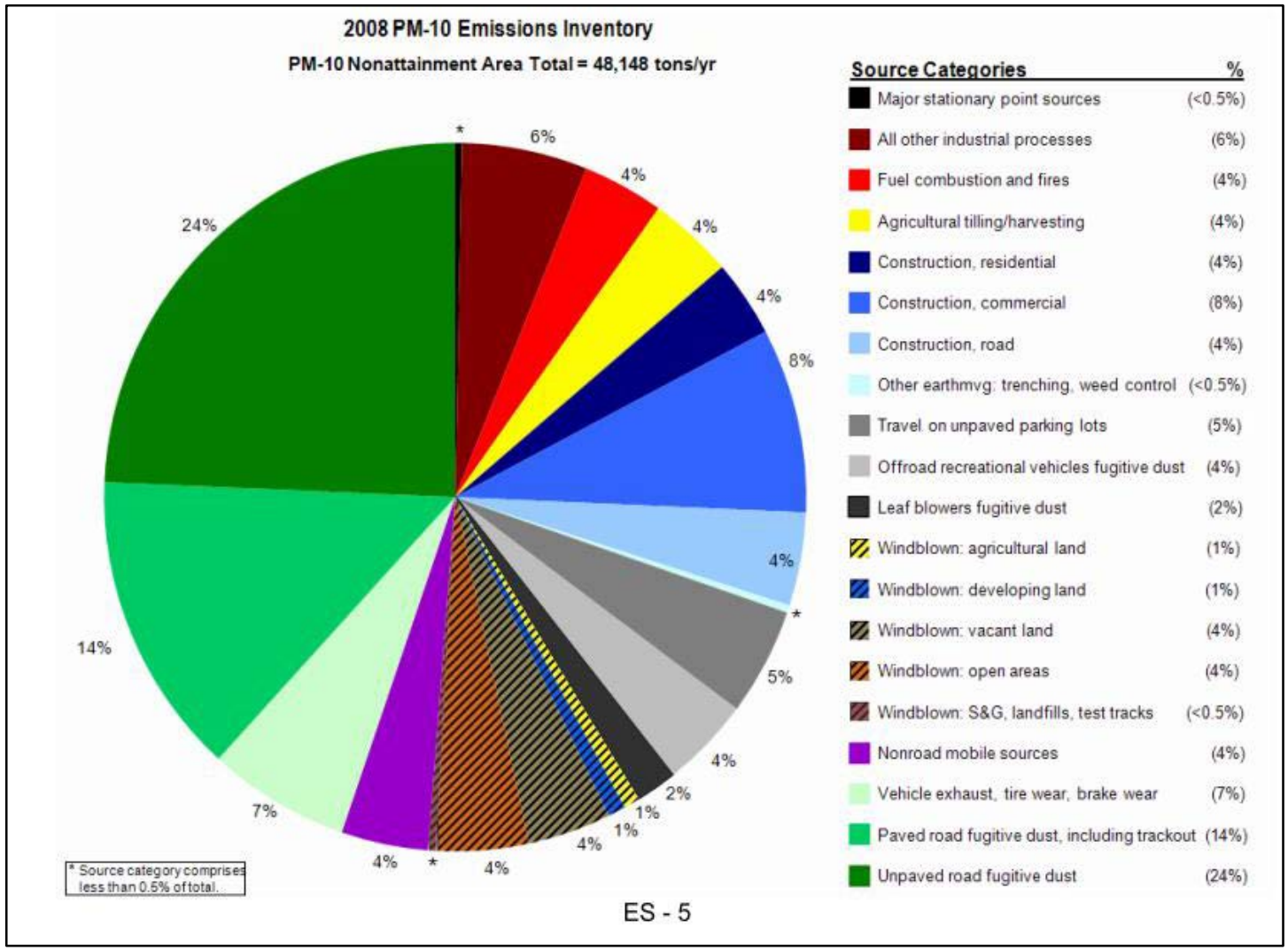

Figure 44. Emissions Inventory for PM10 Nonattainment Area (2008)

A closer look at wind shows that pollution is more likely to move away from the Tonto National Forest and into Phoenix between 07:00 AM and 11:00 PM hours, while Phoenix air pollution is more likely to move into the Forest between 2:00 PM and 7:00 PM. For this project, this means that riding off-highway vehicles in the afternoon is less likely to cause or contribute to a NAAQS violation at the Phoenix air quality monitors.

Environmental Consequences

General Conformity Applicability Analysis

The purpose of General Conformity is to ensure the federal projects don't interfere with air quality planning efforts to attain and maintain federal air quality standards (NAAQS). The General Conformity Applicability Analysis (GCAA) is conducted in order to determine if a federal project would cause or contribute to new air quality violations, increase the frequency or severity of existing violations, or delay attainment of existing air quality goals. If so, the project would be subject to General Conformity requirements. A project is not subject to General Conformity requirements if analysis shows its emissions are below certain thresholds called de minimis thresholds. Results of this analysis show that emissions from this project are below de minimis thresholds (Table 166). No GCAA shows emissions are above the de minimis thresholds. Also, the PM10 NAA emissions for the current condition (Alternative A) are 220 tpy, but this is already accounted for included in the existing state implementation plan. Threshold is 100 tpy, above which, a general conformity analysis may be needed. The General Conformity Applicability Analysis shows that emissions of PM10, NOX, and VOC from off-highway vehicles are below the de minimis levels defined under 40 CFR 93.153(b) for all action alternatives. Thus, according to the General Conformity Regulations, the Tonto National Forest Travel Management Plan does not require a conformity determination.

Table 166. Results from General Conformity Applicability Analysis

	PM10	NOx	VOC
Alternative A			
Phoenix 24-hour PM10 nonattainment	220	---	---
Miami 24-hour PM10 maintenance	93	---	---
Hayden 24-hour PM10 nonattainment	71	---	---
Payson 24-hour PM10 nonattainment	117	---	---
Phoenix 8-hour ozone nonattainment	---	39	1,734
Alternative B			
Phoenix 24-hour PM10 nonattainment	-31.29	---	---
Miami 24-hour PM10 maintenance	-0.01	---	---
Hayden 24-hour PM10 nonattainment	38.60	---	---
Payson 24-hour PM10 nonattainment	-75.74	---	---
Phoenix 8-hour ozone nonattainment	---	-13.37	-590.08
Alternative C			
Phoenix 24-hour PM10 nonattainment	-57	---	---
Miami 24-hour PM10 maintenance	-31	---	---
Hayden 24-hour PM10 nonattainment	-9	---	---
Payson 24-hour PM10 nonattainment	13	---	---
Phoenix 8-hour ozone nonattainment	---	-5	-243
Alternative D			
Phoenix 24-hour PM10 nonattainment	-51	---	---
Miami 24-hour PM10 maintenance	-29	---	---
Hayden 24-hour PM10 nonattainment	-9	---	---
Payson 24-hour PM10 nonattainment	-12	---	---
Phoenix 8-hour ozone nonattainment	---	-6	-279

Alternative A

Under the No-Action Alternative, routes would not be designated and cross country travel would continue unmanaged. Fugitive dust would likely continue to contribute to measured air quality violations in Maricopa and Pinal Counties.

Taking no action would result in continued damage to biological or otherwise physical soil crusts which protect soil surfaces from wind erosion and ultimately air quality from the effects of blowing dust. The severity, size, frequency, and timing of blowing dust define its impact, and where the severity of blowing dust is expected to scale with the area of soil crusts damaged. With time, more severe dust storms are anticipated as more forest soil crust is damaged causing local dust emissions to have a greater impact on regional air quality.

Alternative B

Alternative B has the fewest miles of roads and motorized trails open to the public (3,355.28 miles) and the most miles of roads proposed for decommissioning. Motor vehicle use for big game retrieval is not permitted and dispersed camping use is restricted to designated sites. Cross-country travel for fuelwood gathering within designated areas is permitted for up to 300 feet on both sides of all designated motorized routes.

The portion of blowing dust attributed to cross-country travel would gradually decline for unroaded areas due to their respective prohibitions on cross-country travel. Unroaded areas may eventually return to natural or near-natural conditions as biological crusts restabilize the damaged soils by gluing loose particles back together (USDOI, 2001). However, more severe warming and drought brought on by climate change may lead to additional worsening of air quality by increasing the rate of NOx conversion to ozone and from a greater chance for wildfires, which produce large amounts of both ozone and PM10 pollutants.

Alternative C

Alternative C has the second lowest number of miles of roads designated to be open to the public (3,651.62 miles), but has the most miles of motorized trails (2,151 miles).

The portion of blowing dust attributed to cross-country travel would gradually decline for unroaded areas due to their respective prohibitions on cross-country travel. Unroaded areas may eventually return to natural or near-natural conditions as biological crusts restabilize the damaged soils by gluing loose particles back together (USDOI, 2001). However, more severe warming and drought brought on by climate change may lead to additional worsening of air quality by increasing the rate of NOx conversion to ozone and from a greater chance for wildfires, which produce large amounts of both ozone and PM10 pollutants.

Alternative D

Alternative D has the most miles of motorized roads open to travel by the public (4,859.34 miles) and the most acres of cross-country travel for the purposes of dispersed camping and big game retrieval. Windblown dust emissions would be greatest for this alternative due to cross-country travel, after the no action alternative.

The portion of blowing dust attributed to cross-country travel would gradually decline for unroaded areas due to their respective prohibitions on cross-country travel. Unroaded areas may eventually return to natural or near-natural conditions as biological crusts restabilize the damaged soils by gluing loose particles back together (USDOI, 2001). However, more severe warming and drought brought on by climate change may lead to additional worsening of air quality by increasing the rate of NOx conversion to ozone and from a greater chance for wildfires, which produce large amounts of both ozone and PM10 pollutants.

Direct Effects

Alternative A

Alternative A is the baseline (No-Action) alternative. Emission density is highest for this alternative. Red cells (positive anomaly/positive change from normal) indicate greater than average roadway density in miles per square mile (Figure 46). Green cells (negative anomaly/negative change from normal) show less than average roadway density.

Alternative B

Alternative B has the fewest miles of designated roads and motorized trails open to the public (3,355.28 miles) and the most miles of roads proposed for decommissioning. Motor vehicle use for big game retrieval is not permitted and dispersed camping use is restricted to designated sites. Cross-country travel for fuelwood gathering within designated areas is permitted for up to 300 feet on both sides of all designated motorized routes. Emission rates in tons of PM10 per year for Alternative B are presented in Figure 47.

Alternative C

Alternative C has the second lowest number of miles of roads designated to be open to the public (3,651.62 miles), but has the most miles of motorized trails (2,151 miles). Modeled air quality concentrations are presented in Figure 48.

Alternative D

Alternative D has the most miles of motorized roads open to travel by the public (4,859.34 miles) and the most acres of cross-country travel for the purposes of dispersed camping and big game retrieval. Windblown dust emissions would be greatest for this alternative due to cross-country travel, after the No Action Alternative. Emission rates in tons of PM10 per year for Alternative D are presented in Figure 49.

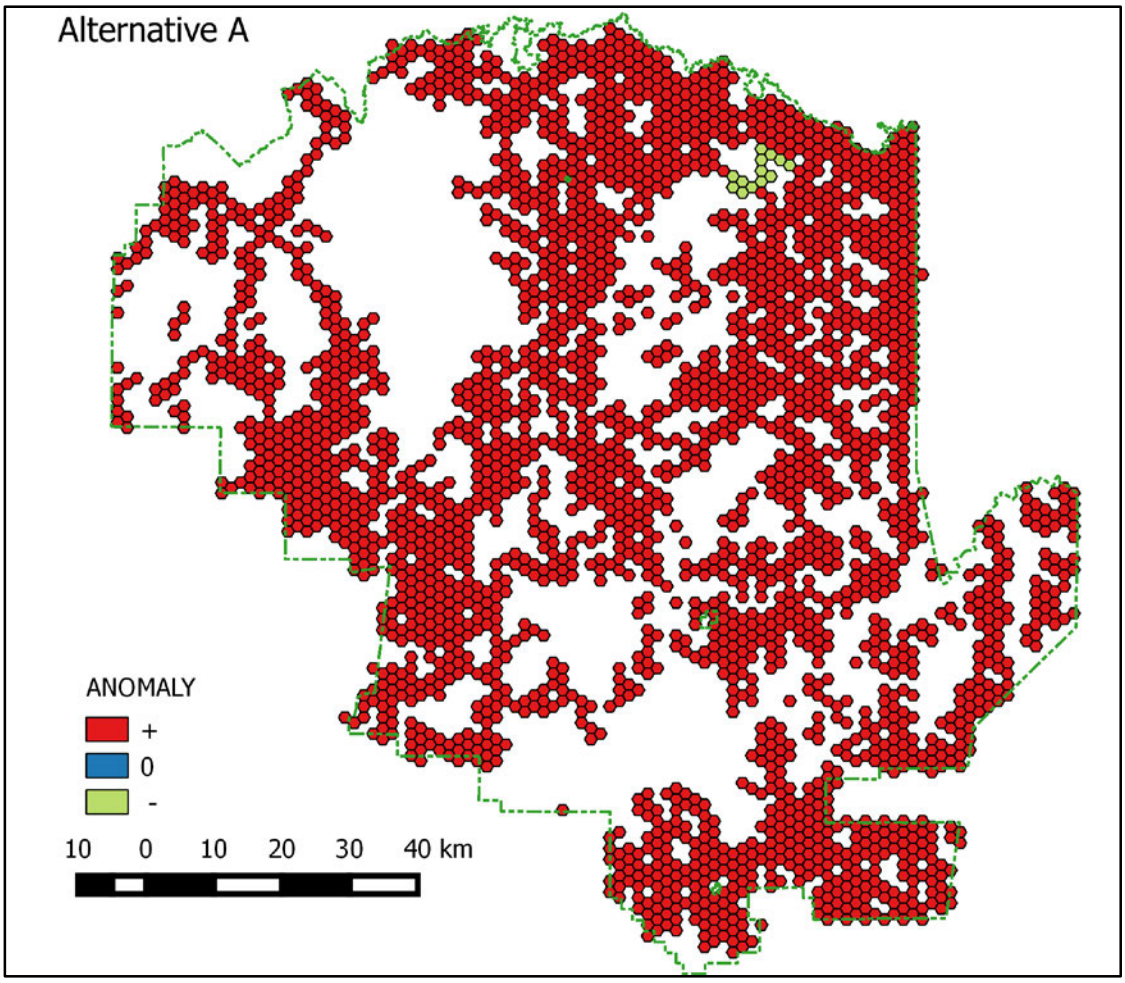

Figure 45. Anomaly PM_{10} Emissions from Roads Open to Public for Alternative A

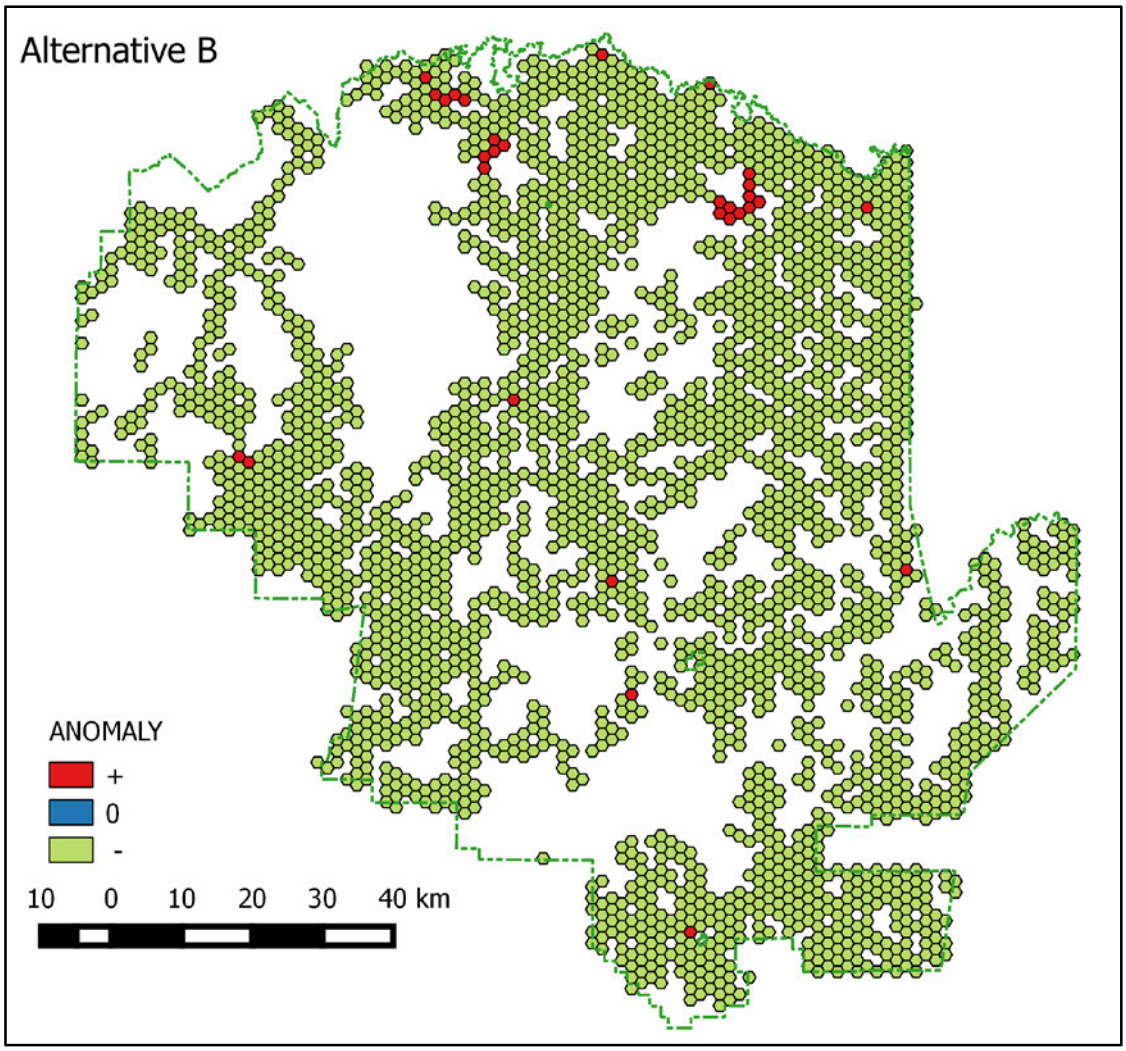

Figure 46. Anomaly PM_{10} Emissions from Roads Open to Public for Alternative B

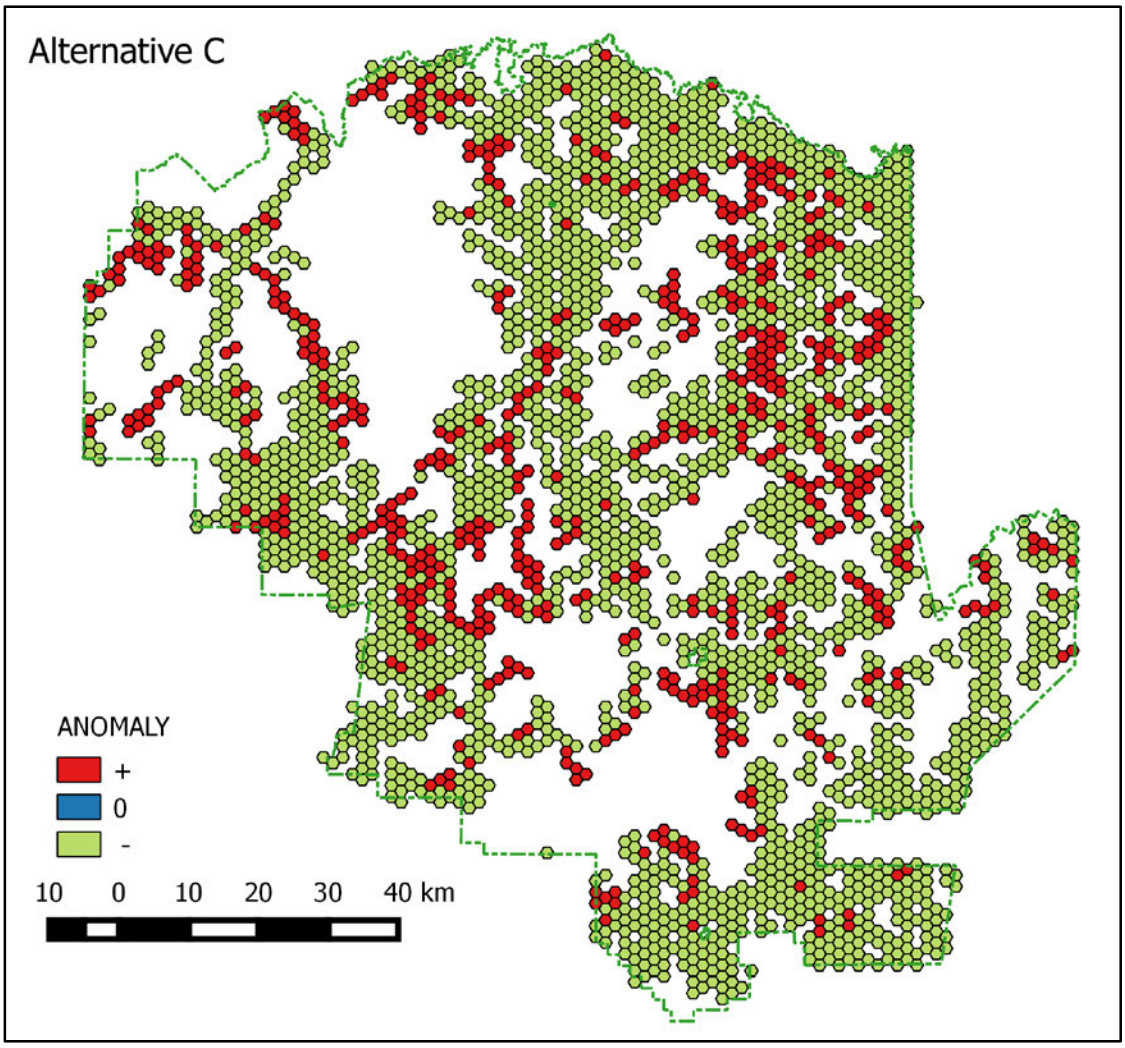

Figure 47. Anomaly PM10 Emissions from Roads Open to Public for Alternative C

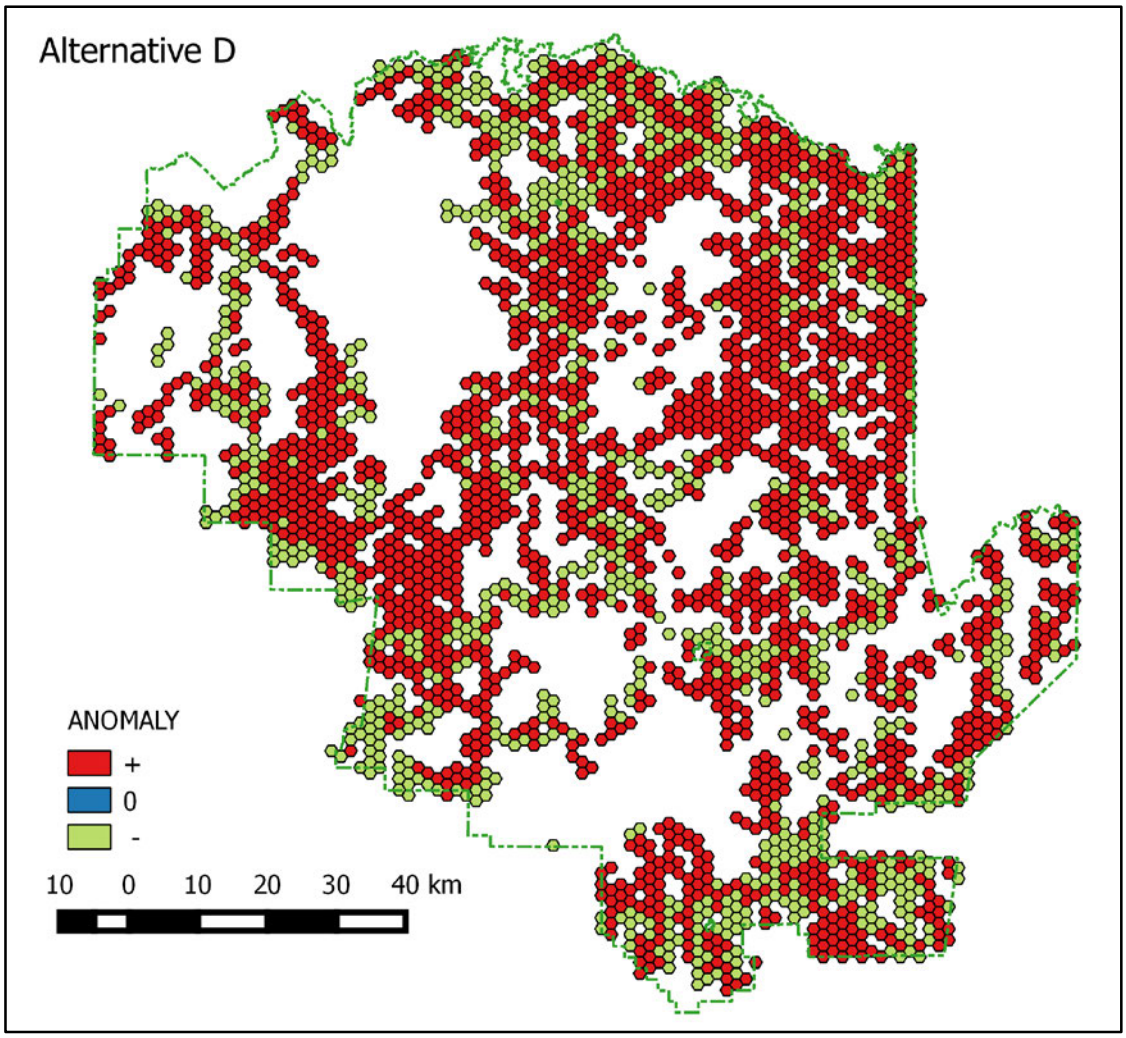

Figure 48. Anomaly PM10 Emissions from Roads Open to Public for Alternative D

Summary of Direct Effects

Table 167 shows a comparison of the alternatives based on prohibiting cross-country travel and the designation of OHV areas where driving off the designated route system will be permitted.

Table 167. Comparison of Alternatives for Direct Effects

Alternative	Allowing Cross-country Travel…	Would Result in…
A	By taking no action	The Least benefit to air quality and greatest impact from blowing dust caused by damage to soil crusts compared with B, C and D.
B	By limiting fuelwood gathering within 300 feet of all designated routes and dispersed camping use at designated sites	The greatest benefit to air quality and lowest impact from blowing dust caused by damage to soil crusts compared with A, C and D.
C	By limiting fuelwood gathering within 300 feet of all designated routes and motorized big game retrieval within 1 mile of designated routes	A benefit to air quality and lower impact from blowing dust caused by damage to soil crusts compared with A and D.
D	By allocating the most acres of for motorized dispersed camping and motorized big game retrieval and allowing fuelwood gathering within permitted areas	The least benefit for air quality and lower impact from blowing dust caused by damage to soil crusts compared with A, B and C.

With respect to air quality, Alternative A is the least sustainable options, while Alternative B is the most sustainable option.

Indirect Impacts

Emissions from OHV use spread beyond the immediate locale and over time may affect air quality beyond its origin. Sensitive areas include PM10 nonattainment areas and Class 1 wilderness areas. NAAQS are also used as air quality indicators for nonattainment areas such as Maricopa County. Class 1 wilderness areas use different indicators called air quality related values (AQRV), as designated wilderness areas over five thousand acres are designated for the most stringent degree of protection from future degradation of air quality by the Clean Air Act. However, for the purposes of this analysis, AQRVs will also be more likely to be affected as air pollutants from exhaust and fugitive dust emitted by off-highway vehicle use on unpaved surfaces increase.

Alternative A

Alternative A is the baseline (No-Action) alternative. It has the greatest amount of roads (4,958.58 miles) and represents the current conditions, where routes would not be designated and OHV activity would continue unmanaged. It is likely that criteria air pollutants from exhaust and fugitive dust emitted by off-highway vehicle use on unpaved surfaces would continue to contribute to the exceedances of Maricopa County air quality standards.

Alternative B

Alternative B has the fewest miles of designated roads and motorized trails open to the public (3,355.28 miles) and the most miles of roads proposed for decommissioning. Motor vehicle use for big game retrieval is not permitted and dispersed camping use is restricted to designated sites. Cross-country travel for fuelwood gathering within designated areas is permitted for up to 300 feet on both sides of all designated motorized routes. It is likely that fugitive dust would indirectly contribute to the exceedance of Maricopa County air quality standards, though less than the other alternatives.

Alternative C

Alternative C has the second lowest number of miles of roads designated to be open to the public (3,651.62 miles), but has the most miles of motorized trails (2,151 miles). It is likely that fugitive dust would indirectly contribute to the exceedance of Maricopa County air quality standards, though less than Alternatives A and D.

Alternative D

Alternative D has the most miles of motorized roads open to travel by the public (4,859.34 miles) and the most acres of cross-country travel for the purposes of dispersed camping and big game retrieval. Windblown dust emissions would be greatest for this alternative due to cross-country travel, after the No Action Alternative. Therefore, it is likely that fugitive dust would indirectly contribute to the exceedance of Maricopa County air quality standards to a greater degree than the other action alternatives.

Cumulative Impacts

Allowing off-highway vehicles uncontrolled access to cross-country travel results in damage to biological and physical soil crusts which protect soils from wind erosion and protect air quality by reducing dust emissions that lead to dust storms. The frequency, timing, and severity of a dust storm determines its impact on air quality. Climate is an important factor in setting the frequency and timing of dust storms, while storm severity scales with the geographic extent of damaged soil crusts.

Under Alternative A, taking no action would result in continued damage to biological and physical soil crusts which protect soils from wind erosion and air quality by reducing impacts from blowing dust. With time, as cross-country travel continues to damage soil crusts, more severe dust storms are anticipated causing localized dust emissions to have a greater impact on regional air quality.

Under Alternatives B, C and D, the portion of blowing dust attributed to cross-country travel would gradually decline for unroaded areas due to their respective prohibitions on cross-country travel. Unroaded areas may eventually return to natural or near-natural conditions as biological crusts restabilize the damaged soils by gluing loose particles back together (USDOI, 2001).

However, more severe warming and drought brought on by climate change may lead to additional worsening of air quality by increasing the rate of NOx conversion to ozone and from a greater chance for wildfires, which produce large amounts of both ozone and PM10 pollutants.

Cumulative benefits from both clean air regulations, aimed at reducing emissions, and from travel management planning efforts, are anticipated to reduce criteria pollutant emissions and lead to cleaner air for both the short term and long term scenarios. However, should air quality planning efforts fail to meet their stated goals, then cumulative effects linked to both population growth and climate change may result in adverse effects to vegetation and worsening public health and, thus, the possibility for additional environmental planning may be required in order to reduce air pollution.

Alternative A

Under the No-Action Alternative, routes would not be designated and cross country travel would continue unmanaged. Fugitive dust would likely continue to contribute to measured air quality violations in Maricopa and Pinal Counties.

Taking no action would result in continued damage to biological or otherwise physical soil crusts which protect soil surfaces from wind erosion and ultimately air quality from the effects of blowing dust. The severity, size, frequency, and timing of blowing dust define its impact, and where the severity of blowing dust is expected to scale with the area of soil crusts damaged. With time, more severe dust storms are anticipated as more forest soil crust is damaged causing local dust emissions to have a greater impact on regional air quality.

Alternative B

Alternative B has the fewest miles of roads and motorized trails open to the public (3,355.28 miles) and the most miles of roads proposed for decommissioning. Motor vehicle use for big game retrieval is not permitted and dispersed camping use is restricted to designated sites. Cross-country travel for fuelwood gathering within designated areas is permitted for up to 300 feet on both sides of all designated motorized routes.

The portion of blowing dust attributed to cross-country travel would gradually decline for unroaded areas due to their respective prohibitions on cross-country travel. Unroaded areas may eventually return to natural or near-natural conditions as biological crusts restabilize the damaged soils by gluing loose particles back together (USDOI, 2001). However, more severe warming and drought brought on by climate change may lead to additional worsening of air quality by increasing the rate of NOx conversion to ozone and from a greater chance for wildfires, which produce large amounts of both ozone and PM10 pollutants.

Alternative C

Alternative C has the second lowest number of miles of roads designated to be open to the public (3,651.62 miles), but has the most miles of motorized trails (2,151 miles).

The portion of blowing dust attributed to cross-country travel would gradually decline for unroaded areas due to their respective prohibitions on cross-country travel. Unroaded areas may eventually return to natural or near-natural conditions as biological crusts restabilize the damaged soils by gluing loose particles back together (USDOI, 2001). However, more severe warming and drought brought on by climate change may lead to additional worsening of air quality by increasing the rate of NOx conversion to ozone and from a greater chance for wildfires, which produce large amounts of both ozone and PM10 pollutants.

Alternative D

Alternative D has the most miles of motorized roads open to travel by the public (4,859.34 miles) and the most acres of cross-country travel for the purposes of dispersed camping and big game retrieval. Windblown dust emissions would be greatest for this alternative due to cross-country travel, after the no action alternative.

The portion of blowing dust attributed to cross-country travel would gradually decline for unroaded areas due to their respective prohibitions on cross-country travel. Unroaded areas may eventually return to natural or near-natural conditions as biological crusts restabilize the damaged soils by gluing loose particles back together (USDOI, 2001). However, more severe warming and drought brought on by climate change may lead to additional worsening of air quality by increasing the rate of NOx conversion to ozone and from a greater chance for wildfires, which produce large amounts of both ozone and PM10 pollutants.

Climate Change

Introduction

Anticipated changes in the global climate over the coming decades could alter weather patterns resulting in higher temperatures, more intense droughts, worsening air quality and greater demand for forest resources. By the end of this century, temperatures are expected to rise approximately five to eight degrees Fahrenheit with the greatest warming to occur during the winter season (IPCC, 2015). This warming trend may lead to shorter winters and a longer season for summer activities (Joyce et al., 2001).

Rising temperatures may also lead to higher ground-level ozone concentrations. Ozone forms more readily under high temperatures and in the presence of nitrogen oxides, which may be emitted to the atmosphere in larger amounts as demand for electricity increases, in part from higher demand for air conditioning. More intense droughts may lead to more fugitive dust from areas where off-highway vehicle (OHV) use is in high demand. As the climate changes, so does the demand for forest resources. Therefore, maintaining forest roadways and managing the use of OHVs has become an important priority.

Current scientific consensus is that climate change is caused by a buildup of atmospheric greenhouse gasses, and that those greenhouse gasses modify the atmosphere's thermal radiative effect on surface temperatures. A review of current literature reveals average global temperatures are expected to increase by 0.5 degrees Fahrenheit to 8.6 degrees Fahrenheit by 2100 and by at least twice as much in the next 100 years as it has during the last 100 years (EPA, 2015). Climate models project an increase in the number of days with maximum temperatures above 90 degrees Fahrenheit for the United States, while precipitation rates will decline by five percent for much of Arizona and as much as ten percent for Arizona's southern half.

Climate modelers generally agree that the Southwestern United States is experiencing a drying tend that will continue into the latter part of 21st century. Some potential ecological implications of climate change trends in the Southwestern United States include (U.S. Forest Service, 2010):

- More extreme disturbance events, including wildfires and intense rain and flashfoods and wind events (Swetnam et al., 1999).
- Greater vulnerability to invasive species, including insects, plants, fungi, and vertebrates (Joyce et al., 2007).
- Long-term shifts in vegetation patterns (Westerling et al., 2006; Millar et al., 2007).
- Cold-tolerant vegetation moving upslope, or disappearing in some areas. Migration of some tree species to the more northern portions of their existing range (Clark, 1998).
- Potential decreases in overall forest productivity due to reduced precipitation (U.S. Forest Service, 2005).
- Shifts in the timing of snowmelt (already observed) in the American West, which, along with increases in summer temperatures, have serious implications for the survival of fish species, and may challenge efforts to reintroduce species into their historic range (Joyce et al., 2007; Millar et al., 2007).

- Effects on biodiversity, pressure on wildlife populations, distribution, viability, and migration patterns, because of increasing temperatures, water shortages, and changing ecological conditions.

Affected Environment

Transportation-related emissions from cars, trucks, trains, ships, airplanes, and other vehicles are a major source of both regional air pollution and global climate change. Greenhouse gas emissions from transportation sources, resulting from the combustion of petroleum-based products like gasoline in internal combustion engines, are emitted in the form of carbon dioxide (CO_2), water vapor, methane (CH_4) and nitrous oxide (N_2O). In 2013, greenhouse gas emissions from transportation accounted for about 27 percent of total U.S. greenhouse gas emissions, making it the second largest contributor of U.S. greenhouse gas emissions after energy production.

Passenger cars and light-duty trucks are the largest sources of transportation-related greenhouse gas emissions in the U.S. and account for over half of the emissions from all mobile sources. The remainder of greenhouse gas emissions comes from other transportation modes such as commercial aircraft, shipping and trains. In 2011, the non-road sector, which is a broad subset of transportation sources that includes recreational off-highway vehicles, contributed approximately one percent of total U.S. emissions of CO_2 and have declined by approximately 25.9 percent between 1990 and 2013.

In Arizona, the majority of carbon dioxide (CO_2) and nitrous oxide (N_2O) emissions come from mobile on-road sources such as passenger vehicles. The non-road sector accounted for approximately two percent of the total CO_2 emissions in 2011, while wildfires and prescribed fires were responsible for approximately 92 percent of all methane emissions during the same year. Figure 49 shows the percent contributions of greenhouse gasses in Arizona for 2011.[148]

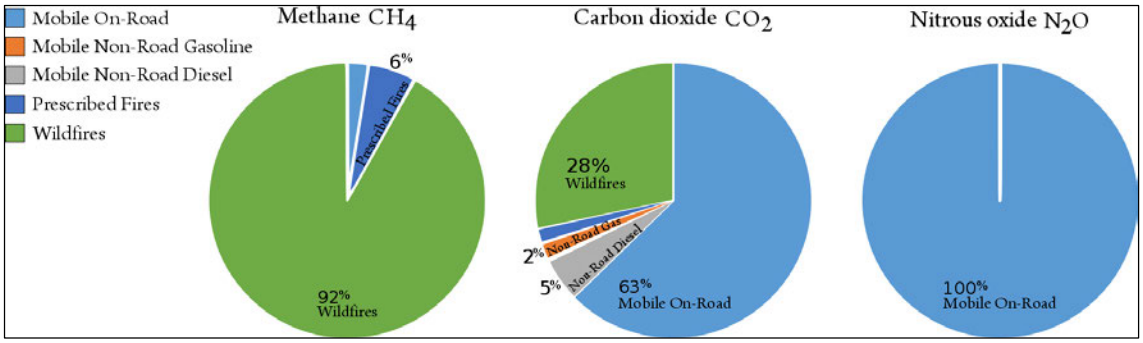

Figure 49. 2011 Arizona Greenhouse Gas Emissions by Sector

[148] Mobile Non-Road sector includes snowmobiles, dirt bikes, and ATVs (www3.epa.gov/climatechange/ghgemissions/inventoryexplorer/#transportation/allgas/source/all)

Environmental Consequences

The following analysis presents the effects of climate change on air quality and public health, including current regulatory and environmental conditions, relevant to travel management planning on the Tonto National Forest. The four alternatives are evaluated based on their potential to contribute to increased air pollution under projected climate change conditions.

General Effects of Climate Change

This section outlines the anticipated effects to forest environment and human health from exposure to increased air pollution under projected climate change conditions.

Anticipated Effects from Increased Air Pollution and Warmer Climate

The cause and effect of higher temperatures and a dryer climate are summarized in Table 168.

Table 168. Cause and Effect of Higher Temperatures and Dryer Climate

Climate Change May Cause:	Resulting in:
Higher temperatures	Increased demand for forest resources at higher elevations and higher ambient ozone concentrations.
Dryer climate	Increased chance for wild fires and higher ambient PM_{10} concentrations

Higher Ambient Temperatures Related to Forest Resources

Anticipated changes in the global climate over the coming decades could reshape off-highway vehicle use for the Tonto National Forest and, thus, alter air quality linked to PM_{10} and NOx emissions. Higher temperatures are anticipated under most climate change scenarios. According to the 5th Assessment Report of the Intergovernmental Panel Climate Change, temperatures are expected to rise approximately five to eight degrees Fahrenheit by the end of this century, with the greatest warming to occur during the winter season. This warming trend may lead to shorter winters and a longer season for summer activities (Joyce et al., 2001). As temperatures rise in the warmer desert areas and lower elevations of the forest, recreation demand may shift, increasing the demand for cooler temperatures in the higher elevations. For example, the Payson and Pleasant Valley Ranger districts may experience an increase in recreational off-highway vehicle use during summer months due to climate change.

Increasing Temperatures Related to Tropospheric Ozone

Higher temperatures are well correlated with high ozone levels. Scientific studies have shown that climate change could favor the formation of more ozone pollution in some areas, including the southwest. This effect may already be evident in Arizona, as summertime ozone levels tend to be higher in summer.

Ground-level ozone pollution is a significant health risk, especially for children with asthma (EPA, 2015) and according to the FLAG 2010 by the National Park Service, ozone is generally acknowledged as the air pollutant causing the greatest amount of injury and damage to vegetation. Because ozone levels are already high for western areas of the forest, increasing temperatures will likely increase ozone production leading to negative health effects, particularly for children who suffer from asthma. According to EPA, evidence from observational studies strongly indicates that higher daily ozone concentrations are associated with increased asthma attacks, increased hospital admissions, increased daily mortality, and other markers of morbidity.

Worsening Drought Related to Dust

Semi-arid regions like the southwestern U.S. that are already prone to blowing dust, which have already been said to cause numerous air quality violations, may experience more of the same under worsening drought conditions due to climate change.

Increasing the aridity of soil makes it more prone to wind erosion during monsoon thunderstorms. High winds from thunderstorm outflows during the Arizona monsoon season cause blowing dust from crustal and otherwise desert surfaces that have been disturbed by past and present human activities. Even under the high winds produced by monsoonal thunderstorms, undisturbed desert surfaces do not emit dust at levels that would cause concern for national air quality standards. Thus, air quality can be improved through management actions such as the prohibition of cross-country travel as proposed in Alternatives B, C, and D, which eliminate cross-country travel entirely.

According to EPA, exposure to ambient PM_{10} particles is linked to a variety of health problems, including hospital admissions for heart disease, hospital admissions, and doctors' visits for respiratory diseases, increased respiratory symptoms in children, and premature death in people with heart or lung disease. Further highlighting the negative effects from PM_{10}, vehicle accidents, and valley fever serve as examples of the importance of reducing cross country travel on forest roads. In comparison with other planning objectives, a prohibition of cross-country travel would likely result in greatest benefit with respect to attainment of the 24-hour national ambient air quality standards (NAAQS) and ultimately to human health.

Effect of the Proposal on Climate Change

Agency direction defines the emission of greenhouse gases and effects to carbon cycling as the direct climate change effects of a project. The interaction of emissions with atmospheric concentrations of greenhouse gasses such that they impact the climate is defined as the potential indirect climate change effect (U.S. Forest Service, 2009a).

Under this definition, there is no direct effect associated with any of the proposed actions considered in any of the alternatives. These alternatives do not authorize the emission of greenhouse gasses; the action alternatives do not limit the emission of greenhouse gasses; the action alternatives are unlikely to change carbon cycling or the emission of greenhouse gasses as compared to the no action alternative.

Regarding indirect effects, Agency direction states, "Because greenhouse gases mix readily into the global pool of greenhouse gases, it is not currently possible to ascertain the indirect effects of emissions from single or multiple sources (projects). Also, because the large majority of Forest Service projects are extremely small in the global atmospheric CO_2 context, it is not presently possible to conduct quantitative analysis of actual climate change effects based on individual projects" (USDA Forest Service 2009a).

Based on this guidance, Alternatives B, C, and D do not have measurable indirect effects as compared with the No Action Alternative (Alternative A).

Effect of Climate Change on the Proposal

Alternative A

This alternative has more miles of motorized routes than any of the alternatives. It also permits the greatest area of off road vehicle use for firewood gathering, motorized big game retrieval,

dispersed camping and general off road vehicle use of any of the alternatives. Increased intensity of storm events expected from climate change would increase erosion and sedimentation from exposed road surfaces. The large number of stream crossings in this alternative reduces the resilience of channels and riparian areas to resist the erosive effects of floods. The larger mileage of roads in this alternative also provide a greater number of pathways for nonnative species to be introduced to native ecosystems which are more susceptible to non- native species due to stress from warmer temperatures and reduced water availability.

Alternative B

This alternative would designate for decommissioning the greatest mileage of motorized routes of all alternatives. This alternative also results in the minimum area of off road disturbance of any of the alternatives for motorized dispersed camping, firewood gathering, and motorized big game retrieval. Reduced mileage of motorized routes area open to cross country travel reduces erosion potential from high intensity storms. The reduced number of stream crossings improves stability of channels and aquatic habitat and provides greater resilience to channel and riparian areas from flooding. Reduced mileage of roads reduces pathways for introducing non-native species to climate change stressed ecosystems. Cumulatively these effects result in greater landscape level resilience to climate change. Eventual revegetation of decommissioned routes may provide negligible sequestration of carbon. Reduced mileage of roads may also reduce greenhouse gas emissions if fewer vehicle miles are driven on motorized routes on the Forest.

Alternative C

Impacts would be similar to Alternative B but at a smaller scale due to designating fewer miles of roads for decommissioning and greater areas open to off road travel for motorized dispersed camping, firewood gathering, and motorized big game retrieval.

Alternative D

Impacts would be greater than Alternatives B and C but less than Alternative A due to designating even fewer miles of roads for decommissioning than in Alternatives B and C, and permitting off road motorized travel in larger areas for motorized big game retrieval, firewood gathering, dispersed camping, and general off road motorized travel in designated OHV areas. Impacts would be less than Alternative A.

Cumulative Effects

The cumulative effects analysis evaluates past, present, and reasonably foreseeable actions effect on climate change within the boundary of the Tonto National Forest.

Wildfire risks increase as dry areas become dryer. Warmer average temperatures intensify the effects of drought, which may increase the intensity and severity of uncontrolled forest fires. These fires, in turn, pose a great threat to both local and regional air quality. According to IPCC 2007 and Seager, et al. 2007, the Southwestern U.S. is experiencing a drying trend that will continue well into the latter part of 21st century. Therefore, the prospect of higher temperatures and more intense drought conditions is of major concern for air quality managers.

Livestock grazing, forest restoration projects, construction projects, and fuels management activities along with various other recreational activities that occur on the Forest may or may not affect climate by altering the abundance or type of carbon-sequestering vegetation available on the landscape (Brown et al., 1997; Asner et al., 2004; Archer and Predick, 2008) or by increasing dust. Industrial mining activities and outflow from major metropolitan areas, such as Phoenix,

are other major sources of pollution with an additive effect on air quality on the Tonto National Forest.

Short-term Uses and Long-term Productivity

NEPA requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). As declared by Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

The change in driving on National Forest System roads and trails created by any of the action alternatives does not jeopardize the long-term productivity of the Tonto National Forest. As described throughout chapter 3, implementing any of the action alternatives would generally improve resources when compared to the current condition.

However, in the case of motor vehicle use for personal use fuelwood gathering, there are anticipated effects in the short-term use and long-term productivity. The Tonto National Forest generates 400,000 to 500,000 cubic feet of available dead and down fuelwood annually. Available fuelwood is the result of both natural occurring events and management activities. Many local small businesses and residents rely on this fuelwood to heat their homes and businesses, offsetting the cost associated with other heat sources. For many residents, this may be their only heat source and wood gathering becomes a family event and recreational activity. The Forest benefits by the removal of scattered fuel accumulations that under natural fire regimes would be removed through frequent fire. Personal use fuelwood gathering allows the general public to be directly involved with the management of their National Forest while removing products that contribute directly to their social and economic wellbeing.

Natural events or disturbances that result in the creation of fuelwood include but are not limited to wildfire, insect outbreaks, droughts, and heavy snowfalls. These occur to varying degrees across the forest in an extremely random pattern. Areas affected can range from small scattered patches to large landscape scales. Resulting fuel loads are also extremely variable, ranging from high concentrations of mortality and breakage to very light and scattered accumulations. Access to these areas is currently provided by both system and non-system roads and often extends for great distances away from roads and trails.

Management activities that generate available fuelwood include prescribed fire, range improvement cuttings, timber stand improvement cuttings and restoration activities. After these treatments are completed, slash and associated breakage becomes available for fuelwood gathering. Treatment areas range in size from 50 to 1000 acres or more in size. Treatments are usually followed several years later by prescribed fire to reduce the increased fuel load to more manageable levels. Personal use fuelwood gathering allows the public to assist land managers by removing valuable products from these areas before burning. This reduces the intensity of the resulting fire making it easier to manage. Access to these areas is also provided by both system and non-system roads and often extends for great distances away from roads and trails.

Fuelwood gathering during the spring and summer is often concentrated near system roads where concentrations of fuelwood can be seen from the vehicle. Available fuelwood in these areas can quickly become depleted requiring fuelwood gatherers to scout the surrounding terrain

to find wood. As areas where disturbances have occurred are located, fuelwood gatherers begin to move off roads and trails to take advantage of these concentrations. Under alternatives A and D this practice would continue, allowing personal use fuelwood gatherers to spread out across the permitted areas to obtain their wood. Alternatives B and C would restrict fuelwood gathers to within 300 feet on both sides of designated roads and trails where availability of fuelwood may become scarce over time. This can lead to concentrated use in some areas, effectively removing all available fuelwood. In areas further away from the roads and trails, concentrations of dead and down fuel would start to accumulate over time, increasing the risk of uncharacteristically intense fire behavior. As the season progresses and the weather turns cool, individuals may have trouble locating areas to legally gather fuelwood and fill their permits.

Historically, along the sides of roads gets cleared of dead and down fuelwood each year by late August, five months into the nine month season. The majority of permits are sold in the latter portion of the season generally from late August through November, as temperatures drop and people being to focus on heating their homes. There have even been cases where some people wait until the last minute and purchase permits in December.

One possible option for enabling the 600 foot corridor to meet the needs that are accomplished yearly by the current fuelwood gathering program would be to move wood outside of the corridor into that corridor. To do this efficiently would require equipment to make repeated trips back and forth across the treatment area and would have a much larger impact on soils and residual vegetation then random trips into the area by individual wood cutters. These wood cutters tend to pick their individual trails directly to their spots and tend to only make one trip to each area they cut.

It would take several years for fuels to begin to build up across the landscape, say five to seven years (normal burn cycle) under “normal” conditions. When treatments occur or there is die off due to drought or insects the time for fuel accumulation can shorten considerably. Insects can create fuel hazards in a single year as evident by the bark beetle outbreak near Pine in the early 2000s.

While it is acknowledged that very few wood cutters will physically haul wood over 100 feet to their truck and even fewer use wheelbarrows to gather wood, they do frequently use old skid trails or gaps in the forest to work their vehicles into the forest a considerable distance where they can load wood directly into their trucks or trailers without having to carry the wood by hand. ATVs with trailers have greatly increased the distances they are able to reach. The larger the tree, the further the wood cutter is often willing to drive off the road. Some wood cutters travel 500 to 1000 feet off the road to gather a large juniper that has burned down. While most of the wood cutters that receive one of the 1,500 permits issued yearly would stay within 300 feet of designated routes, the more experienced cutters rarely cut near the road, and regularly venture beyond 300 feet. A conservative estimate of these wood cutters would be 30 percent of regular permit holders or approximately 300 individuals.

Unavoidable Adverse Effects

Implementation of any of the alternatives would result in some unavoidable adverse environmental effects. Although formation of the alternatives included avoidance of some effects, other adverse effects could occur that cannot be completely mitigated. The environmental effects for each resource area in this chapter discuss these effects in greater detail.

Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of a resource is one that cannot be regained, such as the extinction of a species. An irretrievable commitment is one where the value of the resource is lost for a period of time, such as the loss of soil productivity from the existence of a road.

The No Action Alternative could result in the irreversible loss of cultural resource sites, as cross-country travel is currently permitted on the Payson and Pleasant Valley Ranger Districts. By definition, cultural resource sites and traditional cultural properties are not renewable and damage to them cannot be reversed. By following the Programmatic Agreement discussed in the Heritage Resources section of this chapter, the action alternatives would have no irreversible commitments of resources.

All of the alternatives would result in the irretrievable commitment of some of the forest's soil productivity. This commitment, however, would be negligible when considered at the scale of the forest. All action alternatives designate unauthorized routes, which commits the soil to use as a route rather than for growing plants. Additionally, the action alternatives would continue to allow camping, which also tends to commit soil to that use. Alternative D, which is expected to result in more bare ground from motorized dispersed camping, could irretrievably reduce visual quality in some places. The environmental effects for each resource area in this chapter discuss these effects in greater detail.

Chapter 4. Consultation and Coordination

Preparers and Contributors

The following is a list of contributors to this draft environmental impact statement. Numerous other people have also contributed in many ways to this document. Their help is greatly appreciated.

Bray G. Addison Jr., Patrol Captain, Central Arizona Zone, Law Enforcement Officer

Education: BS and MS degrees in Wildlife Management

Experience: Bray Addison, served 4 years on active duty in the U.S. Army as a Field Artillery officer. After getting his Arizona POST certification as a police officer, he served 8 years as a Wildlife Manager for the Arizona Game and Fish Department. He has been a U.S. Forest Service Law Enforcement Officer on the Tonto National Forest for 11 years, with the last 4 years as the Patrol Captain.

Patti R. Fenner (Retired), Noxious Weed Program Manager, Tonto National Forest

Education: BS Botany from Arizona State University; MS in Natural Resource Management from Arizona State University

Experience: Patti was a Range Conservationist with the Forest Service for 23 years, managing livestock allotments and range vegetation. She has been in her current position we the forest Noxious Weed Program manager for 10 years.

Tim Holt, Wildlife Manager Supervisor, Arizona Game and Fish Department

Education: B.S. Biology (Fish and Wildlife Management), Northern Arizona University

Experience: Tim Holt has worked for the Arizona Game and Fish Department for 13 years in the southwestern, northern, and central portions of Arizona. He has served as a Wildlife Manager, Wildlife Specialist, and currently as a Wildlife Manager Supervisor in Region 6 of the Arizona Game and Fish Department.

Kimber Jones, Forest Landscape Architect, Tonto National Forest

Education: Bachelor of Landscape Architecture, Iowa State University

Experience: Kimber, a registered Landscape Architect, has worked for the Tonto National Forest for 24 years designing recreation sites, overseeing the design and construction of highways crossing through the forest, and is responsible for scenery management.

Grant Loomis[149], Forest Hydrologist, Tonto National Forest

Education: B.A. Economics, UC Davis; MS (all but thesis) Hydrology and Water Resources, University of Arizona.

[149] Grant Loomis also revised the Soils Report and authored the Climate Change section in Chapter 3.

Experience: Grant has been the hydrologist for the Tonto National Forest for the past 26 years. Prior to that, he was the hydrologist on the Bureau of Land Management's Glenwood Springs Resource Area in Colorado for 6 years. He was also an economist/hydrologist on the Bureau of Land Management's Winnemucca District in Nevada for 2 years.

Leonard Montenegro (Contractor), Air Quality Scientist, numAIRic Inc.

Education: B.S. Chemistry, Arizona State University.

Experience: Leonard has worked for fifteen years in the areas of air quality assessment and modeling. He has five years as a professional consultant providing clients with air quality research and analysis necessary to comply with governmental regulations. He was head of evaluation for Arizona's Air Quality Division and has carried out a variety of air quality assessments in Arizona.

Tammy Pike, Natural Resource Specialist, Tonto National Forest

Education: B.S. Environmental Resources, Arizona State University.

Experience: Tammy has worked for the Tonto NF for 12 years in lands and recreation including as the OHV and Trails Coordinator for the Forest during which time she earned two national awards for her work with the FS National Travel Management Team and NOHVCC. She was the Branch Chief of Trails for FS Recreation Solutions. Prior to working for the Forest Service Tammy worked for the Arizona State Land Department, Arizona Game & Fish Department and Arizona Department of Transportation.

Lonny Rollins, Roads Manager, Tonto National Forest

Education: BS Civil Engineering, University of Arizona

Experience: Lonny has worked for the Tonto for over four years as a civil engineer. He has worked on many different development projects throughout the Forest. He is currently the Roads Manager for the Tonto National Forest.

Anne Thomas, Social Scientist and Team Leader, Tonto National Forest

Education: M.S. Human Dimensions of Ecosystem Science and Management, Utah State University; B.S. Environmental Science, Concordia University at Austin.

Experience: Anne has worked for the Forest Service for six years, working on the Wasatch-Cache National Forest, the Intermountain Regional Office, the Humboldt-Toiyabe National Forest, the Sequoia National Forest, and the Tonto National Forest. She has been an interdisciplinary team leader for the Giant Sequoia National Monument Plan and a district NEPA coordinator. Currently she is the NEPA Coordinator for the Tonto National Forest.

Jon Scott Wood (Retired), Forest Archaeologist, Tonto National Forest

Education: BS and MS degrees in Archaeology from Arizona State University

Experience: 38 years working as an archaeologist on the Tonto National Forest.

Tyna Yost, South Zone NEPA Coordinator, Tonto National Forest

Education: M.S. Biology, Arizona State University; B.S. Conservation Biology and Ecological Sustainability, Arizona State University.

Experience: Tyna has worked for the Forest Service for seven months and is the South Zone NEPA Coordinator.

Jill Holderman, Forest Wildlife Biologist

Education: M.S. University of Nevada Reno, Reno NV Land Use Planning; B.S. University of Nevada Integrated Pest Management

Experience: Jill worked for the forest service for 6 years as a seasonal forester and then forester on the Plumas National Forest and 9 years as wildlife biologist on the Boise National Forest Service. She then transferred to the Bureau of Land Management and worked in The Four Rivers Field Office for 7 years and then as the biologist for the Morley Nelson Snake River Birds of Prey National Conservation Area in Boise, Idaho for another 6 years. Currently she is the forest biologist for the Tonto National Forest.

Distribution of the Draft Environmental Impact Statement

This draft environmental impact statement has been distributed to individuals who specifically requested a copy of the document. In addition, copies have been sent to the following Federal agencies, federally recognized tribes, State and local governments, and organizations representing a wide range of views regarding travel management:

ABA Arizona Bowhunters
Adair Desert Tours
Agua Fria Intergroup
Agua Fria National Monument
Airpark Auto
Arizona Repeater Association
Alan Benoit Photography
All Wet Scuba, LLC
Alltel
AMA
American Bass Association
American Fisheries Society
American Motorcycle Association
American Rivers
Americon Realty
AnasArizonai Foundation, Inc.
Animal and Plant Health Inspection Service
Animal Defense League of Arizona
Antenna Sites, Inc.
Antlers
Apache Bass Club
Apache County ATV Roughriders
Apache County Development and Communication Services
Apache Junction Chamber of Commerce
Apache Junction Rock and Gem Club, Inc.
Apple Hill Enterprises
Archaeological Consulting Services, LTD
Arizona Anglers Family Fishing
Arizona Archaeology Society - Phoenix Chapter
Arizona Association of Conservation Districts
Arizona Association of Counties
Arizona ATV Riders, Inc.
Arizona Auto Association
Arizona Awareness Desert Jeep Tours, Inc.
Arizona Bass Club
Arizona Beemers
Arizona Board of Regents - KAET ASU
Arizona Bound Jeep Tours
Arizona Bowhunters
Arizona Cattle Growers Association
Arizona Cattle Grower's Association

Arizona City Gem and Mineral Society
Arizona Commission of Agriculture and Horticulture
Arizona Department of Agriculture
Arizona Department of Agriculture, Animal Services
Arizona Department of Emergency & Military Affairs
Arizona Department of Environmental Quality
Arizona Department of Environmental Quality – Water Quality Division
Arizona Department of Environmental Quality - Emergency Response
Arizona Department of Mines and Mineral Resources
Arizona Department of Public Safety
Arizona Department of Transportation
Arizona Department of Transportation, Maintenance Office
Arizona Department of Water Resources
Arizona Division of Emergency Management
Arizona Elk Society
Arizona Game and Fish Department
Arizona Game and Fish Department - Law Enforcement Branch
Arizona Game and Fish Department - Radio Dispatch
Arizona Game and Fish Department - Regional VI Headquarters
Arizona Game and Fish Department - WMHB
Arizona Game and Fish Department- Adopt-A-Ranch Program Manager
Arizona Game and Fish Department - Region 6 HQ
Arizona Geological Survey
Arizona GrArizonaing Clearinghouse
Arizona Great Outdoors
Arizona Guide Association
Arizona House of Representatives
Arizona Iceman
Arizona Iron Supply, Inc.
Arizona Livestock Board
Arizona Native Plant Society
Arizona Navy
Arizona Office of Tourism
Arizona OHV Association
Arizona OHVC
Arizona OHVC, Arizona Rock Rats
Arizona Outdoor Journal
Arizona Outdoors Club at ASU
Arizona Partnership for Forest Health
Arizona Public Service
Arizona Public Service - Childs Power Plant
Arizona Public Service - Forestry and Special Programs
Arizona Ranch Management
Arizona Repeater Association
Arizona Rivers Coalition
Arizona Senate
Arizona Small Mine Operators Association
Arizona Sportsmasters
Arizona State Association of 4-Wheel Drive Clubs
Arizona State Land Department
Arizona State Land Office
Arizona State Lands - State
Arizona State Mine Inspector
Arizona State Parks
Arizona State Parks - Division of Planning
Arizona State Parks Board
Arizona State Senate
Arizona State Treasurer
Arizona Trail Riders, Inc.
Arizona Trout Unlimited
Arizona Unique Buggy Adventures, Inc.
Arizona State University
Arizona State University - College of Law
Arizona State University - Global Institute of Sustainability
Arizona State University - Morrison School of Agribusiness
Arizona State University - Department of Zoology
Arizona State University - Disability Resource Center
Arizona State University - Global Institute of Sustainability

Arizona State University Hayden Library - Government Documents
Arizona State University - Libraries
Arizona State University - Plant Biology
Arizona State University -Zoology Department
Arizona State University - School of Earth and Space Exploration
Arizona Virtual Jeep Club
Arizona Water Company
Arizona Wholesale Fuelwood
Arizona Wilderness Coalition
Arizona Wildlife Federation
Arizona Wool Producers
Armstrong Living Trust
Arrowhead Canyon Homeowners Association
ASA4WDC Conservation
ASARCO, Inc.
ASARCO, LLC
Audubon Expedition Institute
Audubon Society
Audubon Society-Tucson
Bank One
Bar Eleven Land and Cattle Company
Bar X Ranch Conservatory, Inc.
Barro's Pizza
Bartlett Lake Marina
Barton, Venable, Gullette and Randall
Bat Conservation
Bat Conservation International
Beaver Valley Improvement Association
Biff Miller and Regina Durbin
Big River Films
Bill Johnson's Big Apple Restaurant
Black Brush Ltd. Partnership
Black Canyon City Chamber of Commerce
Black Mountain Coffee Shop
Black Mountain Lions Club
Black Mountain Mining Corp
BLM - Arizona Strip Field Office
BLM, Arizona State Office
Blue Ribbon Coalition
Bob Lee and Sons Tree Services
Bordges Timber, Inc.
Boyce Thompson Arboretum
Braggin Rock Club
Bray Creek Ranch
Brown and Bain
Bubbles Up Drive and Travel
Bullock Logging
Bureau of Indian Affairs
Bureau of Indian Affairs - Navajo
Bureau of Indian Affairs - San Carlos
Bureau of Land Management
Bureau of Reclamation
C.A.S.T. (Central Arizona Spouse Teams)
Cable One
Cactus Shadows High School
Camelback Adventures
Camp Creek Association
Camp Creek Homeowners Association
Camp Creek Residence Association
Camp Verde Chamber of Commerce
Canyon Bass Association
Canyon Bass Club
Canyon de Chelly National Monument
Cave Creek Building Supply
Cave Creek Outfitters
Cave Creek Saddle Club
Cave Creek Unified School District
Cave Creek/Carefree Chamber of Commerce
Center for Biological Diversity
Central Arizona Association of Governments
Central Arizona Project
Central Arizona Trail Hounds
Chamber of Commerce
Chandler Bass Assn
Chaparral Guides and Outfitters
Chino Winds NRCD
Christopher Creek Homeowners Assn
CHRJ Partners

Chuckwalla Wilderness Adventures
Cierra Medical Walk-In
Citizens for a Better Young
City of Apache Junction
City of Flagstaff
City of Globe
City of Hildale
City of Kanab
City of Mesa
City of Mesa, District 5
City of Page
City of Payson
City of Prescott
City of Scottsdale
City of Sedona
City of St. George
City of Williams
Civil Air Patrol
Clarkdale Chamber of Commerce
Coconino County - District 1
Coconino County - District 2
Coconino County - District 3
Coconino County - District 4
Coconino County - District 5
Coconino County - Planning and Zoning
Coconino County Cooperative Extension Office
Coconino County Public Works Department
Coconino Natural Resource Conservation District
Cold Springs Ranch
Community Television Project, Inc.
Continental Mining Inc.
Cooper's Hay Hook Ranch
Copper Hills ATV Riders Association
Copperstate Bass Club
Cottonwood Chamber of Commerce
Creation Research Society
Croman Corporation
CTW Cattle Company
Dames and Moore
Defenders of Wildlife
Del Norte Bass Club
Del Shay Ranch, Inc.
Department of Water Resources
Desert Bighorn Sheep Society
Desert Botanical Garden
Desert Dog Hummer Adventures
Desert Mountain Properties
Desert Southwest Region
Desert Storm Hummer Tours, Inc.
Desert Foothills Medical Center
Destination West, Inc.
D'Eugenio Investment Enterprises, Inc.
Diamond A Ranch Corporation
Diamond Point Homeowners Association
Dirty SW Offroad Badboys Society
Dons of Arizona
Dorothy Cline Wells Trust
Dos S Ranch
Durham Communications
East Maricopa NRCD
East Valley Tribune
East Verde Mine Patents
East Verde Park HOA
East-West Productions
EECO and ECO
El Mar Diving (Tierra Mar)
Eloy Enterprise
Environmental Information Center
Environmental Planning Group
Environmental Services Department - Division of Water and Waste Management
Environmental Strategies, Inc.
EPA - Region 9
Equipment Maintenance Service
ERA - Young Realty
Extreme Arizona
Farm Services Agency
Federal Aviation Administration
Federal Bureau of Investigation
Fenn Land and Cattle Company, LLC

First Western Resources Inc.
Fisher Wireless Services, Inc.
Five County Association of Governments
Flagstaff Activist Network
Flagstaff Area National Monuments
Flagstaff Gem and Mineral Society
Flowing Springs
Foothills Equipment Rental RSC
Foothills Photo
Forest Guardians
Forest Permittee
Fort Apache Timber Company
Foundation for Biodiversity
Fredonia Fire Department
Freedom Wireless Gila, Inc.
Freelance Productions
Freeman McQue Public Relations
Friends of Agua Fria National Monument
Friends of Arizona Rivers
Friends of Pinto Creek
Friends of Sycamore
Friends of the Goldfields
FSEEE
Ft. McDowell Tribal Council
Ft. McDowell Yavapai Nation
General Metals Manufacturing and Supply
Gila County
Gila County Board of Supervisors, District 1 Supervisor
Gila County Board of Supervisors, District 3 Supervisor
Gila County Cattle Growers
Gila County Community Development
Gila County Cooperative Extension
Gila County Emergency Management
Gila County Extension Service
Gila County Planning & Zoning Commission
Gila County Public Works
Gila County Sheriff's Office
Gila County Trails
Gila National Forest
Gila River Cellular General Partnership
Gila River Cellular General Partnership
Gila River Indian Community
Girl Scouts Arizona Cactus-Pine Council
Glendale Chamber of Commerce
Globe-Miami Regional Chamber of Commerce and Economic Development Corporation
Goldfield Ghost Riders
Governor’s Forest Health Councils
Governor's Office
Grand Canyon Chamber of Commerce
Grand Canyon Council
Grand Canyon Council, Inc. Camp Geranimo
Grand Canyon National Park
Grand Canyon Wildlands
Grand Canyon-Parashant National Monument
Grand County Justice Court
Greater Arizona Bicycle Association
Green Valley Lapidary Club
Greenback Valley Ranch
GTWA
H&E Ranch
Happy Jack Information Center
Hardscrabble GrArizonaing Allotment
HEAT Dirt Riders
Hebbard and Webb Inc.
Heritage Camp Timber
High Desert Investment Company
Holliday Timber Products
House of Representatives
Houston Creek Ranch, LLC
Houston Mesa General Store
Huachuca Mineral and Gem Club
Hyatt Regency Scottsdale
Hyland Bay Company
Intermountain Resources
Integrity Land and Cattle, LLC
International Association F&W Agencies
International Llama Association

Irving Power Plant
Isabelle Hunt Memorial Public Library
J Bar B Cattle Company
Jack Arizona Bass
Jerome Chamber of Commerce
JF Ranch
Johnson Cattle Company
Johnson Ranch Partnership
Johnston Farms, Ltd. Partnership
Joseph Auza Sheep Company
K&K Lumber Co, LLC
Kampgrounds of America
Kane County Planning/Zoning
Keep Sedona Beautiful, Inc.
Kelly Clark Automotive
Kendell Family Revocable Trust
KMOG-Radio
Lake Havasu Gem and Mineral Society, Inc.
Lakeview Lapidary Club
LArizonay H Cross Ranch
Lawman Bass Club
Legislative Council
Liars Korner
Living Proof, Inc.
Logan Simpson Design, Inc.
Magma Copper Company
Malcolm Pirnie, Inc.
Maricopa Audubon Society
Maricopa County
Maricopa County Board of Supervisors
Maricopa County Cooperation Extension Service
Maricopa County Department of Transportation
Maricopa County Supervisor's Office Lake Patrol Division
Maricopa Lapidary Society, Inc.
Martin Ranch, Inc.
Mayer Area Chamber of Commerce
Mayo Clinic
McDowell Sonoran Land Trust
Mesa 4-Wheels
Mesa Chamber of Commerce
Mesa East Rock Club
Mesa Four Wheelers
Mesa Tribune Newspaper
Mesa Varmint Callers
Mid Week Bass Anglers
Mineral Resources
Mingus Gem and Mineral Club
M-L Arizonay-S Cattle Co.
Mogollon Sportsman's Assoc.
Mohave County - District 1
Mohave County - District 2
Mohave County - District 3
Mohave County Planning/Zoning
Mojave Electric Coop
Montgomery and Interpreter, PLC
Motorola Rockhound Club
Mountain Bike Association of Arizona
Mueller Revocable Trustees
Muleshoe X Cattle Company
National Park Service
National Wildlife Federation
Native Ecosystems
Nature Conservancy - Northern Arizona Program
Navajo Nation
Navajo Army Depot
Navajo National Monument
Nelson Timber
Nevada Department of Wildlife
New Mexico State University - Agriculture and Economic Department
New River/Desert Hills Community Association
New World Communications of Phoenix, Inc.
Northcott, Inc.
Northern Arizona Audubon Society
Northern Arizona Council of Governments
Northern Arizona University - Department of Geology
Northern Arizona University - Forest ERA
Office of Senator Jon Kyl

Offroad Passport
Old Pueblo Bass Anglers
Old Pueblo Lapidary Club, Inc.
OMYA
Orotex, Inc.
Outback Safari Company Inc.
Outdoors Now
OW Ranch
Oxbow Estates RV
P Diamond, LLC
P.V. Trail Riders
Pacific Legal Foundation
Page Land and Cattle Company
Pago Bass Club
Palo Verde Sierra Club
Patty Ryan Living Trust
Paul Bunyan's Firewood, Inc.
Pauline Peters Living Trust
Pay Dirt MagArizonaine
Payson Chamber of Commerce
Payson Parks, Recreation, and Tourism Department
Payson Police Department
Payson Public Library
Payson Rimstone Rock Club
Payson Roundup
Payson Verde River Ranch, LLC
People for the West
Perimeter Bicycling Association of America
Permagrin Canoe and Kayaking School
Petrified Forest National Park
Phelps Dodge Corp
Phelps Dodge Miami Inc.
Phillips Outdoor Program Center
Phoenix Bassmasters
Phoenix Junior Bassmasters
Phoenix Ski Club
Phoenix Zoo
Pinal County Board of Supervisors
Pinal Mountain Cabin Owners
Pine/Strawberry Fire Department
Pine/Strawberry Water Improvement District
Pleasant Valley Community Council
PNRS
Police Department - Homeland Security/CT102
Ponderosa Fire Deptartment
Precision Marine
Precision Pine and Timber, Inc.
Prescott Bass Club
Prescott Chamber of Commerce
Prescott College
Prescott National Forest Friends
Prescott Valley Economic Development Foundation
Probation Department, County of Gila
Public Lands Information Center
Pueblo of Zuni Heritage and Historic Preservation Office
Qwest Communications
R.A.M. Inc.
Rafter Cross Cattle Company
Rambo Realty and Investment
Rancher ASP Board OHV Advisor
Recon Environmental Inc.
Red Creek Ranch, LLC
Red Mountain Mining, Inc.
Reevis Mountain School
Renegy LLC
Resolution Copper Company
Riding Arizona
Rim Tours Inc.
Rimwood, Inc.
Rio Verde Horsemen's Association
Roadrunner 4 Wheel Drive Club
Roadrunners Prospecting Club
Rock Art Signs
Rock House Grocery
Rockstars Motorcycle Offroad
Rocky Mountain Elk Foundation
Roosevelt Marina, LLC
Roosevelt Residents Organization

Rooster Tails West Bass Club

Rooster Tales West Bass Club

RPAP

Saguaro 4x4s

Saguaro Amateur Remote Base Association, Inc.

Saguaro Bassmasters

Saguaro Dive and Travel

Saguaro Lake Marina

Saguaro Lake Ranch, Inc. (Cimarron A & R. C. Sublease River Running)

Saguaro National Monument

Salt River Pima- Maricopa Indian Community

Salt River Project

Salt River Project - Environmental Services Department

Salt River Project - Water Rights Division

San Carlos Apache Timber Products Company

San Carlos Apache Tribe

San Carlos Apache Tribe -Forest Resources Program

Sanborn Land and Cattle Company

Santa Rita Ranches, Inc.

Save the Peaks Coalition

SBA ONRSA

Scottsdale Artist School, Inc.

Scottsdale Department of Planning and Economic Development

Scottsdale Osborn Trauma Center

Scottsdale Shea Hospital

Scuba Science, Inc.

SEC, Inc.

Sedona Chamber of Commerce

See Canyon Homes

Sheep Springs Sheep Company

Sierra Club

Sierra Club - Grand Canyon Chapter

Sierra Club - Southwest Office

Silvery Colorado River Rock Club

Slat River Canoe and Kayak

Sleep Inn

Soil and Moister Conservation Program

Southern Gila County Economic Development Corp.

Southwest Forest Products

Southwest Forest Science Complex

Southwest Natural History Association

Southwest Network

Southwestern Biological Institute

Spectrum Aerospace

SpringHill Suites by Marriott

Spur Cross Ranch Conservation Area

State Historic Preservation Officer

Station Manager, TV4

Stewart – Martin

Stone Container Corp.

Sun City Rockhound Club

Sunny Mesa Realty

Sunsites Gem and Mineral Club

Superhook Towing

Superior Development Company

Superstition O.K. Corral Stables, Inc.

Superstition Area Land Trust

Superstition Mountain Adventures, Inc. dba Apache Trail Tours

SW Adventure, Inc.

SW Transmission

Telespectra

Telluride White Water

The Arizona Trail Association

The Griffin Cattle Ranch

The Hopi Tribe

The Hopi Tribe - Hopi Cultural Preservation

The Hopi Tribe Preservation Office

The Nature Conservancy, Regional Conservation Manager

The Sparks Law Firm P.C.

The Wilderness Society -Arizona Chapter

The Wilderness Society

The Zia Connection

Thunder Mountain Adventures

Timbersource.com

Tonto Apache Tribal Police Department
Tonto Apache Tribe
Tonto Basin Kiwanis Club
Tonto Creek Estates
Tonto Hills Homeowners Association
Tonto National Monument
Tonto Natural Bridge State Park
Tonto NRCD
Tonto Recreation Alliance
Tonto Rim Sports Club
Town of Big Water
Town of Carefree
Town of Cave Creek
Town of Chino Valley
Town of Clarkdale
Town of Colorado City
Town of Fredonia
Town of Miami
Town of Payson
Town of Prescott Valley
Town of Superior
Trails 'n Tails LLC
Tri Star Logging
Trial Horse Adventures
Triangle P Ranch
Tri-Valley Bass Club
Tucson District Office
Tucson Gem and Mineral Society
Tusayan Fire Department
Tuzigoot National Monument
U.S. Army Corps of Engineers
U.S. Customs and Border Protection
U.S. Environmental Protection Agency
U.S. EPA Region 9
U.S. Fish and Wildlife Service
U.S. Geological Survey
U.S. Geological Survey, Southwest Biological Science Center
U.S. Senate
Union Pacific Railroad
United Association Plumbers and Pipefitters
University of Arizona
University of Arizona - Ecology and Evolutionary Biology
University of Arizona - Gila County Cooperation Extension
University of Arizona, Department of Geosciences
University of Arizona at NAU
University of Arizona -Cooperation Extension
University of Arizona School of Renewable Natural Resources
Univision
UpsJeep
USDA NRCS
USDA, Fish and Wildlife Service
USDA-APHIS-PPQ, Plant health director
USDI, Bureau of Reclamation
Utah Division of Wildlife Resources
Verde Glen Property Association
Verde Natural Resource Conservation District
Verde NRCD
Verde Ranger District
Verde Valley Forum for Public Affairs
Virtual Jeep Club
W.J. Cattle Co.
Walgreens
Wally Smith Logging, Inc.
Walt's Kawasaki-Yamaha
WAPA
WAPA - Desert SW Region
Waste Management
Way Out West Off Road Expeditions
West Side Bassmasters
Western Area Power
Western Land Exchange Project
Western States Public Lands Coalition
Western Technologies, Inc.
Western Watersheds Project
White Mountain Apache Tribe
White Mountain Apache Tribe Legal Department

White Mountain Apache Tribe, Tribal Attorney
White Mountain Conservation League
Wickenburg Gem and Mineral Society, Inc.
Wild Earth Guardians
Wild West Jeep Tours
WildEarth Guardians
Wilderness Aware
Wilderness Watch
Wildland Fire Advisory Council
Williams Fire Department
Willow Hill Ranch
Windwalker Expeditions, Inc.
Winkelman NRCD
Winters Company
Withycombe Family, LLC
Yavapai County - District 1
Yavapai County - District 2
Yavapai County - District 3
Yavapai County Board of Supervisors
Yavapai - Apache Nation
Yavapai - Prescott Tribe
Yuma Gem and Mineral Club
Zuni Pueblo

Glossary of Terms

36 CFR 212: 2005 Travel Management Rule which replaced CFR 295.

***36 CFR 261*:** Establishes prohibitions necessary to manage and control use on National Forest development trails.

***36 CFR 293*:** Prohibits motorized use in wilderness and primitive areas.

***36 CFR 800*:** Implementing regulations for Section 106 of the NHPA

Adaptive management: A system of management practices based on clearly identified intended outcomes and monitoring to determine if management actions are meeting those outcomes; and, if not, to facilitate management changes that will best ensure that those outcomes are met or re-evaluated. Adaptive management stems from the recognition that knowledge about natural resource systems is sometimes uncertain (36 CFR 220.3).

Administrative unit: A National Forest, a National Grassland, a purchase unit, a land utilization project, Columbia River Gorge National Scenic Area, Land Between the Lakes, Lake Tahoe Basin Management Unit, Midewin National Tallgrass Prairie, or other comparable unit of the National Forest System.

Administrative use only (Admin Use): motorized access is restricted, often with a locked gate, to Forest Service personnel or those that hold an authorized use permit to access the road or trail. These routes would not show up on the motor vehicle use map. Motorized user not authorized to be on these routes would be cited for being in violation.

Alluvial: Pertaining to processes or materials associated with transportation or deposition by running water.

Annual maintenance: Work performed to maintain serviceability or repair failures during the year in which they occur. Includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur. Unscheduled or catastrophic failures of components or assets may need to be repaired as a part of annual maintenance.

Aquatic: Growing or living in or frequenting water; taking place in or on water.

Aquatic ecosystem: A stream channel, lake or estuary bed, the water itself, and the biotic (living) communities that occur therein.

Archaeological survey: A systematic, intensive inspection of the landscape in order to identify, inventory, and evaluate archaeological sites, which are defined as locations of purposeful prehistoric or historic human activity.

Area: A discrete, specifically delineated space that is smaller, and in most cases much smaller, than a Ranger District.

Arterial road: Classified road that provides service to large land areas; arterial roads are usually developed and operated for long-term land and resource management purposes and constant service.

Aspect: The direction a slope faces. For example, a hillside facing east has an eastern aspect.

Buffer: A zone of a specified distance around a linear or area feature.

Code of Federal Regulations: A codification of the general and permanent rules published in the *Federal Register* by the executive departments and agencies of the Federal Government.

Collaboration: Managers, scientists, and citizens working together to plan, implement, and monitor national forest management. The intention is to engage people who have information, knowledge, expertise, and an interest in the health of national forest ecosystems and nearby communities.

Collector roads: Classified roads serving smaller land areas than arterial roads; collector roads collect traffic from local roads and usually connect to forest arterial roads or state and county highways. They are operated for either constant or intermittent service depending on land use and resource management objectives.

Council on Environmental Quality (CEQ: The Council on Environmental Quality established by Title II of NEPA (40 CFR 1508.6).

Critical habitat: Areas designated for the survival and recovery of federally listed threatened or endangered species.

Cumulative effects (or impacts): The effect on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative effects can result from individually minor ,but collectively significant, actions taking place over a period of time (40 CFR 1508.7).

Decommissioned (roads or trails): Demolition, dismantling, removal, obliteration, and /or disposal of a deteriorated or otherwise unneeded asset or component, including necessary cleanup work. This action eliminates the deferred maintenance needs for the fixed asset. Portions of an asset or component may remain, if they do not cause problems or require maintenance.

Deferred maintenance: Maintenance activities that can be delayed without critical loss of facility serviceability until the work can be economically or efficiently performed.

Degradation: Reduction in quality. The process whereby the water quality and chemical, physical, or biological integrity of a water body is decreased. Habitat quality can be changed by certain management activities. If the quality is reduced, then habitat degradation has occurred.

Designated road, trail, or area: A National Forest System road, a National Forest System trail, or an area on National Forest System lands that is designated for motor vehicle use pursuant to § 212.51 on a motor vehicle use map.

Draft environmental impact statement (DEIS): A detailed written statement as required by section 102(2) (C) of the NEPA (40 CFR 1508.11) that is released to governmental agencies and the general public for review and comment.

Designated road, trail, route, or area: A National Forest System road, trail or area that is designated for motor vehicle on a motor vehicle use map (36 CFR 212).

Desired conditions: Land or resource conditions that are expected to result based on goals and objectives.

Ecology/ecological: The interrelationships of living things to one another and to their environment, or the study of these interrelationships.

Ecosystem: An arrangement of living and nonliving things and the forces that move them. Living things include plants and animals. Nonliving parts of ecosystems may be rocks and minerals. Weather and wildfire are two of the forces that act within ecosystems.

Endangered species: Those plant or animal species that are in danger of extinction throughout all or a significant portion of their range. Endangered species are identified by the Secretary of the Interior in accordance with the Endangered Species Act of 1973.

Endemic: When referring to a species, means living in defined geographic area: such as a species of organism that is confined to a particular geographic region like an island or river

Environmental impact statement (EIS): A detailed written statement as required by section 102(2) (C) of NEPA (CFR 1508.11).

Ephemeral stream: Streams that flow only as the direct result of rainfall or snowmelt. They have no permanent flow.

Executive orders: United States Presidents issue executive orders to help officers and agencies of the executive branch manage the operations within the federal government itself. Executive orders have the full force of law[1] when they take authority from a power granted directly to the Executive by the Constitution, or are made in pursuance of certain Acts of Congress which explicitly delegate to the President some degree of discretionary power (delegated legislation). Like statutes or regulations promulgated by government agencies, executive orders are subject to judicial review, and may be struck down if deemed by the courts to be unsupported by statute or the Constitution

Executive Orders (EO) 11644 and 11989: These orders provide direction for Federal agencies to establish policies and provide for procedures to control and direct the use of OHVs on public lands so as to: 1) protect the resources of those lands; 2) promote the safety of all users of those lands; and 3) minimize conflicts among the various users on those lands. Section 3(1) establishes that “Areas and trails shall be located to minimize damage to soil, watershed, vegetation, or other resources of the public lands.” Section 9(a) allows the agency head to close trails to use if the use is causing effects to the soil, vegetation, and other resources until the adverse effects have been eliminated and measures are implemented to prevent future recurrence.

Executive Order 11990 of May 24, 1977**:** This order requires each agency to take action to minimize destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

Executive Order 13007: Each executive branch agency with statutory or administrative responsibility for the management of Federal lands shall, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.

Executive Order 13112, issued by the President in 1999: a species is considered invasive if it: 1) is nonnative to the ecosystem under consideration and 2) its introduction causes or is likely to

cause economic or environmental harm or harm to human health. The Tonto National Forest has not been intensively surveyed for noxious weeds. Populations of some noxious weeds have been known for nearly 30 years and have spread considerably since they were first identified. Others are still being found in small infestations.

Executive Order 13443: The purpose of this order is to direct Federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, including the Department of the Interior and the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

Fauna: Animal life

Flora: Plant life

Forest road or trail: A road or trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources (36 CFR 212).

Forest transportation atlas: A display of the system of roads, trails, and airfields of an administrative unit.

Forest transportation facility: A forest road or trail or an airfield that is displayed in a forest transportation atlas, including bridges, culverts, parking lots, marine access facilities, safety devices, and other improvements appurtenant to the forest transportation system.

Forest transportation system: The system of National Forest System roads, National Forest System trails, and airfields on National Forest System *lands (36 CFR 212).*

Four County Area: Refers to the four counties that overlap with the Tonto National Forest: Gila, Maricopa, Pinal, and Yavapai.

Fuels: Plants and woody vegetation, living and dead, which are capable of burning.

Fuelwood: Wood cut into short lengths for burning in a fireplace, woodstove or fire pit.

Geographic information system (GIS): A computer system capable of storing, manipulating, analyzing, and displaying geographic information.

Habitat: The area where a plant or animal lives and grows under natural conditions.

Herbaceous: A plant having little or no woody tissue.

Heritage: Refers to historic preservation, prehistoric, and historic cultural resources and cultural traditions.

Highway: Highway is a way or a place of whatever nature publicly maintained and open to the use of the public for purposes of vehicular travel. The term “highway” does not include fire trails, logging roads, service roads regardless of surface composition, or other roughly graded trails and roads upon which vehicular travel by the public is permitted.

Image: A graphic representation of a person or thing, typically produced by an electronic device. Common examples include remotely sensed data and photographs.

Interdisciplinary team (IDT): A group of professional resource specialists who analyze the effects of alternatives on natural and other resources. Through interaction, participants bring different points of view and a broader range of expertise.

Intermittent stream: A stream that flows only at certain times of the year, when it receives water from streams or from some surface, such as melting snow.

Inventoried roadless area (IRA): areas identified in a set of inventoried roadless area maps, contain in Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000, which are held at the National Headquarters office of the Forest Service, or any subsequent update or revision of those maps.

Irretrievable: A term that applies to the loss of production, harvest, or use of natural resources. For example, some or all of the timber production from an area is lost irretrievably, while an area is serving as a winter sports site. The production lost is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume timber production.

Irreversible: A term that describes the loss of future options. The term applies primarily to the effects of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, which are renewable only over long periods of time.

Landscape: A large land area composed of interacting ecosystems which are repeated due to factors such as geology, soils, climate, and human impacts.

Maintenance: The upkeep of the entire forest transportation facility including surface and shoulders, parking and side areas, structures, and such traffic-control devices, as are necessary for its safe and efficient utilization (36 CFR 212).

Maintenance levels: The Forest Service currently classifies maintenance of National Forest System roads by five maintenance levels. According to the Tonto National Forest Plan, they are defined as follows:

Level 1: Roads are not open to traffic; they are maintained to protect the road investment and its surrounding resources. These roads may be opened for a specific activity and returned to Level 1 upon completion of the project.

Level 2: Roads are maintained open for limited passage of traffic. Roads in this maintenance level are primitive type facilities intended for high clearance vehicles. Passenger car traffic is not a consideration.

Level 3: Roads are maintained open and safe for travel by a prudent driver in a passenger car. However, user comfort and convenience is not considered a priority.

Level 4: Roads are maintained to provide a moderate degree of user comfort and convenience at moderate travel speeds.

Level 5: Roads are maintained to provide a high degree of user comfort and convenience. These roads are normally two lanes with aggregate or paved surface.

Management action: Any activity undertaken as part of the administration of the National Forest.

Meadow: Areas of moist low lying and usually level grasslands. Generally, the water table is just below the surface of the soil and the most abundant vegetation is usually favored by wet, but not constantly, flooded soil.

Mesic: Moderately moist climates or environments. In vegetation it generally refers to vegetation found in moist environments. In soils it refers specifically to soils with mean annual temperatures of 8 to 15 degrees centigrade.

Mitigation: Avoiding the impact altogether by not taking a certain action or parts of an action through:

Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

Compensating for the impact by replacing or providing substitute resources or environments.

Motor vehicle: Any vehicle which is self-propelled, other than: (1) a vehicle operated on rails; and (2) any wheelchair or mobility device, including one that is battery-operated, that is designed solely for use by a mobility-impaired person for locomotion, and that is suitable for use in an indoor pedestrian area (36 CFR 212).

Motor vehicle use map (MVUM): The management of all the various renewable surface resources of the national forests, so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output (Multiple-Use Sustained-Yield Act; Public Law 86–517).

Motorized big game retrieval corridor: defined by the Travel Management Rule as “the designation of the limited use of motor vehicles within a specified distance of designated routes, and if appropriate, within specified time periods solely for purposes of “…retrieval of a downed big game animal by an individual who has legally taken that animal” (36 CFR 212.51 (b)).

Motorized dispersed camping corridor: defined by the Travel Management Rule as “the designation of the limited use of motorized vehicles within a specified distance of certain designated routes, and if appropriate within specified time periods, solely for the purpose of dispersed camping.” (36 CFR212.51 (b)).

Motorized trail: Can range from single tack, that would accommodate a dirt bike, to the width of a standard dirt road, that could be driven by any vehicle with high enough clearance or appropriate suspension.

***National Environmental Policy Act* (NEPA):** Codifies the national policy of encouraging harmony between humans and the environment by promoting efforts to prevent or eliminate damage to the environment, thereby enriching our understanding of ecological systems and natural resources. It declares the federal government to be responsible for: (a) coordinating programs and plans regarding environmental protection; (b) using an interdisciplinary approach to decision-making; (c) developing methods to ensure that non-quantifiable amenity values are included economic analyses; and (d) including in every recommendation, report on proposals for legislation, or other major federal actions significantly affecting the quality of the environment a detailed environmental impact statement (EIS).

National Forest System (NFS): As defined in the Forest Rangeland Renewable Resources Planning Act, the National Forest System includes all national forest lands reserved or withdrawn from the public domain of the United States, all national forest lands acquired through purchase, exchange, donation, or other means; the national grasslands and land utilization projects administered under title III of the Bankhead-Jones Farm Tennant Act (50 Stat. 525, 7 U.S.C. 1010-1012); and other lands, waters, or interests therein which are administered by the Forest Service or are designated for administration through the Forest Service as a part of the system (36 CFR 212).

National Forest System road: Defined by the Travel Management Rule as a "forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority" (36 CFR 212.1). In addition, a road is defined as "a motor vehicle route over 50 inches wide, unless identified and managed as a trail" (36 CFR 212.1).

National Forest System trail: A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a state, county or other local public authority (36 CFR 212).

National Register of Historic Places (NRHP): List of historic resources (districts, sites, buildings, structures, objects, etc.) deemed worthy of preservation. This register is maintained by the Department of Interior. A number of criteria must be met for a resource to be deemed eligible to the NRHP.

Natural resource: A feature of the natural environment that is of value in serving human needs.

Noxious weeds: Aggressive, nonnative plant species that have been introduced. They can be difficult to manage, poisonous, toxic, parasitic, or carrier of insects or disease. Examples of noxious weeds are scotch broom, yellow star thistle, and cheatgrass.

Off-highway vehicle (OHV): Any motor vehicle designed for or capable of cross country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain (36 CFR 212).

OHV recreation: Recreation activities that are conducted, using off-highway vehicles. Activities include riding ATVs, hunting, riding motorcycles, driving for pleasure, and rock crawling (36 CFR 212).

Open to public use: Except during scheduled periods, extreme weather conditions, or emergencies, open to the general public for use with a standard passenger auto, without

restrictive gates or prohibitive signs or regulations, other than for general traffic control or restrictions based on size, weight, or class of registration (23 CFR 660.103).

Objective maintenance level: The objective maintenance level may be the same as, or higher or lower than, the operational maintenance level. The transition from operational maintenance level to objective maintenance level may depend on reconstruction or disinvestment (FSH 7709.58.12.3.1).

Obliteration: A form of decommissioning that recontours and restores natural slopes.

Operational maintenance level: The operational maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns; in other words, it defines the level to which the road is currently being maintained (FSH 7709.58.12.3.1).

Other Power-Driven Mobility Device: Any mobility device powered by batteries, fuel, or other engines—whether or not designed primarily for use by individuals with mobility disabilities--that is used by individuals with mobility disabilities for the purpose of locomotion, including golf carts, electronic personal assistance mobility devises (EPAMDs), such as the Segway®PT, or any mobility device designed to operate in areas without defined pedestrian routes, but that is not a wheelchair within the meaning of this section. This definition does not apply to Federal Wilderness Areas; wheelchairs in such areas are defined in section 508(c)(2) of the ADA, 42 U.S.C. 12207(c)(2).

Over snow vehicle (OSV): A motor vehicle that is designed for use over snow and that runs on a track or tracks and/or a ski or skis, while in use over snow (36 CFR 212).

Patch: An area of vegetation, similar in structure and composition.

Perennial stream: A stream that typically has running water on a year-round basis.

Permit zone: Motorized vehicle users are required to obtain a permit to access the designated permit zone area which has locked gates and barriers restricting non-permitted motorized access. Cross-country travel is not allowed within the permit zone and vehicles are restricted to designated routes.

Pothunting: A form of vandalism against historic and prehistoric resources, where items are taken from a site.

Proposed action: A proposal made by the Forest Service to authorize, recommend, or implement an action to meet a specific purpose and need.

Protected activity centers (PACs): Designated areas that are afforded protection to specific species by restricting certain management activities. For example, Mexican spotted owl PACs protect owl habitat and breeding areas by restricting timber harvest.

Public involvement: The use of appropriate procedures to: inform the public, obtain early and continuing public participation, and consider the views of interested parties in planning and decision-making.

Public land: Land for which title and control rests with a government – Federal, state, regional, county, or municipal.

Public road: Roads under the jurisdiction of and maintained by a public authority that are open to public travel (23 U.S.C 101(a)).

Reasonably foreseeable actions: Those Federal or non-Federal activities not yet undertaken, for which there are existing decisions, funding, or identified proposals. Identified proposals for Forest Service actions are described in 220.4(a) (1) (36 CFR 220.3).

Recreation Opportunity Spectrum (ROS): A land classification system which categorizes National Forest land into six classes, each class being defined by its setting and by the probable recreation experiences and activities it affords. The six classes in the spectrum are: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban as defined below from the Forest Plan:

Primitive (P): Area is characterized by essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induce restrictions and control. Motorized use within the area is not permitted.

Semi-primitive non-motorized (SPNM): Area is characterized by a predominantly natural or natural-appearing environment of moderate-to large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restriction may be present, but are subtle. Motorized used is not permitted.

Semi-primitive motorized (SPM): Area is characterized by a predominantly natural or natural-appearing environment of moderate-to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restriction may be present, but are subtle. Motorized used is permitted.

Roaded natural (RN): Area is characterized by predominantly natural- appearing environments with moderate evidences of sight and sounds of man. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.

Rural (R): Area is characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sight and sounds of humans are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate densities are provided for away from developed sites. Facilities for intensified motorized use and parking are available.

Urban (U): Area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resources modification and utilization practices are to enhance specific recreational activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans, on-site, are predominant. Large numbers of users can be expected, both on-site and in nearby areas. Facilities for highly intensified motor use and parking are available, with forms of mass transit often available to carry people throughout the site.

Responsible official: The Agency employee who has the authority to make and implement a decision on a proposed action (36 CFR 220.3).

Riparian area: The area along a watercourse or around a lake or pond.

Riparian ecosystem: The ecosystem around or next to water areas that support unique vegetation and animal communities as a result of the influence of water.

Road: A motor vehicle route over 50 inches wide, unless identified and managed as a trail (36 CFR 212).

Road construction or reconstruction: Supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road.

Road management objective (RMO): Documentation of the intended purpose of an NFS road based on management area direction and access management objectives; enumerating design, operation, and maintenance criteria and documenting traffic management strategies for each vehicle class and season of use, if applicable, on an NFS road. It also documents forest orders and permits associated with the road.

Route: A road or trail.

Scope: The range of actions, alternatives, and impacts to be considered in an environmental impact statement (40 CFR 1508.25).

Scoping: An early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action (40 CFR 1501.7).

Sensitive species: Plant or animal species which are susceptible to habitat changes or impacts from activities. The official designation is made by the U.S. Forest Service at the regional level and is not part of the designation of threatened or endangered species made by the U.S. Fish and Wildlife Service.

Single track trails: Trail tread width is generally from 18 inches to 60 inches. Designated use can be for hiker, pedestrian, pack and saddle, bicycle, or motorcycle.

Snag: A standing dead tree. Snags are important as habitat for a variety of wildlife species and their prey.

Species: A class of individuals having common attributes and designated by a common name; a category of biological classification ranking immediately below the genus or subgenus; comprising related organisms or populations potentially capable of interbreeding.

Standards and guidelines (S&Gs): The primary instructions for land managers. Standards address mandatory actions, while guidelines are recommended actions necessary to a land management decision.

Suitability: The appropriateness of certain resource management to an area of land. Suitability can be determined by environmental and economic analysis of management practices.

Sustainability: The ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time.

Sustainable: The yield of a natural resource that can be produced continually at a given intensity of management is said to be sustainable. Recreation activities are sustainable if the human activity does not reduce ecologic sustainability.

Taxa: The name applied to any one group or entity in the scientific classification system.

Temporary road of trail: A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or trail and that is not included in a forest transportation atlas.

Threatened species: Those plant or animal species likely to become endangered throughout all or a specific portion of their range within the foreseeable future as designated by the U.S. Fish and Wildlife Service under the Endangered Species Act of 1973.

Traditional cultural property (TCP): Areas which have cultural significance or are sacred to a Native American Tribe or group. May include areas used for gathering traditional foodstuffs, archaeological sites, or sacred sites or areas.

Trail: A route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail (36 CFR 212).

Travel management atlas: An atlas that consists of a forest transportation atlas and a motor vehicle use map or maps.

Unauthorized road, route, or trail: A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas.

Understory: The trees and woody shrubs growing beneath branches and foliage formed collectively by the upper portions of adjacent trees.

Utility terrain vehicle (UTV): A type of off-highway vehicle that travels on four or more low-pressure tires, has a steering wheel or tiller, provides side-by-side seating, and is of various widths (FSH 2309.18, FSM 2353.05).

Visual quality: The forest visual resources; terrain, geological features, or vegetation.

Visual resource management: The art and science of planning and administering the use of National Forest land in such ways that visual effects maintain or upgrade man's psychological welfare. The planning and design of visual aspects of multiple-use land management (Tonto National Forest Plan, p. 234-6).

Watershed: The entire region drained by a waterway, lake, or reservoir. More specifically, a watershed is an area of land above a given point on a stream that contributes water to the streamflows at that point.

Wetlands: Areas that are inundated by surface or ground water with a frequency sufficient to support (and that under normal circumstances do or would support) a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Wild and Scenic Rivers: The National Wild and Scenic River System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding

natural, cultural and recreational values in a free-flowing condition for the enjoyment of present and future generations. Wild river areas are those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shoreline essentially primitive and waters unpolluted. These represent vestiges of primitive America. Scenic river areas are those rivers or sections of rivers that are free of impoundments, with shorelines or watershed still largely primitive and shorelines largely undeveloped, but accessible in places by road.

Wilderness: Per the 1964 Wilderness Act, a wilderness is undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation. No motorized activities are permitted within Wilderness. Public Law 98-406 added additional Wilderness Areas within the Tonto National Forest to the Wilderness Preservation System in Arizona.

Wildland: An area in which development is essentially nonexistent, except for roads, railroads, powerlines, and similar transportation facilities.

Xeric: A soil moisture regime common to Mediterranean climates that have moist cool winters and warm dry summers. A limited amount of water is present, but does not occur at optimum periods for plant growth.

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Appendix A: Proposed Amendments to Forest Plan

In order to comply with the Travel Management Rule, Tonto National Forest Plan would need to be amended to state "Motor vehicle use off the designated system of roads is prohibited, except as identified on the Motor Vehicle Use Map[150]." Specific changes to the Plan are listed in Table A-1.

Table A-1. Specific Changes to the Tonto National Forest Plan Related to ORV and Cross Country Use

Section	Page	Text to be Removed
Public Issues and Management Concerns	13	The section under Fifth Period that refers to areas and miles of road available for ORV use, as well as how the ORV policy will be implemented.
Management Prescriptions Applicable to All Forest Areas	38	Annually review and review off-road vehicle (ORV) maps. Inform the public to ensure maximum volunteer compliance of motor vehicle restrictions.
Management Prescriptions Applicable to All Management Areas	48	Maintain all trails with numbers from 500 to 999 to maintenance level 1 (except those which are to be closed or are under permit) after all other trails have been maintained to their called-for maintenance level.
Management Prescriptions Applicable to All Analysis Areas in Management Area 1D	60	Area is closed to off-road vehicle use, unless posted as open.
Management Prescriptions Applicable to Analysis Areas 3100, 3200, 3201, and 3600 in Management Area 1E	62	ORV use prohibited, unless posted as open.
Management Prescriptions Applicable to All Analysis Areas in Management Area 1F	Replacement Page 67	ORV use prohibited, unless posted as open.
Management Prescriptions Applicable to All Management Areas in 2D	Replacement Page 82	ORV use prohibited, unless posted as open.
Management Prescriptions Applicable to All Analysis Areas in Management Area 2F	86	ORV use prohibited, unless posted as open.
Management Prescriptions Applicable to All Analysis Areas in Management Area 3F	105	ORV use prohibited, unless posted as open.

[150] This change would be necessary regardless of which action alternative is selected.

Section	Page	Text to be Removed
Management Prescriptions Applicable to All Analysis Areas in Management Area 4D	Replacement Page 129	ORV use allowed (except as noted above), unless posted as closed.
Management Prescriptions Applicable to All Analysis Areas in Management Area 4F	Replacement Page 140	ORV use prohibited unless posted as open.
Management Prescriptions Applicable to All Analysis Areas in Management Area 5D	Replacement Page 153	ORV use allowed, unless posted as closed.
Management Prescriptions Applicable to Analysis Areas 5506, 5512, 5530, 5536, 5542 in Management Area 5D	Replacement Page 159	Do not exceed more than seven (7) miles of arterial and collector roads in each 5,000 acre management unit. Additional local or feeder roads necessary for timber harvest will be closed, waterbarred, and blocked with logging slash, when no longer required for post-sale activities
Management Prescriptions Applicable to All Management Areas in 5G	Replacement Page 165	ORV use prohibited, unless posted as closed.
Management Prescriptions Applicable to Analysis Areas 3100, 3200, 3201, and 3600 in Management Area 6F	Replacement Page 180	ORV use prohibited, unless posted as open.
Management Prescriptions Applicable to All Analysis Areas in Management Area 6J	Replacement Page 194	ORV use prohibited, unless posted as open.

Table A-2 shows the specific changes to the Tonto National Forest Plan relating to the Recreation Opportunity Spectrum (ROS)—P is short for primitive, SPNM for semi primitive nonmotorized, SPM for semi primitive motorized, RN for roaded natural, R for rural, and U short for Urban[151].

[151] For more information about the ROS classification system, see the Recreation Resources section of Chapter 3 of this document.

Table A-2. Specific Changes to the Tonto National Forest Plan Related to Recreation Opportunity Spectrum

Mngt. Area	Forest Plan ROS Page	Current ROS Text	Proposed Amendment Language		
			Alternative B	Alternative C	Alternative D
1A; 1B; 1C; 1D	N/A*	-----	-----	-----	-----
1E	62	P: 2% SP[NM]: 4% SPM: 70% RN: 24%	P: 0.92% SPNM:55.63% SPM: 12.26% RN: 31.19%	SPNM: 37.36% SPM: 30.09% RN: 32.56%	SPNM: 27.19% SPM: 40.64% RN: 32.18%
1F	67	P: 4% SP[NM]: 40% SPM: 38% RN: 18%	P: 3.54% SPNM: 55.73% SPM: 31.62% RN: 9.10%	P: 0.63% SPNM: 44.44% SPM: 42.66% RN: 12.27%	P: 0.06% SPNM: 37.32% SPM: 49.25% RN: 13.38%
1G	37†	N/A	SPNM: 26.69% RN: 73.31%	SPNM: 0.06% SPM: 26.63% RN: 73.31%	SPNM: 0.06% SPM: 41.91% RN: 58.03%
2A; 2B	N/A	-----	-----	-----	-----
2C	79	P: 2% SP[NM]: 98%	SPNM: 100%	SPNM: 94.75% SPM: 5.25%	SPNM: 57.90% SPM: 42.10%
2D	82	SP[NM]: 2% SPM: 58% RN: 40%	SPNM: 56.22% SPM: 6.29% RN: 37.48%	SPNM: 32.73% SPM: 25.52% RN: 71.75%	SPNM: 21.39% SPM: 36.64% RN: 41.97%
2E	84	SPM: 100%	SPNM: 83.71% SPM: 9.47% RN: 6.82%	SPNM: 83.71% SPM: 9.47% RN: 6.82%	SPNM: 71.67% SPM: 21.53% RN: 6.80%
2F	86	SP[NM]: 35% SPM: 39% RN: 24% R:1% U:1%	P: 0.02% SPNM: 40.65% SPM: 34.93% RN: 19.59% R: 1.59% U: 3.21%	SPNM: 34.78% SPM: 41.15% RN: 19.27% R: 1.59% U: 3.21%	SPNM: 19.58% SPM: 57.73% RN: 17.89% R: 1.59% U: 3.21%
3A; 3B; 3C; 3D	N/A	-----	-----	-----	-----
3E	103	SP[NM]: 100%	SPM: 91.26%	SPM: 91.26%	SPM: 91.26%

Mngt. Area	Forest Plan ROS Page	Current ROS Text	Proposed Amendment Language		
			Alternative B	Alternative C	Alternative D
			RN: 8.74%	RN: 8.74%	RN: 8.74%
3F	105	SP[NM]: 24% SPM: 21% RN: 55%	P: 0.03% SPNM: 32.64% SPM: 5.27% RN: 60.92% R: 1.13%	SPNM: 30.84% SPM: 6.34% RN: 61.69% R: 1.13%	SPNM: 25.73% SPM: 7.85% RN: 65.28% R: 1.13%
3H	110	SP[NM]: 100%	SPNM: 39.20% RN: 60.80%	SPNM: 39.20% RN: 60.80%	SPNM: 33.94% RN: 66.06%
3I	113	P: 1% SP[NM]: 42% SPM: 36% RN: 21%	P: 0.84% SPNM: 53.91% SPM: 25.51% RN: 19.74%	P: 0.41% SPNM: 35.99% SPM: 41.70% RN: 21.90%	P: 0.32% SPNM: 27.67% SPM: 46.50% RN: 25.50%
3J; 4A; 4B; 4C	N/A	-----	-----	-----	-----
4D	129	SP[NM]: 1% SPM: 55% RN: 38% R: 2% U: 4%	P: 2.69% SPNM: 31.89% SPM: 37.12% RN: 18.05% R: 4.22% U: 6.02%	P: 2.69% SPNM: 21.63% SPM: 32.43% RN: 33.19% R: 4.22% U: 5.83%	SPNM: 18.45% SPM: 32.41% RN: 39.09% R: 4.22% U: 5.83%
4E	137	SP[NM]: 100%	SPNM: 100%	SPNM: 100%	SPNM: 100%
4F	140	SP[NM]: 24% SPM: 46% RN: 26% R: 2% U: 2%	P: 2.64% SPNM: 23.70% SPM: 50.09% RN: 14.57% R: 4.25% U: 4.75%	P: 1.27% SPNM: 12.20% SPM: 60.82% RN: 17.89% R: 3.05% U: 4.77%	P: 0.07% SPNM: 5.91% SPM: 64.21% RN: 20.79% R: 3.05% U: 4.77%
5A; 5B; 5C	N/A	-----	-----	-----	-----
5D	153	SP[NM]: 23% SPM: 40% RN: 36%	P: 0.38% SPNM: 37.44% SPM: 39.56%	SPNM: 7.62% SPM: 62.40% RN: 29.39%	SPNM: 1.74% SPM: 71.45% RN: 26.22%

Mngt. Area	Forest Plan ROS Page	Current ROS Text	Proposed Amendment Language		
			Alternative B	Alternative C	Alternative D
		U: 1%	RN: 22.03% R: 0.59%	R: 0.59%	R: 0.59%
5E	161	SP[NM]: 27% SPM: 32% RN: 41%	SPNM: 32.41% SPM: 5.27% RN: 62.31%	SPNM: 19.89% SPM: 27.43% RN: 52.68%	SPNM: 10.17% SPM: 57.42% RN: 32.41%
5F	163	SPM: 100%	SPNM: 81.79% RN: 18.21%	SPNM: 81.79% RN: 18.21%	SPNM: 72.72% SPM: 9.07% RN: 18.21%
5G	165	SP[NM]: 41% SPM: 46% RN: 12% U: 1%	P: 1.64% SPNM: 39.74% SPM: 43.14% RN: 12.87% R: 2.60%	P: 0.03% SPNM: 21.41% SPM: 62.59% RN: 13.38% R: 2.60%	P: 0.03% SPNM: 16.47% SPM: 75.72% RN: 5.19% R: 2.60%
6A; 6B	N/A	-----	-----	-----	-----
6C	175	SP[NM]: 63% SPM: 37%	P: 1.01% SPNM: 64.03% SPM: 25.41% RN: 9.55%	SPNM: 59.76% SPM: 26.18% RN: 14.07%	SPNM: 49.67% SPM: 39.57% RN: 10.77%
6D	177	SP[NM]: 80% SPM: 20%	P: 71.31% SPNM: 28.69%	P: 71.31% SPNM: 28.69%	P: 71.31% SPNM: 28.69%
6E	178	SP[NM]: 80% SPM: 20%	SPNM: 49.79% SPM: 26.59% R: 23.62%	SPNM: 76.38% R: 23.62%	SPNM: 46.47% SPM: 25.18% R: 28.34%
6F	180	SP[NM]: 1% SPM: 14% RN: 84% R: 1%	P: 1.46% SPNM: 8.82% SPM: 0.38% RN: 88.20% R: 1.14%	P: 0.80% SPNM: 9.48% SPM: 0.38% RN: 88.20% R: 1.14%	P: 0.76% SPNM: 8.60% SPM: 0.45% RN: 89.04% R: 1.14%
6G; 6H; 6I	N/A	-----	-----	-----	-----
6J	194	SP[NM]: 37%	SPNM: 34.50%	SPNM: 25.90%	SPNM: 20.42%

Mngt. Area	Forest Plan ROS Page	Current ROS Text	Proposed Amendment Language		
			Alternative B	Alternative C	Alternative D
		SPM: 33% RN: 27% R: 3%	SPM: 44.14% RN: 18.08% R: 3.28%	SPM: 46.40% RN: 24.42% R: 3.28%	SPM: 51.39% RN: 24.90% R: 3.29%
6K	N/A	-----	-----	-----	-----

†Acreage for this area included Management Areas 1E and 1F.

Appendix B: Desired Road Network Criteria

Assumptions and Limitations

Assumptions are based on original RATM decisions of 1990 which identified system roads, instituted current road numeration, and identified long term objectives for roads. These designations of roads were the initial consideration of the minimum roads system necessary for management of the National Forest in a safe and efficient manner. These decisions were documented through corporate databases and maps and became the foundation of the current roads atlas data which is currently stored in the 1-Web databases.

The I-Web database contains operational and objective changes and additions such as newly added campgrounds which have systemized roads within them. Newly collected roads that were found to be systemized through local district management, as well as miscellaneous routes that may have been collected for future decisions may also exist as part of the standard atlas data held in I-Web.

The limitations of this I-Web road atlas data exist in that there is no differentiation between roads and what could further be described in the context of motorized recreational use specific to a "motorized trail," therefore the current limitation is that all routes which were systemized appear to have been added as roads without criteria or consideration of types of vehicle use, predominate usage, maintenance and administration characteristics.

The following questions provide a basis for Engineering analysis in determining the road system above previously identified roads, which allow for an additional level of consideration in determining our minimum roads system and differentiating the aspects of transportation routes that may exist and function solely as a motorized trail and those which provide administration as part of an engineered road system or primary transportation group.

A weight of 1 point is awarded for each yes answer. A total of 7 points are available for each route. If the combined total of the yes answers are 4 or more there is sufficient subjective data to presume the route can be considered as a portion of a road system. If the total is 4 or less, further subjective analysis related to the type and class of vehicles should be rationalized.

Evaluation Criteria

Question 1: Does the route provide access for any function related to a facility, Residence, or site of importance? Yes= 1 Point; No = 0 Points

Question 2: Does the route provide connectivity on a macro level to a system which is fundamental to the minimum needs of the agency and the public to provide access and administration to portions of the Forest which are without any other type of access? Yes= 1 Point; No = 0 Points

Question 3: Does the route have any nonrecreation based administrative uses such as allotment management, mining, special uses, commercial uses, beyond recreational access? Yes= 1 Point; No = 0 Points

Question 4: Is there any record of maintenance in the last 7 years on the route? Does the route exist on a schedule, agreement or other instrument which indicates maintenance? Yes= 1 Point; No = 0 Points

Question 5: What is the predominate type of vehicle that utilizes the route on a most regular basis (what traffic is perceived and acknowledged by local Forest Staff in ongoing operations and observations as well as local expertise)? And in what terms would it be most commonly identified in terms of the majority of use and widely used and accepted by public travelers? 1 Point = High clearance full sized vehicles such as suburbans, tahoes, and pickups in administration and utilization of the National Forest system lands, generally accepted as 4x4 full sized vehicles; 0 Points = Recreation based off highway travel primarily recreation based traffic in the form of OHV/UTV/ATV/Motorcycle, Jeeps and other short wheelbase, 4x4 or off highway types of vehicles.

Question 6: Would a prudent driver in a standard 4x4 SUV or pickup truck consider the route as a safe and efficient route for primary transportation access? Yes= 1 Point; No = 0 Points

Question 7: Does the route End or terminate at a dead end termini? NO= 1 Point; YES = 0 Points

Appendix C: Route Evaluation to Minimize Impact

The Center for Biologically Diversity (the Center) et al. submitted comments on the draft EIS, including an Excel spreadsheet and map information for the forest to consider (Appendix C to their comment letter). This information appears to reflect a general GIS exercise that simply shows where routes within the Tonto intersect with wildlife habitat, streams, and inventoried roadless area. Based on this general information provided, we chose to reexamine those routes who's total score was 5 and greater (max of 9) as that is half of the total of instances that can be indicated by this spreadsheet and look specifically at opportunities to minimize the effects of the routes on resources (Table A-3). The reexamination of these selected routes was done at the district level—at the same time route specific comments were addressed—and included input from district biologists, silviculturalists, para-archeologists, and range and recreation staff, along with Forest Service Law Enforcement officers, Arizona Game and Fish Department Game Enforcement Officers, and district rangers, many of whom had participated in trips to the field to assess current conditions on the ground[152]. These routes were reviewed based on use—either for public or permitted use access with an emphasis on assessing potential user conflicts—and resource protection—including effects to watersheds, vegetation, wildlife habitat, and water resources as required in the Final Travel Management Rule (36 CFR 212.55).

Table A-3. Routes Reevaluated to Minimize Impacts

Route Number	Type of Route	Miles	District Name	Total	Response
205	3 - Suitable for Passenger Cars	10.901425	Cave Creek	9	This route only crosses water in a rain event, when it is often unsafe for motor vehicles. All other times it is a dry wash. The route has water bars and bar ditches to minimize erosion when there is a rain even. SRP provides maintenance for the route yearly.
479	2 - High Clearance Vehicles	13.200936	Cave Creek	8	Rock-filled boxes have been installed to stabilize the route where it crosses the Verde River, minimizing sedimentation and effects from motor vehicles. Where the route crosses is not near wildlife habitat.
568	2 - High Clearance Vehicles	0.751848	Cave Creek	5	This route ends at the river and is difficult to access by most vehicles so use is minimal.
57B	2 - High Clearance Vehicles	4.675469	Cave Creek	6	This route crosses a perineal creek (which is not suitable for garter snake habitat) at a narrow point. There is ample natural debris along the creek at this crossing to minimize effects from OHV use.
20	3 - Suitable for Passenger Cars	2.987046	Cave Creek	5	This route is paved and maintained yearly by the county. Since it is a popular road, when a storm event occurs maintenance workers are out on the road quickly, hauling away sediment before it inundates creeks and washes.

[152] These meetings were conducted in late January and early February of 2015, and involved site specific knowledge and the use of the most recent areal imagery.

Route Number	Type of Route	Miles	District Name	Total	Response
24	4 - Moderate Degree of Comfort	25.969629	Cave Creek	5	This route is maintained yearly by the county and Forest Service personnel. All low water crossings are built to minimize sediment from vehicles. Many of the crossings are intermittent.
269A	2 - High Clearance Vehicles	10.870094	Cave Creek	9	This route contains multiple water crossings, many that are within the BLM boundary that are outside our authority to manage. One water crossing is on the Tonto National Forest. This crossing is adjacent to two cattle enclosures which limits the ability for motor vehicles to increase the size of the crossing, thus minimizing sedimentation. The crossing is also designed to be perpendicular to the creek, further minimizing sedimentation and stream bank damage. Finally, the stream gradient is very low at the crossing, localizing sedimentation and minimizing the chances of it traveling downstream.
569	2 - High Clearance Vehicles	0.461214	Cave Creek	6	This route is designated administrative use only and has a locked gate to control access to only those with permitted access. This route is on a natural bench above wildlife habitat for most of its length. The route terminates before the riparian green line.
U2387	D - Decommission	0.519935	Cave Creek	5	Route is designated for decommissioning which will minimize or completely alleviate effects.
U1048	D - Decommission	0.268259	Cave Creek	5	Route is designated for decommissioning which will minimize or completely alleviate effects.
U1049	2 - High Clearance Vehicles	0.188588	Cave Creek	6	Route is designated for decommissioning which will minimize or completely alleviate effects.
U1049	2 - High Clearance Vehicles	0.236632	Cave Creek	6	Route is designated for decommissioning which will minimize or completely alleviate effects.
U1049	2 - High Clearance Vehicles	0.132072	Cave Creek	6	Route is designated for decommissioning which will minimize or completely alleviate effects.
U1049	2 - High Clearance Vehicles	0.059275	Cave Creek	6	Route is designated for decommissioning which will minimize or completely alleviate effects.
413A	2 - High Clearance Vehicles	0.370413	Cave Creek	5	This route leads to an intermittent waterfall that is primarily bedrock with no riparian vegetation. Topography and large boulders do not allow for vehicles to travel off the route nor go into the dry wash, which minimizes effects to resources.
20	Non-Motorized Trail	4.539232	Cave Creek	6	Non-motorized route which will not change with this decision, thus outside the scope required under the final Travel Management Rule.
223	Non-Motorized Trail	12.462429	Cave Creek	8	Non-motorized route which will not change with this decision, thus outside the scope required under the final Travel Management Rule.

Route Number	Type of Route	Miles	District Name	Total	Response
89	Non-Motorized Trail	12.704965	Cave Creek	5	Non-motorized route which will not change with this decision, thus outside the scope required under the final Travel Management Rule.
11	Non-Motorized Trail	17.980098	Cave Creek	7	Non-motorized route which will not change with this decision, thus outside the scope required under the final Travel Management Rule.
203	Non-Motorized Trail	8.517618	Globe	6	Non-motorized route which will not change with this decision, thus outside the scope required under the final Travel Management Rule. NOTE: Carlota and Pinto Valley Mine use the first segment of 203 past the gate to maintain their well fields as authorized through their mining Plans of Operations.
SR-87	Major Highway or State Route	56.266024	Mesa	5	This route is a State of Arizona Highway, and as such is outside the authority of the Forest Service when considering designation of a motor vehicle system for the Tonto National Forest.
11	2 - High Clearance Vehicles	6.272631	Mesa	5	This route goes through Mud Springs, which is habitat for Gila topminnow and desert pupfish. However, much of the habitat for these species along this route is fenced off to exclude OHV access.
204A	3 - Suitable for Passenger Cars	1.266023	Mesa	5	This route is administrative use only, and traffic is limited to Forest Service, Sheriff's Office, and other permitted uses. This route is paved and fenced in its length to prevent travel off the road. This minimizes effects to nearby species, such as river species and bald eagles. This road is under county jurisdiction and is county maintained.
204G	3 - Suitable for Passenger Cars	0.757376	Mesa	5	This road is paved, which minimizes sedimentation and effects to water species. This road is under county jurisdiction and is county maintained.
204	Major Highway or State Route	14.670725	Mesa	6	This road is paved, which minimizes sedimentation and effects to water species. This road is under county jurisdiction and is county maintained.
SR-88	Major Highway or State Route	24.19573	Mesa	8	This route is a State of Arizona Highway, and as such is outside the authority of the Forest Service when considering designation of a motor vehicle system for the Tonto National Forest.
SR-260	Major Highway or State Route	24.535408	Payson	5	This route is a State of Arizona Highway, and as such is outside the authority of the Forest Service when considering designation of a motor vehicle system for the Tonto National Forest.
1187	2 - High Clearance Vehicles	2.486869	Payson	6	Designated for decommissioning to minimize or completely mitigate potential effects to natural resources.
1187A	2 - High Clearance Vehicles	0.589698	Payson	6	Known effects to resources, thus designated for decommissioning to minimize or completely mitigate potential effects to natural resources.

Route Number	Type of Route	Miles	District Name	Total	Response
708	4 - Moderate Degree of Comfort	7.407901	Payson	8	Designated open to motorized travel because (section 1.5 miles west of Strawberry) no resource concerns were identified by district staff.
1194	2 - High Clearance Vehicles	0.532006	Payson	6	Route will be considered for seasonal closure to minimize water quality and sensitive species concerns. However, by keeping route open it will actually disperse use rather than concentrating it at the creek which could negatively affect wildlife habitat and water quality.
285	Non-Motorized Trail	3.396723	Payson	5	Non-motorized route which will not change with this decision, thus outside the scope required under the final Travel Management Rule.
671	ML2 Road, Motorized Trail	4.919953	Pleasant Valley	5	This route is designated open to 60" or less vehicles (ATV), which will minimize impact to wildlife by decreasing they type of use. In addition, this route provides for access for prescribed fire management.
3025	2 - High Clearance Vehicles	0.5898	Pleasant Valley	5	This route is designated open to motor vehicle use as no resource concerns were identified by district staff.
33	3 - Suitable for Passenger Cars	5.410616	Pleasant Valley	5	The area east of Canyon Creek is already administrative use only and the river crossing has bridge. This route is subject to seasonal closure in the winter to minimize effects of vehicles on wet roads.
512	4 - Moderate Degree of Comfort	13.891435	Pleasant Valley	5	This route has a hardened and improved surface which minimizes effects for this route.
SR-288	Major Highway or State Route	28.97128	Pleasant Valley	6	This route is a State of Arizona Highway, and as such is outside the authority of the Forest Service when considering designation of a motor vehicle system for the Tonto National Forest.
188A	3 - Suitable for Passenger Cars	2.129895	Pleasant Valley	6	This route has a hardened and improved surface which minimizes effects for this route. Where the route crosses the river there is a bridge, which decreases to nearly zero the effects to sediment and water species. No known wildlife concerns that biologists are aware of.
2830	2 - High Clearance Vehicles	0.101277	Pleasant Valley	5	Route is designated for decommissioning which will minimize or completely alleviate effects.
152	2 - High Clearance Vehicles	0.054574	Pleasant Valley	5	This route will be considered for a future bridge project over intermittent water crossing to minimize effects from sedimentation and effects to water species.
152	3 - Suitable for Passenger Cars	0.14246	Pleasant Valley	5	This route will be considered for a future bridge project over intermittent water crossing to minimize effects from sedimentation and effects to water species.
487B	2 - High Clearance Vehicles	0.882884	Pleasant Valley	5	This road will be closed to public use and travel on it north past where it enters the Sierra Ancha Wilderness will be permitted to ONLY the Murphy Ranch private inholding. This will minimize impacts to resources by limiting access.

Route Number	Type of Route	Miles	District Name	Total	Response
203B	2 - High Clearance Vehicles	1.298461	Pleasant Valley	5	The Cherry Creek Road (Forest Service Road 203) has been designated as decommissioned and after site-specific analysis, will be blocked from motor vehicle travel south of where it first enters the Sierra Ancha Wilderness from the north, south of P.B. Creek and where it exits the wilderness area near Devils Chasm, which will minimize or completely mitigate potential effects to natural resources.
PV1058	2 - High Clearance Vehicles	0.841418	Pleasant Valley	5	Route is designated for decommissioning which will minimize or completely alleviate effects.
2234	2 - High Clearance Vehicles	1.003763	Pleasant Valley	5	This route is already partially fenced, minimizing the likelihood for illegal off road use. Administrative use only is required to access the wildlife drinker, minimizing effects to wildlife.
2238	2 - High Clearance Vehicles	0.556449	Pleasant Valley	5	The route will be administrative use only for timber sales access. Drainage problems will be addressed through re-seeding and the route will be returned to a ML 1 road after timber sale, meaning that it will be closed to ALL motorized use, minimizing the effects to resources from OHV use.
2239	2 - High Clearance Vehicles	0.56943	Pleasant Valley	5	Route is designated for decommissioning which will minimize or completely alleviate effects.
2242	2 - High Clearance Vehicles	0.541128	Pleasant Valley	5	The route will be administrative use only for timber sales access. Drainage problems will be addressed through re-seeding and the route will be returned to a ML 1 road after timber sale, meaning that it will be closed to ALL motorized use, minimizing the effects to resources from OHV use.
139	Non-Motorized Trail	2.759484	Pleasant Valley	5	Non-motorized route which will not change with this decision, thus outside the scope required under the final Travel Management Rule.
142	Non-Motorized Trail	2.803585	Pleasant Valley	6	Non-motorized route which will not change with this decision, thus outside the scope required under the final Travel Management Rule.
150	Non-Motorized Trail	2.291962	Pleasant Valley	5	Non-motorized route which will not change with this decision, thus outside the scope required under the final Travel Management Rule.
1387	2 - High Clearance Vehicles	0.008692	Tonto Basin	5	Road doesn't go through habitat for threatened and endangered species. The road is on the schedule for maintenance once a year by the county which minimizes erosion.
1387	2 - High Clearance Vehicles	1.017745	Tonto Basin	8	Road doesn't go through habitat for threatened and endangered species. The road is on the schedule for maintenance once a year by the county which minimizes erosion.
1446	2 - High Clearance Vehicles	0.006209	Tonto Basin	5	The portion of the route that leads to water is designated for decommissioning. The rest of the route is doesn't go through habitat for threatened and endangered species and is on the schedule for maintenance once a year by the county which minimizes erosion.

Route Number	Type of Route	Miles	District Name	Total	Response
1446	2 - High Clearance Vehicles	0.6761	Tonto Basin	7	The portion of the route that leads to water is designated for decommissioning. The rest of the route is doesn't go through habitat for threatened and endangered species and is on the schedule for maintenance once a year by the county which minimizes erosion.
894	2 - High Clearance Vehicles	0.150912	Tonto Basin	6	Where this road crosses the river, the crossing is naturally vegetation free and consists of large rocks, which minimizes erosion and habitat effects.
71	3 - Suitable for Passenger Cars	11.991868	Tonto Basin	7	Road is on yearly county maintenance schedule which minimizes erosion and there is a proposed bridge development across Tonto Creek. Stream crossing is intermittent and the Gila top minnow is located above the road, making sedimentation from the road not a concern.
60	2 - High Clearance Vehicles	24.694572	Tonto Basin	7	Road is on a yearly county maintenance schedule which minimizes erosion. Habitat is adjacent to both sides of Tonto Creek, Salome Creek crossing is intermittent and has a cement apron crossing to minimize sedimentation. No known threatened or endangered species in area.
SR-188	Major Highway or State Route	41.788747	Tonto Basin	8	This route is a State of Arizona Highway, and as such is outside the authority of the Forest Service when considering designation of a motor vehicle system for the Tonto National Forest.
3778	3 - Suitable for Passenger Cars	0.199467	Tonto Basin	6	Recently expanded cement boat ramp to minimize effects. There are no known species in area but there is marginal habitat possible.
SR-288	Major Highway or State Route	13.854	Tonto Basin	7	This route is a State of Arizona Highway, and as such is outside the authority of the Forest Service when considering designation of a motor vehicle system for the Tonto National Forest.
203E	2 - High Clearance Vehicles	6.965827	Tonto Basin	7	Cherry Creek has a cement crossing and the county maintains the road on a yearly basis, which minimizes effects. There is potential habitat for snakes to exist along Coon Creek and Cherry Creek but no confirmed sightings. Realignment of Cherry Creek road has been done to minimize bank impacts at Cherry Creek crossing.
659B	2 - High Clearance Vehicles	0.595922	Tonto Basin	5	Route is designated for decommissioning which will minimize or completely alleviate effects.

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