

**RESULTS OF BIRD SURVEYS
CONDUCTED AT NEAR WEST 2013**

RESOLUTION COPPER MINING

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EXECUTIVE SUMMARY

WestLand Resources, Inc. (WestLand) was retained by Resolution Copper Mining, LLC to conduct avian surveys in support of the proposed Near West tailings alternatives area (the Analysis Area). The Analysis Area occurs on federal lands managed by the Tonto National Forest. The Analysis Area encompasses approximately 6,600 acres (2,671 ha) and is located north of US Highway 60 between Superior and Florence Junction in Pinal County, Arizona (*Figure 1*).

Biologists from WestLand and BIOME Ecological & Wildlife Research (BIOME) conducted a two-day site reconnaissance on April 15 and 16, 2013, during which they located 30 survey points (*Table 1*). Survey locations were selected to provide thorough coverage of habitat variability within the Analysis Area; including major vegetation types and topographic features. WestLand and BIOME biologists recorded all bird species encountered during the April site reconnaissance (*Table 2*).

WestLand and BIOME Biologists conducted avian surveys that were designed to provide information on the avian species occurring in the vicinity of the Analysis Area and to determine the presence of Tonto National Forest (TNF) sensitive and management indicator species (MIS), as well as species protected under the Migratory Bird Treaty Act (MBTA). Surveyors employed a point-count method at 30 survey points, two times during the breeding season (May 13 and 14, and June 2, 3, and 4, 2013), where they recorded all visually and audibly identified species observed during a five-minute period. Surveys were conducted from just before sunrise to approximately four hours after, in five of the most common vegetation associations found within the Analysis Area (*Figure 3*). Incidental observations, or species observed outside the 5-minute survey periods were also documented; including species observed while Biologists were traveling between survey points. Daily surveys were followed by informal site reconnaissance during which Biologists recorded all avian observations made within the Analysis Area as incidental. All incidental observations made during the 2013 Near West Bird Surveys are included in *Table 3*.

During the preliminary surveys in April, 44 species and 477 individual birds were recorded. These species included several migratory species that were in transit and would not be expected to breed in the vegetation associations available within the Analysis Area. During the breeding bird surveys in May and June, 46 species and 827 individuals were recorded. These included a few breeding species that were late arrivals, and a few late migrants still en route to other breeding areas. The Mesquite-Catclaw Wash vegetation association had the highest average number of species and the highest average number of individuals per point of the five vegetation associations within the Analysis Area. The other four vegetation associations, all communities within the Arizona Upland Subdivision of Sonoran Desertscrub, were similar in their bird species densities and diversities.

1. INTRODUCTION

WestLand Resources, Inc. (WestLand) was retained by Resolution Copper Mining, LLC (RCM) to conduct biological baseline studies related to proposed tailings alternatives in the area known as Near West (Analysis Area) (*Figure 1*). The Analysis Area includes approximately 6,600 acres (2,671 ha) of federal lands managed by Tonto National Forest (TNF). The Analysis Area is located adjacent to and north of US Highway 60, less than one mile west of the Town of Superior in Township 1 South, Range 11 East, portions of Sections 13-15, 22-27, and 34-36; Township 1 South, Range 12 East, portions of Sections 17-21 and 29-31; and Township 2 South, Range 11 East, in a portion of Section 2 (*Figure 1*).

This 6,600-acre parcel generally slopes downhill from the northeast to the southwest, and is dissected by numerous ephemeral washes. The highest elevation is 3,146 ft (959 m) at a ridge near its eastern boundary, and the lowest elevation is 2,240 ft (683 m) near the western boundary. Vegetation within the Analysis Area is characteristic of the Arizona upland subdivision of Sonoran desertscrub (Turner and Brown 1982). The Analysis Area remains largely unaltered by human activity; however, contains several Forest Roads, historic mining features, and disturbance caused by Off-Highway Vehicle (OHV) usage.

In support of the Near West tailings alternatives area studies, WestLand and BIOME Ecological & Wildlife Research (BIOME) Biologists conducted surveys designed to gather information on the avian species occurring in the vicinity of the Analysis Area, and to determine the presence of TNF sensitive and management indicator species (MIS). Virtually all North American bird species are protected under the Migratory Bird Treaty Act (MBTA), but TNF maintains a separate list of Migratory Bird Species of Concern, which includes a variety of species that are associated with particular vegetation communities. The purpose of this study is to provide baseline survey information which could be used in future studies to analyze potential impacts of the proposed mine features.

2. METHODS

2.1. APRIL RECONNAISSANCE

Biologists from WestLand and BIOME conducted a two-day site reconnaissance on April 15 and 16, 2013, during which they located 30 survey points. Survey points were distributed throughout the five most common vegetation associations found within the Analysis Area: Jojoba-Paloverde Shrubland (JPS), Jojoba-Paloverde/Triangleleaf Bursage Shrubland (JPT), Mesquite-Catclaw Acacia Wash (MCW), Ocotillo-Paloverde/Mixed Cacti Shrubland (OPV), and Paloverde-Creosotebush Shrubland (PCS) (*Figures 2 and 3*). These vegetation associations, as delineated by WestLand 2013, are generally comprised of a similar set of species common in the Sonoran Desertscrub biome. The primary differences among these associations are in the relative proportions of the various species. Within each association, the most dominant, widespread species are those included in the association name, but many species not included in the association name are likely to be present. In particular, saguaros may be present in any of these associations, but they are never the most dominant species. The scale at which Figure 3 was prepared precludes the possibility of identifying all small areas of potentially different associations within a larger area of relatively homogeneous vegetation. As such, the lines separating

vegetation associations represent transition zones; not sharp boundaries. The vegetation association in which each survey point was designated is appropriate as observed in the field. WestLand and BIOME biologists recorded all bird species encountered during the April site reconnaissance (*Table 2*).

2.2. 2013 NEAR WEST BIRD SURVEYS

WestLand and BIOME Biologists conducted two sets of surveys for breeding birds between spring and early summer. The first surveys were conducted May 13 and 14, 2013, and the second from June 3 through 5, 2013. Procedures used in this survey were similar to those used in the surveys conducted in the Oak Flat vicinity in 2008 and 2009 (WestLand 2009 and 2010). Surveys were conducted from just before sunrise to approximately four hours after sunrise, or until Biologists noted a significant decrease in the number of detectable birds. Biologists remained at each point for 5 minutes; scanning the vegetation for perching birds and listening for bird songs. Although the survey effort was concentrated within a 100-m radius surrounding each survey point, Biologists recorded all birds observed less than 200 m away. Species beyond the 100-m radius were recorded as incidental observations. Species observed outside the 5-minute survey periods, including those observed while Biologists were traveling between survey points, were also documented as incidental observations (*Table 3*).

The following data were recorded for observations made during each 5-minute survey period: species or best possible identification, number of individuals observed, whether the observation was a fly over, estimated distance from the observer, sex and age class (if possible), whether the observation was audial or visual, if it was a repeat individual, and any additional comments or unusual observations (*Appendix A*). Biologists also recorded the location, date, start and end time, weather information, and general habitat descriptions for each observation period. Representative habitat photos were taken at each survey point (*Appendix B*).

Biologists conducted informal site reconnaissance following each survey in an effort to gather additional information on avian species occurring in the vicinity of the Analysis Area. During site reconnaissance, Biologists recorded all avian observations made while in the Analysis Area.

3. RESULTS

3.1. APRIL RECONNAISSANCE

During the April site reconnaissance, 30 survey points were identified and located for breeding season point count surveys. Six points were selected in each of the five major vegetation associations as described above. Point designations, vegetation associations, and UTM coordinates for all survey points are provided in *Table 1*. Locations of these points are presented in *Figure 3*.

Table 1. Locations of Survey Points

Point Designation	UTM Coordinates, NAD-83		Vegetation Association
	Easting	Northing	
MCW1	479517	3686896	<i>Mesquite-Catclaw Wash</i>
MCW2	482960	3688837	<i>Mesquite-Catclaw Wash</i>
MCW3	481730	3685201	<i>Mesquite-Catclaw Wash</i>
MCW4	482602	3683862	<i>Mesquite-Catclaw Wash</i>
MCW5	483147	3684578	<i>Mesquite-Catclaw Wash</i>
MCW6	484031	3685130	<i>Mesquite-Catclaw Wash</i>
PCS1	481639	3694999	<i>Paloverde-Creosotebush Shrubland</i>
PCS2	481968	3684936	<i>Paloverde-Creosotebush Shrubland</i>
PCS3	481936	3684503	<i>Paloverde-Creosotebush Shrubland</i>
PCS4	482347	3684255	<i>Paloverde-Creosotebush Shrubland</i>
PCS5	481485	3685407	<i>Paloverde-Creosotebush Shrubland</i>
PCS6	481736	3684438	<i>Paloverde-Creosotebush Shrubland</i>
JPS1	481136	3686337	<i>Jojoba-Paloverde Shrubland</i>
JPS2	482083	3686205	<i>Jojoba-Paloverde Shrubland</i>
JPS3	481935	3687032	<i>Jojoba-Paloverde Shrubland</i>
JPS4	482474	3687656	<i>Jojoba-Paloverde Shrubland</i>
JPS5	483129	3688357	<i>Jojoba-Paloverde Shrubland</i>
JPS6	482675	3686206	<i>Jojoba-Paloverde Shrubland</i>
OPV1	483043	3689093	<i>Ocotillo-Paloverde-Mixed Cacti Shrubland</i>
OPV2	482076	3688253	<i>Ocotillo-Paloverde-Mixed Cacti Shrubland</i>
OPV3	482027	3687869	<i>Ocotillo-Paloverde-Mixed Cacti Shrubland</i>
OPV4	483811	3686655	<i>Ocotillo-Paloverde-Mixed Cacti Shrubland</i>
OPV5	484333	3687119	<i>Ocotillo-Paloverde-Mixed Cacti Shrubland</i>
OPV6	483999	3686873	<i>Ocotillo-Paloverde-Mixed Cacti Shrubland</i>
JPT1	480902	3685890	<i>Jojoba-Paloverde-Triangleleaf Bursage Shrubland</i>
JPT2	480618	3686684	<i>Jojoba-Paloverde-Triangleleaf Bursage Shrubland</i>
JPT3	480399	3686727	<i>Jojoba-Paloverde-Triangleleaf Bursage Shrubland</i>
JPT4	480910	3687077	<i>Jojoba-Paloverde-Triangleleaf Bursage Shrubland</i>
JPT5	480275	3686991	<i>Jojoba-Paloverde-Triangleleaf Bursage Shrubland</i>
JPT6	480680	3687161	<i>Jojoba-Paloverde-Triangleleaf Bursage Shrubland</i>

Forty-four avian species and a total of 477 individual avian observations were documented during the April reconnaissance. Avian species, as well as the number of individuals observed for each of those species are presented in **Table 2**. Species in this table and following tables are listed alphabetically by common name.

Table 2. List of Avian Species Observed During the April 2013 Site Reconnaissance

Common Name	Scientific Name	Special Status Categories*	Total Observations
Abert's towhee	<i>Melospiza aberti</i>		1
American kestrel	<i>Falco sparverius</i>		5
Anna's hummingbird	<i>Calypte anna</i>		1
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	MIS	11
Bell's vireo	<i>Vireo bellii</i>	TNF-S MIS MBTA	3
Black-tailed gnatcatcher	<i>Poliophtila melanura</i>		5
Black-throated sparrow	<i>Amphispiza bilineata</i>	MIS	13
Brewer's sparrow	<i>Spizella breweri</i>		88
Bronzed cowbird	<i>Molothrus aeneus</i>		1
Brown-headed cowbird	<i>Molothrus ater</i>		1
Cactus wren	<i>Campylorhynchus brunneicapillus</i>		35
Canyon towhee	<i>Melospiza fusca</i>	MBTA	1
Common poorwill	<i>Phalaenoptilus nuttallii</i>		1
Common raven	<i>Corvus corax</i>		8
Cooper's hawk	<i>Accipiter cooperii</i>		2
Curve-billed thrasher	<i>Toxostoma curvirostre</i>		12
Empidonax flycatcher	<i>Empidonax</i> sp.		3
Gambel's quail	<i>Callipepla gambelii</i>		39
Gila woodpecker	<i>Melanerpes uropygialis</i>	MBTA	19
Gilded flicker	<i>Colaptes chrysoides</i>	MBTA	9
Gray flycatcher	<i>Empidonax wrightii</i>	MBTA	1
Gray vireo	<i>Vireo vicinior</i>	MIS MBTA	2
Greater roadrunner	<i>Geococcyx californianus</i>		2
Green-tailed towhee	<i>Pipilo chlorurus</i>		1
Hooded oriole	<i>Icterus cucullatus</i>	MIS	1
House finch	<i>Haemorhous mexicanus</i>		4
Ladder-backed woodpecker	<i>Picoides scalaris</i>		7
Lark bunting	<i>Calamospiza melanocorys</i>		1
Lark sparrow	<i>Chondestes grammacus</i>		24
Lesser goldfinch	<i>Spinus psaltria</i>		1
Lincoln's sparrow	<i>Melospiza lincolnii</i>		1
Lucy's warbler	<i>Oreothlypis luciae</i>	MBTA	13
Mourning dove	<i>Zenaidura macroura</i>		42
Northern cardinal	<i>Cardinalis cardinalis</i>		13
Northern mockingbird	<i>Mimus polyglottos</i>		3
Phainopepla	<i>Phainopepla nitens</i>	MBTA	8
Red-tailed hawk	<i>Buteo jamaicensis</i>		6
Savannah sparrow	<i>Passerculus sandwichensis</i>	MIS	1
Turkey vulture	<i>Cathartes aura</i>		40
Verdin	<i>Auriparus flaviceps</i>		25
Violet-green swallow	<i>Tachycineta thalassina</i>		1
Western kingbird	<i>Tyrannus verticalis</i>		1
White-crowned sparrow	<i>Zonotrichia leucophrys</i>		15
White-throated swift	<i>Aeronautes saxatalis</i>		3
White-winged dove	<i>Zenaidura asiatica</i>		2
Yellow-rumped warbler	<i>Setophaga coronata</i>		1
Total Observations			477

* Special Status Categories; TNF-S = TNF Sensitive Species; MIS = TNF Management Indicator Species; MBTA = TNF Migratory Bird Species of Concern.

3.2. MAY AND JUNE 2013 BIRD SURVEYS

Biologists conducted two sets of surveys for breeding birds between spring and early summer. The first surveys were conducted May 13 and 14, 2013, and the second from June 3 through 5, 2013.

Forty-one avian species and a total of 394 individual avian observations were documented during the May 2013 bird surveys, while thirty-two avian species and a total of 433 individual observations were documented during the June 2013 surveys. Avian species observed during the May and June 2013 surveys and their associated habitats as well as the number of individuals observed for each of those species are presented in *Table 3*.

Table 3. Avian Species Breeding Season Observations May and June, 2013

Bird Species Common Name <i>Scientific Name</i>	Special Status Categories*	Incidental Observations		Jojoba Palo Verde Shrubland		Jojoba Palo Verde Triangle-leaf Bursage Shrubland		Mesquite Catclaw Acacia Wash		Ocotillo Palo Verde Mixed Cacti Shrubland		Palo Verde Creosotebush Shrubland		Total	Relative Abundance (Percent)
		May	June	May	June	May	June	May	June	May	June	May	June		
Abert's towhee <i>Melospiza aberti</i>		0	1		1			2	3			1	2	10	1.21
American kestrel <i>Falco sparverius</i>		4	9						1					14	1.69
Ash-throated flycatcher <i>Myiarchus cinerascens</i>	MIS	4	8	2	1	1		4	1	4	1	1	4	31	3.75
Bell's vireo <i>Vireo bellii</i>	TNF-S MIS MBTA	0	0					1	1					2	0.24
Black-chinned hummingbird <i>Archilochus alexandri</i>		0	0		1	1		1		1				4	0.48
Black-headed grosbeak <i>Pheucticus melanocephalus</i>		1	0											1	0.12
Black-tailed gnatcatcher <i>Poliophtila melanura</i>		1	1			1	2	1	2		1		1	10	1.21
Black-throated sparrow <i>Amphispiza bilineata</i>	MIS	8	13	4	1	3	1		3	2	3	4	2	44	5.32
Bronzed cowbird <i>Molothrus aeneus</i>		2	0						3	1				6	0.73
Brown-crested flycatcher <i>Myiarchus tyrannulus</i>		8	23			3	2	4	10	2	2	3	3	60	7.26
Brown-headed cowbird <i>Molothrus ater</i>		0	0				1	1						2	0.24
Cactus wren <i>Campylorhynchus brunneicapillus</i>		13	15	3	6	2	9	1	7	3	4	6	8	77	9.31
Common poorwill <i>Phalaenoptilus nuttallii</i>		1	0											1	0.12
Common raven <i>Corvus corax</i>		1	1											2	0.24
Cooper's hawk <i>Accipiter cooperii</i>		1	0											1	0.12

Bird Species Common Name <i>Scientific Name</i>	Special Status Categories*	Incidental Observations		Jojoba Palo Verde Shrubland		Jojoba Palo Verde Triangle-leaf Bursage Shrubland		Mesquite Catclaw Acacia Wash		Ocotillo Palo Verde Mixed Cacti Shrubland		Palo Verde Creosotebush Shrubland		Total	Relative Abundance (Percent)
		May	June	May	June	May	June	May	June	May	June	May	June		
Crissal thrasher <i>Toxostoma crissale</i>		0	1				2							3	0.36
Curve-billed thrasher <i>Toxostoma curvirostre</i>		5	15	4	2			1		2	1	3	2	35	4.23
Gambel's quail <i>Callipepla gambelii</i>		23	51	3		2	5	8	6	3		4	4	109	13.18
Gila woodpecker <i>Melanerpes uropygialis</i>	MBTA	4	9	2	1	2	8	4	5	3	1	3	3	45	5.44
Gilded flicker <i>Colaptes chrysoides</i>	MBTA	14	4	1			3		1	3		1	1	28	3.39
Great horned owl <i>Bubo virginianus</i>		0	3											3	0.36
Greater roadrunner <i>Geococcyx californianus</i>		2	4											6	0.73
Harris's hawk <i>Parabuteo unicinctus</i>		0	1											1	0.12
Hooded oriole <i>Icterus cucullatus</i>	MIS	0	0									1		1	0.12
House finch <i>Haemorhous mexicanus</i>		5	1	1	3		3	1	3	1		6	6	30	3.63
Ladder-backed woodpecker <i>Picoides scalaris</i>		1	1			1		2	1	2			1	9	1.09
Lark sparrow <i>Chondestes grammacus</i>		2	0											2	0.24
Lesser goldfinch <i>Spinus psaltria</i>		0	0	1										1	0.12
Lesser nighthawk <i>Chordeiles acutipennis</i>		0	1						1				1	3	0.36
Lucy's warbler <i>Oreothlypis luciae</i>	MBTA	0	0			1	1	6	4					12	1.45
Mourning dove <i>Zenaida macroura</i>		36	18	3	2	3		3	3	1		4		73	8.83

Bird Species Common Name <i>Scientific Name</i>	Special Status Categories*	Incidental Observations		Jojoba Palo Verde Shrubland		Jojoba Palo Verde Triangle-leaf Bursage Shrubland		Mesquite Catclaw Acacia Wash		Ocotillo Palo Verde Mixed Cacti Shrubland		Palo Verde Creosotebush Shrubland		Total	Relative Abundance (Percent)
		May	June	May	June	May	June	May	June	May	June	May	June		
Northern cardinal <i>Cardinalis cardinalis</i>		7	1	1		2		3	1	3		1		19	2.30
Northern mockingbird <i>Mimus polyglottos</i>		0	0							1				1	0.12
Northern rough-winged swallow <i>Stelgidopteryx serripennis</i>		2	0											2	0.24
Phainopepla <i>Phainopepla nitens</i>	MBTA	0	0			3								3	0.36
Purple martin <i>Progne subis</i>	MBTA	2	0											2	0.24
Pyrhuloxia <i>Cardinalis sinuatus</i>		4	11	1	2		3					1	1	23	2.78
Red-tailed hawk <i>Buteo jamaicensis</i>		6	3											9	1.09
Rock wren <i>Salpinctes obsoletus</i>		0	1											1	0.12
Scott's oriole <i>Icterus parisorum</i>		0	0									2		2	0.24
Turkey vulture <i>Cathartes aura</i>		14	11			1								26	3.14
Verdin <i>Auriparus flaviceps</i>		5	5	5	5	3	6	4	6	2	2	3	3	49	5.93
White-throated Swift <i>Aeronautes saxatalis</i>		8	0											8	0.97
White-winged dove <i>Zenaida asiatica</i>		8	23	2	2	1	2	3	1		2	2	1	47	5.68
Yellow-rumped warbler <i>Setophaga coronata</i>		0	0							8				8	0.97
Zone-tailed hawk <i>Buteo albonotatus</i>		1	0											1	0.12
Total Number of observations		193	235	33	27	30	48	50	63	42	17	46	43	827	100.00

* Special Status Categories; TNF-S = TNF Sensitive Species; MIS = TNF Management Indicator Species; MBTA = TNF Migratory Bird Species of Concern.

As is typical with most bird surveys, some species are relatively common and widespread, while others are relatively uncommon and restricted in their distribution. The final column in **Table 3** provides the relative abundance of each species observed during the breeding season surveys in May and June 2013. These values are based on the numbers of observations of each species expressed as a percentage of the total numbers of individuals observed. The number of occupied vegetation associations and survey points also give an indication of the relative distribution of species, as shown in **Table 4**.

Table 4. Breeding Season Bird Species Distribution among Habitats and Survey Points

Bird Species		Number of Occupied Bird Survey Points	Number of Occupied Vegetation Associations
Common Name	Scientific Name		
Abert's towhee	<i>Melospiza aberti</i>	5	3
American kestrel	<i>Falco sparverius</i>	1	1
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	12	5
Bell's vireo	<i>Vireo bellii</i>	1	1
Black-chinned hummingbird	<i>Archilochus alexandri</i>	4	3
Black-tailed gnatcatcher	<i>Poliophtila melanura</i>	7	4
Black-throated sparrow	<i>Amphispiza bilineata</i>	15	5
Bronzed cowbird	<i>Molothrus aeneus</i>	3	2
Brown-crested flycatcher	<i>Myiarchus tyrannulus</i>	17	4
Brown-headed cowbird	<i>Molothrus ater</i>	2	2
Cactus wren	<i>Campylorhynchus brunneicapillus</i>	26	5
Crissal thrasher	<i>Toxostoma crissale</i>	2	1
Curve-billed thrasher	<i>Toxostoma curvirostre</i>	13	5
Gambel's quail	<i>Callipepla gambelii</i>	17	5
Gila woodpecker	<i>Melanerpes uropygialis</i>	20	5
Gilded flicker	<i>Colaptes chrysoides</i>	9	4
Hooded oriole	<i>Icterus cucullatus</i>	1	1
House finch	<i>Haemorhous mexicanus</i>	9	5
Ladder-backed woodpecker	<i>Picoides scalaris</i>	6	4
Lesser goldfinch	<i>Spinus psaltria</i>	1	1
Lesser nighthawk	<i>Chordeiles acutipennis</i>	2	2
Lucy's warbler	<i>Oreothlypis luciae</i>	7	2
Mourning dove	<i>Zenaida macroura</i>	10	5
Northern cardinal	<i>Cardinalis cardinalis</i>	8	5
Northern mockingbird	<i>Mimus polyglottos</i>	1	1
Phainopepla	<i>Phainopepla nitens</i>	1	1
Pyrrhuloxia	<i>Cardinalis sinuatus</i>	5	3
Scott's oriole	<i>Icterus parisorum</i>	2	1
Turkey vulture	<i>Cathartes aura</i>	1	1
Verdin	<i>Auriparus flaviceps</i>	22	5
White-winged dove	<i>Zenaida asiatica</i>	14	5
Yellow-rumped warbler	<i>Setophaga coronata</i>	2	1

The survey data from **Table 5** can be used to compare the total number of individuals per survey point and the diversity of species observed at each point. These results, as well as the averages for each vegetation association, are summarized in **Table 5**.

Table 5. Survey Point Abundance and Diversity

Point Designation	Total Number of Individuals	Number of Species
JPS1	18	10
JPS2	7	5
JPS3	10	7
JPS4	10	8
JPS5	6	4
JPS6	9	7
JPS Association Average	10	6.8
JPT1	10	6
JPT2	13	6
JPT3	9	6
JPT4	11	8
JPT5	19	9
JPT6	16	12
JPT Association Average	13	7.8
MCW1	17	10
MCW2	25	13
MCW3	20	11
MCW4	13	9
MCW5	19	9
MCW6	19	12
MCW Association Average	18.83	10.7
OPV1	10	5
OPV2	14	8
OPV3	13	10
OPV4	10	7
OPV5	9	8
OPV6	3	2
OPV Association Average	9.83	6.7
PCS1	8	8
PCS2	16	10
PCS4	11	9
PCS5	19	11
PCS6	21	6
PCS Association Average	14.83	9.0

4. DISCUSSION

4.1. AVIAN USE

The results of these surveys indicate that the Analysis Area is used by a large number of bird species in moderate densities. Forty-four species were observed on this site in April, 41 species were observed in May, and 32 species were observed in June. These observations gave a combined total of 59 species. Observations of individuals totaled 477 in April, 394 in May, and 433 in June, for a total of 1,304 individuals. Several of the species observed in April are winter residents or migratory species that would not be expected to breed in Sonoran desertscrub. These species include Brewer's sparrow (*Spizella breweri*), Empidonax flycatcher (*Empidonax* sp.), gray flycatcher (*Empidonax wrightii*), gray vireo (*Vireo vicinior*), green-tailed towhee (*Pipilo chlorurus*), lark bunting (*Calamospiza melanocorys*), lark sparrow (*Chondestes grammacus*), Lincoln's sparrow (*Melospiza lincolnii*), violet-green swallow (*Tachycineta thalassina*), white-throated swift (*Aeronautes saxatalis*), and yellow-rumped warbler (*Setophaga coronata*). Other migratory species are known to breed in this area but typically do not arrive until May. These species include brown-crested flycatcher (*Myiarchus tyrannulus*), lesser nighthawk (*Chordeiles acutipennis*), purple martin (*Progne subis*), and Scott's oriole (*Icterus parisorum*). A few species seen in May were late migrants that would not normally breed in the habitat conditions available in the Analysis Area. Examples of these species include black-headed grosbeak (*Pheucticus melanocephalus*), lark sparrow, white-throated swift, and yellow-rumped warbler.

Most of the vegetation associations in the Analysis area are comprised of similar plant species. The mesquite-catchlaw wash association is the most distinctive, having relatively high densities of large mesquites, palo verdes, and catchlaw in narrow corridors along washes. Saguaros are another distinctive component of the vegetation, but these cacti may be found in most of the vegetation associations on the site. Relatively few avian species appear to make a great distinction among the five vegetation associations in their habitat selection; however, both observations of Bell's vireo (*Vireo bellii*) in May and June, and 10 out of the 12 observations of Lucy's warblers (*Oreothlypis luciae*) were in the mesquite-catchlaw wash association.

4.2. TONTO NATIONAL FOREST SPECIAL STATUS SPECIES

Tonto National Forest (TNF) maintains several lists of species that have special status categories. Sensitive species are those that are of concern due to overall population declines or potential risks from land management activities. TNF Sensitive species are presented in **Appendix C**. Management Indicator Species (MIS) are those for whom changes in populations can indicate potential changes or risks in wider-scale vegetation associations. These species are listed in **Appendix D**. TNF also maintains a list of migratory bird species of concern under the Migratory Bird Treaty Act (MBTA) (**Appendix E**). Bird species on any of these lists that were observed during these surveys are identified on **Table 2** and **Table 3** and are discussed below.

Several of the bird species observed during these surveys are included in one or more of these lists. Bell's vireo is the only TNF sensitive species observed, making it the only observed species that is included on

all three of the TNF lists. Observations were limited to three sightings in April and single occurrences in May and June in the mesquite-catclaw wash association. Bell's vireo is listed as an MIS for this association. Other management indicator species that were observed during these surveys include ash-throated flycatcher (*Myiarchus cinerascens*), black-throated sparrow (*Amphispiza bilineata*), gray vireo, hooded oriole (*Icterus cucullatus*), and savannah sparrow (*Passerculus sandwichensis*). The ash-throated flycatcher, a migratory species, is common in all vegetation associations throughout the Analysis Area and during each month of observation. The black-throated sparrow is a permanent resident and is also common in all vegetation associations. The gray vireo and savannah sparrow are both migratory species that pass through this area in migration but do not remain to breed in these vegetation associations. The hooded oriole is a relatively uncommon migratory species that was observed once in April and once in June.

Other migratory bird species of special concern include canyon towhee (*Melospiza fusca*), Gila woodpecker (*Melanerpes uropygialis*), gilded flicker (*Colaptes chrysoides*), Lucy's warbler, phainopepla (*Phainopepla nitens*), and purple martin. The canyon towhee was observed only once during April, but it should be present as a breeding species in this vicinity. The Gila woodpecker and gilded flicker are legally considered to be migratory species, but in reality, they are both resident throughout the year in the Sonoran Desert, and both were relatively common in all vegetation associations where saguaro cacti are available. Lucy's warbler is a migratory species that returns to Arizona relatively early in the spring and begins leaving in early summer with most birds gone from Arizona by August. It is most abundant in the mesquite-catclaw wash association, with 10 out of 12 total observations in that association in May and June. Phainopeplas breed in late winter and early spring in the Sonoran Desert, and they typically leave this area by mid-May. This pattern is consistent with our observations of eight individuals in April, three individuals in May, and none in June.

4.3. RELATIVE SPECIES ABUNDANCE AND DISTRIBUTION

Bird species, in any given location or set of vegetation associations, will vary widely in their relative abundance, as shown in **Table 3**. Bird communities typically have a few species that are common and widespread, while many other species are relatively uncommon and limited in their distribution (Strong 1987). The data on relative abundance presented in **Table 3** show that there are relatively few observations of most species and that only a few species have many observations. These data are based on a combination of the results of point counts and all other incidental observations in the Analysis Area. The six most frequently observed species, Gambel's quail (*Callipepla gambellii*), cactus wren (*Campephaga ruficapilla*), mourning dove (*Zenaidura macroura*), brown-crested flycatcher, verdin (*Auriparus flaviceps*), and white-winged dove (*Zenaidura asiatica*), comprise over 50 percent of all observations in May and June. In contrast, the 28 least abundant species comprise only about 10 percent of all observations. Only eight species have individual observations greater than five percent of the total, while 25 species have individual observations less than one percent of the total.

The distribution data presented in **Table 4** summarize the number of survey points and vegetation associations at which each bird species was observed. These data are limited to observations within 100 m of survey points. Not surprisingly, many of the species with high relative abundance are also present at

high numbers of survey points. Likewise, bird species with very low relative abundance are present at very few survey points. None of the species were recorded at all 30 survey points, and only three species, cactus wren, verdin, and Gila woodpecker, were recorded at 20 or more survey points. Seven species were observed at only a single survey point, and 16 of the 32 species on this list were observed at five or fewer points. Eleven of the more widespread species were observed in all five of the vegetation associations, while ten of the more restricted species were found in only one association.

4.4. SURVEY POINT ABUNDANCE AND DIVERSITY

The summary data from *Table 5* indicate substantial differences among survey points for numbers of individuals observed and, to a lesser degree, in the numbers of species observed at each point. These data combine the breeding season results from May and June. The number of individuals observed at a survey point ranged from a low of three individuals at OPV6 to a high of 25 individuals at MCW2. However, most points were in the middle of the range, with only four points having fewer than nine individuals, and only three points having greater than 19 individuals. The numbers of species observed at a survey point followed a similar pattern, with a minimum of two species at OPV6 and a maximum of 13 species at MCW2. The distribution of the number of species at a survey point is skewed to the higher end, with only eleven survey points below the median value of 7.5 species, and 19 survey points above the median value of seven species.

Vegetation association averages can also provide information about the distribution and abundance of species within the Analysis Area. The data presented in *Table 5* indicate relatively minor differences in avian abundance and diversity among the five vegetation communities. As expected because of high vegetation density, the Mesquite-Catclaw Wash association has the highest average number of individuals and species, at 18.83 individuals and 10.67 species. The Ocotillo-Paloverde-Mixed Cacti Shrubland association had the lowest averages, at 9.83 individuals and 6.67 species. The averages presented in *Table 5* indicate no major differences among the Ocotillo-Paloverde-Mixed Cacti Shrubland, the Jojoba-Paloverde Shrubland, and the Jojoba-Paloverde-Triangleleaf Bursage Shrubland associations.

5. REFERENCES

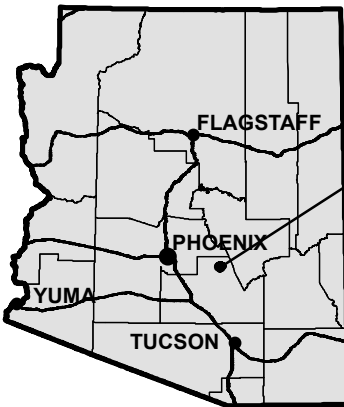
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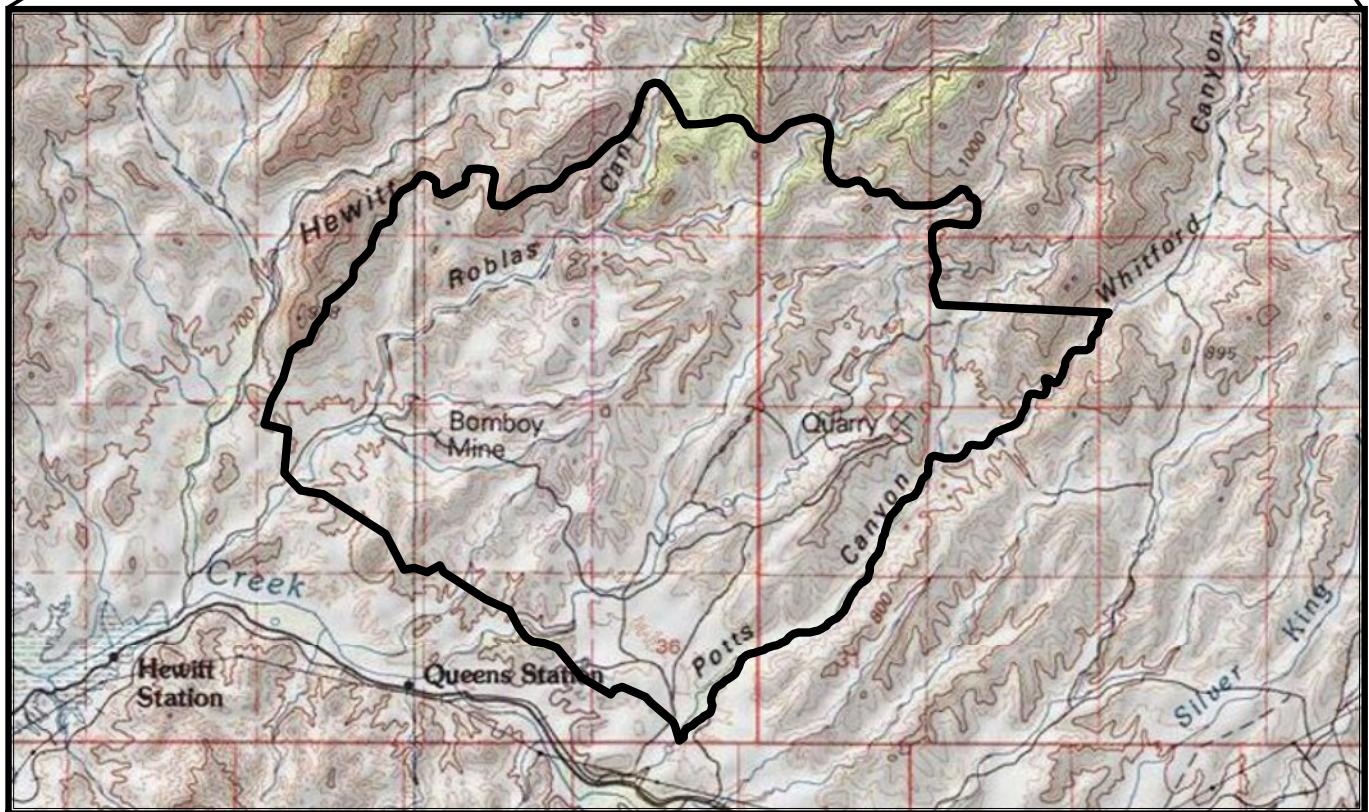


FIGURES

ARIZONA

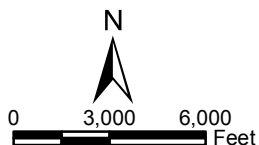
PROJECT
LOCATION

Approximate Scale 1 Inch = 10 Miles



T1S, R11E, Portion of Sections 13-15, 22-27, 34-36
 T1S, R12E, Portion of Sections 17-21, 29-31
 T2S, R11E, Portion of Section 2,
 Pinal County, Arizona,
 Picketpost Mountain USGS 7.5' Quadrangle

WestLand Resources, Inc.
 Tucson • Phoenix • Flagstaff
 2020 N. Central Ave. Suite 695
 Phoenix, Arizona 85004 (602) 888-7000



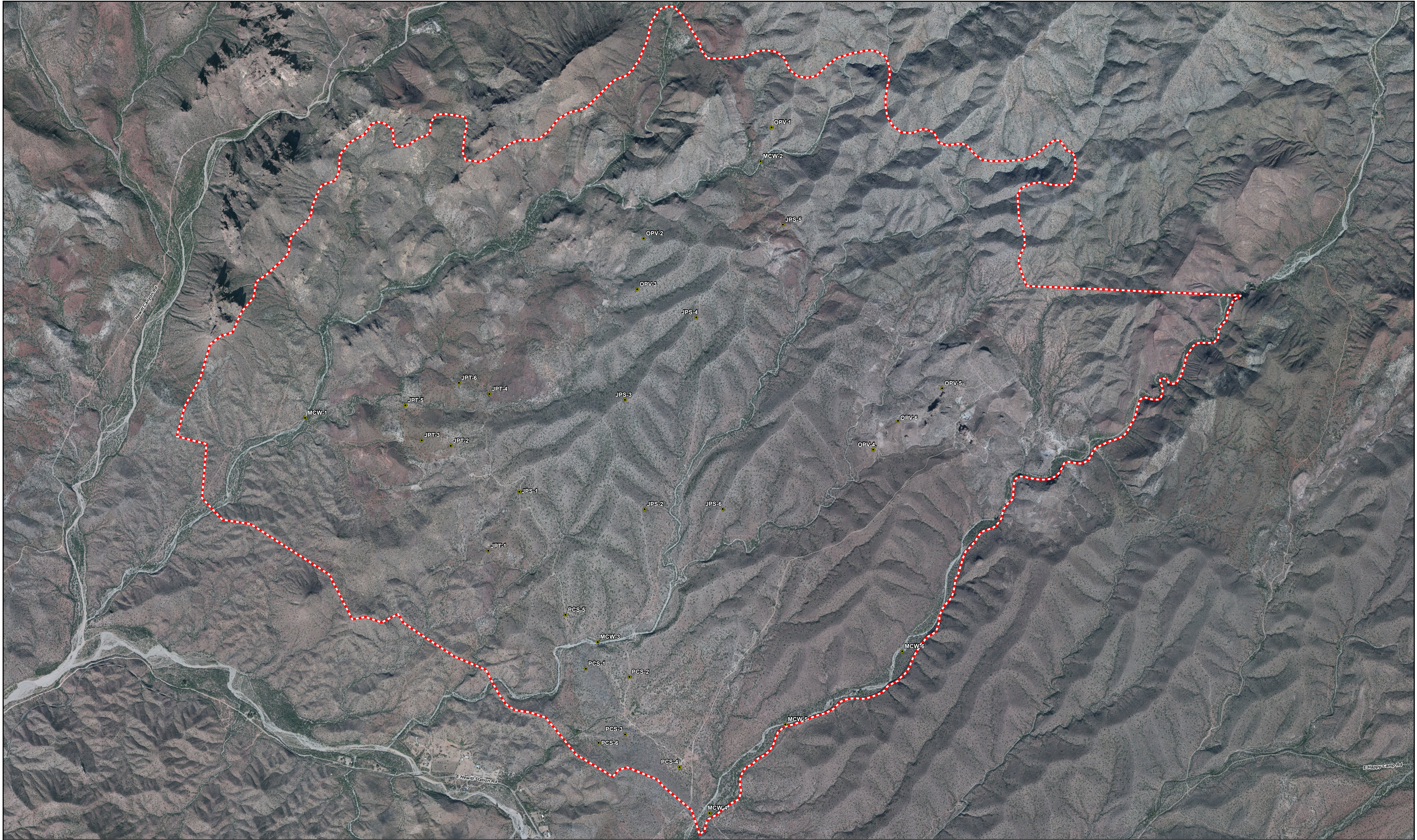
Legend

Survey Area

RESOLUTION COPPER MINING

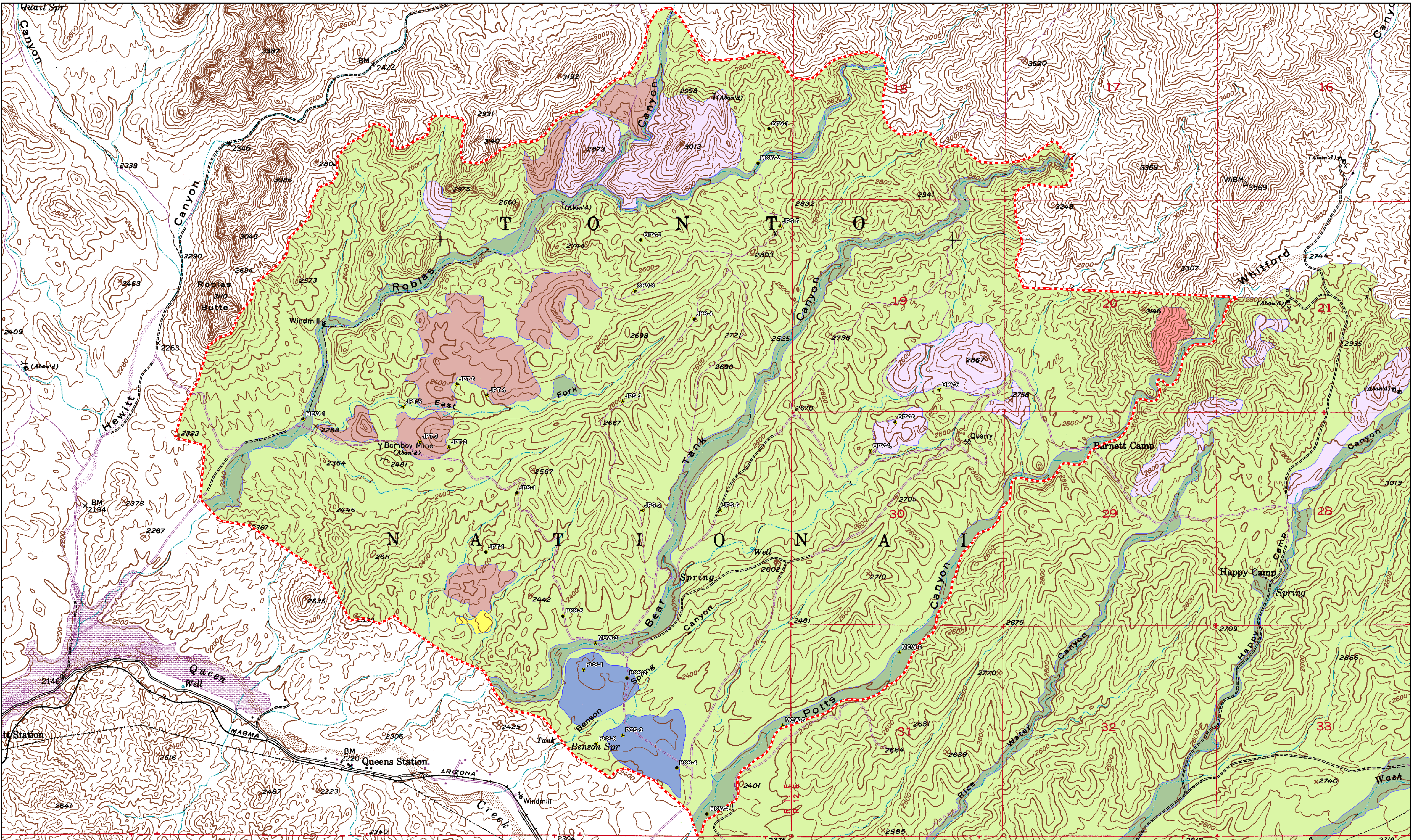
2013 Avian Survey of the Near West Analysis Area

VICINITY MAP
Figure 1



Legend

- Bird Survey Points
- ▭ Bird Survey Area



T1S, R11E, Portion of Sections 13-15, 22-27, 34-36
T1S, R12E, Portion of Sections 17-21, 29-31
T2S, R11E, Portion of Section 2,
Pinal County, Arizona,
Picketpost Mountain USGS 7.5' Quadrangle
WestLand Resources, Inc. 2013. Biological Evaluation of the Near West Analysis Area.
Prepared for Resolution Copper Mining, March 2013.



Legend

- Bird Survey Points
- Bird Survey Area
- Vegetation Associations**
 - Crucifixion thorn Shrubland (7 Acres)
 - Jojoba-Paloverde Shrubland (4,955 Acres)
 - Jojoba-Paloverde/Triangleleaf bursage Shrubland (354 Acres)
 - Mesquite-Catclaw acacia Wash (412 Acres)
 - Ocotillo-Paloverde/mixed cacti Shrubland (650 Acres)
 - Paloverde-Creosotebush Shrubland (217 Acres)
 - Rock Outcrop (24 Acres)

RESOLUTION COPPER MINING
2013 Avian Survey of the
Near West Analysis Area
VEGETATION ASSOCIATION MAP
WITH BIRD SURVEY POINTS
Figure 3

APPENDIX A

DATA SHEETS

APRIL 2013

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 807.90

Date (yr/mm/dd) 2013/04/15

Surveyor(s) J. Gilligan
B. Marshall Point ID MLW10

UTM Coordinates (NAD-83)

483147 ME
3184578 FN

Survey Time

Start 10:27 AM

GPS CAM C-6PS 14

End 10:32

Site Photo #'s 45-SW, 46-NE

TEMP

Start 54

End

54°F

Wind (Beaufort#)

Cloud %

PPT. 0

General Habitat Description:

mesquite, catclaw, saguaro upland

Field Biologist Signature

Simon Birnbaum

Supervisor Signature

Data Entry Signature

Data Proofing Signature

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

0 = None
1 = fog
2 = light rain
3 = heavy rain

Wind:	PPT:
0 = <1 mph: Smoke rises straight up	0 = None
1 = 1-3 mph: Smoke drifts	1 = fog
2 = 4-7 mph: Feel wind, leaves rustle	2 = light rain
3 = 8-12 mph: Leaves/small twigs in constant motion	3 = heavy rain

Project # 807.90 Date (yr/mm/dd) 2013/04/15 Surveyor(s) J. Gilligan
B. Marshall Point ID PCS 4

Coordinates (NAD-83) 482347 NE Survey Time Start 7:29 AM GPS CAM C-6PS 14
3084255 EN End 7:34 Site Photo #'s 49-SE, 50-NW

TEMP Start 65 End 65°F Wind (Beaufort#) 1 Cloud % 0 PPT. 0

[illegible]

Palo verde, cheat grass, catclaw, hedgehog cactus, prickly pear, wolfberry

Jessica Gilman

Data Proofing Signature

Wind:

- 0 = <1 mph: Smoke rises straight up
- 1 = 1-3 mph: Smoke drifts
- 2 = 4-7 mph: Feel wind, leaves rustle
- 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Wind:	PPT:
0 = <1 mph: Smoke rises straight up	0 = None
1 = 1-3 mph: Smoke drifts	1 = fog
2 = 4-7 mph: Feel wind, leaves rustle	2 = light rain
3 = 8-12 mph: Leaves/small twigs in constant motion	3 = heavy rain

Wind:	PPT:
0 = <1 mph: Smoke rises straight up	0 = None
1 = 1-3 mph: Smoke drifts	1 = fog
2 = 4-7 mph: Feel wind, leaves rustle	2 = light rain
3 = 8-12 mph: Leaves/small twigs in constant motion	3 = heavy rain

0 = None
1 = fog
2 = light rain
3 = heavy rain

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 907.90

Date (yr/mm/dd) 13/04/15

Surveyor(s) J. Billigan
B. Marshall Point ID JPS 1

UTM Coordinates (NAD-83)

481485 ☒ E
3085407 ☒ N

Survey Time

Start 9:17 AM

GPS CAM C-6PS 14

End 9:22 AM

Site Photo #'s 61-S, 62-N

TEMP

Start 76

End 76°F

Wind (Beaufort#) 3

Cloud % 0

PPT. 0

[illegible]

General Habitat Description:

pavo verde, cholla, prickly pear, wolfberry, no jojoba in sight. Habitat more PCS (will need to change to PCS habitat type)

Chain of Custody

Field Biologist Signature

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

Project # 807.90

Date (yr/mm/dd) 13/04/15

Surveyor(s) J. Billigan
B. Marshall Point ID UPS 2

UTM Coordinates (NAD-83)

481130 NE
310810337 EN

Survey Time

Start 9:35 AM

GPS CAM C-6PS 14

End 9:40

Site Photo #'s 03-S, 04-N

TEMP

Start 74

End 74° F

Wind (Beaufort#) 2-3

Cloud % 0

PPT. @

[illegible]

General Habitat Description:

jajoba, palo verde, prickly pear, saguaro

*Comments: ATEL + CALW heard off plot
RTH observed 100+ (see above)

Chain of Custody

Field Biologist Signature

Jason Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

0 = No
1 = fog

2 = light rain

3 = heavy rain

Project # 307.90

Date (yr/mm/dd) 2013/04/16

Surveyor(s) J. Billigan
B. Marshall

Point ID Opv1

UTM Coordinates (NAD-83)

403043 NE
3689093 EN

Survey Time

Start 6:00 AM

GPS CAM C-6PS 14

End 10:05

Site Photo #'s 65-N, 66-S

TEMP

Start 57

End 57° F

Wind (Beaufort#) 0-1

Cloud % D

PPT. 0

General Habitat Description:

Ocotillo, palo verde, saguaro dominated habitat. Some cholla

Comments: observed COPO (common poolwill) on road during travel to point

Field Biologist Signature

Simon Billigan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

0 = None
1 = fog
2 = light rain
3 = heavy rain

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 807-90

Date (yr/mm/dd) 2013/04/16

Surveyor(s) J. Billigan
B. Marshall

Point ID MCN15

UTM Coordinates (NAD-83)

482900 N
31088837 E

Survey Time

Start 6:21 AM

GPS CAM C-GPS 14

End 6:21

Site Photo #'s 107-5, 108-NE

TEMP

Start 58

End 58°F

Wind (Beaufort#)

0-1

Cloud % 0

PPT. 0

Species (4-Letter Code)	#	# Juv	Fly Over?	Distance (m)					Sex	Repeat?	Detect S/H	Comments
				0-10	10-25	25-50	50-100	>100				
LUWA	1					35					S	
ATFL	1						100				H	
VERD	1						75				H	
WCSP	1						100				H	
CACW	1						100				H	
GAQU	1						100				H	
CACW	1						100				H	
PHAI	1						85				S	
GIWD	1						100				H	
GIWD	1					35					H	
LASP	2					30					S	
NOMO	1					32					S	Northern mockingbird
LISP	1				15						S	Lincoln Sparrow
BRSP	1						85				H	
GTTD	1					37					S	Green-tailed towhee
ATFL	1						90				H	
BHLD	1					37					S	Brown-headed cowbird
ATFL	1					40					S	
CBTH	1				20						H	

General Habitat Description:

Mesquite, catclaw, saguaro upland

Comments:

NOCA heard outside 5-minute survey
+ Gray flycatcher (GRFL)

Chain of Custody

Field Biologist Signature

Junia Billigan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 907.90

Date (yr/mm/dd) 20/3/04/116

Surveyor(s) J. Billigan
B. Marshall Point ID JPS6

UTM Coordinates (NAD-83)

483129 NE
3088357 EN

Survey Time

Start 10:43 AM

GPS CAM C-6PS 14

End 10:48

Site Photo #'s 109-SE, 70-NW

TEMP

Start 103

End 103⁹ F

Wind (Beaufort#) 0-1

Cloud % 0

PPT. 0

[illegible]

General Habitat Description:

Palo verde, jojoba dominant hillside.

Wolfberry, Brittlebush, Cheat grass

Comments: GRD heard in plot outside 5-minute survey

Chain of Custody

Field Biologist Signature _____

James Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 807.90

Date (yr/mm/dd) 2013/04/10

Surveyor(s) J. Milligan B. Marshall Point ID DPV3

UTM Coordinates (NAD-83) 492027 N E
3087809 E N

Survey Time Start 7:32 AM GPS CAM C-6PS 14

End 7:37 Site Photo #'s 75-SW, 76-NE

TEMP Start 70 End 70°F Wind (Beaufort#) 0-1 Cloud % 0 PPT. 0 77-SW, 78-NE

Species (4-Letter Code)	#	# Juv	Fly Over?	Distance (m)					Sex	Repeat?	Detect S/H	Comments
				0-10	10-25	25-50	50-100	>100				
LASP	4				15						S	
CAQU	1						65				H	
GIWD	1							100+			H	
CACW	1							100+			H	
NDCA	1						85				H	
CAQU	1					45					H	
GIWD	1							100+			H	
NDCA	1							100+			H	
CACW	1						90				H	
PHAI	1					32					S	
VERD	1							100+			H	
WVDD	1							100+			H	
MODD	1							100+			H	
BRSP	1							100+			H	
NOMO	1							100+			H	

General Habitat Description: Desert, palo verde dominant ridge top.
Prickly pear, brittlebush, Wolfberry, jojoba, cholla
 *Comments: GIFL^{+AMKE} heard 100+ m away outside 5-minute survey
Photos taken on both sides of ridge line road.

Chain of Custody
 Field Biologist Signature Jessica Milligan

Supervisor Signature _____

Data Entry Signature _____

Data Proofing Signature _____

Wind:
 0 = <1 mph: Smoke rises straight up
 1 = 1-3 mph: Smoke drifts
 2 = 4-7 mph: Feel wind, leaves rustle
 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
 0 = None
 1 = fog
 2 = light rain
 3 = heavy rain

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 807.90

Date (yr/mm/dd) 2013/04/16

Surveyor(s) J. Gilligan
B. Marshall Point ID JPS 5

UTM Coordinates (NAD-83)

482474 NE
3087056 EN

Survey Time

Start 8:00 AM

GPS CAM C-GPS 14

End 8:11

Site Photo #'s 79-SW, 80-NE

TEMP

Start 73

End 73°F

Wind (Beaufort#)

1-2

Cloud % 0

PPT. 0

Species (4-Letter Code)	#	# Juv	Fly Over?	Distance (m)					Sex	Repeat?	Detect S/H	Comments
				0-10	10-25	25-50	50-100	>100				
GAQU	1						55				H	
CBTH	1							100+			H	
GIWD	1							100+			H	
CALW	1							100+			H	
NOCA	1							100+			H	
GAQU	1							100+			H	
VERD	1						100				H	
BRSP	1							100+			H	
MODD	1							100+			H	
NOCA	1							100+			H	
BTGN	1						75				H	
PHAI	1		✓								S	
CACW	1					45					H	

General Habitat Description:

paio verde, jojoba habitat. Cholla, brittlebush,
prickly pear

Comments: 2 CORA heard outside 5-min. survey; AMKE + RTHA
Flew in/over plot fly over outside 5-minute survey

Chain of Custody

Field Biologist Signature

Jenni Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 807.90

Date (yr/mm/dd) 2013/04/16

Surveyor(s) J. Gilligan
B. Marshall Point ID JP54

UTM Coordinates (NAD-83)

401935 NF
3087032 FN

Survey Time

Start

0:26 AM

GPS CAM

C-6PS14

End

8:31

Site Photo #'s

B1-SW, B2+B3-NE

TEMP

Start

74

End

74°F

Wind (Beaufort#)

2

Cloud %

D

PPT.

2

[illegible]

General Habitat Description:

Jojoba - paid verde dominant habitat.

Brittle bush, ~~cat claw~~, cholla, prickly pear, fairy duster

Comments: BTGN fly-by + perched in plot after 5-minute survey

Chain of Custody

Field Biologist Signature

Junior Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

Wind:	PPT:
0 = <1 mph: Smoke rises straight up	0 = None
1 = 1-3 mph: Smoke drifts	1 = fog
2 = 4-7 mph: Feel wind, leaves rustle	2 = light rain
3 = 8-12 mph: Leaves/small twigs in constant motion	3 = heavy rain

J. Billigan

Point ID JPT 6

Site Photo #'s 810-S, 817-N

PPT. 0

General Habitat Description:

Jojoba, palo verde, triangle-leaf bursage dom.
Brittle bush, creosote, ocotillo

* comment: ~12 TUVV observed flying about 2 mi. away

Field Biologist Signature _____

Supervisor Signature _____

Data Entry Signature

Data Proofing Signature _____

Wind:
 0 = <1 mph: Smoke rises straight up
 1 = 1-3 mph: Smoke drifts
 2 = 4-7 mph: Feel wind, leaves rustle
 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # B07.90 Date (yr/mm/dd) 2013/04/10 Surveyor(s) J. Billigan
B. Marshall Point ID JPT5

400275 NE
3686991 E N

Start 9:40 AM
End 9:45

Site Photo #'s 88-W, 89-E, 90-S
91-N

Start 76

End 76°F

Wind (Beaufort#)

3

Cloud % 0

PPT. 0

General Habitat Description:

Triangle-leaf bursage, jojoba, palo verde dominant.
 Cheat grass, wolf berry, creosote, cat claw, cholla

Field Biologist Signature _____

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

- 0 = <1 mph: Smoke rises straight up
- 1 = 1-3 mph: Smoke drifts
- 2 = 4-7 mph: Feel wind, leaves rustle
- 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 807.90 Date (yr/mm/dd) 2013/04/16 Surveyor(s) J. Gilligan
B. Marshall Point ID JPT3

Coordinates (NAD-83) 480.399 310816727 Survey Time Start 9:55 AM GPS CAM C-6PS14
N E End 10:00 Site Photo #'s 92-N, 93-S

TEMP Start 77 End 77°F Wind (Beaufort#) 3 Cloud % 0 PPT. 0

[illegible]

Triangle-leaf bursage, palo verde, jojoba
Brittlebush, fairy duster, cheat grass

Junior Gilligan

Data Proofing Signature

Wind:
0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Habitat Recon

*species observed during Recon following the
4 hour period after sunrise

4/15/13 10:00 AM - 1:30 PM

BTSP - III
TUVU - IHH I
CORA - IHH I
BRSP - IHH IHH IHH IHH IHH IHH IHH IHH IHH II
VERD - IHH I
WGSP - IHH I
MODD - IHH IHH II
GIWD - III
LBND - III
LABU - I
PHAI - IHH
GAQU - IHH II
BTGN - I
EMFL - I
GRVI - II
NOCA - II
CACW - III
LUWA - III
BEVI - I
CBTH - I
ATFL - I
LASP - III
CATD - I
COHA - I
HOFI - II
ANHU - I
SASP - I

4/16/2013 10:00 AM - 1:15 PM

COHA - I
TUVU - IHH IHH IHH IIII
GAQU - IHH IHH I
BRSP - IHH IHH IHH IHH I
WGSP - II
VERD - III
MODD - IHH II
ATFL - III
LASP - III
AMKE - II
LBND - I
VERD - I
MODD - I
LUWA - II
WTSW - III
CACW - III
VGSW - I
GIFL - I
BTSP - I
RTHA - III
LEGO - I

MAY 2013

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 807.90

Date (yr/mm/dd) 13/05/13

Surveyor(s) J. Gilligan, B. Marshall Point ID OPV 1

UTM Coordinates (NAD-83) 403043 E
3089093 N

Survey Time Start 5:30 AM GPS CAM C-GPS 14
End 5:35 Site Photo #s 98-N, 99-S, 100-N

TEMP (°F) Start 75 End 75 Wind (Beaufort #) 2-3 Cloud % 0 PPT. 0

[illegible]

General Habitat Description: jijoba, olotillo, palo verde

Additional Comments: * photos 94 + 95 show jujoba, pv dominant hillside to west
96 + 97 show jujoba pv, dominant hillside to east
saguaro

Chain of Custody

Field Biologist Signature

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

- 0 = <1 mph: Smoke rises straight up
- 1 = 1-3 mph: Smoke drifts
- 2 = 4-7 mph: Feel wind, leaves rustle
- 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 807.90

Date (yr/mm/dd) 2013/05/13

Surveyor(s) J. Gilligan, B. Marshall Point ID JPS 5

Point ID JPS 5

UTM Coordinates (NAD-83)

493129

E

Survey Time

Start

6:07 AM

GPS

6-6PS14

End

4:12

Site Photo #'s 105+106 - N, 107+108 - S

TEMP (°F)

Start

79

End

Wind (Beaufort #)

3

Cloud % 0

PPT. 0

[illegible]

General Habitat Description:

Jojoba, palo verde dominant

Additional Comments:

LASP seen outside 5-min. survey (within plot)

Chain of Custody

Field Biologist Signature

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

Project # 807.90

Date (yr/mm/dd) 2013/05/13

Surveyor(s) J. Gilligan, B. Marshall Point ID OPV 3

UTM Coordinates (NAD-83)

402027 E
3081969 N

Survey Time Start 6:49 AM

GPS CAM C-6FS 14

End 10:54 AM

Site Photo #'s 115-NE, 1110-NW

TEMP (°F) Start 82 End 82

Wind (Beaufort #) 3

Cloud % 0

PPT. 0 117-SW; 118-SW
119-NE

[illegible]

General Habitat Description: PAID verde + OCOTILLO dominant veg.

Additional Comments:

Chain of Custody

Field Biologist Signature

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

3 = heavy rain

Project # 807.90

Date (yr/mm/dd) 2013/05/13

Surveyor(s) J. Gilligan, B. Marshall Point ID JPT 4

UTM Coordinates (NAD-83)

480910 E
31287077 N

Survey Time Start 8:00 AM

GPS CAM C-GPS 14

End 9:05

Site Photo #'s 128-N, 129-N, 130-S

TEMP (°F) Start 90

End 90

Wind (Beaufort #) 1-2

Cloud % 0

PPT. 0

131-NE

General Habitat Description:

jojoba, triangle leaf bursage, saguaro dominant veg.

Additional Comments:

Chain of Custody

Field Biologist Signature

Jesse Giviger

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts.

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT.

0 = None

1 = fog

2 = light rain

3 = heavy rain

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 807.90 Date (yr/mm/dd) 2013/05/13 Surveyor(s) J. Gilligan, B. Marshall Point ID JPT5

UTM Coordinates (NAD-83) 480275 E 31281991 N Survey Time Start 8:34 End 8:39 GPS CAM C-6PS 14 Site Photo #'s 136-137-W, 138-N

TEMP (°F) Start 93 End 93 Wind (Beaufort #) 2-3 Cloud % 0 PPT. 0 139-E
140-S

Species (4-Letter Code)	#	# Juv	Fly Over?	Distance (m)					Sex	Repeat?	Detect S/H	Comments
				0-10	10-25	25-50	50-100	>100				
GAQU	1							100+			H	
MODD	1							100+			H	
WWDG	1						100				H	
LUWA	1						100				H	
VERD	1					34					S	
MODD	1							100+			H	
CAUN	1						100	100+			H	
GIWD	1						85				H	
NDCA	1							100+			H	
VERD	1							100+			H	
MODD	1						100				S	
PHAI	2	1	✓		25				1 M, 1 F 1 juv.		S	
HDFI	1							100+				

General Habitat Description: jojoba, palo verde, trianque-leaf bursage dominant veg.

Additional Comments: photo 141 - JPT veg dominant hillside to SW
142 - JPT " " to NW, 143 - N

Chain of Custody

Field Biologist Signature Jenna Gilligan

Supervisor Signature _____

Data Entry Signature _____

Data Proofing Signature _____

Wind:
0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 807.90

Date (yr/mm/dd) 2013/05/13

Surveyor(s) J. Gilligan, B. Marshall

Point ID 4PS1

UTM Coordinates (NAD-83)

401130

E

Survey Time

Start 9:42

GPS CAM

L-LPS 1A

End 9:47

Site Photo #'s

150-W, 159-N

TEMP (°F)

Start

End

Wind (Beaufort #)

Cloud % 0

PPT.

161-S, 160-E

[illegible]

General Habitat Description:

jojoba paloverde dominant veg.

Additional Comments:

Chain of Custody

Field Biologist Signature

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

Jessica Gilligan

Point ID OPV 5

PHOTOS
OPG-CAM 1102-E, 1103-N, 1104-S
GPS CAM
Site Photo 1105-W
C-GPS 1105-W

PPT.

CACW

Data Proofing Signature

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Joshua Gilligan

Point ID OPV 6

GPS CAM 167-W 168-J
169-E

End 0542 ✓ Site Photo #'s C-67PS 14

Cloud % 25% PPT. 0

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature _____

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

Jessica Gilligan

Point ID OPV 4

Site Photo #'s C-6PS 14

PPT. 

Data Proofing Signature

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Jessica Gilligan

PPT. Ø

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Jessica Gilligan

Date (yr/mm/dd) 5/14/13

Surveyor(s) Bryce Marshall

Point ID JPS2
178-N 180-S
CAM 179-W 181-E

482083 E
31086205 N

Survey Time Start 0637
 End 0642

GPS CAM 179-W 181-E
Site Photo #'s C-6PS 14

TEMP (°F) Start 78°F End 78°F

Wind (Beaufort #) 

Cloud % **20%**

PPT. ~~Q~~[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

Jessica Gilligan

Point ID MCW3
182-N 184-S

GPS CAM 183-W 185-E
Site Photo #'s C-6PS 14

Cloud % 20% PPT. 0

General Habitat Description:

Additional Comments:

Field Biologist Signature

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 807.90

Date (yr/mm/dd) 5/14/13

Surveyor(s) Jessica Culligan
Brya Marshall

Point ID PCS 5
186°N 188°S

UTM Coordinates (NAD-83)

481485 E
3685407 N

Survey Time

Start 0706

End 0711

GPS CAM 187°W 189°E

Site Photo #'s C-0PS 14

TEMP (°F)

Start 84°F

End 84°F

Wind (Beaufort #)

0

Cloud % 15%

PPT. 0

Species (4-Letter Code)	#	# Juv	Fly Over?	Distance (m)					Sex	Repeat?	Detect S/H	Comments
				0-10	10-25	25-50	50-100	>100				
NOLA	1						75		M	N	H	
NOLA	1							100+	M	N	H	
PYRZ	1						80		M	N	H	
MODO	1		Y				90		M	N	H	
BCFL	1						95		M	N	H	
GIWO	1						85		M	N	H	
GSFL	1		Y		15				M	N	H	
GAQU	1							100+	M	N	H	
ABTD	1						75		M	N	H	
CALW	1						95		M	N	H	
WWDO	1							100+	M	N	H	
BTSP	1						95		M	N	H	
VERD	1						100		M	N	H	
LASP	1							100+	M	N	H	

General Habitat Description: _____

Additional Comments: _____

Chain of Custody

Field Biologist Signature

Jessica Culligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

0 = None
1 = fog
2 = light rain
3 = heavy rain

Jessica Gilligan

Date (yr/mm/dd) 5/14/13

Surveyor(s) Bryce Marshall

Point ID PES-1
198-N 200-S

48112.39 E
31284999 N

Survey Time Start 0745
End 0750

GPS CAM 199-W 201-203
Site Photo #'s C-GPS 14 E

TEMP (°F) Start 80°F End 80°F

Wind (Beaufort #) 1

Cloud % 30%

PPT. ~~Ø~~

SCOR

Field Biologist Signature

Jessie Gilman

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:
 0 = <1 mph: Smoke rises straight up
 1 = 1-3 mph: Smoke drifts
 2 = 4-7 mph: Feel wind, leaves rustle
 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

West Bird Surveys
Jessica Gilligan

Point ID PCS-2
204N 206S

GPS CAM 205-W 207-E
Site Photo #'s C-6PS 14

Cloud % 40% PPT. 0

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature _____

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

- 0 = <1 mph: Smoke rises straight up
- 1 = 1-3 mph: Smoke drifts
- 2 = 4-7 mph: Feel wind, leaves rustle
- 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

N of road

Point ID PCS-6 ↓

GPS CAM 209-W 211-E

Site Photo #'s C-6PS 14

Cloud % 30%

PPT. 212-N 214-S
213-W 215-E

5 of road

Data Proofing Signature

0 = None
1 = fog
2 = light rain
3 = heavy rain

S. of road

Jessica Elligan

Date (yr/mm/dd) 5/14/13

Surveyor(s) Bryce Marshall

Point ID PCS-3 ✓
216-N 218-S
CAM 217-W 219-E

481936 E
31084503 N

Survey Time

Start	0822
End	0827

GPS CAM 21-FW-21
Site Photo #'s C-6PS 1A

TEMP (°F)

Start 86°F End 86°F **Wind (Beaufort #)**

Cloud % 30%

PPT.

220-N 222-S
221-W 223-E

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature _____

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

Jessica Gilligan

Point ID PCS-4
224-N 226-S
CAM 225-W 222-E

GPS CAM 225-W 22
Site Photo #'s C-6PS 14

PPT.

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

Jessica Williger

Date (yr/mm/dd) 5/14/13

Surveyor(s) Bryce Marshall

Point ID MCW-6

404031 E
31085130 N

Survey Time

Start 0856

GPS CAM C-6PS 14

End 0901

Site Photo #'s 228 S 229 W

TEMP (°F)

Start 90°F

End 90°F

Wind (Beaufort #) 1

Cloud % 20%

PPT. 28

N231 E

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph; Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

West Bird Surveys
Jessica Gilligan

Point ID MCW 95

GPS CAM C-6PS14

Site Photo #'s 232 N 234 S
237 N 235 S

PPT. 233 W 23 E

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature

Jessica Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

Jessica Gilligan

Point ID MCW - 1

GPS CAM C-6PS 11
236 N 238 S
te Photo #s 237 W 239 E

Cloud % 10% PPT. 0

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

- 0 = <1 mph: Smoke rises straight up
- 1 = 1-3 mph: Smoke drifts
- 2 = 4-7 mph: Feel wind, leaves rustle
- 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

JUNE 2013

Resolution Copper Company – 2013 Near West Bird Surveys

Project # B07.90

Date (yr/mm/dd) 6/3/2013

Surveyor(s) J. Gilligan, B. Marshall

Point ID MCN 3

UTM Coordinates (NAD-83)

481730 E
31685201 N

Survey Time

Start 5:15 AM

GPS CAM L-6PS14

End 5:20 AM

Site Photo #'s 01-NE, 02-SW

TEMP (°F)

Start 64

End 64

Wind (Beaufort #) 0

Cloud % 0

PPT. 0

Species (4-Letter Code)	#	# Juv	Fly Over?	Distance (m)					Sex	Repeat?	Detect S/H	Comments
				0-10	10-25	25-50	50-100	>100				
HOFI	1					30					S	
MODD	1							100+			H	
GAQU	1							100+			H	
PYRR	1							100+			H	
BCFL	2							100+			H	
MODD	1							100+			H	
LALW	1						80				H	
BCFL	1						90				H	
WNDO	1							100+			H	
GIWD	1							100+			H	
GAQU	1							100+			H	
ABTO	1						65				H	
HOFI	1						70				S	
BTSP	1						100				H	
HOFI	1					30					S	
VERD	1						60				H	

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature

Jenna Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

Point ID PLS 1

GPS CAM C-6PS 14

Site Photo #'s 03 - N, 04 - S

Cloud % 0

PPT. 0

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature Jenna Morgan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 807.90

Date (yr/mm/dd) 13/06/03

Surveyor(s) J. Gilligan, B Marshall Point ID PLS-2

UTM Coordinates (NAD-83)

481968	E
3684936	N

Survey Time

Start 5:51 AM

GPS CAM L-6PS 14

End 5:56 AM Site Photo #'s 05-N, 06-S

TEMP (°F) Start 70 End 70

Wind (Beaufort #) 6

Cloud % 0

PPT. [illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

0 = None
1 = fog
2 = light rain
3 = heavy rain

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 807.90

Date (yr/mm/dd) 13/06/03

Surveyor(s) J. Billigan, B. Marshall Point ID PLS-4

UTM Coordinates (NAD-83)

482347 E

Survey Time

Start

10:30 AM

GPS CAM

U-6PS 14

End

10:43 AM

Site Photo #'s 11-5, 12-NE

TEMP (°F)

Start 73

End 73

Wind (Beaufort #)

1

Cloud % 0

PPT. 0

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 807.90

Date (yr/mm/dd) 13/06/03

Surveyor(s) J. Gilligan, B. Marshall Point ID OPV-6

UTM Coordinates (NAD-83)

483999	E
3606873	N

Survey Time

Start 7:18 AM

GPS CAM C-6PS 14

End

7:23 AM

Site Photo #'s

13-N 14-S

TEMP (°F)

Start 80

End 80

Wind (Beaufort #)

Cloud % 0

PPT. 0

15-E, 16-W

General Habitat Description: 1 RTH observed flying on way to survey point.

Additional Comments:

Field Biologist Signature

Jens in Griligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

Wind:

- 0 = <1 mph: Smoke rises straight up
- 1 = 1-3 mph: Smoke drifts
- 2 = 4-7 mph: Feel wind, leaves rustle
- 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Point ID OPV-4

Site Photo #'s 21-NW, 22-SE

PPT. 0

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 807.90

Date (yr/mm/dd) 13/06/04

Surveyor(s) J. Gilligan, B. Mausman

Point ID PCS-5

UTM Coordinates (NAD-83)

481485 E

Survey Time **Start** 5:15

GPS CAM C-6PS 1A

End 5:10

Site Photo #'s 23-N 24-S

TEMP (°F) Start 63 End 63

Wind (Beaufort #) 0

Cloud % 30

PPT. 0

[illegible]

General Habitat Description:

Additional Comments: * Observed 1 lesser nighthawk flying + 1 GHO perched on
saguaro on way to survey pt. PCS-5. Both outside project/
survey area

Chain of Custody

Field Biologist Signature

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

- 0 = <1 mph: Smoke rises straight up
- 1 = 1-3 mph: Smoke drifts
- 2 = 4-7 mph: Feel wind, leaves rustle
- 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

0

Surveyor(s) J. Gilligan, B. Marshall Point ID JPT-1

Survey Time Start 5:33 AM GPS CAM U-6PS 14
End 5:38 Site Photo #'s 25-E, 26-W

TEMP (°F) Start 45 End 45 Wind (Beaufort #) 0 Cloud % 30 PPT. 0 27-W

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature

Data Entry Signature

Supervisor Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 807.90

Date (yr/mm/dd) 13/06/04

Surveyor(s) J. Gilligan, B. Marshall Point ID JPT-3

UTM Coordinates (NAD-83)

480399	E
3086727	N

Survey Time Start 10:19 AM GPS CAM C-6PS 14
End 10:24 Site Photo #'s 34-N, 35-W

TEMP (°F) Start 78 End 78 Wind (Beaufort #) 0

Cloud % 35 PPT. 0 36.5, 37-E

[illegible]

General Habitat Description:

Additional Comments:

RTAA heard outside 5-min. survey (Perched nearby in survey plot.)

Chain of Custody

Field Biologist Signature

Samuel Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 007.90

Date (yr/mm/dd) 13/06/04

Surveyor(s) J. Gilligan, B. Marshall

Point ID JPTS

UTM Coordinates (NAD-83)

480275 E

Survey Time

Start 10:30 AM

GPS CAM C-GPS 14

End 10:41

Site Photo #'s 38-W, 39-N

TEMP (°F)

Start 8

End

Wind (Beaufort #)

Cloud % 35

PPT. 0 40-S, 41-N

[illegible]

General Habitat Description: Survey pt. surrounded by JPT dominant habitat

Additional Comments: * photo 41 to N shows JPT dominant hillside

Chain of Custody

Field Biologist Signature

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

Wind:	PPT:
0 = <1 mph: Smoke rises straight up	0 = None
1 = 1-3 mph: Smoke drifts	1 = fog
2 = 4-7 mph: Feel wind, leaves rustle	2 = light rain
3 = 8-12 mph: Leaves/small twigs in constant motion	3 = heavy rain

Project # 807.90

Date (yr/mm/dd) 13/06/04

Surveyor(s) J. Gilligan, B. Marshall

Point ID JPT-4

UTM Coordinates (NAD-83)

$$\begin{array}{r} 480910 \\ 3687077 \end{array} \begin{array}{l} E \\ N \end{array}$$

Survey Time

Start 7:02 AM

GPS CAM L-6PS14

End 7:07

Site Photo #'s 46-N, 47-W

TEMP (°F)

Start 84

End 84

Wind (Beaufort #) 0-1

Cloud % 35

PPT. 0 40-S, 49-E

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature _____

Jun'ns Güter

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

- 0 = <1 mph: Smoke rises straight up
- 1 = 1-3 mph: Smoke drifts
- 2 = 4-7 mph: Feel wind, leaves rustle
- 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 007.90

Date (yr/mm/dd) 13/06/04

Surveyor(s) J. Gilligan, B. Marshall

Point ID MCW 1

UTM Coordinates (NAD-83)

479517 E
3128128910 N

Survey Time

Start 7:22 AM
End 7:27

GPS CAM C-6PS 14

End 1:27

Site Photo #'s 50-N, 51-N

TEMP (°F)

Start 95

End 85

Wind (Beaufort #)

①

Cloud % 30

PPT. 0

52-5

[illegible]

General Habitat Description:

Additional Comments:

Chain of Custody

Field Biologist Signature

Jennier Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:

0 = <1 mph: Smoke rises straight up

1 = 1-3 mph: Smoke drifts

2 = 4-7 mph: Feel wind, leaves rustle

3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None

1 = fog

2 = light rain

3 = heavy rain

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 807.90

Date (yr/mm/dd) 13/06/04

Surveyor(s) J. Gilligan, B. Marshall Point ID JPS-4

UTM Coordinates (NAD-83)

482474 E
36871056 N

Survey Time Start 8:03

GPS CAM 1-GPS 14

End 3:08

Site Photo #'s 55-NE, 56-SW

TEMP (°F) Start 87 End 87

Wind (Beaufort #) 0-1

Cloud % 30

PPT. 0 57 SW, 58-
NE

[illegible]

General Habitat Description:

Additional Comments: * Observed 1 ~~crab~~ running in survey plot; not during 5-min survey period

Chain of Custody

Field Biologist Signature Jeanne Hilgner

Supervisor Signature _____

Data Entry Signature _____

Data Proofing Signature _____

Wind:

0 = <1 mph: Smoke rises straight up
1 = 1-3 mph: Smoke drifts
2 = 4-7 mph: Feel wind, leaves rustle
3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:

0 = None
1 = fog
2 = light rain
3 = heavy rain

Wind:	PPT:
0 = <1 mph: Smoke rises straight up	0 = None
1 = 1-3 mph: Smoke drifts	1 = fog
2 = 4-7 mph: Feel wind, leaves rustle	2 = light rain
3 = 8-12 mph: Leaves/small twigs in constant motion	3 = heavy rain

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 907.90 Date (yr/mm/dd) 13/06/05 Surveyor(s) J. Gilligan, B. Marshall Point ID OPV-1

Coordinates (NAD-83) 483043 E 3089093 N Survey Time Start 5:16 AM GPS CAM C-GPS 14

TEMP (°F) Start 72 End 72 Wind (Beaufort #) 2 End 5:21 Site Photo #s 107-N, 48-5

Cloud % 0 PPT. 0

[illegible]

Additional Comments:

* Observed Great horned owl perched on Saguaro on way to OPV-1 (first pt. of day) Outside survey area.

Field Biologist Signature

Jeuner Miligen

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:
 0 = <1 mph: Smoke rises straight up
 1 = 1-3 mph: Smoke drifts
 2 = 4-7 mph: Feel wind, leaves rustle
 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Project # 80790 Date (yr/mm/dd) 13/06/05 Surveyor(s) J. Billigan, B. Marshall Point ID OPV-2

UTM Coordinates (NAD-83) 482076 E 3688253 N Survey Time Start 5:56 GPS CAM 6-GPS 14
End 6:01 Site Photo #s 74-N, 75-W
76-S, 77-E

TEMP (°F) Start 75 End 75 Wind (Beaufort #) 1 Cloud % 0 PPT. 0

General Habitat Description: _____

Additional Comments: _____

Field Biologist Signature Kevin P. Hilsenrath

Supervisor Signature _____

Data Entry Signature _____

Data Proofing Signature _____

Wind:
 0 = <1 mph: Smoke rises straight up
 1 = 1-3 mph: Smoke drifts
 2 = 4-7 mph: Feel wind, leaves rustle
 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Wind:	PPT:
0 = <1 mph: Smoke rises straight up	0 = None
1 = 1-3 mph: Smoke drifts	1 = fog
2 = 4-7 mph: Feel wind, leaves rustle	2 = light rain
3 = 8-12 mph: Leaves/small twigs in constant motion	3 = heavy rain

Wind:

- 0 = <1 mph: Smoke rises straight up
- 1 = 1-3 mph: Smoke drifts
- 2 = 4-7 mph: Feel wind, leaves rustle
- 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
0 = None
1 = fog
2 = light rain
3 = heavy rain

Resolution Copper Company – 2013 Near West Bird Surveys

Project # 807.90 Date (yr/mm/dd) 12/06/05 Surveyor(s) J. Gilligan, B. Marshall Point ID MCW-6
 UTM Coordinates (NAD-83) 484031 E 3085130 N Survey Time Start 7:29 AM GPS CAM C-GPS 14
 End 7:34 Site Photo #'s BA-NE, BS-NE
 TEMP (°F) Start 81 End 81 Wind (Beaufort #) 0-1 Cloud % 0 PPT. 0 BU-SW

Species (4- Letter Code)	#	# Juv	Fly Over?	Distance (m)					Sex	Repeat?	Detect S/H	Comments
				0-10	10-25	25-50	50-100	>100				
BRLO	1				18						H	
BCFL	1					34					H	
BIGN	1					30					H	
GRQU	1						70				H	
VERD	1						55				H	
GIWO	1				22						S	
BEVI	1						90				H	
MODD	1						60				H	
CAEW	1						80				H	
MODD	2		✓			38					S	
LUWA	1						60				H	
ABTO	1					38					H	
BCFL	1						90				H	
GIWO	1					45					S	

General Habitat Description: _____

Additional Comments: _____

Chain of Custody

Field Biologist Signature

Juan M. Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Wind:
 0 = <1 mph: Smoke rises straight up
 1 = 1-3 mph: Smoke drifts
 2 = 4-7 mph: Feel wind, leaves rustle
 3 = 8-12 mph: Leaves/small twigs in constant motion

PPT:
 0 = None
 1 = fog
 2 = light rain
 3 = heavy rain

Wind:

- 0 = <1 mph: Smoke rises straight up
- 1 = 1-3 mph: Smoke drifts
- 2 = 4-7 mph: Feel wind, leaves rustle
- 3 = 8-12 mph: Leaves/small twigs in constant motion

Resolution Copper Company - 2013 Bird Survey Site Recon

Project # 807.90

Date (yr/mm/dd) 13/06/03

Surveyors J. Gilligan, B. Marshall

[illegible]

Chain of Custody

Field Biologist Signature

James Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Resolution Copper Company - 2013 Bird Survey Site Recon

Surveyors J. Gilligan, B. Marshall

[illegible]

Chain of Custody

Field Biologist Signature

James Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

Resolution Copper Company - 2013 Bird Survey Site Recon

Surveyors J. Gilligan, B. Marshall

Chain of Custody

James Gilligan

Supervisor Signature

Data Entry Signature

Data Proofing Signature

APPENDIX B

REPRESENTATIVE PHOTOGRAPHS OF THE VEGETATION ASSOCIATIONS IN THE ANALYSIS AREA



PHOTO 1. Jojoba-Paloverde Shrubland



PHOTO 2. Jojoba-Paloverde Shrubland



PHOTO 3. Jojoba-Paloverde/triangle leaf bursage Shrubland association.



PHOTO 4. Jojoba-Paloverde/triangle leaf bursage Shrubland association.



PHOTO 5. Mesquite-Catclaw acacia Wash



PHOTO 6. Mesquite-Catclaw acacia Wash



PHOTO 7. Ocotillo-Paloverde/mixed cacti Shrubland association



PHOTO 8. Ocotillo-Paloverde/mixed cacti Shrubland association



PHOTO 9. Paloverde–Creosotebush Shrubland



PHOTO 10. Paloverde–Creosotebush Shrubland

APPENDIX C

**TONTO
NATIONAL
FOREST
SENSITIVE
SPECIES**

Tonto National Forest
Forest Sensitive Species (includes Federal candidate species)
Mar 2011

Common Name	Scientific Name
Mammals	
Bat, Allen's lappet-browed	<i>Idionycteris phyllotis</i>
Bat, California leaf-nosed	<i>Macrotus californicus</i>
Bat, greater western mastiff	<i>Eumops perotis californicus</i>
Bat, pale townsend's big-eared	<i>Corynorhinus townsendii pallescens</i>
Bat, pocketed free-tailed	<i>Nyctinomops femorosaccus</i>
Bat, spotted	<i>Euderma maculatum</i>
Bat, western red	<i>Lasiurus blossevillei</i>
Coati, white-nosed	<i>Nasua narica</i>
Sheep, desert bighorn	<i>Ovis canadensis mexicana</i>
Sheep, rocky mountain bighorn	<i>Ovis canadensis canadensis</i>
Birds	
Blackhawk, common	<i>Buteogallus anthracinus</i>
Cuckoo, western yellow-billed*	<i>Coccyzus americanus occidentalis</i>
Eagle, bald	<i>Haliaeetus leucocephalus</i>
Falcon, American peregrine	<i>Falco peregrinus anatum</i>
Goshawk, northern	<i>Accipiter gentilis</i>
Grebe, Clark's	<i>Aechmophorus clarkii</i>
Hawk, northern gray	<i>Asturina nitida maximus</i>
Hawk, zone-tailed	<i>Buteo albonotatus</i>
Towhee, Abert's	<i>Pipilo aberti</i>
Reptiles	
Gartersnake, northern Mexican*	<i>Thamnophis eques megalops</i>
Gartersnake, Narrow-headed	<i>Thamnophis rufipunctatus</i>
Monster, reticulate Gila monster	<i>Heloderma suspectum suspectum</i>
Snake, Maricopa leaf-nosed	<i>Phyllorhynchus browni lucidus</i>
Tortoise, Morafka's desert*	<i>Gopherus morafkai</i>
Amphibians	
Frog, lowland leopard	<i>Rana yavapaiensis</i>
Frog, northern leopard	<i>Rana pipiens</i>
Frog, western barking	<i>Eleutherodactylus augusti cactorum</i>
Toad, Arizona	<i>Bufo microscaphus</i>
Fish	
Chub, headwater*	<i>Gila nigra</i>
Chub, roundtail*	<i>Gila robusta</i>
Dace, longfin	<i>Agosia chrysogaster</i>
Sucker, desert	<i>Catostomus clarki</i>
Sucker, Sonora	<i>Catostomus insignis</i>
Invertebrates	
Beetle, Parker's cyloepus riffle	<i>Cylloepus parkeri</i>
Midge, netwing	<i>Agathon arizonicus</i>
Springsnail, fossil	<i>Pyrgulopsis simplex</i>
Plants	
Agave, Hohokam	<i>Agave murpheyi</i>
Agave, Tonto basin	<i>Agave delamateri</i>
Buckwheat, Ripley wild	<i>Eriogonum ripleyi</i>
Bugbane, Arizona	<i>Cimicifuga arizonica</i>

Common Name	Scientific Name
Dock, blumer's	<i>Rumex orthoneurus</i>
Fleabane, fish creek	<i>Erigeron piscaticus</i>
Fleabane, Mogollon	<i>Erigeron anchana</i>
Groundsel, toumey	<i>Packera neomexicana</i> var. <i>toumeyi</i> (= <i>Senecio</i> n. var. <i>t.</i>)
Mallow, Pima Indian	<i>Abutilon parishii</i>
Milkwort, Hualapai	<i>Polygala rusbyi</i>
Phlox, Arizona	<i>Phlox amabilis</i>
Rockdaisy, fish creek	<i>Perityle saxicola</i>
Rockdaisy, salt river	<i>Perityle gilensis</i> var. <i>salensis</i>
Root, Arizona alum	<i>Heuchera glomerulata</i>
Root, eastwood alum	<i>Heuchera eastwoodiae</i>
Sage, galiuro	<i>Salvia amissa</i>
Sandwort, Mt. Dellenbaugh	<i>Arenaria aberrans</i>
Sedge, Chihuahuan	<i>Carex chihuahuensis</i>
Sedge, Cochise	<i>Carex ultra</i> (= <i>C. spissa</i> var. <i>ultra</i>)
Snapdragon, mapleleaf false	<i>Mabrya acerifolia</i> (= <i>Maurandya</i> a.)
Vetch, horseshoe deer	<i>Lotus mearnsii</i> var. <i>equisolensis</i>
Woodfern, Aravaipa	<i>Thelypteris puberula</i> var. <i>sonorensis</i>
* also a federal candidate species.	

APPENDIX D

**TONTO
NATIONAL
FOREST
MANAGEMENT
INDICATOR
SPECIES**

**Tonto National Forest
Management Indicator Species
May 2012**

Management Indicator Species	Potential Natural Vegetation Crosswalk w/ Forest Plan Vegetation	Indicator of	Habitat Trend	Population Trend
Elk	PPM, MCA	general forest conditions	Static	Increase
Turkey	PPM, MCA	vertical diversity – forest mix	Static	Increase
Pygmy Nuthatch	PPM	Old growth pine	Static	Increase
Violet-green swallow	PPM, MCA	Cavity-nesting habitat	Static	Increase
Western Bluebird	PPM, MCA	Forest openings	Static	Increase
Hairy Woodpecker	PPM, MCA	Snags	Static	Increase
Goshawk	PPM, MCA	Vertical diversity	Static	Increase
Abert Squirrel	PPM, MCA	Successional stages of pine	Static	Increase
Ash-throated Flycatcher	PJC, PJG,	Ground cover	Static	Increase
Gray Vireo	PJC, PJG	Tree density	Static	Decrease
Townsend's Solitaire	PJC, PJG	Juniper berry production	Static	Decrease
Juniper Titmouse	PJC, PJG	General woodland conditions	Static	Decrease
Northern Flicker	PJC, PJG	Snags	Static	Increase
Spotted Towhee	PJC, PJG	Successional stages of pinyon-juniper	Static	Increase
Spotted Towhee	IC	Shrub density	Static	Increase
Black-chinned Sparrow	IC	Shrub diversity	Static	Increase
Savannah	CPG, PJG	Grass species diversity	Upward/sta	Increase

Management Indicator Species	Potential Natural Vegetation Crosswalk w/ Forest Plan Vegetation	Indicator of	Habitat Trend	Population Trend
Sparrow			tic	
Horned Lark	CPG, PJG	Vegetation aspect	Upward/static	Increase
Black-throated Sparrow	DC, SDG	Shrub diversity	Downward/static	Increase
Canyon Towhee	DC, , SDG	Ground cover	Downward/static	Increase
Bald Eagle	CWRF	General riparian	No change	Increase
Bell's Vireo	CWRF	Well-developed understory	No change	Increase
Summer Tanager	CWRF	Tall, mature trees	No change	Increase
Hooded Oriole	CWRF	Medium-sized Trees	No change	Increase
Hairy Woodpecker	MBDRF	Snags, cavities	No change	Increase
Arizona Gray Squirrel	MBDRF	General riparian	No change	Increase
Warbling Vireo	MBDRF	Tall overstory	No change	Increase
Western Wood Pewee	MBDRF	Medium overstory	No change	Increase
Common black-hawk	MBDRF	Riparian streamside	No change	Increase
Macro-invertebrates	Aquatic	Water quality	N/A	N/A
CPG - colorado plateau grassland, CWRF - cottonwood willow riparian forest, DC - desert communities, IC - interior chaparral, MBDRF - mixed broadleaf deciduous riparian forest, MCA - mixed conifer w/ aspen, MWRF- montane willow riparian forest, PJC - PJ chaparral, PJG - PJ grassland, PPM - ponderosa pine – mild, SDG - semi-desert grassland.				

APPENDIX E

**TONTO
NATIONAL
FOREST
MIGRATORY
BIRD SPECIES
OF CONCERN**

Tonto National Forest
Migratory bird species of concern
Mar 2011

Ponderosa Pine Forest: primarily pure ponderosa pine forest		
Flammulated Owl*	Northern Goshawk*	Olive-sided Flycatcher*
Grace's Warbler*	Lewis's Woodpecker*	Olive Warbler*
Ponderosa-Gambel's Oak Forest		
Band-tailed Pigeon*	Grace's Warbler*	Northern Goshawk*
Flammulated Owl*	Lewis's Woodpecker*	Olive Warbler*
Mixed Conifer Forest: Douglas fir, white fir, ponderosa pine, often some aspen and Gambel's oak.		
Band-tailed Pigeon*	Golden-crowned Kinglet	Olive-sided Flycatcher*
Cordilleran Flycatcher	Mexican Spotted Owl	Red-faced Warbler*
Flammulated Owl*	Northern Goshawk*	Red-naped Sapsucker*
Pinyon Pine – Juniper woodland		
Black-throated Gray Warbler*	Gray Vireo	Peregrine Falcon*
Golden Eagle*	Juniper Titmouse	Pinyon Jay
Gray Flycatcher		
Madrean Evergreen woodland: Madrean evergreen oaks, juniper, pinyon pine		
Black-throated Gray Warbler*	Golden Eagle*	
Interior chaparral: shrub live oak, manzanita, mountain-mahogany, cliffrose		
Black-chinned Sparrow		
Semiarid grassland, often with scattered sotol, agaves burroweed, snakeweed, yucca, mesquite		
Golden Eagle*	Swainson's Hawk	
Sonoran Desertscrub (Arizona Upland Biome): paloverde, ironwood, mesquite, catclaw, acacia, saguaro, cholla, barrel cactus, prickly pear, creosote bush, jojoba, crucifixion thorn		
Bendire's Thrasher	Gila Woodpecker	Phainopepla*
Canyon Towhee	Gilded Flicker	Prairie Falcon
Costa's Hummingbird*	Golden Eagle*	Purple Martin
Elf Owl	Peregrine Falcon*	
Montane riparian wetlands: cottonwood, maple, box elder, alder, willow, some Gambel's oak, ponderosa pine, Douglas fir, white fir, and aspen		
Cordilleran Flycatcher*	Red-faced Warbler*	Red-naped Sapsucker*
MacGillivray's Warbler		
Marshlands, cienegas, ponds, and lake edges: bulrush, sedges, pondweeds, cattail, duckweed, saltgrass		
Yuma Clapper Rail		
Interior riparian deciduous forests and woodlands: sycamore, cottonwood, willow, ash, walnut, bigtooth maple, hackberry, cypress, juniper, oak		
Common Black-Hawk*	Northern Beardless-Tyrannulet*	Yellow Warbler*
Sonoran riparian deciduous forest and woodlands: primarily cottonwood, willow, mesquite, tamarisk (salt cedar), some ash, walnut, and hackberry		
Bald Eagle	Northern Beardless-Tyrannulet	Western Yellow-billed Cuckoo
Bell's Vireo*	Southwestern Willow Flycatcher	Yellow Warbler*
Common Black-Hawk*		
Sonoran riparian scrubland (dry wash): mesquite, paloverde, ironwood, burrobrush, desert broom, quailbush, desert willow		
Bell's Vireo*	Lucy's Warbler	Phainopepla*
Costa's Hummingbird*		
* Species occurs in more than 1 type of habitat		

APPENDIX F

**PHOTOGRAPHS
OF AVIAN SPECIES
OBSERVED
WITHIN THE
ANALYSIS AREA**



PHOTO 1. Harris's hawk
(*Parabuteo unicinctus*)



PHOTO 2. Gambel's quail
(*Callipepla gambelii*)



PHOTO 3. Western kingbird
(*Tyrannus verticalis*)



PHOTO 4. Black-throated sparrow
(*Amphispiza bilineata*)



PHOTO 5. Brown-headed cowbird
(*Molothrus ater*)



PHOTO 6. Red-tailed hawk
(*Buteo jamaicensis*)