

Biological Evaluation

Authorization of Grazing on the Barboot, Big Bend, Boss, Bruno, Hunt Canyon, Lower Rucker, Pedregosa, and Rak Grazing Allotments Douglas Ranger District Coronado National Forest

May 12, 2008

Introduction

This Biological Evaluation (BE) addresses the effects on Forest Service Sensitive Species resulting from a proposal to authorize grazing on the Barboot, Big Bend, Boss, Bruno, Hunt Canyon, Lower Rucker, Pedregosa and Rak Allotments on the Douglas Ranger District, Coronado National Forest (CNF). This BE is prepared in accordance with and follows procedures established in Forest Service Manual direction (FSM 2672.4).

Project Area Description

The Chiricahua Mountains are the most southeastern of several mountain ranges within the Basin and Range Geographic Province of southern Arizona and are part of an archipelago of “sky islands” connecting the Rocky Mountains to the Sierra Madre Occidental of Mexico. The mountains are located in an intersection zone where Rocky Mountain forests, Sierra Madrean woodlands, Chihuahuan and Sonoran deserts and plains grasslands converge. As a result, the Chiricahua Mountains are one of the most biologically diverse areas in the continental United States. More than 1400 species of plants, 500 vertebrate species and thousands of invertebrates are known from the area. More than 300 species of birds nest in or migrate through the mountain range.

All seven allotments are contiguous and are located in the southwest portion of the Chiricahua Mountains. Much of the biotic diversity characteristic of the mountain range is found within the allotments. Elevations range from around 4,000 feet to over 8,000 feet at the highest. The allotments are characterized by steep, rugged terrain and are extensively wooded.

Description of the Proposed Action and Alternatives

In 2007, the Forest developed new proposed actions for the 7 allotments as part of the National Environmental Policy Act (NEPA) analysis of grazing authorization required by the Rescissions Act of 1995 (PL 104-19). For the most part, proposed management would be a continuation of the management currently being implemented on the allotments under an adaptive management strategy. Minor modifications would reduce permitted use on some of the allotments and change the grazing season, primarily to increase growing season rest. The proposed action is described in detail in the environmental assessment being prepared for the project and is incorporated by reference.

Species Identification

Forest Service Sensitive animals and plants¹ initially considered for the analysis are shown in Tables 1 and 2. Species for which there are no records in the project area, but for which suitable habitat is found in the project area are presumed to be present.

Table 1. Forest Service sensitive animal species considered for the analysis.

Species	Comments
Mammals	
Arizona shrew <i>Sorex arizonae</i>	Occurs in Chiricahua EMA, no known locations in project/analysis area. Possible habitat in higher elevation canyons and riparian habitats with dense ground cover.
Mexican long-tongued bat <i>Choeronycteris mexicana</i>	Summer resident. Nectar feeder.
Allen's lappet-browed bat <i>Idionycteris phyllotis</i>	Records from Portal vicinity.
Townsend's big-eared bat <i>Corynorhinus townsendii pallescens</i>	
Western red bat <i>Lasiurus blossevillii</i>	Cave Creek vicinity
Western yellow bat <i>Lasiurus xanthinus</i>	Cave Creek vicinity
Apache fox squirrel <i>Sciurus nayaritensis chiricahuae</i>	Occurs in Chiricahua EMA, no known locations in project/analysis area. Possible habitat composed of partially open Apache pine-oak forest with mixed broadleaf deciduous trees, mainly in the thick growth of canyon bottoms.
White-nosed coati <i>Nasua narica</i>	
Birds	
Broad-billed hummingbird <i>Cynanthus latirostris</i>	Uncommon summer resident in riparian areas.
White-eared hummingbird <i>Hylocharis leucotis</i>	Irregular summer visitor at higher elevations in Chiricahua Mountains.
Violet-crowned hummingbird <i>Amazilia violiceps</i>	Uncommon summer resident near Portal.
Lucifer hummingbird <i>Calothorax lucifer</i>	Uncommon summer resident near Portal.
Eared quetzal <i>Euptilotis neoxenus</i>	Sporadic, rare and local in Cave Creek Canyon. Not recorded within project area.
Northern buff-breasted flycatcher <i>Empidonax fulvifrons pygmaeus</i>	Suitable habitats in upper elevations. Species is also MIS.
Northern goshawk/Apache <i>Accipiter gentilis</i>	Apache goshawks nest within Chiricahua Mountains. No known nests in analysis area. Potential foraging and nesting habitat in analysis area.
Gould's wild turkey <i>Meleagris gallopavo mexicana</i>	Suitable habitat present. Re-introduced into Chiricahua mountains.
American peregrine falcon <i>Falco peregrinus anatum</i>	Nesting habitat on Cochise Head allotment. Foraging habitat potentially on all allotments.
Abert's towhee	Nests near Portal. Likely not present in project area.

¹ Source: Regional Forester's Sensitive Species List of Plants and Animals, October 1, 2007.

Species	Comments
<i>Pipilo aberti</i>	
Reptiles	
Twin-spotted rattlesnake <i>Crotalus pricei</i>	Common throughout Chiricahua Mountains.
Slevins bunchgrass lizard <i>Sceloporus slevini</i>	
Green ratsnake <i>Senticolis triaspis</i>	
Reticulate Gila monster <i>Heloderma suspectum suspectum</i>	
Fish	
Mexican stoneroller <i>Campostoma ornatum</i>	Occurs in Rucker Creek.
Longfin dace <i>Agosia chrysogaster</i>	Occurs in Rucker Creek.
Invertebrates	
<i>Cymbiodyta arizonica</i> Chiricahua water scavenger beetle	Occurs in Chiricahua EMA, no known locations in project/analysis area.
<i>Piruna polingii</i> Spotted skipperling	Occurs in Chiricahua EMA, no known locations in project/analysis area.

Table 2. Forest Service sensitive plant species considered in the analysis.

Species	Comments
<i>Arabis tricornuta</i> Chiricahua Rockcress	Occurs in project/analysis area.
<i>Asclepias lemmonii</i> Lemmon milkweed	Occurs in project/analysis area.
<i>Astragalus cobrensis</i> var. <i>maguiri</i> Coppermine milk-vetch	Occurs in riparian canyon bottoms in project/analysis area.
<i>Carex chihuahuensis</i> Chihuahuan sedge	Occurs in Cave Creek.
<i>Castilleja nervata</i> Trans-Pecos Indian Paint Brush	Occurs in project/analysis area near Rock Creek.
<i>Erigeron arisolius</i> Arid throne fleabane	Wide distribution. Moist rocky soils in grasslands or openings in woodlands. No records, but suitable habitat present.
<i>Erigeron kuschei</i> Chiricahua Fleabane	Occurs in Chiricahua EMA at highest elevations above 6,800 feet.
<i>Gentianella wislizeni</i> Wislizeni Gentian	Occurs in Chiricahua EMA above 6,800 feet. Outside of suitable rangelands.
<i>Graptopetalum bartramii</i> Bartram's Stonecrop	Occurs in Chiricahua EMA, no known locations in project/analysis area. Cliff plant.
<i>Heuchera glomerulata</i> Chiricahua mountain alumroot	Occurs in Chiricahua EMA, on shaded rocky slopes near moisture.
<i>Hexalectris warnockii</i> Texas purple spike	Occurs in Chiricahua EMA, no known locations in project/analysis area.

Species	Comments
<i>Lupinus lemmonii</i> Lemmon's lupine	Occurs in Chiricahua EMA, no known locations in project/analysis area.
<i>Packera neomexicana</i> var. <i>toumeyii</i> Toumy groundsel	Occurs in project area.
<i>Perityle cochisensis</i> Chiricahua Rock Daisy	Occurs in Chiricahua NM, no known locations in project/analysis area.. Grows on rhyolite cliffs.
<i>Polemonium pauciflorum</i> ssp. <i>hinckleyi</i> Davis Mountain Jacob's Ladder	Occurs in Chiricahua EMA, no known locations in project/analysis area. Occurs in upper elevation conifer forests.
<i>Rumex orthoneurus</i> Blumer's Dock	Occurs in high elevation wet sites.
<i>Samolus vagans</i> Chiricahua Mountain brookweed	Confined to permanently wet areas.
<i>Senecio multidentatus</i> Huachuca groundsel	
<i>Sisyrinchium cernuum</i> Nodding blue-eyed grass	Found in wet soils along streams.
<i>Stellaria porsildii</i> Porsild's Starwort	Occurs in Chiricahua EMA above 8,000 feet in conifer forests.
<i>Viola umbraticola</i> Shade Violet	Occurs in Chiricahua EMA

Species Evaluations

Mammals

Chiricahua (Mexican) fox squirrel (*Sciurus nayaritensis*). The Mexican fox squirrel inhabits mixed pine-oak forests from the Chiricahua Mountains south through the Sierra Madre Occidental in Mexico. It is typically found at elevations from 5,200 to 8,000 feet. Populations of Chiricahua fox squirrel are associated with denser mixed broadleaf communities of the riparian deciduous forest, especially where this community is in juxtaposition with montane forest or evergreen woodlands. Suitable habitats are found in upper elevations of the project area in pine-oak forests and evergreen and coniferous riparian plant communities. Fox squirrels are highly arboreal and are probably not greatly affected by moderate levels of grazing. Heavy grazing that reduces the recruitment of large riparian trees may impact fox squirrels over the long term. Livestock grazing as proposed under the proposed action is designed to assure moderate levels of use and provide for tree recruitment. In addition, very little grazing is anticipated in upper elevation canyons that provide the best squirrel habitat. Based on this, the proposed action is expected to have *no impact* on Chiricahua fox squirrel.

Arizona shrew (*Sorex arizonae*). The Arizona shrew inhabits canyons in Madrean evergreen woodlands and conifer forests in the Huachuca, Santa Rita and Chiricahua Mountains. It is found at elevations from 5,600 to 6,600 feet, usually near perennial or seasonal surface water sources. Dense leaf litter and forest debris, such as downed logs are important as cover for foraging shrews (Van Pelt 1994). The species has been

documented in East Turkey Creek, and suitable habitats may occur in the Cave Creek drainage. Both are outside the project area. Effects from livestock grazing would only occur if livestock were allowed to concentrate in narrow wet canyons preferred by the shrew; and if this use resulted in the degradation of leaf litter and herbaceous cover that provide habitat. The proposed winter grazing (Nov-April) should help reduce the potential impact in narrow canyons. Based on this, the proposed action *may impact individual Arizona shrews, but is not likely to result in a trend toward federal listing or a loss of viability.*

White-nosed coati (*Nasua narica*). This species is common in oak woodlands and riparian habitats throughout the Forest, including the Chiricahua Ecosystem Management Area (EMA). The species is considered imperiled in New Mexico, but is relatively abundant and well distributed in Arizona. Identified threats include indiscriminate killing and predator control. The Arizona Game and Fish Department restricts the take of this species through an annual bag limit. No predator control is proposed as part of the proposed action. Managed grazing does not affect woodland habitats for this species. *No Impact.*

Bats: Mexican long-tongued bat (*Choeronycteris mexicana*), Allen's lappet-browed bat (*Idionycteris phyllotis*), Townsend's big-eared bat, (*Corynorhinus townsendii pallescens*), Western red bat (*Lasiurus blossevillii*), Western yellow bat (*Lasiurus xanthinus*). All five bat species listed in Table 1 are considered together because habitat needs and effects are similar. Populations of the five species of bats potentially occurring in the project area are affected primarily by disturbance or destruction of roost sites, which are primarily caves, crevices, abandoned mines or, in the case of the western red bat and western yellow bat, riparian trees. Bat roosts are found in the project area, but these are not affected by grazing. The proposed action includes mitigation that would avoid disturbance of bat roosts. Therefore, the proposed action would not affect caves or mines. Grazing in riparian areas would not be of sufficient intensity or duration to alter the composition or recruitment of mature riparian trees. *No Impact* for all species.

Birds

American Peregrine Falcon (*Falco peregrinus anatum*). Active peregrine falcon eyries are known from Cave Creek and Portal Peak, well outside the project area. Observations of falcons have been recorded from the allotments and the area is likely used as a foraging area for birds nesting nearby. The primary threat to the species is disturbance at nest sites, primarily by recreational rock climbers, but also through other ground-disturbing or loud activities that take place during the nesting season (March 1 to July 15). Grazing may affect peregrine falcons if grazing effects are sufficient to change plant species composition and vegetative structure. Changes in these parameters could change the habitat suitability for primary prey species (songbirds). Generally, reductions in plant species composition and structure would result in corresponding reductions in prey species diversity and abundance. Grazing effects that lead to a more heterogeneous plant community would, in general, result in a greater diversity and abundance of prey.

Under the proposed action, grazing will predominantly during the winter only. No potentially disturbing activities are planned in the vicinity of existing eyries, so no direct

impacts to peregrine falcons are anticipated as a result of any of the project alternatives. Light to moderate grazing intensity under the proposed action should maintain vegetative diversity and corresponding prey species habitat quality. Based on the foregoing, the proposed action should have *no impact* on peregrine falcon.

Apache Goshawk (*Accipiter gentilis apache*). There are ten goshawk post-fledging family areas (PFAs) within the analysis area. Mammalian prey includes; tree squirrels, rock squirrels, and cottontails. Avian prey includes: Band-tailed pigeons, mourning doves, Stellar's jay, Northern flickers, and Montezuma quail. Nesting and foraging habitat is found at higher elevations within the analysis area. Nesting habitat includes closed-canopied Madrean oak woodland and Mexican pine-oak woodlands. Goshawks have been known to nest in relatively low elevation oak forests in Southeastern Arizona. The lowest elevation nest found was at 4,900 feet. Forest plan standards and guidelines for goshawk call for management that results in uneven age conditions to sustain a mosaic of vegetation densities (overstory and understory), age classes and species composition well distributed across the landscape. Under the proposed action the combination of winter grazing and moderate (<45%) utilization proposed should maintain vegetative diversity and would not be expected to affect prey species abundance. Effects would be limited to minor disturbance related to grazing, construction of new range improvements, maintenance of existing improvements, and movement of livestock. Goshawks have persisted in the Chiricahua Mountains in the presence of managed grazing for many years. For the most part, grazing will occur outside of the nesting season for this species (March-September). The proposed action *may impact individuals, but is not likely to result in a trend toward federal listing or a loss of viability.*

Gould's Wild Turkey (*Meleagris gallopavo mexicana*). Historically, the Gould's turkey was distributed throughout northern Mexico and into the southwestern U.S. The indigenous population of this subspecies is thought to have been extirpated on the Forest during the late 1800s and early 1900s. Beginning in the 1980s the subspecies has been re-established in the Huachuca Mountains and the Peloncillo Mountains in New Mexico as a result of transplant efforts using birds captured in Mexico. More recently Gould's turkeys have been re-introduced into the Santa Catalina, Santa Rita, Chiricahua, and Pinaleno Mountains. These populations appear to be growing. A well-established population in the Huachuca Mountains has done well enough to allow limited hunting. Within the analysis area, suitable habitats are: coniferous woodland, riparian corridors in oak woodlands, and grassland savannas.

The species appears to be able to coexist with well-managed livestock grazing. Limiting factors appear to be the presence of roost trees of sufficient size and the availability of free water. Mature grass seed heads are a source of forage for turkeys as well as green herbaceous leafage, insects, and mast (acorns and juniper/manzanita berries). The proposed action is expected to retain sufficient herbaceous forage for turkeys across the landscape, although areas of livestock concentration may impact forage resources on a local scale during the late winter and spring. The winter grazing proposed will allow plant vigor and re-growth during the monsoon season (non-use). The development of additional water sources is part of the proposed action. Mitigation measures included in the proposed action require wildlife access features at each new water. Effects are

expected to be limited to disturbance as a result of minor construction or livestock management activities and localized removal of grass cover and forage. None of the project alternatives will affect the quantity or quality of roost trees. The proposed action *may impact individual turkeys, but is not likely to result in a trend toward federal listing or a loss of viability.*

Broad-billed Hummingbird (*Cynanthus latirostris*). This is a summer resident in riparian areas from Guadalupe Canyon west to the Baboquivari Mountains. The center of abundance in Arizona is southern Pima and Santa Cruz Counties. They have been documented in the Chiricahua Mountains, but are not as abundant as farther west. The species would be affected by activities that degrade riparian areas. Light to moderate dormant season grazing is not expected to affect riparian vegetation to a significant degree. Much of the best habitat for this species is located in Cave Creek, which is outside the project area. *No impact.*

White-eared Hummingbird (*Hylocharis leucotis*). This hummingbird breeds from Nicaragua through Mexico to Arizona where it is considered a rare summer visitor on the CNF (Corman 2006). It is likely a “sparse but widespread summer resident in the Chiricahua Mountains” (Corman 2006). Most observations are from Cave Creek or higher elevations. Known habitats in Cave Creek are outside the project area. *No impact.*

Violet-crowned Hummingbird (*Amazilia violiceps*). This is another primarily Mexican species that reaches the northern extent of its range in southern Arizona. As with many primarily Mexican species, numbers appear to be increasing. The species nests most often high in Arizona sycamores. Suitable habitats are found in Cave Creek, which is outside the project area. *No impact.*

Lucifer Hummingbird (*Calothorax lucifer*). This hummingbird prefers open arid landscapes with agave, ocotillo, yucca and penstemon. These types of landscapes are widespread in southern Arizona. The range of the species is centered in Mexico and barely extends into the southwest north of the Mexican border. It is considered a rare breeder in Arizona (Corman 2006). Nests are built on a variety of trees. Heavy grazing in preferred habitats could potentially affect the species, but light to moderate dormant season grazing proposed is not expected to affect the species. *No impact.*

Eared Quetzal (*Euptilotis neoxenus*). This species was added to the Regional Forester’s List of Sensitive Species in 2007 based on restricted range and low abundance within that range. This is a forest bird of Mexico that rarely ranges north into Arizona. It is observed infrequently in the Chiricahua Mountains. Threats are associated with the loss of nesting trees due to logging. No tree removal is proposed. The proposed action will have *no impact* on this species.

Northern Buff-breasted Flycatcher (*Empidonax fulvifrons pygmaeus*). The buff-breasted flycatcher occurs quite widely in open pine forests south of the United States in Mexico and Central America. However, within the United States, the species breeding range is very limited (Bowers and Dunning 1994). An estimated 98% of the U.S. breeding population is restricted to a few canyons in the Huachuca and Chiricahua Mountains. Habitats on the Forest are at the extreme northern edge of this species’ range. The distribution and numbers of Buff-breasted flycatchers in Arizona were reported to have decreased markedly over the last century (Phillips 1964, Bowers and Dunning

1994). Habitat often includes an open under story of grasses and small trees or burned forest with patches of living pines. The species is found on the CNF only during the breeding season from March to September. It winters in Mexico and Central America. The population of the species is probably affected by fire maintenance of preferred habitat. Bowers and Dunning (1994) noted that population numbers varied widely between years in Arizona.

Martin (1997) conducted extensive surveys for the species in canyons where the bird has been seen during the previous 20 years. He also surveyed in randomly selected sites concentrating on the Chiricahua, Santa Catalina, and Huachuca Mountains and reported 121 birds observed including 19 in canyons not previously having records. In 2000, Conway and Kirkpatrick (2001) repeated Martin's surveys and reported significant population declines between 1996 and 2000.

Populations of buff-breasted flycatcher appear to be influenced by events such as fire that create or maintain an open grass understory in the bird's pine-oak woodland habitat. Occupied habitats are found in several canyons in the project area but they are almost entirely at higher elevations where livestock do not graze. Winter use should optimize herbaceous understory by allowing for complete grass re-growth each summer and light to moderate utilization should retain sufficient residual herbaceous biomass to provide suitable year round habitats. Based on this information, the implementation of the proposed action *may impact individual buff-breasted flycatchers, but is not likely to result in a trend toward federal listing or a loss of viability.*

Abert's Towhee (*Pipilo aberti*). This species is widely distributed throughout southern Arizona, nesting in dense vegetation ranging from riparian thickets to suburban back yards (Corman 2006). The species' rang is restricted almost entirely to Arizona. The species' extremely limited distribution and declining population in New Mexico, where it is considered imperiled, apparently led to its listing as sensitive. Towhees tend to prefer native dense low elevation riparian habitat, but adapt readily to agricultural and urban settings, provided sufficient cover is present. Suitable habitats are limited in the project area and there are no breeding records. The Chiricahua Mountains are largely above the elevation range preferred by the species. The proposed action will have *no impact* on Abert's towhee.

Reptiles

Twin-spotted Rattlesnake (*Crotalus pricei*). This small rattlesnake is locally common on talus slopes and other rocky sites in ponderosa pine, aspen, and mixed conifer, generally above 8,000 feet in elevation. They eat lizards and small mammals, and breeding occurs from late June through August. Habitats for this species are relatively secure on the Coronado National Forest (CNF). The greatest threats are related to illegal collecting. Current telemetry research indicates that historic habitat remains occupied. This species is likely to be unaffected by continued grazing practices. Preferred rocky habitats are not amenable to cattle grazing due to loose footing and sparse vegetation, and are found at elevations above which grazing occurs. In addition, most grazing will occur during the winter when the snake is not active. The proposed action will have *no impact* on Twin-spotted Rattlesnake.

Slevin's Bunchgrass Lizard (*Sceloporous slevini*). This lizard is found in several mountain ranges in southeastern Arizona, including the Chiricahua range. It is found mainly above 6,000 feet elevation in sunny patches of bunchgrass in open coniferous forests. This species was added to the Sensitive Species list in 2007, based on concerns for New Mexico populations. Arizona Game and Fish Department describes it as "thriving at many localities within a very limited Arizona range" (AGFD 2003). There are no known ongoing threats to populations in Arizona. Grazing as proposed would result in minor modification of bunchgrass communities, but most grazing would occur during the winter and grasses would be allowed to regrow each year. Based on the apparently healthy status of the population and the low potential for effects, the proposed action *may impact individuals of this species, but is not likely to result in a trend toward federal listing or a loss of viability.*

Green Ratsnake (*Senticolis triapsis*). This snake is found from Costa Rica north through Mexico into the southernmost mountain ranges in Arizona, including the Chiricahua Mountains. Distribution is very limited in New Mexico, where it is listed as threatened, and this may account for its 2007 listing as Sensitive. The species is rarely seen, although its Madrean evergreen woodland habitats are quite abundant. There are no known threats, other than collecting for the pet trade. The effects of grazing on this species are not well documented, but rocky woodland sites preferred by this species would normally be avoided by cattle. Therefore, the proposed action *may impact individuals of this species, but is not likely to result in a trend toward federal listing or a loss of viability.*

Reticulate Gila Monster (*Heloderma suspectum suspectum*). This subspecies is found in desert scrub habitats, desert grasslands and the lower reaches of Madrean evergreen woodlands. The species is threatened by overcollection and loss of habitat near urban areas like Tucson, but populations and habitats in remote locations (like the Chiricahua Mountains) are secure. Livestock grazing is not known to be a threat. The proposed action will have *no impact* on Reticulate Gila Monster.

Fish

Mexican Stoneroller (*Campostoma ornatum*). This species is a small fish (11 cm) that occurs in moderate to high gradient creeks with frequent pools and riffles. The species was reduced in Arizona primarily as a result of habitat loss and degradation due to overgrazing (late 1800s, early 1900s), erosion, water diversion, and aquifer pumping. Current threats include aquifer pumping, reduction in stream flows, water diversion, drought, and predation by non-native green sunfish (NatureServe Explorer, 2008). This species occurs within the project area only in parts of Rucker Creek. The proposed action *may impact individual Mexican stonerollers, but is not likely to result in a trend toward federal listing or a loss of viability.*

Longfin Dace (*Agosia chrysogaster*). This is a small fish that reaches a maximum length of about 10 cm that inhabits Streams from deserts to lower mountains, generally below 1500 m in north but ranging to 2000 m in south (Lee et al. 1980). It's found typically in shallow water with sand substrate and moderate current; eddys, pools near overhanging banks or other cover. It has a high tolerance for elevated temperatures and reduced oxygen and is commonly the only native species at the terminus of desert

streams where surface flows disappear (NatureServe Explorer, 2008). This species occurs within the project area only in parts of Rucker Creek. The proposed action *may impact individual longfin dace, but is not likely to result in a trend toward federal listing or a loss of viability.*

Invertebrates

Chiricahua water scavenger beetle (*Cymbiodyta arizonica*). Adults and larvae are aquatic, mostly along the waters' edge. Pupations occur in moist soil along waters' edge. Adults are largely herbivorous, feeding mostly on algae and decaying vegetation. Larvae are carnivorous eating small organisms. There is likely very limited habitat because of a lack of perennial water. The best habitats are found in Cave Creek, which is not grazed, and outside the project area. When water become scarce there could be trampling effects to wet/damp areas elsewhere. The emphasis on winter use should help keep cattle up out of canyon bottoms. The proposed action *may impact individual water scavenger beetles, but is not likely to result in a trend toward federal listing or a loss of viability.*

Four Spotted Skipperling (*Piruna polingii*). This species is found from central New Mexico and Arizona south to Mexico. Habitat is moist woodland openings with lush vegetation, meadows, ravines, and streamsides in the mountains. Caterpillars likely feed on native grasses. Caterpillars live and feed within nests of webbed leaves. Adults feed on the nectar of various flowers including yellow composites. If habitat were present, however grazing would reduce grasses. The proposed utilization (maximum of 45%) would retain more than half of the vegetative biomass. The proposed action *may impact individual spotted skipperlings, but is not likely to result in a trend toward federal listing or a loss of viability.*

Sensitive Plants

Chiricahua Rockcress (*Arabis tricornuta*). Distribution in Arizona: Chiricahua, Huachuca, Rincon, and Santa Cruz mountains. This plant is generally found on steep rocky slopes in understory of pine trees, and on road banks at approximately 6,000 to 8,840 feet elevations; open shade. The steep rocky slopes on which this plant grows makes it unlikely that livestock grazing during winter to moderate levels would impact this plant. All known occurrences of this plant are at elevations above which livestock grazing would occur. There will be *no impact* to this species from the proposed action.

Lemmon Milkweed (*Asclepias lemmonii*). Distribution: Total range for this species is southern and southeastern Arizona south into Chihuahua and Sonora, Mexico. Range within Arizona: Huachuca, Chiricahua, Baboquivari, and Santa Rita mountains. In Arizona it grows often on north and east-facing slopes, but has been collected from west-facing slopes. Plants have been found in shaded or partially shaded situations as well as open forest habitat in Madrean evergreen, pine-oak, and oak woodland communities between 5,050 to 7,200 feet. This plant occurs in the project area in Cave Creek and Turkey Creek. Since this plant grows during the monsoon season, it's unlikely to be significantly affected by the proposed winter grazing. Most milkweeds contain resinoids and glycosides poisonous to cattle and are seldom eaten because of low palatability. Effects would primarily be related to ground disturbance. The proposed action *may impact individuals, but is not likely to result in a trend toward federal listing or a loss of viability.*

Copper Mine Milk-Vetch (*Astragalus cobrensis* var *maguirei*). Range: Southern Arizona and southwestern New Mexico; in Arizona: Chiricahua, Peloncillo, and Pinaleno Mountains. Grows on shattered rock and rich humus in shady canyons near stream bottoms and lower ledges above normal water flow. Elevations range from 5,080 to 7,450 feet, and perhaps up to 9,000 feet. Flowers March through May. This plant is found in canyon bottoms and drainages in Pinery Canyon and West Turkey Creek, as well as Chiricahua National Monument. Populations were surveyed by J. Malusa in 2001 (Malusa 2001) who concluded that populations do not appear to be threatened by current levels of human use. The plant appears to be fairly tolerant of disturbance. Taking care not to exceed the proposed level of grazing especially in riparian/wet areas would help maintain this plant. The proposed action *may impact individual plants, but is not likely to result in a trend toward federal listing or a loss of viability.*

Chihuahuan Sedge (*Carex chihuahuensis*). Total Range: From eastern Arizona, Hildago County, New Mexico and Sonora and Chihuahua, Mexico. Range within Arizona: Chiricahua, Huachuca, Pinaleno, Sierra Anchas, Santa Catalina, San Luis, Rincon, Atascosa, and Santa Cruz Mountains; San Bernadino Valley and Santa Cruz River. This grasslike perennial grows in wet soil in streambeds, shallow draws in pine-oak forests and riparian woodland; wet meadows, marshy areas, cienegas, and canyon bottoms. It has been documented from Cave Creek, which is outside the project area. Yet if the plant occurs it could be grazed, especial during late winter when temperatures rise and water supplies dwindle. Rest during the monsoon season would allow for re-growth and plant vigor to be restored. Taking care not to exceed the proposed level of grazing especially in riparian/wet areas would help maintain this plant. The proposed action *may impact individual plants, but is not likely to result in a trend toward federal listing or a loss of viability.*

Trans-Pecos Indian Paint Brush (*Castilleja nervata*). Total Range: Southeastern Arizona and the mountains of western Mexico (Sonora, Sinaloa, Chihuahua. Range within Arizona: Chiricahua, Dragoon, Rincon, Santa Rita, and Pinaleno Mountains. This plant grows on rocky, south facing, grassy slopes on rhyolitic soils at elevation between 4,200 to 9,640 feet. Plants are part of a tall bunch grass community in open sun with a scattering of small trees. Grasses appear to be the only close associates and probable root-host. This plant is known from private land near Turkey Creek. If present on the Forest, this plant could be grazed because it occurs on south facing grassy slopes where cattle would graze during winter. Heavy grazing is considered a potential threat, but light to moderate levels proposed should allow the species to persist. The proposed action *may impact individual plants, but is not likely to result in a trend toward federal listing or a loss of viability.*

Arid Throne Fleabane (*Erigeron arisolius*). Total Range of Species: Arizona, southwestern New Mexico, and Sonora, Mexico. Range within Arizona: Cochise, Pima, and Santa Cruz Counties. This plant grows in moist rocky soils within grasslands, grassy openings in woodlands or roadsides. One population is known from upper Pinery Canyon, which is outside the project area. This annual/short lived perennial always grows in open situations. Elevations typically range from 4,200 to 5,700 feet, but have been collected at around 2,600 feet from a floodwater field. Plants bloom in May to October depending on elevation. Baker (1999) surveyed numerous locations on the Forest and

considered it common and abundant over a large range. This annual plant appears tolerant of disturbance and is unlikely to be seriously affected by dormant season grazing with a light to moderate use level. Livestock are not present when plant is actively growing. The proposed action *may impact individual plants, but is not likely to result in a trend toward federal listing or a loss of viability.*

Chiricahua Fleabane (*Erigeron kuschei*). This plant is known only from the Chiricahua Mountains. It grows at elevations between 6,875 to 9,360 feet within pine and mixed-conifer forest on shaded, north-facing cliffs and rock ledges carpeted with moss. The moss carpet serves as a moisture collecting area and collects soil that washes down the cliff. This plant grows in areas not accessible to livestock. The proposed action will have *no impact* to this plant.

Wislizeni Gentian (*Gentianella wislizeni*). Total Range: Southeastern Arizona and northern Mexico (Chihuahua, Sonora, and Durango). Range within Arizona: Chiricahua and White Mountains (near Hannigan Meadow). Open meadows, roadsides, and steep unstable slopes in pine-oak and mixed-conifer forests. High-elevation clearings, usually with open sunlight appear to be best habitat; elevations between 6,880 to 9,600 feet. Plants survived the Rattlesnake Fire (1994) and increased in number at some locations that experienced low intensity fire damage. Plants also increased after fire in the Centella Point area of the Chiricahuas. This plant is found only at highest elevations within the Chiricahua Wilderness along the crest trail and in areas that are inaccessible to cattle. The proposed action will have *no impact* on this plant.

Bartram Stonecrop (*Graptopetalum bartramii*). Total Range: Southern Arizona and Chihuahua, Mexico. Range within Arizona: Patagonia, Santa Rita, Tumacacori, Baboquivari, Dragoon, Mule, Rincon, and Chiricahua Mountains. This small succulent grows in cracks in rocky outcrops in shrub live oak-grassland on sides of rugged canyons. Usually grows in heavy litter and shade associated with water, but sometimes occurs in hot dry slopes. This plant generally grows in habitat not generally used by livestock. Nevertheless it sometimes grows in situations where trampling or limited grazing may occur. The species has not been found in the project area, but is known from one location north of the project area. The proposed action *may impact individual plants, but is not likely to result in a trend toward federal listing or a loss of viability.*

Arizona Mountain Alumroot (*Heuchera glomerulata*). Distribution: Pinaleno, Santa Theresa, Galiuro, Santa Catalina, Chiricahua, and Pinal mountains. Also present in Greenlee, southern Apache and Navajo Counties. **Evaluation:** This herbaceous perennial grows on shaded rocky slopes, in humus soil, near seeps, streams, and riparian areas within oak, pine-oak, pinyon-juniper woodlands and ponderosa pine forests between 4,000 to 9,000 feet. This plant occurs in upper elevations of Pinery Canyon and near Rustler Park. These locations are generally above capable rangelands and are outside the project area. Given the wide elevational range that this plant grows and that it grows in association with seeps, springs and riparian area, undetected populations could be exposed to grazing. The proposed utilization (maximum of 45 % in key areas) and emphasis on dormant season use makes it unlikely that grazing would have serious effects. The proposed action *may impact individuals, but is not likely to result in a trend toward federal listing or a loss of viability.*

Purple-spike coralroot/Texas Purple-spike (*Hexalectris warnockii*). Total Range: Southeastern Arizona, New Mexico, Texas, Baja California (Mexico). Range in Arizona: Chiricahua Mountains, Huachuca, and Mule Mountains. This orchid grows on shaded slopes and dry, rocky creek beds in canyons within oak-juniper-pinyon pine woodlands. It is found in heavy leaf litter beneath oaks along streambeds. Spikes emerge in June to early August. Individual plants usually do not bloom in successive years. Found between 5,400 to 6,300 feet in Arizona. Plants are purely parasitic, host plant unknown. This plant is known to occur in the Chiricahua National Monument, but is not known from the project area. Spikes of this plant are not above ground during season when livestock are grazed. The proposed action will have *no impact* to this plant.

Lemmon Lily (*Lilium parryi*). Total Range: Southern Arizona, Southern California and northern Sonora, Mexico. Range within Arizona: Huachuca, Chiricahua, and Santa Rita Mountains. Mesic, shady canyon bottoms along perennial streams, or adjacent hillside springs. Sandy soil with high organic material and remains saturated, or nearly so yearlong. Sites are usually well shaded. A single population was discovered in 1992 in East Turkey Creek growing on the edge of an inaccessible waterfall. This population was washed out in 1994 after the Rattlesnake Fire. The proposed action will have *no effect* on this plant.

Lemmon's lupine (*Lupinus lemmonii*). Total Range: Arizona, Nevada, New Mexico, and Utah. Range in Arizona: Chiricahua, Dragoon, Winchester, Santa Rita Mountains and Blue Lue Mountains; also Sulphur Springs, Flagstaff and Maricopa County. This plant grows in sandy washes within Pine/Oak/Juniper woodland to Desert Grassland with scattered mesquite; sandy ridges and pine woods at elevation 4,000 to 7,300 feet. There are no known records from the analysis area. One location occurs on private land west of National Forest land in the Chiricahua Mountains (vicinity of West Whitetail Creek). Not likely to occur in analysis area. There will be *no impact* to this species from the proposed action.

Toumey groundsel (*Packera neomexicana* var *toumeyii*). This herbaceous perennial occurs infrequently in pine forests between 5,200 and 9,200 feet. There are no known populations from the project area. Populations may occur undetected elsewhere. Impacts would be limited to grazing of individual plants, but these are expected to be minimal due to the emphasis on low elevation winter grazing. The proposed action *may impact individual plants, but is not likely to result in a trend toward federal listing or a loss of viability.*

Chiricahua Rock Daisy (*Perityle cochisensis*). Total Range: Southern Arizona. Range within Arizona: Chiricahua Mountains; possibly Dos Cabezas Mountains. This plant grows in crevices and ledges of rhyolitic cliff faces in canyons with madrean evergreen woodland communities at elevations of approximately 5,500 to 7,000 feet. This habitat is not accessible by livestock. The proposed action will have *no impact* on this plant.

Davis Mountain Jacob's Ladder (*Polemonium pauciflorum* ssp. *hinckleyi*). Range within Arizona: Chiricahua Mountains. Total Range: Southern Arizona, western Texas south to northern Chihuahua and Nuevo Leon, Mexico. This species occurs in mountains of northern Mexico (Nuevo Leon, Coahuila, Queretaro, Chihuahua, and Sonora) and Chiricahua Mountains. Found in a variety of habitats; grows on very steep slopes, in talus

below cliffs, in rubble at the edge of a dirt road in open shade, in open shade on a recently burned area, and along a canyon bottom near a stream. Occurs in Ponderosa pine and oak forests up to alpine fir; at elevations from 6,800 to 9,500 feet. This plant would generally be found at elevations above the majority of suitable range. Livestock would not graze the steep rubble habitats that are associated with some locations of this plant. Other areas in which this plant is known to occur i.e., canyon bottoms, open shade would be expected to be impacted by grazing. The proposed action *may impact individual plants, but is not likely to result in a trend toward federal listing or a loss of viability.*

Blumer's Dock (*Rumex orthoneurus*). This herbaceous perennial grows in mid-to-high elevation wetlands in canyon and meadow situations. Populations in the Chiricahua Mountains grow at elevations that are not exposed to grazing. Malusa (1993) reported that plants in Long Park were grazed heavily by cattle in 1991, but cattle are no longer allowed to graze at this elevation. Under the proposed action, no grazing would occur in the vicinity of populations, but there is a slight chance that cattle may get through fences on rare occasions. The proposed action *may impact individual plants, but is not likely to result in a trend toward federal listing or a loss of viability.*

Chiricahua Mountain brookweed (*Samolus vegans*). This perennial herb is confined to areas with permanent water. Little is known about the biology of this plant. One population is known from Cave Creek, which is outside the project area. The proposed action will have *no effect* on this plant.

Huachuca groundsel (*Senecio multidentatus*). This herbaceous perennial grows in montane conifer forests above 7,000 feet. Several populations occur in the Santa Rita and Huachuca Mountains. A single population is known from the vicinity of Chiricahua Peak. This population is found inside the Chiricahua Wilderness well above where grazing would occur. The proposed action will have *no effect* on this plant.

Nodding blue-eyed grass (*Sisyrinchium ceruum*). Range: Southeastern Arizona and Mexico (Chihuahua and Durango). Grows in moist areas, meadows, stream banks as woods at elevations between 3,300 and 8,000 feet. Flowers are produced in early spring to late summer. This small plant could be impacted through trampling in seeps, springs, and wet areas when livestock concentrate around dwindling water. This plant is not known to occur within the project area, but given its wide elevation range, could occur in lower elevations. Taking care to avoid use in riparian/wet areas and emphasizing dormant season use would help maintain this plant. The proposed action *may impact individual plants, but is not likely to result in a trend toward federal listing or a loss of viability.*

Porsild's Starwort (*Stellaria porsildii*). Distribution: Southeastern Arizona and a single peak in southwestern New Mexico. Found in partially shaded understory of pine, Douglas fir and oak at elevations from 7,900 to 9,200 feet. In Arizona it's found in open parkland type habitat and at the edge of meadows in Madrean Montane Conifer Forest communities. **Note:** Only known from three areas (two are in Chiricahua Mts.) and in Pinos Altos Range. Known locations are in high elevation meadows that are not grazed. The proposed action will have *no effect* on this plant.

Shade Violet (*Viola umbraticola*). Total range is Southern Arizona and northern Mexico. Within Arizona it occurs in the Chiricahua, Huachuca, Santa Catalina, and Santa

Rita mountains. This plant occurs in shady areas in canyon bottoms, usually within riparian ponderosa pine forest in Arizona, and pine-oak in Mexico. In Arizona it has been collected in Ponderosa pine-juniper-oak. In Arizona found between 5,200 to 7,500 feet in elevation. It is not known to occur within the project area. A population growing elsewhere may be affected by grazing since it grows in shady canyon bottoms and riparian forests. The proposed action *may impact individuals, but is not likely to result in a trend toward federal listing or a loss of viability.*

Cumulative Effects

Livestock grazing on State, BLM and private lands associated with these allotments is expected to continue. In some cases, there are plans to develop coordinated Ranch Management plans to cover the private land. This should enhance management. The effects to the National Forest lands should be the same as predicted by the proposed action. These state, BLM and private land areas are down slope from the project area and are unlikely to significantly affect watershed conditions in the project area. Private land development on the boundary of the Forest is expected to continue into the foreseeable future. Rates of future development are difficult to predict, but given the relatively remote location of the project area, urban developments are unlikely to contribute significantly to effects to sensitive species over the 10-year life of the action.

Recreational activities such as hiking, hunting and off-highway vehicle driving are expected to continue within the project area over the life of the project. Hunting is regulated by the Arizona Game and Fish Department and is restricted to relatively few hunters, generally during the fall and winter bear, deer and Montezuma quail seasons. Hiking and off-highway vehicle driving occur year-round, but levels of activity are low and confined to a few roads and trails.

Portions of the project area serve as a route for illegal immigrants from Mexico. This use appears to be limited to existing roads and trails and the impacts have been limited to the accumulation of trash in some areas that serve as rest stops. There is a concern that warming fires started by undocumented immigrants or drug smugglers may contribute to a greater risk of fire in the area. These illegal activities are totally outside Forest Service control, but do impact the lands this agency administers.

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