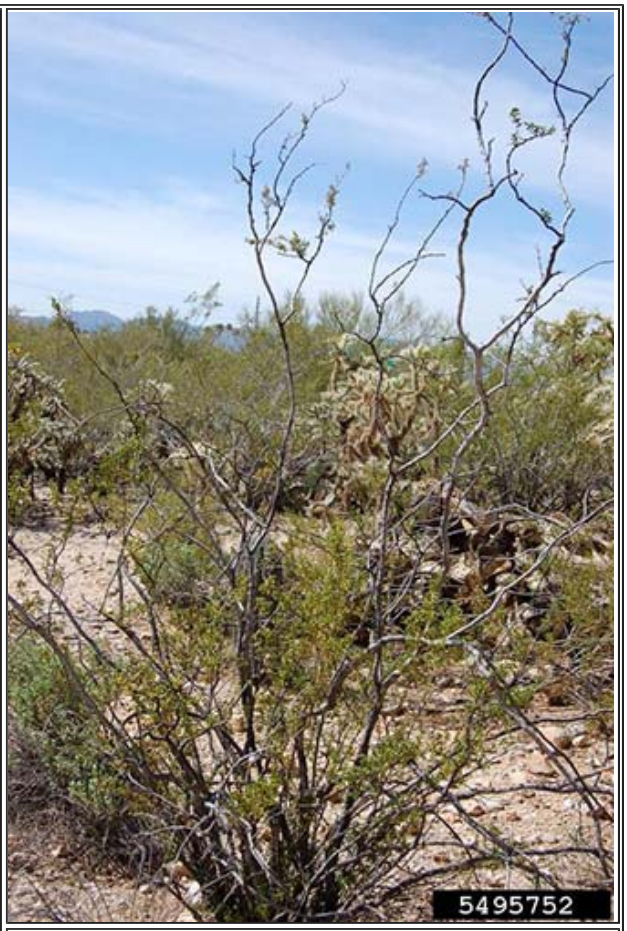
Fire Effects Information System (FEIS)

FEIS Home Page

Index of Species Information

SPECIES: Larrea tridentata



Creosote bush. Image by Joy Viola, Northeastern University, Bugwood.org.

Introductory

SPECIES: Larrea tridentata

AUTHORSHIP AND CITATION:
Marshall, K. Anna. 1995. Larrea tridentata. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: https://www.fs.fed.us/database/feis/plants/shrub/lartri/all.html [

2018, September 10].

Revisions:
Images were added on 17 July 2018.

ABBREVIATION:
LARTRI

SYNONYMS:
Larrea divaricata Cav. [110]

NRCS PLANT CODE:
LATR2

COMMON NAMES:
creosote bush
greasewood

TAXONOMY:
The scientific name of creosote bush is Larrea tridentata (D.C.) Cov. It is a member of the caltrop family (Zygophyllaceae) [52,98]. Varieites include [98]:

Larrea tridentata (DC.) Coville var. arenaria L.D. Benson
Larrea tridentata (DC.) Coville var. tridentata

LIFE FORM:
Shrub

FEDERAL LEGAL STATUS:
No special status

OTHER STATUS:
NO-ENTRY

DISTRIBUTION AND OCCURRENCE

SPECIES: Larrea tridentata

GENERAL DISTRIBUTION:
Creosote bush occurs throughout the Mojave, Sonoran, and Chihuahuan deserts [11]. Its distribution extends from southern California northeast through southern Nevada to the southwest corner of Utah and southeast through southern Arizona and New Mexico to western Texas and north-central Mexico [67].

Distribution of creosote bush. 1970 USDA, Forest Service map digitized by Thompson and others [117].

ECOSYSTEMS:

FRES30 Desert shrub
FRES32 Texas savanna
FRES33 Southwestern shrubsteppe
FRES40 Desert grasslands

STATES:

AZ CA NV NM TX UT MEXICO

BLM PHYSIOGRAPHIC REGIONS:

3 Southern Pacific Border
6 Upper Basin and Range
7 Lower Basin and Range
12 Colorado Plateau
13 Rocky Mountain Piedmont

KUCHLER PLANT ASSOCIATIONS:

K041 Creosote bush
K042 Creosote bush - bursage
K043 Paloverde - cactus shrub
K044 Creosote bush - tarbush

K045 Ceniza shrub
K058 Grama - tobosa shrubsteppe
K059 Trans-Pecos shrub savanna

SAF COVER TYPES:
68 Mesquite
242 Mesquite

SRM (RANGELAND) COVER TYPES:
NO-ENTRY

HABITAT TYPES AND PLANT COMMUNITIES:
Creosote bush is a dominant or codominant member of most plant communities in the Mojave, Sonoran, and Chihuahuan deserts. Creosote bush occurs on 35 to 46 million acres (14-18.4 million ha) in the Southwest [25]. Creosote bush usually occurs in open, species-poor communities, sometimes in pure stands. It also occurs as a transitional species in desert grasslands [59], viscid acacia (Acacia neovernicosa)-mariola (Parthenium incanum) chaparillo [60], mesquite (Prosopis spp.) woodlands [90], Joshua tree (Yucca brevifolia)/big galleta (Hilaria rigida) communities [57], and xeroriparian areas [14].

The creosote bush-burrobush (Ambrosia dumosa) association covers approximately 70 percent of the Mojave Desert [42,67,91]. Ackerman [3] estimated the density of creosote bush at 959 plants per hectare on Mojave Desert sites in Rock Valley, Nevada. Relative abundance was 10.8 percent and relative plant cover was 19.6 percent. Species associated with creosote bush-burrobush communities in the Mojave Desert include Shockley's goldenhead (Acamptopappus shockleyi), Anderson's wolfberry (Lycium andersonii), range ratany (Krameria parvifolia), Mojave yucca (Yucca schidigera), California jointfir (Ephedra funerea), spiny hopsage (Grayia spinosa), and winterfat (Krascheninnikovia lanata) [88]. Creosote bush also occurs in the Mojave Desert scrub association with desertholly (Atriplex hymenelytra), shadscale (A. confertifolia), white burrobrush (Hymenoclea salsola), blackbrush (Coleogyne ramosissima), Joshua tree, desertsenna (Cassia armata), and Nevada ephedra (Ephedra nevadensis) [54,97].

In the Sonoran Desert, creosote bush commonly occurs in the creosote bush-triangle bur ragweed (Ambrosia deltoidea) [7], creosote bush-burrobush [91], and Sonoran Desert scrub [54] associations. Other species associated with creosote bush in the Sonoran Desert include yellow paloverde (Cercidium microphyllum), tesota (Olneya tesota), big galleta, prickly pear (Opuntia spp.), acacia (Acacia paucipina), fourwing saltbush (Atriplex canescens), ocotillo (Fouquieria splendens), western honey mesquite (Prosopis glandulosa var. torreyana), brittle bush (Encelia farinosa), and pachycereus (Pachycereus schottii) [7, 26, 91]. The densities of creosote bush in the subdivisions of the Sonoran Desert are 448 plants per hectare in the Lower Colorado River Valley, 437.7 plants per hectare in the Arizona Upland Subdivision, and 1.1 plants per hectare on the Central Gulf Coast [67].

The creosote bush scrub phase covers 40 percent of the Chihuahuan Desert [67]. Associated species include tarbush (Flourensia cernua), acacia (Acacia spp.), leucophyllum (Leucophyllum spp.), mesquite, palma (Yucca filifera), ocotillo, small-leaf geigertree (Cordia parviflora), and anisacanthus (Anisacanthus spp.) [49, 73]. Creosote bush also occurs in the sand dune scrub phase in the Chihuahuan Desert [49].

Publications listing creosote bush as a dominant or codominant species include:

The structure and distribution of Larrea communities [9]
Sonoran Desert [24]
Vegetation and community types of the Chihuahuan Desert [49]
Preliminary descriptions of the terrestrial natural communities of California [54]
The natural vegetation of Arizona [81]
Vegetation of the Santa Catalina Mountains: community types and dynamics [82]
Plant communities of Texas (Series level) [94]
Vegetation and flora of Fort Bowie National Historic Site, Arizona [103]

MANAGEMENT CONSIDERATIONS

SPECIES: Larrea tridentata

IMPORTANCE TO LIVESTOCK AND WILDLIFE:
Many animals bed in or under creosote bush. Domestic sheep dig shallow beds under creosote bush because it provides the only shade in the desert scrub community [105]. Desert reptiles and amphibians use creosote bush as a food source and perch site and hibernate or estivate in burrows under creosote bush, avoiding predators and excessive daytime temperatures. Desert tortoises dig their shelters under creosote bush where its roots stabilize the soil [12,30]. Seventy-one percent of desert tortoise burrows studied near San Bernardino, California, were associated with creosote bush [12]. Banner-tailed kangaroo rats frequently use creosote bush for cover [76]. Merriam's kangaroo rats often make their dens under creosote bush [76]. Some special status subspecies of kit fox rest and den in creosote bush flats in the Sonoran Desert [111].

Many small mammals browse creosote bush or consume its seeds. Creosote bush comprised 14.6 percent of black-tailed jackrabbit diets on Isla Carmen in the Gulf of California. Terminal twigs of creosote bush were consumed in proportion to their availability in black-tailed jackrabbit habitat. Ninety percent of creosote bush were browsed, and 52.5 percent of twigs on those plants were browsed [53]. Creosote bush dominated the diet of desert woodrats in the Mojave Desert of California; the desert woodrats strongly preferred creosote bush foliage of relatively low resin content [74]. Boyd and Brum [19] found that 27.5 percent of creosote bush seed mericarps on a Mojave Desert site showed signs of postdispersal rodent predation.

PALATABILITY:
Creosote bush is unpalatable to livestock and most browsing wildlife [8,55,70,95]. Consumption of creosote bush may be fatal to sheep [35]. A few researchers have treated creosote bush chemically to make it palatable [95,36,4]. Such treatments can produce a feed that is relatively palatable and nutritious.

NUTRITIONAL VALUE:
Catlin [27] evaluated the nutritional content of creosote bush browse in Arizona:

Water	4.79%
Ash	8.06%
Crude protein	13.37%
Crude fiber	11.21%
Fat	9.13%
Nitrogen-free extract	43.38%

Reichman [86] estimated that creosote bush seeds contain 4,966 calories per gram or 11.37 calories per seed.

COVER VALUE:
Creosote bush in Utah provides good cover for small mammals and nongame birds, fair cover for pronghorn and upland game birds, and poor cover for bighorn sheep, mountain goats, and waterfowl [113].

VALUE FOR REHABILITATION OF DISTURBED SITES:
Creosote bush may be used to rehabilitate disturbed environments in southwestern deserts. Once established, creosote bush may improve sites for annuals that grow under its canopy by trapping fine soil, organic matter, and symbiont propagules. It may also increase water infiltration and storage [8].

Creosote bush should be transplanted rather than spot-seeded [47]. Miller and Holden [75] increased germination success by leaching seeds in running water for 12 hours. At Organ Pipe National Monument, the survival rate for creosote bush was 78 percent when seeds were germinated in grow tubes filled with nursery soil mix and allowed to harden-off before being transplanted outside. Creosote bush should be planted in the spring or fall [31,96]. Bainbridge and Virginia [8] recommend pruning seedlings heavily 1 month before transplanting. Rodent protectors are necessary [31].

OTHER USES AND VALUES:
Creosote bush has been highly valued for its medicinal properties by desert peoples. It has been used to treat at least 14 illnesses [80]. Twigs and leaves may be boiled as tea, steamed, pounded into a powder, pressed into a poultice, or heated into an infusion.

Creosote bush is host to an insect, Tachardiella larreae, which produces lac and deposits it on the stems of creosote bush [39]. Lac is plastic when heated but hardens again on cooling, forming a strong bond like commercial sealing wax. Lac has been used by desert peoples to seal lids on food jars [39,80].

Creosote bush contains phototoxins in its leaves that inhibit the growth of Escherichia coli and Saccharomyces cerevisiae cultures [35].

Creosote bush is used as an ornamental throughout its range [42].

OTHER MANAGEMENT CONSIDERATIONS:
Creosote bush invades desert grasslands [6,17,22,56,58]. In 1904, creosote bush was confined to about 950 acres (380 ha) at the Santa Rita Experimental Range in Arizona [56]. By 1934, the number of acres occupied by creosote bush had increased more than 12-fold to 11,900 acres (4760 ha). By 1954, creosote bush occupied an area 73 times as great as it had 50 years before. Humphrey and Mehrhoff [56] attribute creosote bush expansion to a reduction in range fires. Buffington and Herbel [22] cite heavy grazing and periodic droughts as the major causes of the rapid increase of creosote bush and other shrubs in desert grasslands.

Controlling creosote bush can be difficult because it can sprout from the root crown following disturbance [16]. A variety of herbicides may be used to kill creosote bush [37,51,77,50], but Flores and others [40] suggested that revegetation of former creosote bush sites with more desirable species is very difficult.

Bush muhly (Muhlenbergia porteri) often grows under creosote bush canopies where their ranges overlap. Where creosote bush is 3.3 feet (1

m) or less tall, bush muhly shades the lower branches of creosote bush, causing its leaves to fall. In some instances, this competition may kill creosote bush [106].

Creosote bush is susceptible to severe drought during short-term climate changes like El Nino [102]. During dry years, creosote bush undergoes severe moisture stress and subsequent defoliation. Older branches do not produce new foliage, but sprouting may occur. The cumulative result of El Nino can be a 60-80 percent stem dieback. Dead stemwood remains standing within the shrub biomass for several years.

Pollution from electric power generating facilities may adversely affect creosote bush. Creosote bush showed sensitivity to sulfur dioxide and nitrogen dioxide fumigation [112].

BOTANICAL AND ECOLOGICAL CHARACTERISTICS

SPECIES: Larrea tridentata

GENERAL BOTANICAL CHARACTERISTICS:
Creosote bush is a native, drought-tolerant, evergreen shrub growing up to 13.2 feet (4 m) tall [79]. Its numerous branches are brittle and densely leafy at the tips [41,79]. Because of leaf and stem alignment, creosote bush provides little shade during the full desert sunshine [70].

The leaves of creosote bush are thick, resinous, and strongly scented [8,61] . Flowers are solitary and axillary [61]. Fruits are globose, consisting of five united, indehiscent, one-seeded carpels which may or may not break apart after maturing [13,68,79]. Each carpel is densely covered by long trichomes [68].

The root system of creosote bush consists of a shallow taproot and several lateral secondary roots, each about 10 feet (3 m) in length and 8 to 14 inches (20-35 cm) deep. The taproot extends to a depth of about 32 inches (80 cm); further penetration is usually inhibited by caliche [41,114]. Barbour [10] found that root growth decreased as pH increased above 8.0. Optimum root growth occurred at acid pH; however, only one of the topsoils from which seeds were gathered exhibited acid pH. Root growth was inhibited by high concentrations of salt (>10,000 ppm). Creosote bush roots require relatively large amounts of oxygen for growth [66].

Creosote bush is known to attain ages of several thousand years; some creosote bush clones may be the earth's oldest living organisms. The age of the largest clone in Johnson Valley, California, is estimated at 9,400 years [101]. McAuliffe [71] estimated the average longevity of creosote bush to be 1,250 years at a study site in Dateland, California, and 625 years at a San Luis site.

RAUNKIAER LIFE FORM:
Phanerophyte

REGENERATION PROCESSES:
Creosote bush reproduces both vegetatively and sexually.

Vegetative reproduction: Creosote bush achieves its status as one of the most stable members of desert communities by cloning. When drought is extreme, old branches and roots of creosote bush die back. When rains return, branches are replaced by sprouts originating near the outside of the root crown. Creosote bush clones gradually expand to form rings many meters in diameter [32,63]. Creosote bush may occasionally sprout from its root crown after disturbance. New sprouts were produced by

creosote bush on a Mojave Desert site that had been denuded by grading [89].

Sexual reproduction: Age distribution in many stands of creosote bush indicates that germination and survival under natural conditions are rare [11,66]. Sexual reproduction may be especially rare at the upper elevational limits of creosote bush [104].

Creosote bush requires summer rains for successful sexual reproduction. The flowering success of creosote bush is greatest with moderate rainfall. In years of high rainfall, a high proportion of flowers is diseased [13].

Creosote bush seeds are primarily adapted for tumbling rather than for animal dispersal or lofting [68]. The stiff trichomes radiate equally in all directions so that little wind is required to send the seeds tumbling. The trichomes are not stiff enough to penetrate animal skin, and the seeds are too heavy for lofting. However, Chew and Chew [29] suggested that the shucking and burial of creosote bush seeds by rodents may facilitate the germination and survival of creosote bush. Shreve [91] noted poor creosote bush reproduction on level plains. More seedlings established if the soil surface was broken or scarred. Leitner [116] found creosote bush more abundant on southern or northern slopes of a pediment in Sonora, Mexico, than in washes. Rock crevices and irregularities of the pediment may provide protection and footholds for wind-tumbled seeds.

Germination of creosote bush is related to rainfall. A minimum of about 1 inch of rainfall seems necessary to induce germination. A 1971 rain of 1 to 1.96 inches (25-49 mm) in the Mojave Desert was sufficient, but neither an August 1972 rain of 0.68 inch (17 mm) nor a July rain of 0.84 inch (21 mm) promoted germination of creosote bush seeds [2]. If less than 2 to 3 inches (50-80 mm) or more than 6 inches (150 mm) of rain fall during the summer, germinability of seeds is usually less than 20 percent. If 3 to 6 inches (80-150 mm) fall, germination is 20 to 60 percent.

Germination experiments have been conducted on creosote bush seeds from all three southwestern deserts. Barbour [10] found that the average creosote bush mericarp contained one seed, and viability ranged from 15 to 76 percent. The presence or absence of mericarp about the seed had no effect on germination. Germination was two times higher in darkness than under light, and optimal germination temperature was 73.4 degrees Fahrenheit (23 deg C). Optimum salinity was 500 parts per million of sodium chloride. Germination was not affected by pH. Creosote bush seeds may lose viability if they remain in topsoils during the summer; seeds from the Sonoran and Chihuahuan deserts showed decreased germination as storage temperature increased.

SITE CHARACTERISTICS:

Creosote bush commonly grows on bajadas, gentle slopes, valley floors, sand dunes, and in arroyos [23,34,107] at elevations up to 5,000 feet (1,515 m) [61,79] throughout the Sonoran, Mojave, and Chihuahuan deserts. It occurs on calcareous, sandy, and alluvial soils that are often underlain by a caliche hardpan [21,43,45,48,67].

Temperatures in the southwestern deserts are variable and extreme. Near the southern boundary of creosote bush distribution, at Puerto Libertad, Sonora, the mean annual temperature is 68.37 degrees Fahrenheit (20.2 degrees C). Daytime temperatures in the summer often reach 117 degrees Fahrenheit (47 deg C) [26]. In Rock Valley, Nevada, near the northern boundary of creosote bush distribution, temperatures range from 5 degrees Fahrenheit (-15 deg C) in winter to 117 degrees Fahrenheit (47 deg C) in summer [3].

Phenological events in the southwestern deserts are triggered by rain. In the Sonoran Desert, annual rainfall averages 4 to 12 inches (100-300 mm) and is distributed bimodally [67]. The Mojave Desert gets more winter than summer rain [67]; in Rock Valley, Nevada, rainfall averages 5.524 inches (138.1 mm), with 60 percent falling between September and February [18]. The Chihuahuan Desert is slightly less dry; in the Rio Grande Valley, New Mexico, rainfall averages from 8.5 inches at San Marcial to slightly more than 10 inches at Socorro. Two-thirds to three-fourths of the precipitation falls between April 1 and September 30 [43].

Low soil oxygen may be a controlling factor in the distribution of desert species. Creosote bush is less tolerant of low soil oxygen than burrobush [46]. Lunt [66] attributes the exclusion of creosote bush from fine-textured and poorly drained soils to its high oxygen requirement.

SUCCESSIONAL STATUS:
Creosote bush density and cover are generally decreased by disturbance. In a comparison between vegetation on disturbed and undisturbed Mojave Desert sites, creosote bush was dominant on all control sites and subdominant to burrobush on disturbed sites [84]. Webb [104] noted that desert succession can be described using life-history strategies: Species with high recruitment and mortality rates, such as white bursage, are dominant in the colonizing stage and species with low recruitment and mortality, such as creosote bush, eventually dominate the landscape, although colonizing species usually remain present.

Creosote bush uses burrobush as a nurse plant. McAuliffe [71] found that 85.5 percent of all young creosote bush were rooted beneath the canopies of live burrobush or positioned next to dead ones. The smallest creosote bush plants in McAuliffe's [71] study were all associated with live burrobush. Most creosote bush establishment apparently occurs near live burrobush.

Recruitment of creosote bush is infrequent. Despite the abundance of potentially suitable areas beneath burrobush, McAuliffe [71] found young creosote bush beneath only 1 percent of all burrobush. Total densities of young creosote bush were between 12 and 15 plants per hectare. The density of burrobush plants was ten times that of creosote bush. Although large-scale creosote bush seedling establishment does not occur after disturbance, relict creosote bush usually increases in size by cloning [100,101,104]. Creosote bush canopies may grow to exceed the coverage of burrobush by more than six times [71].

Creosote bush exhibits root-mediated allelopathy. In a laboratory study, creosote bush test roots grew freely through soil occupied by white bursage roots, but burrobush test roots grew at reduced rates into soil occupied by creosote bush [69]. Mature creosote bush may be allelopathic to their own seedlings, encouraging an open community structure [71].

SEASONAL DEVELOPMENT:
Creosote bush leafs out in response to spring, summer, or fall rains [1]. Creosote bush usually flowers in May [1] in the Mojave Desert, but it can flower anytime during the summer if it receives enough rain [1,3,9]. In the Sonoran Desert, most creosote bush seeds are shed in the summer, but creosote bush in the Chihuahuan Desert does not shed its seeds until fall [10]. Creosote bush seeds germinate after rains from mid-June to mid-September in the Mojave Desert [2].

FIRE ECOLOGY

SPECIES: Larrea tridentata

FIRE ECOLOGY OR ADAPTATIONS:
Creosote bush is poorly adapted to fire because of its limited sprouting ability [59,115]. Creosote bush survives some fires that burn patchily or are of low severity [87,115]. Historically, infrequent fires may have limited the invasion of desert grasslands by creosote bush [59].

Most fires in the desert are infrequent and of low severity because production of annual and perennial herbs seldom provides a fuel load capable of sustaining fire. Humphrey [59] stated that the creosote bush-burrobush community is "essentially nonflammable" because the shrubs are too sparse to carry fire. The resinous foliage of creosote bush, however, is very flammable.

POSTFIRE REGENERATION STRATEGY:
Secondary colonizer - off-site seed
Tall shrub, adventitious-bud root crown

FIRE REGIMES: Find fire regime information for the plant communities in which this species may occur by entering the species name in the FEIS home page under "Find Fire Regimes".

FIRE EFFECTS

SPECIES: Larrea tridentata

IMMEDIATE FIRE EFFECT ON PLANT:
Fire kills many creosote bush. During a low-severity California fire, many creosote bush were scorched and few burned, but overall mortality was still 97 percent [115]. Dalton [33] reported mortality rates of 69 and 63 percent for moderately and lightly burned plants, respectively. A low-severity fire near Florence, Arizona, top-killed 97 percent of all creosote bush; however, 37 percent of those sprouted. Overall creosote bush mortality was 61 percent [72].

PLANT RESPONSE TO FIRE:
Creosote bush may sprout if its root crown is not killed by fire [64]. In a southern California brushfire, creosote bush successfully sprouted and regained its estimated former cover within 5 years [83]. In a low-severity Arizona fire, 37 percent of top-killed creosote bush sprouted [72]. However, Brown and Minnich [115] reported that creosote bush rarely sprouted even though most shrubs were incompletely burned in a low-severity fire near Palm Springs, California.

Dalton [33] reported good creosote bush seedling establishment on a burned site in Arizona, possibly due to reduced competition for soil moisture. No seedling establishment occurred on unburned sites. Seedling establishment also occurred after a low-severity fire in Arizona. Prefire density of creosote bush was 45 plants per hectare, and creosote bush cover was 1.3 percent [72]. In postfire year 1, the density of creosote bush was 125 plants per hectare and creosote bush cover was 0.3 percent. In postfire year 2, the density of creosote bush was 95 plants per hectare and creosote bush cover was 0.6 percent.

DISCUSSION AND QUALIFICATION OF PLANT RESPONSE:
Season of burning, fuel quantity, fire temperature, and age of existing creosote bush may affect the ability of creosote bush to sprout. White

[108] noted that burning creosote bush during different seasons at the Sant Rita Experimental Range near Tucson, Arizona, resulted in significant differences in sprout production. The most sprouts were produced following February and August fires. The least sprouts were produced following June and July fires. The seasonal pattern of sprout production closely followed trends in growth of terminal shoots. Sprouting in creosote bush decreased with increasing fuel quantity and decreased as soil temperature and duration of heating increased [108,109]. Young plants produced fewer sprouts after burning than mature plants [108].

The Research Project Summary Nonnative annual grass fuels and fire in California's Mojave Desert provides information on prescribed fire and postfire response of plant community species, including creosote bush, that was not available when this species review was written.

FIRE MANAGEMENT CONSIDERATIONS:
Fire can be used to control creosote bush and promote the growth of grasses in desert grasslands and shrublands. Prescribed burning should be conducted in spring or early fall following 2 years of above average plant growth. Britton and Wright [20] describe specific procedures for burning shrub-invaded grasslands.

Soils under some creosote bush are water repellant because of associated soil microorganisms. The hydrophobic characteristic of such soils precludes the establishment of annuals normally occurring under creosote bush. The degree to which the soils are hydrophobic may be intensified by fire [5].

Standing biomass, deadwood, and leaf litter from creosote bush can fuel desert fires. Dead fuels are increased by drought, and live fuels are increased after rainy seasons. The shoot volume, dry weight, and biomass production of creosote bush all increase in sigmoid fashion with age. The period of most rapid increase is from 20 to 50 years of age. From 20 years onward, leaves average 53 percent of total shoot cumulative production, stems with leaves average 13 percent, and the stem trunk averages 4 percent [28]. Woody remains of creosote bush take about 60 years to decay beyond the point of recognition [71].

References for species: Larrea tridentata

1. Ackerman, T. L.; Romney, E. M.; Wallace, A.; Kinnear, J. E. 1980. Phenology of desert shrubs in southern Nye County, Nevada. In: The Great Basin Naturalist Memoirs No. 4. Nevada desert ecology. Provo, UT: Brigham Young University: 4-23. [3197]

2. Ackerman, Thomas L. 1979. Germination and survival of perennial plant species in the Mojave Desert. The Southwestern Naturalist. 24(3): 399-408. [12219]

3. Ackerman, Thomas L.; Bamberg, Sam A. 1974. Phenological studies in the Mojave Desert at Rock Valley (Nevada Test Site). In: Lieth, Helmut, ed. Phenology and seasonality modeling. New York: Springer-Verlag: 215-226. (Ecological studies; Analysis and synthesis, volume 8). [21506]

4. Adams, David W. 1970. A study of the possibilities of treating creosotebush with NaOH to make a good livestock feed. Alpine, TX: Sul Ross State University. 51 p. Thesis. [5066]

5. Adams, Susan; Strain, B. R.; Adams, M. S. 1970. Water-repellent soils, fire, and annual plant cover in a desert scrub community of southeastern California. Ecology. 51(4): 696-700. [5407]

6. Ahlstrand, Gary M. 1979. Preliminary report on the ecology of fire study, Guadalupe Mountains and Carlsbad Caverns National Parks. In: Genoways, Hugh H.; Baker, Robert J., eds. Biological investigations in the Guadalupe Mountains National Park: Proceedings of a symposium; 1975 April 4-5; Lubbock, TX. Proceedings and Transactions Series No. 4. Washington, DC: U.S. Department of the Interior, National Park Service: 31-44. [16015]

7. Albert, Steven K.; Krausman, Paul R. 1993. Desert mule deer and forage resources in southwest Arizona. The Southwestern Naturalist. 38(3): 198-205. [22140]

8. Bainbridge, David A.; Virginia, Ross A. 1990. Restoration in the Sonoran Desert of California. Restoration and Management Notes. 8(1): 3-14. [14975]

9. Barbour, M. G.; MacMahon, J. A.; Bamberg, S. A.; Ludwig, J. A. 1977. The structure and distribution of Larrea communities. In: Mabry, T. J.; Hunziker, J. H.; DiFeo, D. R., Jr., eds. Creosote bush: Biology and chemistry of Larrea in New World deserts. U.S./IBP Synthesis Series 6. Stroudsburg, PA: Dowden, Hutchinson & Ross, Inc.: 227-251. [7172]

10. Barbour, Michael G. 1968. Germination requirements of the desert shrub Larrea divaricata. Ecology. 49: 915-923. [4212]

11. Barbour, Michael G. 1969. Age and space distribution of the desert shrub Larrea divaricata. Ecology. 50(4): 679-685. [3989]

12. Baxter, Ronald J. 1988. Spatial distribution of desert tortoises (Gopherus agassizii) at Twentynine Palms, California: implications for relocations. In: Szaro, Robert C.; Severson, Kieth E.; Patton, David R., technical coordinators. Management of amphibians, reptiles, and small mammals in North America: Proceedings of the symposium; 1988 July 19-21; Flagstaff, AZ. Gen. Tech. Rep. RM-166. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 180-189. [7112]

13. Beatley, Janice C. 1974. Effects of rainfall and temperature on the distribution and behavior of Larrea tridentata (creosote-bush) in the Mojave Desert of Nevada. Ecology. 55: 245-261. [197]

14. Bennett, Peter S.; Kunzmann, Michael R.; Johnson, R. Roy. 1989. Relative nature of wetlands: riparian and vegetational considerations. In: Abell, Dana L., technical coordinator. Protection, management, and restoration for the 1990's: Proceedings of the California riparian systems conference; 1988 September 22-24; Davis, CA. Gen. Tech. Rep. PSW-110. Berkeley, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station: 140-142. [13516]

15. Bernard, Stephen R.; Brown, Kenneth F. 1977. Distribution of mammals, reptiles, and amphibians by BLM physiographic regions and A.W. Kuchler's associations for the eleven western states. Tech. Note 301. Denver, CO: U.S. Department of the Interior, Bureau of Land Management. 169 p. [434]

16. Blackburn, W. H. 1983. Influence of brush control on hydrologic characteristics. In: McDaniel, Kirk C., ed. Proceedings--brush management symposium; 1983 February 16; Albuquerque, NM. Denver, CO: Society for Range Management; 1983: 73-88. [452]

17. Blydenstein, John; Hungerford, C. Roger; Day, Gerald I.; Humphrey, R. 1957. Effect of domestic livestock exclusion on vegetation in the Sonoran Desert. Ecology. 38(3): 522-526. [4570]

18. Bowers, Michael A. 1987. Precipitation and the relative abundances of desert winter annuals: a 6-year study in the northern Mohave Desert. Journal of Arid Environments. 12: 141-149. [4850]

19. Boyd, Robert S.; Brum, Gilbert D. 1983. Predispersal reproductive attrition in a Mojave Desert population of Larrea tridentata (Zygophyllaceae). The American Midland Naturalist. 110(1): 4-24. [3968]

20. Britton, Carlton M.; Wright, Henry A. 1983. Brush management with fire. In: McDaniel, Kirk C., ed. Proceedings--brush management symposium; 1983 February 16; Albuquerque, NM. Denver, CO: Society for Range Management: 61-68. [521]

21. Brown, David E. 1982. Chihuahuan desertscrub. In: Brown, David E., ed. Biotic communities of the American Southwest--United States and Mexico. Desert Plants. 4(1-4): 169-179. [3607]

22. Buffington, Lee C.; Herbel, Carlton H. 1965. Vegetational changes on a semidesert grassland range from 1858 to 1963. Ecological Monographs. 35: 139-164. [3383]

23. Burgess, Tony L.; Northington, David K. 1974. Desert vegetation in the Guadalupe Mountains region. In: Wauer, Roland H.; Riskind, David H., eds. Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico; 1974 October 17-18; Alpine, TX. Transactions and Proceedings Series No. 3. Washington, DC: U.S. Department of the Interior, National Park Service: 229-242. [16061]

24. Burk, Jack H. 1977. Sonoran Desert. In: Barbour, M. G.; Major, J., eds. Terrestrial vegetation of California. New York: John Wiley and Sons: 869-899. [3731]

25. Cable, Dwight R. 1973. Fire effects in southwestern semidesert grass-shrub communities. In: Proceedings, annual Tall Timbers fire ecology conference; 1972 June 8-9; Lubbock, TX. Number 12. Tallahassee, FL: Tall Timbers Research Station: 109-127. [4338]

26. Castellanos, A. E.; Molina, F. E. 1990. Differential survivorship and establishment in Simmondsia chinensis (jojoba). Journal of Arid Environments. 19: 65-76. [14982]

27. Catlin, C. N. 1925. Composition of Arizona forages, with comparative data. Bull. 113. Tucson, AZ: University of Arizona, Agricultural Experiment Station: 155-171. [4525]

28. Chew, Robert M.; Chew, Alice Eastlake. 1965. The primary productivity of a desert-shrub (Larrea tridentata) community. Ecological Monographs. 35: 355-375. [4254]

29. Chew, Robert M.; Chew, Alice Eastlake. 1970. Energy relationships of the mammals of a desert shrub (Larrea tridentata) community. Ecological Monographs. 40(1): 1-21. [5055]

30. Christensen, Jon. 1992. Sin City's luck tortoise. Nature Conservancy. 42(4): 8-13. [19291]

31. Clary, Raimond F., Jr.; Slayback, Robert D. 1985. Revegetation in the Mojave Desert using native woody plants. In: Rieger, John P.; Steele, Bobbie A., eds. Proceedings of the native plant revegetation symposium; 1984 November 15; San Diego, CA. San Diego, CA: California Native Plant Society: 42-47. [3343]

32. Cody, M. L. 1986. Spacing patterns in Mojave Desert plant communities: near-neighbor analyses. Journal of Arid Environments. 11: 199-217. [4411]

33. Dalton, Patrick Daly, Jr. 1962. Ecology of the creosotebush Larrea tridentata (DC.) Cov.. Tucson, AZ: University of Arizona. 170 p. In: Dissertation Abstracts International: 2556. [Abstract]. [5061]

34. Darrow, Robert A. 1944. Arizona range resources and their utilization: 1. Cochise County. Tech. Bull. 103. Tucson, AZ: University of Arizona, Agricultural Experiment Station: 311-364. [4521]

35. Downum, Kelsey R.; Villegas, Sergio; Rodriguez, Eloy; Keil, David J. 1989. Plant photosensitizers: a survey of their occurrence in arid and semiarid plants from North America. Journal of Chemical Ecology. 15(1): 345-355. [7658]

36. Duisberg, Peter C. 1952. Development of a feed from the creosote bush and the determination of its nutritive value. Journal of Animal Science. 11: 174-180. [4573]

37. Emmerich, W. E.; Helmer, J. D.; Renard, K. G.; Lane, L. J. 1984. Fate and effectiveness of tebuthiuron applied to a rangeland watershed. Journal of Environmental Quality. 13(3): 382-386. [3969]

38. Eyre, F. H., ed. 1980. Forest cover types of the United States and Canada. Washington, DC: Society of American Foresters. 148 p. [905]

39. Felger, R. S. 1977. Mesquite in Indian cultures of southwestern North America. In: Simpson, B. B., ed. Mesquite: Its biology in two desert ecosystems. US/IBP Synthesis 4. Stroudsburg, PA: Dowden, Hutchinson & Ross, Inc: 150-176. [5195]

40. Flores, Ernesto; Conoly, Marty; Sosebee, Ronald E.; Hartmann, Steve. 1990. Reclamation of creosotebush-infested rangeland. In: Webster, David B.; Schramm, Harold L., Jr., eds. Research highlights: Noxious brush and weed control; range and wildlife management. Vol. 21. Lubbock, TX: Texas Tech University, College of Agricultural Sciences: 10. [14565]

41. Fonteyn, P. J.; Mahall, B. E. 1981. An experimental analysis of structure in a desert plant community. Journal of Ecology. 69: 883-896. [4249]

42. Fonteyn, Paul J.; Mahall, Bruce E. 1978. Competition among desert perennials. Nature. 275: 544-545. [3618]

43. Gardner, J. L. 1951. Vegetation of the creosotebush area of the Rio Grande Valley in New Mexico. Ecological Monographs. 21: 379-403. [4243]

44. Garrison, George A.; Bjugstad, Ardell J.; Duncan, Don A.; [and others]. 1977. Vegetation and environmental features of forest and range ecosystems. Agric. Handb. 475. Washington, DC: U.S. Department of Agriculture, Forest Service. 68 p. [998]

45. Gehlbach, Frederick R. 1967. Vegetation of the Guadalupe Escarpment, New Mexico-Texas. Ecology. 48(3): 404-419. [5149]

46. Goldberg, Deborah E.; Turner, Raymond M. 1986. Vegetation change and plant demography in permanent plots in the Sonoran Desert. Ecology. 67(3): 695-712. [4410]

47. Graves, Walter L.; Kay, Burgess L.; Williams, William A. 1975. Seed treatment of Mojave Desert shrubs. Agronomy Journal. 67(6): 773-777. [4192]

48. Haase, Edward F. 1972. Survey of floodplain vegetation along the lower Gila River in southwestern Arizona. Journal of the Arizona Academy of Science. 7: 75-81. [10860]

49. Henrickson, James; Johnston, Marshall C. 1986. Vegetation and community types of the Chihuahuan Desert. In: Barlow, J. C.; [and others], eds. Chihuahuan Desert--U.S. and Mexico, II. Alpine, TX: Sul Ross State University: 20-39. [12979]

50. Herbel, Carlton H.; Gould, Walter L. 1970. Control of mesquite, creosote bush, and tarbush on arid rangelands of the southwestern United States. In: Proceedings, 11th international grasslands congress; [Date of conference unknown]; Queensland, Australia. [Place of publication unknown].

[Publisher unknown]: 38-41. On file with: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Lab, Missoula, MT. [4246]

51. Herbel, Carlton H.; Morton, Howard L.; Gibbens, Robert P. 1985. Controlling shrubs in the arid Southwest with tebuthiuron. Journal of Range Management. 38(5): 391-394. [10080]

52. Hickman, James C., ed. 1993. The Jepson manual: Higher plants of California. Berkeley, CA: University of California Press. 1400 p. [21992]

53. Hoagland, Donald B. 1992. Feeding ecology of an insular population of the black-tailed jackrabbit (Lepus californicus) in the Gulf of California. The Southwestern Naturalist. 37(3): 280-286. [19693]

54. Holland, Robert F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Sacramento, CA: California Department of Fish and Game. 156 p. [12756]

55. Humphrey, R. R. 1950. Arizona range resources. II. Yavapai County. Bull. 229. Tucson, AZ: University of Arizona, Agricultural Experiment Station. 55 p. [5088]

56. Humphrey, R. R.; Mehrhoff, L. A. 1958. Vegetation changes on a southern Arizona grassland range. Ecology. 39(4): 720-726. [4215]

57. Humphrey, Robert R. 1953. Forage production on Arizona ranges. III. Mohave County: A study in range condition. Bulletin 244. Tucson, AZ: University of Arizona, Agricultural Experiment Station. 79 p. [4440]

58. Humphrey, Robert R. 1960. Forage production on Arizona ranges. V. Pima, Pinal and Santa Cruz Counties. Bulletin 502. Tucson, AZ: University of Arizona, Agricultural Experiment Station. 137 p. [4520]

59. Humphrey, Robert R. 1974. Fire in the deserts and desert grassland of North America. In: Kozlowski, T. T.; Ahlgren, C. E., eds. Fire and ecosystems. New York: Academic Press: 365-400. [14064]

60. Johnston, Marshall C. 1974. Brief resume of botanical, including vegetational, features of the Chihuahuan Desert region with special emphasis on their uniqueness. In: Wauer, Roland H.; Riskind, David H., eds. Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico; 1974 October 17-18; Alpine, TX. Transactions and Proceedings Series No. 3. Washington, DC: U.S. Department of the Interior, National Park Service: 335-359. [16064]

61. Kearney, Thomas H.; Peebles, Robert H.; Howell, John Thomas; McClintock, Elizabeth. 1960. Arizona flora. 2d ed. Berkeley, CA: University of California Press. 1085 p. [6563]

62. Kuchler, A. W. 1964. Manual to accompany the map of potential vegetation of the conterminous United States. Special Publication No. 36. New York: American Geographical Society. 77 p. [1384]

63. Levin, Geoffrey A. 1988. How plants survive in the desert. Environment Southwest. Summer: 20-25. [9239]

64. Loftin, Samuel Robert. 1987. Postfire dynamics of a Sonoran Desert ecosystem. Tempe, AZ: Arizona State University. 97 p. Thesis. [12296]

65. Losher, Lee. 1993. Propagation, revegetation program underway Organ Pipe National Monument. Restoration & Management Notes. 11(2): 166-167. [22790]

66. Lunt, O. R.; Letey, J.; Clark, S. B. 1973. Oxygen requirements for root growth in three species of desert shrubs. Ecology. 54(6): 1356-1362. [1489]

67. MacMahon, James A. 1988. Warm deserts. In: Barbour, Michael G.; Billings, William Dwight, eds. North American terrestrial vegetation. Cambridge; New York: Cambridge University Press: 231-264. [19547]

68. Maddox, Jay C.; Carlquist, Sherwin. 1985. Wind dispersal in Californian desert plants: experimental studies and conceptual considerations. Aliso. 11(1): 77-96. [3256]

69. Mahall, Bruce E.; Callaway, Ragan M. 1991. Root communication among desert shrubs. Proceedings, National Academy of Sciences, USA. 88: 874-876. [22248]

70. Mares, M. A.; Enders, F. A.; Kingsolver, J. M.; [and others]. 1977. Prosopis as a niche component. In: Simpson, B. B., ed. Mesquite: Its biology in two desert ecosystems. US/IBP Synthesis 4. Stroudsburg, PA: Dowden, Hutchinson & Ross, Inc: 123-149. [5194]

71. McAuliffe, Joseph R. 1988. Markovian dynamics of simple and complex desert plant communities. The American Naturalist. 131(4): 459-490. [6744]

72. McLaughlin, Steven P.; Bowers, Janice E. 1982. Effects of wildfire on a Sonoran Desert plant community. Ecology. 63(1): 246-248. [1619]

73. Medina T., Jorge Galo; Garza C., Hector. 1987. Range seeding research in northern Mexico. In: Frasier, Gary W.; Evans, Raymond A., eds. Proceedings of symposium: "Seed and seedbed ecology of rangeland plants"; 1987 April 21-23; Tucson, AZ. Washington, DC: U.S. Department of Agriculture, Agricultural Research Service: 246-259. [3900]

74. Meyer, Edward R. 1974. A reconnaissance survey of pollen rain in Big Bend National Park, Texas: modern control for a paleoenvironmental study. In: Wauer, Roland H.; Riskind, David H., eds. Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico; 1974 October 17-18; Alpine, TX. Transactions and Proceedings Series No. 3. Washington, DC: U.S. Department of the Interior, National Park Service: 115-123. [16058]

75. Miller, Carol; Holden, Mark. 1993. Propagating desert plants. In: Landis, Thomas D., ed. Proceedings, Western Forest Nursery Association; 1992 September 14-18; Fallen Leaf Lake, CA. Gen. Tech. Rep. RM-221. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 68-71. [22075]

76. Monson, Gale; Kessler, Wayne. 1940. Life history notes on the banner-tailed kangaroo rat, Merriam's kangaroo rat, and white-throated wood rat in Arizona and New Mexico. Journal of Wildlife Management. 4(1): 37-43. [12166]

77. Morton, Howard L.; Ibarra-F., Fernando A.; Martin-R., Martha H.; Cox, Jerry R. 1990. Creosotebush control and forage production in the Chihuahuan and Sonoran Deserts. Journal of Range Management. 43(1): 43-48. [12228]

78. Muller, Cornelius H. 1940. Plant succession in the Larrea-Flourensia climax. Ecology. 21: 206-212. [4244]

79. Munz, Philip A.; Keck, David D. 1959. A California flora. Berkeley & Los Angeles: University of California Press. 1104 p. [4592]

80. Nabhan, Gary Paul. 1985. Gathering the desert. Tucson, AZ: The University of Arizona Press. 209 p. [2848]

81. Nichol, A. A. [revisions by Phillips, W. S.]. 1952. The natural vegetation of Arizona. Tech. Bull. 68 [revision]. Tucson, AZ: University of Arizona, Agricultural Experiment Station: 189-230. [3928]

82. Niering, William A.; Lowe, Charles H. 1984. Vegetation of the Santa Catalina Mountains: community types and dynamics. Vegetatio. 58: 3-28. [12037]

83. O'Leary, John F.; Minnich, Richard A. 1981. Postfire recovery of creosote bush scrub vegetation in the western Colorado Desert. Madrono. 28(2): 61-66. [3973]

84. Prose, D. V.; Metzger, Susan K.; Wilshire, H. G. 1987. Effects of substrate disturbance on secondary plant succession; Mojave Desert, California. Journal of Applied Ecology. 24: 305-313. [4590]

85. Raunkiaer, C. 1934. The life forms of plants and statistical plant geography. Oxford: Clarendon Press. 632 p. [2843]

86. Reichman, O. J. 1976. Relationships between dimensions, weights, volumes, and calories of some Sonoran Desert seeds. The Southwestern Naturalist. 20(4): 573-574. [12326]

87. Rogers, Garry F.; Steele, Jeff. 1980. Sonoran Desert fire ecology. In: Stokes, Marvin A.; Dieterich, John H., technical coordinators. Proceedings of the fire history workshop; 1980 October 20-24; Tucson, AZ. Gen. Tech. Rep. RM-81. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 15-19. [16036]

88. Romney, E. M.; Wallace, A. 1980. Ecotonal distribution of salt-tolerant shrubs in the northern Mojave Desert. The Great Basin Naturalist Memoirs. 0(4): 134-139. [4247]

89. Romney, E. M.; Wallace, A.; Hunter, B. 1989. Pulse establishment of woody shrubs of denuded Mojave Desert land. In: Wallace, Arthur; McArthur, E. Durant; Haferkamp, Marshall R., compilers. Proceedings--symposium on shrub ecophysiology and biotechnology; 1987 June 30 - July 2; Logan, UT. Gen. Tech. Rep. INT-256. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station: 54-57. [5923]

90. Sharifi, M. Rasoul; Nilsen, Erik T.; Rundel, Philip W. 1982. Biomass and net primary production of Prosopis glandulosa (Fabaceae) in the Sonoran Desert of California. American Journal of Botany. 69(5): 760-767. [5469]

91. Shreve, Forrest. 1942. The desert vegetation of North America. Botanical Review. 8(4): 195-246. [5051]

92. Steger, Robert E.; Beck, Reldon F. 1973. Range plants as ornamentals. Journal of Range Management. 26: 72-74. [12038]

93. Stickney, Peter F. 1989. Seral origin of species originating in northern Rocky Mountain forests. Unpublished draft on file at: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Fire Sciences Laboratory, Missoula, MT; RWU 4403 files. 10 p. [20090]

94. Texas Parks and Wildlife Department. 1992. Plant communities of Texas (Series level): February 1992. Austin, TX: Texas Parks and Wildlife Department, Texas Natural Heritage Program. 38 p. [20509]

95. Timmermann, B. N. 1977. Practical uses of Larrea. In: Mabry, T. J.; Hunziker, J. H.; DiFeo, D. R., Jr., eds. Creosote bush: Biology and chemistry of Larrea in New World deserts. U.S./IBP Synthesis Series 6. Stroudsburg, PA: Dowden, Hutchinson & Ross, Inc: 252-256. [7173]

96. Tipton, J. L.; Taylor, R. M. 1984. Transplanting success with creosotebush (Larrea tridentata (D.C.) Cav.) from native stands. Journal of Environmental Horticulture. 2(3): 83-85. [5627]

97. Turner, Raymond M. 1982. Mohave desertscrub. In: Brown, David E., ed. Biotic communities of the American Southwest--United States and Mexico. Desert Plants. 4(1-4): 157-168. [2374]

98. U.S. Department of Agriculture, Natural Resources Conservation Service. 2018. PLANTS Database, [Online]. U.S. Department of Agriculture, Natural Resources Conservation Service (Producer). Available: https://plants.usda.gov/. [34262]

99. U.S. Department of the Interior, National Biological Survey. [n.d.]. NP Flora [Data base]. Davis, CA: U.S. Department of the Interior, National Biological Survey. [23119]

100. Vasek, Frank C. 1979. Early successional stages in Mojave Desert scrub vegetation. Israel Journal of Botany. 28: 133-148. [4579]

101. Vasek, Frank C. 1980. Creosote bush: long-lived clones in the Mojave Desert. American Journal of Botany. 67(2): 246-255. [2761]

102. Wallace, Arthur; Nelson, David L. 1990. Wildland shrub dieoffs following excessively wet periods: a synthesis. In: McArthur, E. Durant; Romney, Evan M.; Smith, Stanley D.; Tueller, Paul T., compilers. Proceedings--symposium on cheatgrass invasion, shrub die-off, and other aspects of shrub biology and management; 1989 April 5-7; Las Vegas, NV. Gen. Tech. Rep. INT-276. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station: 81-83. [12839]

103. Warren, Peter L.; Hoy, Marina S.; Hoy, Wilton E. 1992. Vegetation and flora of Fort Bowie National Historic Site, Arizona. Tech. Rep. NPS/WRUA/NRTR-92/43. Tucson, AZ: The University of Arizona, School of Renewable Natural Resources, Cooperative National Park Resources Studies Unit. 78 p. [19871]

104. Webb, Robert H.; Steiger, John W.; Newman, Evelyn B. 1988. The response of vegetation to disturbance in Death Valley National Monument, California. U.S. Geological Survey Bulletin 1793. Washington, DC: U.S. Department of the Interior, U.S. Geological Survey. 69 p. [8915]

105. Webb, Robert H.; Stielstra, Steven S. 1979. Sheep grazing effects on Mojave Desert vegetation and soils. Environmental Management. 3(6): 517-529. [4164]

106. Welsh, Richard G.; Beck, Reldon F. 1976. Some ecological relationships between creosotebush and bush muhly. Journal of Range Management. 29(6): 472-475. [3970]

107. Went, F. W.; Westergaard, M. 1949. Ecology of desert plants. III. Development of plants in the Death Valley National Monument, California. Ecology. 30(1): 26-38. [11102]

108. White, Larry D. 1968. Factors affecting susceptibility of creosotebush (Larrea tridentata (D.C.) Cov.) to burning. Tucson, AZ: University of Arizona. 96 p. Ph.D. dissertation. [1785]

109. White, Larry D. 1980. Principles, requirements, and techniques for prescribed range burning. In: Hanselka, C. Wayne, ed. Prescribed range burning in the coastal prairie and eastern Rio Grande Plains of Texas: Proceedings of a symposium; 1980 October 16; Kingsville, TX. College Station, TX: The Texas A&M University System, Texas Agricultural Extension Service: 30-64. [11450]

110. Hunziker, J. H.; Palacios, R. A.; Poggio, L.; [and others]. 1977. Geographic distribution, morphology, hybridization, cytogenetics, and evolution. In: Mabry, T. J.; Hunziker, J. H.; DiFeo, D. R., Jr., eds. Creosote bush: Biology and chemistry of Larrea in New World deserts. U.S./IBP Synthesis Series 6. Stroudsburg, PA: Dowden, Hutchinson & Ross, Inc: 10-47. [7154]

111. Zoellick, Bruce W.; Smith, Norman S.; Henry, Robert S. 1989. Habitat use and movements of desert kit foxes in western Arizona. Journal of Wildlife Management. 53(4): 955-961. [24012]

112. Thompson, C. Ray; Kats, Gerrit; Lennox; R. W. 1980. Effects of SO2 and/or NO2 on native plants of the Mojave Desert and eastern Mojave-Colorado Desert. Journal of the Air Pollution Control Association. 30(12): 1304-1309. [4191]

113. Dittberner, Phillip L.; Olson, Michael R. 1983. The plant information network (PIN) data base: Colorado, Montana, North Dakota, Utah, and Wyoming. FWS/OBS-83/86. Washington, DC: U.S. Department of the Interior, Fish and Wildlife Service. 786 p. [806]

114. Singh, Surendra Pratap. 1964. Cover, biomass, and root-shoot habit of Larrea divaricata on a selected site in southern New Mexico. University Park, NM: New Mexico State University. 36 p. Thesis. [24013]

115. Brown, David E.; Minnich, Richard A. 1986. Fire and changes in creosote bush scrub of the western Sonoran Desert, California. The American Midland Naturalist. 116(2): 411-422. [537]

116. Leitner, Lawrence A. 1987. Plant communities of a large arroyo at Punta Cirio, Sonora. The Southwestern Naturalist. 32(1): 21-28. [1439]

117. Thompson, Robert S.; Anderson, Katherine H.; Bartlein, Patrick J. 1999. Digital representations of tree species range maps from "Atlas of United States trees" by Elbert L. Little, Jr. (and other publications). In: Atlas of relations between climatic parameters and distributions of important trees and shrubs in North America. Denver, CO: U.S. Geological Survey, Information Services (Producer). On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, Missoula, MT; FEIS files. [92575]

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