United States Department of Agriculture

Animal and Plant Health Inspection Service

Plant Protection and Quarantine

Suppression Treatments for Infestations of Rangeland Grasshoppers and Mormon Crickets in Arizona

Environmental Assessment
EA Number: AZ-16-02

March 1, 2016

Site-Specific
MOHAVE and COCONINO County portion of BLM District- Arizona Strip
COCONINO County portion of Coconino National Forest –
Grazing Allotments 9 mile radius from Brolliar Park and South with a 6 mile radius along Forest Highway 3 to Highway 87.

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1.1. Purpose and Need Statement

An infestation of grasshoppers and/or Mormon crickets (hereafter referred to collectively as grasshoppers) may occur in Mohave and Coconino County portion of BLM District Arizona Strip; and Coconino County portion of Coconino National Forest Grazing Allotments within 9 mile radius from Brolliar Park and South with a 6 mile radius along Forest Highway 3 to Highway 87. The Animal and Plant Health Inspection Service (APHIS) may, upon request by land managers or State departments of agriculture, conduct treatments to suppress grasshopper infestations.

Populations of grasshoppers that trigger the need for a suppression program are normally considered on a case-by-case basis. Participation is based on potential damage such as stressing and/or causing the mortality of native and planted range plants or adjacent crops due to the feeding habits of large numbers of grasshoppers. Economic damage could cause; a decrease in forage quantity and quality for livestock and wildlife; decrease of native grasses and forbs due to damage and stress; increase risk for competition of invasive species of plants; increase in soil erosion due to significant damage to grasses and forbs taken down to soil level. The benefits of treatments include the suppressing of over abundant grasshopper populations to lower adverse impacts to range plants and adjacent crops. Treatment would also decrease the economic impact to local agricultural operations and permit normal range plant utilization by wildlife and livestock.

The goal of the proposed suppression program analyzed in this EA is to reduce grasshopper populations below an economic infestation[1] level in order to protect rangeland ecosystems and/or cropland adjacent to rangeland. This environmental assessment (EA) analyzes potential environmental consequences of the proposed action and its alternatives. This EA applies to a proposed suppression program that would take place from 04/01/16 to 09/30/16 in Mohave and Coconino County portion of BLM District Arizona Strip; and Coconino County portion of Coconino National Forest Grazing Allotments within 9 mile radius from Brolliar Park and South with a 6 mile radius along Forest Highway 3 to Highway 87.

This EA is prepared in accordance with the requirements under the National Environmental Policy Act of 1969 (NEPA) (42 United States Code § 4321 *et. seq.*) and the NEPA procedural requirements promulgated by the Council on Environmental Quality, United States Department of Agriculture (USDA), and APHIS.

[1] The "economic infestation level" is a measurement of the economic losses caused by a particular population level of grasshoppers to the infested rangeland. This value is determined on a case-by-case basis with knowledge of many factors including, but not limited to, the following: economic use of available forage or crops; grasshopper species, age, and density present; rangeland productivity and composition; accessibility and cost of alternative forage; and weather patterns. In decision-making, the level of economic infestation is balanced against the cost of treating to determine an "economic threshold" below which there would not be an overall benefit for the treatment. Short-term economic benefits accrue during the years of treatments, but additional long-term benefit may accrue and be considered in deciding the total value gained by treatment. Additional losses to rangeland habitat and cultural and personal values (e.g., aesthetics and cultural resources), although a part of decision-making, are not part of the economic values in determining the necessity of treatment.

1.2. Background Discussion

In rangeland ecosystem areas of the United States, grasshopper populations can build up to levels of economic infestation despite even the best land management and other efforts to prevent outbreaks. At such a time, a rapid and effective response may be requested and needed to reduce the destruction of rangeland vegetation. In some cases, a response is also needed to prevent grasshopper migration to cropland adjacent to rangeland.

APHIS conducts surveys for grasshopper populations on rangeland in the Western United States, provides technical assistance on grasshopper management to land owners/managers, and cooperatively suppresses grasshoppers when direct intervention is requested by a Federal land management agency or a State agriculture department (on behalf of a State or local government, or a private group or individual) and deemed necessary. The need for rapid and effective suppression of grasshoppers when an outbreak occurs limits the options available to APHIS. The application of an insecticide within all or part of the outbreak area is the response available to APHIS to rapidly suppress or reduce (but not eradicate) grasshopper populations and effectively protect rangeland.

In June 2002, APHIS completed an Environmental Impact Statement (EIS) document concerning suppression of grasshopper populations in 17 Western States (Rangeland Grasshopper and Mormon Cricket Suppression Program, Environmental Impact Statement, June 21, 2002). The EIS described the actions available to APHIS to reduce the destruction caused by grasshopper populations in 17 States (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming).

APHIS' authority for cooperation in this suppression program is based on Section 417 of the Plant Protection Act of 2000 (7 U.S.C. § 7717).

On June 14, 2010, APHIS and the Bureau of Indian Affairs (BIA) signed a Memorandum of Understanding (MOU) detailing cooperative efforts between the two groups on suppression of grasshoppers on BIA managed lands (Document #10-8100-0941-MU, June 10, 2010). This MOU clarifies that APHIS will prepare and issue to the public, site-specific environmental documents that evaluate potential impacts associated with the proposed measures to suppress economically damaging grasshopper populations. The MOU also states that these documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from the BIA.

The MOU further states that the responsible BIA official will request in writing the inclusion of appropriate lands in the APHIS suppression project when treatment on BIA land is necessary. The BIA must also approve a Pesticide Use Proposal for APHIS to treat infestations. According to the provisions of the MOU, APHIS can begin treatments after APHIS issues an appropriate decision document and BIA approves the Pesticide Use Proposal.

On April 22, 2014, APHIS and the Forest Service (FS) signed a Memorandum of Understanding (MOU) detailing cooperative efforts between the two groups on suppression of grasshoppers on FS managed lands (Document #14-8100-0573-MU, April 22, 2014). This MOU clarifies that APHIS will prepare and issue to the public, site-specific environmental documents that evaluate potential impacts associated with the proposed measures to suppress economically damaging

grasshopper populations. The MOU also states that these documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from the FS.

The MOU further states that the responsible FS official will request in writing the inclusion of appropriate lands in the APHIS suppression project when treatment on FS land is necessary. The FS must also approve a Pesticide Use Proposal for APHIS to treat infestations. According to the provisions of the MOU, APHIS can begin treatments after APHIS issues an appropriate decision document and FS approves the Pesticide Use Proposal.

On October 15, 2015, APHIS and the Bureau of Land Management (BLM) signed a Memorandum of Understanding (MOU) detailing cooperative efforts between the two groups on suppression of grasshoppers on BLM managed lands (Document #15-8100-0870-MU, October 15, 2015). This MOU clarifies that APHIS will prepare and issue to the public, site-specific environmental documents that evaluate potential impacts associated with the proposed measures to suppress economically damaging grasshopper populations. The MOU also states that these documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from the BLM.

The MOU further states that the responsible BLM official will request in writing the inclusion of appropriate lands in the APHIS suppression project when treatment on BLM land is necessary. The BLM must also approve a Pesticide Use Proposal for APHIS to treat infestations. According to the provisions of the MOU, APHIS can begin treatments after APHIS issues an appropriate decision document and BLM approves the Pesticide Use Proposal.

1.3. About This Process

The EA process for grasshopper management is complicated by the fact that there is very little time between requests for treatment and the need for APHIS to take action with respect to those requests. Fall and winter surveys help to determine general areas, among the scores of millions of acres that potentially could be affected, where grasshopper infestations may occur in the spring. There is considerable uncertainty, however, in the forecasts, so that framing specific proposals for analysis under NEPA would waste limited resources. At the same time, the program strives to alert the public in a timely manner to its more concrete treatment plans and avoid or minimize harm to the environment in implementing those plans.

The 2002 EIS provides a solid analytical and regulatory foundation; however, it may not be enough to satisfy NEPA completely for actual treatment proposals, and the “conventional” EA process will seldom, if ever, meet the program’s timeframe of need. The following approach to NEPA compliance for anticipated requests to treat for grasshopper infestations will be followed:
This EA will analyze aspects of environmental quality that could be affected by grasshopper treatments in Mohave and Coconino County portion of BLM District Arizona Strip; and Coconino County portion of Coconino National Forest Grazing Allotments within 9 mile radius from Brolliar Park and South with a 6 mile radius along Forest Highway 3 to Highway 87.
This EA and an anticipatory finding of no significant impact (FONSI) will be made available to the public with a comment period. When the program receives a treatment request and determines that treatment is necessary, the specific treatment site within Mohave and Coconino County portion of BLM District Arizona Strip; and Coconino County portion of Coconino National Forest Grazing Allotments within 9 mile radius from Brolliar Park and South with a 6 mile radius along Forest Highway 3 to Highway 87; will be extensively examined to determine if

environmental issues exist that were not covered in this EA. If no changes to the EA, FONSI, or APHIS' Guidelines for Treatment of Rangelands for Grasshopper and Mormon Crickets (treatment guidelines) (Appendix 1) are warranted, based on the comments received and examination of the treatment site, an addendum to the EA will be prepared stating this. If changes need to be made to the EA, FONSI, or treatment guidelines, the program will prepare a supplement to the EA describing the changes and/or additional site-specific issues that were not covered in the EA. Whether an addendum or supplement is prepared, these documents will be provided to all parties who comment on this EA.

2. Alternatives

The alternatives presented in the 2002 EIS and considered for the proposed action in this EA are: (A) no action; (B) insecticide applications at conventional rates and complete area coverage; (C) reduced agent area treatments (RAATS). Each of these alternatives, their control methods, and their potential impacts were described and analyzed in detail in the 2002 EIS. Copies of the complete 2002 EIS document are available for review at 3640 E. Weir Rd, Phoenix AZ 85040. It is also available at the Rangeland Grasshopper and Mormon Cricket Program web site, http://www.aphis.usda.gov/ppd/es/ppqdocs.html.

The 2002 EIS is intended to explore and explain potential environmental effects associated with grasshopper suppression programs that could occur in 17 Western States (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming). The 2002 EIS outlines the importance of grasshoppers as a natural part of the rangeland ecosystem. However, grasshopper outbreaks can compete with livestock for rangeland forage and cause devastating damage to crops and rangeland ecosystems. Rather than opting for a specific proposed action from the alternatives presented, the 2002 EIS analyzes in detail the environmental impacts associated with each programmatic action alternative related to grasshopper suppression based on new information and technologies.

All insecticides used by APHIS for grasshopper suppression are used in accordance with applicable product label instructions and restrictions. Representative product specimen labels can be accessed at the Crop Data Management Systems, Inc. web site at www.cdms.net/manuf/manuf.asp. Labels for actual products used in suppression programs will vary, depending on supply issues. All insecticide treatments conducted by APHIS will be implemented in accordance with APHIS' treatment guidelines, included as Appendix 1 to this EA.

2.1. No Action Alternative

Under Alternative A, the no action alternative, APHIS would not fund or participate in any program to suppress grasshopper infestations. Under this alternative, APHIS may opt to provide limited technical assistance, but any suppression program would be implemented by a Federal land management agency, a State agriculture department, a local government, or a private group or individual.

2.2. Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative

Alternative B, insecticide applications at conventional rates and complete area coverage, is generally the approach that APHIS has used for many years. Under this alternative, carbaryl, diflubenzuron (Dimilin®), or malathion will be employed. Carbaryl and malathion are insecticides that have traditionally been used by APHIS. The insect growth regulator, diflubenzuron, is also included in this alternative. Applications would cover all treatable sites within the infested area (total or blanket coverage) per label directions. The application rates under this alternative are as follows:

- 16.0 fluid ounces (0.50 pound active ingredient (lb a.i.)) of carbaryl spray per acre;
- 10.0 pounds (0.50 lb a.i.) of 5 percent carbaryl bait per acre;
- 1.0 fluid ounce (0.016 lb a.i.) of diflubenzuron per acre; or
- 8.0 fluid ounces (0.62 lb a.i.) of malathion per acre.

In accordance with EPA regulations, these insecticides may be applied at lower rates than those listed above. Additionally, coverage may be reduced to less than the full area coverage, resulting in lesser effects to nontarget organisms.

The potential generalized environmental effects of the application of carbaryl, diflubenzuron, and malathion, under this alternative are discussed in detail in the 2002 EIS (Environmental Consequences of Alternative 2: Insecticide Applications at Conventional Rates and Complete Area Coverage, pp. 38–48). A description of anticipated site-specific impacts from this alternative may be found in Part 4 of this document.

2.3. Reduced Agent Area Treatments (RAATs) Alternative

Alternative C, RAATs, is a recently developed grasshopper suppression method in which the rate of insecticide is reduced from conventional levels, and treated swaths are alternated with swaths that are not directly treated. The RAATs strategy relies on the effects of an insecticide to suppress grasshoppers within treated swaths while conserving grasshopper predators and parasites in swaths not directly treated. Either carbaryl, diflubenzuron, or malathion would be considered under this alternative at the following application rates:

- 8.0 fluid ounces (0.25 lb a.i.) of carbaryl spray per acre;
- 10.0 pounds (0.20 lb a.i.) of 2 percent carbaryl bait per acre;
- 0.75 fluid ounce (0.012 lb a.i.) of diflubenzuron per acre; or
- 4.0 fluid ounces (0.31 lb a.i.) of malathion per acre.

The area not directly treated (the untreated swath) under the RAATs approach is not standardized. In the past, the area infested with grasshoppers that remains untreated has ranged from 20 to 67 percent. The 2002 EIS analyzed the reduced pesticide application rates associated with the RAATs approach but assumed pesticide coverage on 100 percent of the area as a worst-case assumption. The reason for this is there is no way to predict how much area will actually be left untreated as a result of the specific action requiring this EA. Rather than suppress

grasshopper populations to the greatest extent possible, the goal of this alternative is to suppress grasshopper populations to a desired level.

The potential environmental effects of application of carbaryl, diflubenzuron, and malathion under this alternative are discussed in detail in the 2002 EIS (Environmental Consequences of Alternative 3: Reduced Agent Area Treatments (RAATs), pp. 49–57). A description of anticipated site-specific impacts from this proposed treatment may be found in Part 4 of this document.

2.4. Experimental Treatments Alternative *(Applied using air and/or ground equipment)*

APHIS continues to refine its methods of grasshopper control in order to make the program more economically feasible and environmentally acceptable. These refinements can include reduced rates of a currently used pesticides, improved formulations, development of more target specific baits, and development of biological pesticide suppression alternatives or improvements to aerial and ground application equipment. A division of APHIS, the Center of Plant Health Science and Technology (CPHST) located in Phoenix, AZ conducts methods development and evaluations for our agency.

To accomplish this work, experimental plots are used to refine equipment and methods or develop formulations that will possibly be used in future rangeland grasshopper programs. The experimental plot investigations are typically located throughout the western United States, including Arizona.

Stressor tests, mixtures of native pathogens isolates combined with low doses of insecticides, will be conducted on native species of grasshopper in a series of field exposures. Each test will consist of a series of mini-plots to be treated with a simulated aerial application system (FAASSTT). The treated plots, ten for each treatment, will be 14 inches in diameter. They will be followed to determine if the combination enhances field mortality of grasshoppers. Likely insecticides are diflubenzuron, Neem oil and chlorantraniliprole.

A series of experiments using ATVs to apply labeled materials to applied using RAATs and blanket applications to determine expected mortalities associated with barrier or crop protection and hot spot treatments. This may include baits or liquid applications.

A companion non-target study may be conducted if grasshopper populations are expansive and warrant control applications at a location in Arizona. Treatments would not be as large but would follow a similar design with the treatments consisting of Dimilin and Prevathon. Dimilin would be applied at 1.0 fl. oz., 10 fl. oz. crop oil concentrate and 20 fl. oz. water applied in a RAATs application. The Prevathon would be applied at 2 fl. oz. with 0.32 fl. oz. methylated seed oil and water up to a total volume of 32 fl. oz. per acre applied as a RAATs along with 4 fl. oz. Prevathon, 0.32 fl. oz. methylated seed oil up to a total volume of 32 fl. oz. applied as a blanket treatment. These plots would be monitored by APHIS.

During the local informal field level consultation with the appropriate agencies, locations of experimental trials will be made available in order to ensure these activities are not conducted near sensitive species or habitats. Due to the small size of experimental plots, location of plots away from sites with endangered species conflicts, EPA approval and informal field level consultations, no adverse effects to the environment or its components are expected from these research activities.

3. Affected Environment

APHIS conducts adult grasshopper surveys throughout the assessment area in the fall of each year and identifies areas where grasshopper populations could indicate significant infestations in the following year. Appendix 2 illustrates the results of the 2016 Rangeland Grasshopper Hazard map and the areas which may be at risk for outbreak populations.

Appendix 3 indicates the boundaries of the area covered by EA's in Arizona. Control programs may occur throughout the assessment area as per program guidelines (Appendix 1) and as agreed to by cooperators (private, State and Federal land managers).

The 2002 programmatic Final Environmental Impact Statement (APHIS FEIS 2002) contains detailed analyses of impacts of selected grasshopper control methods. In addition, APHIS FEIS 2002 contains a hazard, exposure, and risk analysis for grasshopper control chemicals on terrestrial wildlife, aquatic species, and humans. Those analyses serve as the basis for the determination of impacts in this EA, and are here incorporated by reference. The following components of the affected area are identified as being within the scope of this EA.

3.1. Description of Affected Environment

The proposed suppression program could potentially encompass acreage in locations in Mohave and Coconino County portion of BLM District Arizona Strip (map appendix 4), **excluding** Threatened & Endangered and sensitive species occupied habitats made known to APHIS; and Coconino County portion of Coconino National Forest Grazing Allotments within 9 mile radius from Brolliar Park and South with a 6 mile radius along Forest Highway 3 to Highway 87.
(Map appendix 5). Potential acreages lay within the Arizona / New Mexico Plateau, Arizona / New Mexico Mountain, and Colorado Plateau level III ecoregions. Soil types include basalt and basalt flows, weakly consolidated sandstone and siltstone, unconsolidated alluvial sand, silt, and some gravel.

Elevations range from approximately 3,500 to over 7,000 feet. Potential treatment sites are within watersheds which drain into tributaries of the Colorado and Virgin River. There are stock tanks in the potential treatment area. All potential treatment areas fall within the Great Basin shrub-grassland, Great Basin desert-scrub and Rocky Mountain montane conifer forest biomes (Brown, 1998). Rangeland representative species (table 1) of these biomes include but not limited to:

Plants: Emory oak (*Quercus emoryi*), alligator bark juniper (*Juniperus deppeana*), pinyon pine (*Pinus edulis*), gray oak (*Quercus grisea*), canyon live oak (*Quercus chrysolepis*), Arizona oak (*Quercus arizonica*), western chokecherry (*Prunus virginiana*), shrub live-oak (*Quercus turbinella*), ceanothus (*Ceanothus greggii*), crucifixion thorn (*Canotia holocantha*), penstemon (*Penstemon spp.*), desert verbena (*Verbena wrightii*), Wright buckwheat (*Eriogonum wrightii*), narrowleaf yerbasanta (*Eriodictyon angustifolium*), sideoats grama (*Bouteloua curtipendula*), cane bluestem (*Bothriochloa barbinodis*), plains lovegrass (*Eragrostis intermedia*), Black grama (*Bouteloua eriopoda*), Blue grama, (*Bouteloua gracilis)* Hairy grama, (*Bouteloua hirsuta)* Rothrock's grama, *(Bouteloua rothrockii),* Fendler three-awn (*Aristida spp.*), agave (*Agave parryi*), beargrass (*Nolina microcarpa*), sotol (*Dasylirion wheeleri*), banana yucca (*Yucca baccata*), squirreltail, *(Elymus elymoides),* Arizona cottontop, *(Digitaria californica),* Green sprangletop (*Leptochloa dubia*), *Junegrass, (Koeleria spp.),* Western wheatgrass (*Pascopyrum smithii),* Tobosagrass, (*Pleuraphis mutica),* Vine Mesquite, *(Panicum obtusum*), curly-mesquite

(*Hilaria belangeri),* Cholla (*Opuntia spp.*), Prickly Pear (*Opuntia spp.).*

Mammals: cliff chipmunk (*Eutamias dorsalis*), white-throated woodrat (*Neotoma albigula*), mule deer (*Odocoileus hemionus*), brush mouse (*Peromyscus boylei*), rock mouse (*P. difficilis*), white-footed mouse (*Peromyscus maniculatus sonoriensis*), cottontail rabbit (*Syhilagus nuttalii granger*), pronghorn antelope (*Antilocapra americana americana*), elk (*Cervus elaphus)* javalina **(***Pecari tajacu),* jackrabbit(*Lepus spp.*), coyote (*Canis latran),* White-tailed deer *(Odocoileus virginianus),* coyote (*Canis latrans lestes),* antelope ground squirrel (*Citellus leucurus leucurus),*piaute ground squirrel (*Citellus townsendi mollis),* kangaroo rat(*Dipodomys microps honnevillei*),(*Dipodomys ordii celeripes),*pallid big brown bat (*Eptesicus fuscus pallidus),* black-tailed jackrabbit(*Lepus californicus deserticola*), Great Basin pocketmouse(*Perognathus parvus olivaceus*), harvest mouse(*Reithrodontomys megalotis megalotis*), badger, (*Taxidea taxus*).

Birds: rufous-crowned sparrow (*Aimophila ruficeps*), scrub jay (*Aphelocoma coerulescens*), canyon wren (*Catherpes mexicanus*), rufous-sided towhee (*Pipilo erythrophthalmus*), brown towhee (*P. fuscus*), bushtit (*Psaltriparus minimus*), black-chinned sparrow (*Spizella atrogularis*), crissal thrasher (*Toxostoma dorsale*), burrowing owl (*Athene cunicularia*), Cooper's hawk (*Accipiter cooperii*), northern sage sparrow (*Amphispiza helli nevadensis*), desert black-throated sparrow(*Amphispiza bilineata deserticola*), golden eagle (*Ayuila chrysaetos canadensis*), long-eared owl(*Asio otus wilsonianus*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*),
western turkey vulture(*Cathartes aura teter*), nighthawk (*Chordeiles minor*), marsh hawk (*Circus cyaneus hudsonicus*), American raven (*Corvus corax sinulatus*), pinion jay (*Cyanocephalus cyanocephalus*), Brewer's blackbird (*Euphagus c.vnnocephalus cyanocephalus*), prairie falcon (*Falco mexicanus*), Great Basin shrike (*Lanius ludovicianus nevadensis*), western mockingbird (*Mimus polyglottos leucopterus*), green-tailed towhee (*Oberkolseria chlorura*), sage thrasher (*Oreoscoptes montanus*), slate-colored fox sparrow (*Passerella iliaca schistacea*), Nuttall's poor-will (*Phalaenoptilus nuttallii nuttallii*),
American magpie (*Pica pica hudsonia*), western gnatcatcher (*Polioptila caerulea amoenissima*), western vesper sparrow (*Pooecetes gramineus confinis*), rock wren (*Salpinctes obsoletus obsoletus*), say phoebe (*Sayornis saya saya*),
Broad-tailed hummingbird (*Selasphorus platycercus platycercus*), mountain bluebird (*Sialia currucoides*), Brewer's sparrow (*Spizella breweri breweri*), western chipping sparrow (*Spizella passerina arizonae*), kingbird (*Tvrannus verticalis*), western mourning dove (*Zenaidura macroura marginella*), white-crowned sparrow (*Zonotrichia Ieucophrys*).

Amphibians and reptiles: glossy snake (*Arizona elegans*), Arizona alligator lizard (*Gerrhonotus kingi*), night snake (*Hypsiglena torquata*), Sonoran mountain kingsnake (*Lampropeltis pyromelana*), southwestern blind snake (*Leptotyphlops humilis*), Sonora whipsnake (*Masticophis bilineatus*), desert striped whipsnake (*M. taeniatus*), western fence lizard (*Scleroporus occidentalis*), eastern fence lizard (*S. undulates*), western blackhead snake (*Tantilla planiceps*), Sonoran lyre snake (*Trimorphodon biscutatus lambda*), Texas lyre snake (*T. b. vilkinsoni*), side-blotched lizard (*Uta stansburiana*), Arizona night lizard (*Zantusia arizonae*), Western Diamond-backed Rattlesnake *(Crotalus atrox),* Black-tailed Rattlesnake *(Crotalus molossus),* Arizona Black Rattlesnake *(Crotalus cerberus)*

Grassland, shrub land, and woodlands are present across the general area. Grasshopper treatments would occur only in grass and shrub lands, not in forested areas. The rangelands are utilized for cattle and sheep grazing. They provide habitat for native and introduced game and non-game animal species.

Up to 100 species of grasshoppers may occur within the proposed suppression area. Of these, no more than ten species have been known to reach outbreak status and threaten crops and/or valuable range resources in Arizona. The widespread grasshopper outbreaks of the mid-1980s were comprised primarily of the *Melanopli* group. It is anticipated that potential treatment suppression requests in 2014 would be most likely for *Aulocara elliotti, Camnula pellucida, Melanoplus sanguinipes, M. femurrubrum, M. packardi* and possibly *Anabrus simplex* in Northern Arizona.

3.2. Site-Specific Considerations

3.2.1. Human Health

The 2002 EIS contains detailed hazard, exposure, and risk analyses for the chemicals available to APHIS. Impacts to workers and the general public were analyzed for all possible routes of exposure (dermal, oral, inhalation) under a range of conditions designed to overestimate risk. The operational procedures and spraying conditions examined in those analyses conform to those expected for operations. The following discussion summarizes the hazards, potential exposure, and risk to workers and the general public for operations within these treatment areas of this EA. The operational procedures identified in Appendix 1 would be required in all cases and further mitigation measures are identified in this section, as appropriate.

The suppression program would be conducted on federally managed rangelands. No treatments will occur over congested or residential areas, recreation areas, and schools. The nearest residential or populated area to potential treatment areas are at least 6 miles away. Refer to the Operational Procedures, Specific Procedures for Aerial and Ground Applications in Appendix 1 for further information.

Groundwater wells are a major source of domestic water supplies. Groundwater and surface water are the major rural and livestock water sources. No impact is anticipated. Strict adherence to label requirements and the USDA treatment guidelines (appendix 1) will be followed in regard to treatments bordering open surface waters.

3.2.2. Nontarget Species

3.2.2.1. Threatened & Endangered Species and Sensitive Species of Concern

The area assessed by this EA includes a variety of organisms i.e.; terrestrial vertebrates and invertebrates, migratory birds, biocontrol agents, pollinators, aquatic organisms, plants (both native and introduced), etc. APHIS will employ measures, such as buffer zones, to protect these species and their habitat. APHIS will also consult with local agency officials to determine appropriate protective measures.

Federally Listed Threatened and Endangered Species:

BIRDS
Mexican spotted owl, St*rix occidentalis lucida* - Threatened
Southwestern willow flycatcher, *Empidonax traillii extimus* - Endangered
California condor, *Gymnogyps californianus* - Endangered
Western yellow-billed cuckoo, *Coccyzus americanus* - Threatened

RETILES
Mohave Desert tortoise, *Gopherus agassizii* - Threatened

PLANTS
Brady pincushion cactus, *Pediocactus bradyi* - Endangered
Fickeisen plains cactus, *Pediocactus peeblesianus fickeiseniae* - Endangered
Gierisch mallow, *Sphaeralcea gierischii* - Endangered
Holmgren milk-vetch, *Astragalus holmgrenorium* - Endangered
Jones cycladenia, *Cycladenia jonesii* - Threatened
Sentry milk-vetch, *Astragalus cremnophylax var. cremnophylax* - Endangered
Siler pincushion cactus, *Pediocactus sileri* - Threatened
Welsh's milkweed, *Asclepias welshii* - Threatened

Sensitive Species of Concern:
Northern leopard frog**,** *Lithobates pipiens* - (Arizona Game and Fish Department Species of Greatest Conservation Need).

3.2.2.2. Bald and Golden Eagle Protection Act (BGEPA)

The Eagle Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal and civil penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." "Disturb'' means: "Disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagles return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

As listed in the National Bald Eagle Management Guidelines (USFWS, May 2007) and adapting recommendations from (Driscoll et al. 2006) the following mitigation measures will be followed.

*Category G Helicopters and fixed-wing aircraft. Except for authorized biologists trained in survey techniques, avoid operating aircraft within **2,000** feet of the nest during the breeding season, except where eagles have demonstrated tolerance for such activity. In addition, Category A (Agriculture) and Category D (Off Road Vehicle Use) both provide the same guidance for use of ATV's or trucks: No buffer is necessary around nest sites outside the breeding season. During the breeding season, do not operate off-road vehicles within **1,000** feet of the nest. In open areas, where there is increased visibility and exposure to noise, this distance should be extended to 1,000 feet.*

3.2.2.3. Representative Species

See Table 1 for list of representative wildlife, and plant spp.

Exposure to program insecticides could occur. Exposures and effects on representative species in each non-target group are discussed in the 2002 FEIS Appendix B and part V. C. pp. 39-48.

Under the no action alternative, destruction of grasses and forbs by grasshoppers could cause localized disruption of food and cover for a number of wildlife species. Under chemical control there is a possibility of indirect effects on local wildlife populations, particularly insectivorous birds that depend on a readily available supply of insects, including grasshoppers, for their own food supply and for their young. We have found no valid data which suggests that (absent a spill) any species other than certain mice would be subjected to a dosage in excess of 1/5 of the LD50 for carbaryl (Pg. B-37 GH EIS.) Therefore, it is not apparent that any fatalities would be likely to occur as a result of carbaryl intoxication.

Malathion and carbaryl have been shown to reduce brain cholinesterase (ChE) (an enzyme important in nerve cell transmissions) levels in birds. Effects of ChE inhibition are not fully understood but could cause inability to gather food, escape predation, or care for young.

In any given treatment season, only a fraction (less than 1 percent) of the total rangeland in a region is likely to be sprayed for grasshopper control. For species that are wide spread and numerous lowered survival and lowered reproductive success in a small portion of their habitat would not constitute a significant threat to the population.

The wildlife risk assessment in APHIS FEIS 2002 estimated wildlife doses of Malathion and carbaryl to representative rangeland species and compared them with toxicity reference levels.

No dose of Malathion will approach or exceed the reference species LD50. Some individual animals may be at risk of fatality or behavioral alterations that make them more susceptible to predation resulting from ChE level changes in Malathion spraying for grasshopper control. However, most individual animals would not be seriously affected.

Carbaryl also poses a low risk to wildlife, with few fatalities likely to occur and a low risk of behavioral anomalies caused by cholinesterase depression.

There is some chance of adverse effects on bird reproduction through the use of any of these chemicals or diesel oil through direct toxicity to developing embryos in birds' eggs.

Some species of herbivorous mammals and birds may consume wheat bran bait after it has been applied to grasshopper-infested areas. Carbaryl is moderately toxic to mammals and slightly toxic to birds. We have found no valid data which suggests that (absent a spill) any species other than certain mice would be subjected to a dosage in excess of 1/5 of the LD50 for carbaryl (Pg. B-37 GH EIS.) Therefore, it is not apparent that any fatalities would be likely to occur as a result of carbaryl intoxication. Additionally, we note that carbaryl 5% bait is labeled at 3 lbs/1000 sq. ft in poultry houses when poultry are present. (http://www.cdms.net/manuf/)

Chitin or chitin-like substances are not as important to terrestrial mammals, birds, and other vertebrates as chitin is to insects; therefore, the chitin inhibiting properties of diflubenzuron applications under the conditions of Alternative 2 such as reductions in the food base for insectivorous wildlife species, especially birds. As stated above, diflubenzuron is practically nontoxic to birds, including those birds that ingest moribund grasshoppers resulting from diflubenzuron applications, as described in Alternative 2.

While immature grasshoppers and other immature insects can be reduced up to 98 percent in area covered with diflubenzuron, some grasshoppers and other insects remain in the treatment area. Although the density of grasshoppers and other insects may be low, it is most likely sufficient to sustain birds and other insectivores until insect populations recover. Those rangeland birds that feed primarily on grasshoppers may switch to other diet items. However, in some areas the reduced number of invertebrates necessary for bird survival and development may result in birds having less available food. In these cases, birds will either have less than optimal diets or travel to untreated areas for suitable prey items, causing a greater foraging effort and a possible increased susceptibility to predation. It also should be noted that suppressing grasshopper populations conserves rangeland vegetation that often is important habitat to rangeland wildlife. Habitat loss is frequently the most important factor leading to the decline of a species, and reducing grasshopper densities can be an aid in reducing habitat loss.

Biological Control agents used for controlling introduced weeds may be encountered within treatment areas. Local mitigation will be determined on a case by case basis in consultation with the local land managers.

3.2.3. Socioeconomic Issues

Livestock grazing and hunting are the main uses of the potential treatment area. These grasslands provide forage for cattle and wildlife. Farming, forestry occupations, agriculture, fishing and hunting, and mining provide the employment on these rangeland areas.

The possible treatment areas are subject to reoccurring drought. A combination of drought and grasshopper damage causes economic stress to landowners and permittees. The control of grasshoppers in this area would have beneficial economic impacts to local land owners. The forage not utilized by grasshoppers will be available for livestock consumption, and harvesting. This will allow greater livestock grazing, decreased needs for supplemental feed, and increased monetary returns.

3.2.4. Cultural Resources and Events

To ensure that historical or cultural sites, monuments, buildings or artifacts of special concern are not adversely affected by program treatments, APHIS will confer with BIA, or other appropriate land management agencies on a local level to protect these areas of special concern. APHIS will also confer with the appropriate Tribal Authority and with the BIA office at a local level to ensure that the timing and location of planned program treatments do not coincide or conflict with cultural events or observances, on Tribal and/or allotted lands.

3.2.5. Special Considerations for Certain Populations

3.2.5.1. Executive Order No. 12898,

Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order (E.O.) 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, was signed by President Clinton on February 11, 1994 (59 *Federal Register* (FR) 7269). This E.O. requires each Federal agency to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Consistent with this E.O., APHIS will consider the potential for disproportionately high and adverse human health or environmental effects on minority populations and low-income populations for any of its actions related to grasshopper suppression programs.

3.2.5.2. Executive Order No. 13045,

Protection of Children from Environmental Health Risks and Safety Risks

The increased scientific knowledge about the environmental health risks and safety risks associated with hazardous substance exposures to children and recognition of these issues in Congress and Federal agencies brought about legislation and other requirements to protect the health and safety of children. On April 21, 1997, President Clinton signed E.O. 13045, Protection of Children from Environmental Health Risks and Safety Risks (62 FR 19885). This E.O. requires each Federal agency, consistent with its mission, to identify and assess environmental health risks and safety risks that may disproportionately affect children and to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. APHIS has developed agency guidance for its programs to follow to ensure the protection of children (USDA, APHIS, 1999).

The human health risk assessment for the 2002 EIS analyzed the effects of exposure to children from the three insecticides. Based on review of the insecticides and their use in the grasshopper program, the assessment concluded that the likelihood of children being exposed to insecticides is very slight and that no disproportionate adverse effects to children are anticipated over the

negligible effects to the general populations. Treatments are primarily conducted on open rangelands where children would not be expected to be present during treatment or enter should there be any restricted entry period after treatment.

Impacts on children will be minimized by the implementation of the treatment guidelines:

Aerial Broadcast Applications of Liquid Insecticides

- Notify all residents in treatment areas, or their designated representatives, prior to proposed operations. Advise them of the control method to be used, the proposed method of application, and precautions to be taken (e.g., advise parents to keep children and pets indoors during ULV treatments). Refer to label recommendations related to restricted entry period.
- No treatments will occur over congested urban area. For all flights over congested areas, the contractor must submit a plan to the appropriate Federal Aviation Administration District Office and this office must approve of the plan; a letter of authorization signed by city or town authorities must accompany each plan. Whenever possible, plan aerial ferrying and turnaround routes to avoid flights over congested areas, bodies of water and other sensitive areas that are not to be treated.

Aerial Application of Dry Insecticidal Bait

- Do not apply within 500 feet of any school or recreational facility.

Ultra-Low-Volume (ULV) Aerial Application of Liquid Insecticides

- Do not spray while school buses are operating in the treatment area.
- Do not apply within 500 feet of any school or recreational facility.

4. Environmental Consequences

Each alternative described in this EA potentially has adverse environmental effects. The general environmental impacts of each alternative are discussed in detail in the 2002 EIS. The specific impacts of the alternatives are highly dependent upon the particular action and location of infestation. The principal concerns associated with the alternatives are: (1) the potential effects of insecticides on human health (including subpopulations that might be at increased risk); and (2) impacts of insecticides on non-target organisms (including threatened and endangered species). Assessments of the relative risk of each insecticide option are discussed in detail in the 2002 EIS document.

4.1. Environmental Consequences of the Alternatives

Site-specific environmental consequences of the alternatives are discussed in this section.

4.1.1. No Action Alternative

Under this alternative, APHIS would not fund or participate in any program to suppress grasshoppers. If APHIS does not participate in any grasshopper suppression program, Federal land management agencies, State agriculture departments, local governments, or private groups or individuals, may not effectively combat outbreaks in a coordinated effort. In these situations, grasshopper outbreaks could develop and spread unimpeded.

Grasshoppers in unsuppressed outbreaks would consume agricultural and nonagricultural plants. The damage caused by grasshopper outbreaks could also pose a risk to rare, threatened, or endangered plants that often have a low number of individuals and limited distribution. Habitat loss for birds and other wildlife and rangeland susceptibility to invasion by nonnative plants are among the consequences that would likely occur should existing vegetation be removed by grasshoppers. Loss of plant cover due to grasshopper consumption will occur. Plant cover may protect the soil from the drying effects of the sun, and plant root systems hold the soil in place that may otherwise be eroded.
Another potential scenario, if APHIS does not participate in any grasshopper suppression programs, is that some Federal land management agencies, State agriculture departments, local governments, or private groups or individuals may attempt to conduct widespread grasshopper programs. Without the technical assistance and program coordination that APHIS can provide to grasshopper programs, it is possible that a large amount of insecticides, including those APHIS considers too environmentally harsh but labeled for rangeland use, could be applied, reapplied, and perhaps misapplied in an effort to suppress or even locally eradicate grasshopper populations. It is not possible to accurately predict the environmental consequences of the no action alternative because the type and amount of insecticides that could be used in this scenario are unknown.

4.1.2. Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative

Under Alternative 2, APHIS would participate in grasshopper programs with the option of using one of the insecticides carbaryl, diflubenzuron, or Malathion, depending upon the various factors related to the grasshopper outbreak and the site-specific characteristics. The use of an insecticide would occur at the conventional rates. With only rare exceptions, APHIS would apply a single treatment in an outbreak year that would blanket affected rangeland areas in an attempt to suppress grasshopper outbreak populations by a range of 35 to 98 percent, depending upon the insecticide used.

Carbaryl

Carbaryl is of moderate acute oral toxicity to humans. The mode of toxic action of carbaryl occurs through inhibition of acetylcholinesterase (AChE) function in the nervous system. This inhibition is reversible over time if exposure to carbaryl ceases. The Environmental Protection Agency (EPA) has classified carbaryl as a Apossible human carcinogen@ (EPA, 1993). However, it is not considered to pose any mutagenic or genotoxic risk.

Potential exposures to the general public from conventional application rates are infrequent and of low magnitude. These low exposures to the public pose no risk of direct toxicity,

carcinogenicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. The potential for adverse effects to workers are negligible if proper safety procedures are followed, including wearing the required protective clothing. Carbaryl has been used routinely in other programs with no reports of adverse health effects. Therefore, routine safety precautions are expected to provide adequate worker health protection.

Carbaryl is of moderate acute oral toxicity to mammals (McEwen *et al*., 1996a). Carbaryl applied at Alternative 2 rates is unlikely to be directly toxic to upland birds, mammals, or reptiles. Field studies have shown that carbaryl applied as either ultra-low-volume (ULV) spray or bait at Alternative 2 rates posed little risk to killdeer (McEwen *et al*., 1996a), vesper sparrows (McEwen *et al*., 1996a; Adam *et al*., 1994), or golden eagles (McEwen *et al*., 1996b) in the treatment areas. AChE inhibition at 40 to 60 percent can affect coordination, behavior, and foraging ability in vertebrates. Multi-year studies conducted at several grasshopper treatment areas have shown AChE inhibition at levels of no more that 40 percent with most at less than 20 percent (McEwen *et al*., 1996a). Carbaryl is not subject to significant bioaccumulation due to its low water solubility and low octanol-water partition coefficient (Dobroski *et al*., 1985).

Carbaryl will most likely affect non-target insects that are exposed to ULV carbaryl spray or that consume carbaryl bait within the grasshopper treatment area. Field studies have shown that affected insect populations can recover rapidly and generally have suffered no long-term effects, including some insects that are particularly sensitive to carbaryl, such as bees (Catangui *et al*., 1996). The use of carbaryl in bait form generally has considerable environmental advantages over liquid insecticide applications: bait is easier than liquid spray applications to direct toward the target area, bait is more specific to grasshoppers, and bait affects fewer non-target organisms than sprays (Quinn, 1996).

Should carbaryl enter water, there is the potential to affect the aquatic invertebrate assemblage, especially amphipods. Field studies with carbaryl concluded that there was no biologically significant effect on aquatic resources, although invertebrate downstream drift increased for a short period after treatment due to toxic effects (Beyers *et al*., 1995). Carbaryl is moderately toxic to most fish (Mayer and Ellersieck, 1986).

Diflubenzuron

The acute oral toxicity of diflubenzuron formulations to humans ranges from very slight to slight. The most sensitive indicator of exposure and effects of diflubenzuron in humans is the formation of methemoglobin (a compound in blood responsible for the transport of oxygen) in blood.

Potential exposures to the general public from Alternative 2 rates are infrequent and of low magnitude. These low exposures to the public pose no risk of methemoglobinemia (a condition where the heme iron in blood is chemically oxidized and lacks the ability to properly transport oxygen), direct toxicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. Potential worker exposures are higher than the general public but are not expected to pose any risk of adverse health effects.

Because diflubenzuron is a chitin inhibitor that disrupts insects from forming their exoskeleton, organisms without a chitinous exoskeleton, such as mammals, fish, and plants are largely unaffected by diflubenzuron. In addition, adult insects, including wild and cultivated bees, would be mostly unaffected by diflubenzuron applications (Schroeder *et al*., 1980; Emmett and

Archer, 1980). Among birds, nestling growth rates, behavior data, and survival of wild American kestrels in diflubenzuron treated areas showed no significant differences among kestrels in treated areas and untreated areas (McEwen *et al*., 1996b). The acute oral toxicity of diflubenzuron to mammals ranges from very slight to slight. Little, if any, bioaccumulation of diflubenzuron would be expected (Opdycke *et al*., 1982).

Diflubenzuron is most likely to affect immature terrestrial insects and early life stages of aquatic invertebrates (Eisler, 2000). While this would reduce the prey base within the treatment area for organisms that feed on insects, adult insects, including grasshoppers, would remain available as prey items. Many of the aquatic organisms most susceptible to diflubenzuron are marine organisms that would not be exposed to rangeland treatments. Freshwater invertebrate populations would be reduced if exposed to diflubenzuron, but these decreases would be expected to be temporary given the rapid regeneration time of many aquatic invertebrates.

Malathion

Malathion is of slight acute oral toxicity to humans. The mode of toxic action of Malathion occurs through inhibition of AChE function in the nervous system. Unlike carbaryl, AChE inhibition from malathion is not readily reversible over time if exposure ceases. However, strong inhibition of AChE from malathion occurs only when chemical oxidation results in formation of the metabolite malaoxon. Human metabolism of malathion favors hydroxylation and seldom produces much malaoxon.

Potential exposures to the general public from conventional application rates are infrequent and of low magnitude. These low exposures to the public pose no risk of direct toxicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. Potential worker exposures are higher, but still have little potential for adverse health effects except under accidental scenarios. Malathion has been used routinely in other programs with no reports of adverse health effects. Therefore, routine safety precautions are expected to continue to provide adequate protection of worker health.

EPA has recently reviewed the potential for carcinogenic effects from malathion. EPA=s classification describes malathion as having Asuggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential@ (EPA, 2000). This indicates that any carcinogenic potential of malathion cannot be quantified based upon EPA=s weight of evidence determination in this classification. The low exposures to malathion from program applications would not be expected to pose carcinogenic risks to workers or the general public.

Malathion is of slight acute oral toxicity to mammals. There is little possibility of toxicity-induced mortality of upland birds, mammals, or reptiles, and no direct toxic effects have been observed in field studies. Malathion is not directly toxic to vertebrates at the concentrations used for grasshopper suppression, but it may be possible that sublethal effects to nervous system functions caused by AChE inhibition may lead directly to decrease survival. AChE inhibition at 40 to 60 percent affects coordination, behavior, and foraging ability in vertebrates. Multi-year studies at several grasshopper treatment areas have shown AChE inhibition at levels of no more than 40 percent with most at less than 20 percent (McEwen *et al*., 1996a). Field studies of birds within Malathion treatment areas showed that, in general, the total number of birds and bird reproduction were not different from untreated areas (McEwen *et al*., 1996a). Malathion does not bioaccumulate HSDB, 1990; Tsuda *et al*., 1989).

Malathion will most likely affect nontarget insects within a treatment area. Large reductions in some insect populations would be expected after a malathion treatment under Alternative 2. While the number of insects would be diminished, there would be some insects remaining. The remaining insects would be available prey items for insectivorous organisms, and those insects with short generation times may soon increase.

Malathion is highly toxic to some fish and aquatic invertebrates; however, malathion concentrations in water, as a result of grasshopper treatments, are expected to be low presenting a low risk to aquatic organisms, especially those organisms with short generation times.

The implementation of pesticide label instructions and restrictions and the APHIS treatment guidelines will reduce potential impacts from the program use of insecticides (see Appendix 1 treatment guidelines)

4.1.3. Reduced Area Agent Treatments (RAATs) Alternative

Under Alternative 3, the insecticide carbaryl, diflubenzuron, or malathion would be used at a reduced rate and over reduced areas of coverage. Rarely would APHIS apply more than a single treatment to an area per year. The maximum insecticide application rate under the RAATs strategy is reduced 50 percent from the conventional rates for carbaryl and malathion and 25 percent from the Alternative 2 rate for diflubenzuron. Although this strategy involves leaving variable amounts of land not directly treated, the risk assessment conducted for the 2002 EIS assumed 100 percent area coverage because not all possible scenarios could be analyzed. However, when utilized in grasshopper suppression, the amount of untreated area in RAATs often ranges from 20 to 67 percent of the total infested area but can be adjusted to meet site-specific needs.

Carbaryl

Potential exposures to the general public and workers from RAATs application rates are lower than those from conventional application rates, and adverse effects decrease commensurately with decreased magnitude of exposure. These low exposures to the public
pose no risk of direct toxicity, carcinogenicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. The potential for adverse effects to workers is negligible if proper safety procedures are followed, including wearing the required protective clothing. Routine safety precautions are expected to provide adequate protection of worker health at the lower application rates under RAATs.

Carbaryl will most likely affect nontarget insects that are exposed to liquid carbaryl or that consume carbaryl bait. While carbaryl applied at a RAATs rate will reduce susceptible insect populations, the decrease will be less than under Alternative 2 rates. Carbaryl ULV applications applied in alternate swaths have been shown to affect terrestrial arthropods less than malathion applied in a similar fashion.

Direct toxicity of carbaryl to birds, mammals, and reptiles is unlikely in swaths treated with carbaryl under a RAATs approach. Carbaryl bait also has minimal potential for direct effects on birds and mammals. Field studies indicated that bee populations did not decline after carbaryl bait treatments, (Catangui *et al*., 1996) and American kestrels were unaffected by bait applications made at a RAATs rate (McEwen *et al*., 1996a). Using alternating swaths will

furthermore reduce adverse effects because organisms that are in untreated swaths will be mostly unexposed to carbaryl.

Carbaryl applied at a RAATs rate has the potential to affect invertebrates in aquatic ecosystems. However, these affects would be less than effects expected under Alternative 2. Fish are not likely to be affected at any concentrations that could be expected under Alternative 3.

Diflubenzuron

Potential exposures and adverse effects to the general public and workers from RAATs application rates are commensurately less than conventional application rates. These low exposures to the public pose no risk of methemoglobinemia, direct toxicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. Potential worker exposures pose negligible risk of adverse health effects.

Because diflubenzuron is a chitin inhibitor that disrupts insects from forming their exoskeleton, organisms without a chitinous exoskeleton, such as mammals, fish, and plants are largely unaffected by diflubenzuron. Diflubenzuron exposures at Alternative 3 rates are not hazardous to terrestrial mammals, birds, and other vertebrates. Insects in untreated swaths would have little to no exposure, and adult insects in the treated swaths are not
susceptible to diflubenzuron's mode of action. The indirect effects to insectivores would be negligible as not all insects in the treatment area will be affected by diflubenzuron.

Diflubenzuron is most likely to affect immature terrestrial insects and, if it enters water, will affect early life stages of aquatic invertebrates. While diflubenzuron would reduce insects within the treatment area, insects in untreated swaths would have little to no exposure. Many of the aquatic organisms most susceptible to diflubenzuron are marine organisms that would not be exposed to rangeland treatments. Freshwater invertebrate populations would be reduced if exposed to diflubenzuron, but these decreases may be temporary given the rapid regeneration time of many aquatic invertebrates.

4.1.4. Experimental Treatments

The insecticide Dimilin® (diflubenzuron) and In-Place adjuvant will be evaluated to reduce the currently standard 10 and 20 oz of oil and water diluent applied respectively per acre. This research would involve small replicated 40-160 acre plots.

APHIS continues to refine its methods of grasshopper control in order to make the program more economically feasible and environmentally acceptable. These refinements can include reduced rates of a currently used pesticides, improved formulations, development of more target specific baits, and development of biological suppression alternatives or improvements to aerial application equipment. A division of APHIS, the Center of Plant Health Science and Technology (CPHST) located in Phoenix, AZ conducts these evaluations for our agency.

To accomplish this work, experimental plots are used to refine material or develop formulations that will possibly be used in future rangeland grasshopper programs. The experimental plot investigations are typically located throughout the western United States, including Arizona.

When new materials or formulations are investigated, Experimental Use Permits (EUP) is issued by the Environmental Protection Agency (EPA) to the company developing the product. The necessary experiments may then be carried out under the guidelines or the limitations outlined in the EUP.

During the local informal field level consultation with the appropriate agencies locations of experimental trials will be made available in order to ensure these activities are not conducted near sensitive species or habitats. Due to the small size of experimental plots, location of plots away from sites with ESA conflicts, EPA approval and informal field level consultations, no adverse effects to the environment or its components are expected from research activities.

Malathion

Potential exposures to the general public and workers from RAATs application rates are of a commensurately lower magnitude than conventional rates. These low exposures to the public pose no risk of direct toxicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity.

Potential risks to workers are negligible if proper safety procedures are adhered to, including the use of required protective clothing. Malathion has been used routinely in other programs with no reports of adverse health effects. The low exposures to malathion from program applications are not expected to pose any carcinogenic risks to workers or the general public.

Malathion applied at a RAATs rate will cause mortalities to susceptible insects. Organisms in untreated areas will be mostly unaffected. Field applications of malathion at a RAATs rate and applied in alternate swaths resulted in less reduction in nontarget organisms than would occur in blanket treatments. Birds in RAATs areas were not substantially affected. Should malathion applied at RAATs rates enter water, it is most likely to affect aquatic invertebrates. However, these effects would soon be compensated for by the surviving organisms given the rapid generation time of most aquatic invertebrates and the rapid degradation of malathion in most water bodies.

The implementation of pesticide label instructions and restrictions and the APHIS treatment guidelines will reduce potential impacts from the program use of insecticides (see Appendix 1 treatment guidelines).

4.2. Other Environmental Considerations

4.2.1. Cumulative Impacts

Cumulative impact, as defined in the CEQ NEPA implementing regulations (40 CFR § 1508.7) “is the impact on the environment which results from the incremental impact of the action when added to the past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

APHIS does not anticipate cumulative impacts and does not expect overlapping grasshopper treatments. Herbicides do not have a known cumulative effect with Carbaryl, Diflubenzuron, and Malathion. If at the time of treatment other chemical treatment programs are discovered within the site specific area and addendum will be added explaining the synergistic effects that may occur.

4.2.2. Executive Order 13186
Responsibilities of Federal Agencies to Protect Migratory Birds

In accordance with various environmental statutes, APHIS routinely conducts programs in a manner that minimizes impact to the environment, including any impact to migratory birds. In January 2001, President Clinton signed E.O. 13186 to ensure that all government programs protect migratory birds to the extent practicable. To further its purposes, the E.O. requires each agency with a potential to impact migratory birds to enter into a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service (FWS). In compliance with the E.O., APHIS is currently working with FWS to develop such an MOU.

4.2.3. Endangered Species Act

Under the Endangered Species Act of 1973, Section 7, federal agencies are required to consult with the U.S. Fish and Wildlife Service regarding the degree of impact to federally proposed and listed species and critical habitat from the program action and the necessary protective measures to avoid or minimize adverse effects.

Local consultations are being conducted between APHIS and FWS regarding section 7 of the Endangered Species Act. The FWS Letter of Concurrence is located as Appendix 6.

5.0 ASSESSMENTS

5.1 BIRDS

5.1.1. Mexican spotted owl, *Strix occidentalis lucida*

Status: Threatened (58 FR 14248, March 16, 1993). Critical habitat designated (69 FR 53182, August 31, 2004).

Habitat and Distribution: Occurs in varied habitat, consisting of mature montane forest and woodland, shady wooded canyons, and steep canyons. In forested habitat, uneven-aged stands with a high canopy closure, high tree density, and a sloped terrain appear to be key habitat components. They can also be found in mixed conifer and pine-oak vegetation types. Generally nests in older forests of mixed conifer or ponderosa pine/Gambel oak. Nests are found in live trees in natural platforms (e.g., dwarf mistletoe brooms), snags, and on canyon walls. Elevation ranges from 1,249 to 2,743 m (4,100 to 9,000 ft).

Historical Range extended from the southern Rocky mountains in Colorado and the Colorado Plateau in southern Utah southward through Arizona, New Mexico, and far western Texas, through the Sierra Madre Occidental and Oriental, to the mountains at the southern end of the Mexican Plateau.

Current range is thought to be similar to the historical range. Populations in Arizona are patchily distributed and occur where appropriate habitat is present throughout all but the arid southwestern portion of the state.
The San Carlos Apache Reservation is excluded from critical habitat designation under section 4(b) 2 of CFR 50 Part 17.

Assessment: No aerial treatments will occur in areas designated to be critical habitat. Ground treatments that may occur near areas where MSO are known to forage (e.g., Brolliar Park area) will use the RAAT's methodology. The potential effects would likely be disturbance with ground equipment for a few hours a day over a 2 day period of time in potential foraging areas.

Protective measures: APHIS will confer with the local Service at least 5 days prior to grasshopper control activities to determine if protective measures are needed.

Determination: APHIS will exclude the use of aerial treatments occurring in any forested areas where nesting may occur or critical habitat. All ground RAAT's treatments will occur on rangeland, based on proposed pesticides and the proposed rates of application, grasshopper treatments, **may affect not likely to adversely affect** the Mexican Spotted owl. Based on the potential disturbance from ground equipment which may occur in potential foraging areas, the duration of time as foreseen by APHIS would not exceed a few hours over a maximum of 2 days, may affect not likely to adversely affect the critical habitat of the Mexican spotted owl. APHIS will confer with FWS 5 days before applications and implementation of any protective measures recommended by the local Service.

5.1.2 Southwestern willow flycatcher, *Empidonax traillii extimus*

Status: Endangered (60 FR 10694, February 27, 1995) with critical habitat (50 CFR 60886, October 19, 2005).

Habitat and Distribution: Nests and forages in dense riparian habitats along streams, rivers, lakesides, and other wetlands. Some of the more common plant species used for nesting is: willow, boxelder, tamarisk, Russian olive, buttonbush, cottonwood, and mesquite. Nests are found in dense thickets of these and other plant species that are about 4-7 m (13-23 ft) in height. Migration habitat is believed to primarily occur along riparian corridors. Habitat occurs at elevations below 8,500 ft (2,590 m).
Historical range includes southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, southwestern Colorado, and extreme northwestern Mexico.

Current range: In Arizona, since the listing, territories have been detected on the Agua Fria, Gila, Little Colorado, Salt, San Pedro, Colorado, San Francisco, Hassayampa, Verde, Big Sandy, Santa Maria, Virgin, and Bill Williams rivers, and Pinal, Tonto and Cienega creeks. This species likely overwinters in Mexico, Central America, and possibly northern South America.

Assessment: No riparian areas are in the boundaries of proposed treatments. The common species of trees for nesting are not present in the proposed treatment areas. The proposed treatments are not likely to adversely affect the southwest willow flycatcher.

Protective measures: No treatments will occur within 5 miles of the Agua Fria, Gila, Little Colorado, Salt, San Pedro, Colorado, San Francisco, Hassayampa, Verde, Big Sandy, Santa Maria, Virgin, and Bill Williams's rivers, and Pinal, Tonto and Cienega creeks.

Determination: Based on the determined protection measures, proposed pesticides and the proposed rates of application, grasshopper treatments **may affect, are not likely to adversely** affect the Southwestern willow flycatcher.

5.1.3. California Condor, *Gymnogyps californianus*

Status: Experimental nonessential population designated for Southwest reintroduction (61 FR 54044, October 16, 1996). Endangered (32 FR 4001, March 11, 1967) with critical habitat in California (41 FR 187, September 24, 1976).

Habitat and Distribution: Nesting sites are in various rock formations, including caves, crevices, and potholes in isolated regions of the southwestern U.S. Foraging for carrion occurs over long distances, as a condor can travel 80-160 km (48-96 miles) per day in search of food. Flights follow routes over foothills and mountains. Roosting is usually on rock cliffs, snags, or in live conifer stands. These areas are important for resting, preening, and socializing.
RANGE: Historic**:** Isolated regions of the California Coast, Sierra Nevada, and Transverse Ranges, western Texas, Arizona, Utah, New Mexico, and Baja California Norte, Mexico.
CURRENT: Captive-reared condors have been reintroduced to Hopper Mountain and Bitter Creek National Wildlife Refuges, and Los Padres National Forest in Kern, Ventura, San Luis Obispo, and Santa Barbara Counties, California, and further north in Ventana Wilderness Sanctuary in Monterey County in California. USFWS began reintroducing an experimental nonessential population of California condors in the Vermilion Cliffs area in northern Arizona (Coconino County) and southern Utah in December 1996 and Hurricane Cliffs on the Arizona Strip in December 1998. California condors may be found in Mohave, Coconino, Navajo, and Apache counties, Arizona.

Assessment: Roosting is usually on rock cliffs, snags, or in live conifer stands. These areas are important for resting, preening, and socializing. No treatments will occur in any forested areas or over terrain considered habitat for nesting, roosting and release sites.

Protective measures: Treatments that may occur near Vermillon Cliffs on the Arizona Strip District of BLM, APHIS will observe the following buffers from currently occupied nests, roosts or release sites, for ground applications a .25 mile buffer will be observed, for high aerial applications 1.5 mile buffer will be applied. If flight over a nest is necessary, applicators should maintain a minimal altitude of 3,000 feet and make sure the shutoff of pesticide sprayers or spreaders has occurred. APHIS will confer with the local Service at least 5 days prior to grasshopper control activities to determine if any other protective measures are needed.

Determination: Based on the implementation of protective measures and the fact that no treatments will occur in any forested areas or terrain where nesting may occur. All treatments will occur on open rangeland. APHIS has determined based on proposed pesticides and the

proposed rates of application, grasshopper treatments **may affect, not likely to adversely affect** the California condor.

5.1.4 Western Yellow-billed cuckoo, *Coccyzus americanus*

Status: Threatened (79 FR 59992, October 3, 2014). Proposed critical habitat (79 FR 48548, August 15, 2014). A final rule to designate critical habitat is expected in 2015.

Habitat: The western yellow-billed cuckoo currently nests almost exclusively in low to moderate elevation riparian woodlands that cover 50 acres (ac) (20 hectares (ha)) or more within arid to semiarid landscapes. Occupied habitat in Arizona may also contain box elder (*Acer negundo*), Arizona alder (*Alnus oblongifolia*), Arizona walnut (*Juglans major*), Arizona sycamore (*Platanus wrightii*), oak (*Quercus* spp.), netleaf hackberry (*Celtis reticulata*), velvet ash (*Fraxinus velutina*), Mexican elderberry (*Sambuccus mexicanus*), tamarisk (*Tamarix* spp.; also called salt cedar), and seepwillow (*Baccharis glutinosa*). Surveys conducted by the Arizona Breeding Bird Atlas reported 68 percent of the yellow-billed cuckoo observations were in lowland riparian woodlands, often containing a variable combination of Fremont cottonwood, willow, velvet ash, Arizona walnut, mesquite, and tamarisk.

Western yellow-billed cuckoos require large blocks of riparian habitat for breeding. Home ranges are large, vary in size depending on seasonal food abundance, and overlap greatly both between members of a pair and between neighboring pairs. At the landscape level, the amount of cottonwood–willow-dominated vegetation cover and the width of riparian habitat influences western yellow-billed cuckoo distribution and abundance. On the lower Colorado River, in a comparison of occupied versus unoccupied habitat, yellow-billed cuckoos were found at sites with denser riparian vegetation and more variation in vegetation density, and less tamarisk and shrubby vegetation, compared to unoccupied sites.

Recent radio telemetry studies on the Rio Grande in New Mexico, the San Pedro River in Arizona, and the Colorado River in Arizona and California have shown that yellow-billed cuckoos use large home ranges of 204 ac (82 ha), 125 ac (51 ha), and 95 ac (38 ha), respectively. Breeding densities on the South Fork Kern River, where intensive surveys for yellow-billed cuckoos were conducted for 17 years, averaged 0.81 pairs per 100 ac (40 ha) which means they had home ranges of about 123 ac (50 ha) on average. On the Verde River in Arizona, sites occupied by yellow-billed cuckoos were composed of deciduous riparian habitat at least 325 ft. (100 m) in width, dominated by Fremont cottonwood, Goodding's willow (*Salix gooddingii*), Arizona alder, and Arizona sycamore, often adjacent to patches of mesquite.

Assessment: No riparian areas are in the boundaries of proposed treatments. The common species of trees for nesting are not present in the proposed treatment areas. The proposed treatments are not likely to adversely affect the yellow-billed cuckoo.
Protective measures: No treatments will occur within 5 miles of the Gila River known nesting habitat of yellow-billed cuckoo. Treatments that may occur near the San Carlos River, a buffer of a .25 mile will be placed on nesting or habitat of this species. No treatments will occur within 5 miles of the Virgin and Colorado River known nesting or habitat of the yellow-billed cuckoo.

Determination: Based on the determined protection measures, proposed pesticides and the proposed rates of application, grasshopper treatments will have **may affect, not likely to adversely affect** the yellow-billed cuckoo.

5.2 AMPHIBIANS

5.2.1 Northern leopard frog, *Lithobates pipiens*

Status: No Federal status. It is the Arizona Game and Fish Department's "Species of Greatest Conservation Need". The U.S. Fish and Wildlife Service were petitioned in June 2006 to list the western United States Distinct Population Segment of northern leopard frog as an endangered or threatened species with critical habitat under the Endangered Species Act. The U.S. Fish and Wildlife Service are currently working on a status review to determine if the species warrants protection under the Act.

Habitat and Distribution: Northern leopard frogs use a variety of habitats including grassland, brush land, woodland, and forest, usually in permanent waters with rooted aquatic vegetation; also frequents ponds, canals, marshes, springs, and streams. In Arizona they are found in elevations of 2,640-9,155 ft (805-2,790 m). Adult frogs consume small invertebrates. Larvae eat algae, plant tissue, organic debris, and probably small invertebrates.
HISTORICAL RANGE: The northern leopard frog historically ranged from Newfoundland and southern Quebec, south through New England to West Virginia, west across the Canadian provinces and northern and central portions of the United States to British Columbia, Oregon, Washington, and northern California, and south to Arizona, New Mexico, and extreme western Texas. In Arizona, L. *pipiens* has been found in the lakes, earthen tanks, springs, creeks, and rivers of the Colorado Plateau in the northeast portion of the state (Coconino, Navajo, and Apache Counties). Historically, the northern leopard frog was well-distributed across northern Arizona, including wetlands in wooded areas and meadows above and below the Mogollon Rim, as well as in more open and arid country on the Colorado Plateau.
CURRENT RANGE: The overall extent of the northern leopard frog has decreased throughout the western portion of its range. The species is greatly reduced and/or extirpated from a significant portion of its western range throughout the United States and Canada. Currently in Arizona, northern leopard frogs are largely restricted to man-made waters (earthen tanks constructed for livestock and wildlife) on the Coconino National Forest. This may be the only remaining functional meta-population in Arizona, although a few small and isolated populations persist elsewhere in its Arizona range.

Assessment: APHIS grasshopper and Mormon cricket program activities may adversely affect the Northern leopard frog. Direct toxic effects could occur to the Northern leopard frog and indirect effects through loss of prey items could also occur should it be exposed to program insecticides. However, in order to remove the potential for adverse effects to the Northern leopard frog and its prey, APHIS will implement the following measures.

Protective measures: To protect this species, treatments that may occur on the Coconino National Forest, APHIS will apply only RAAT's ground applications of carbaryl bait (pellets) and implement a 100 foot buffer from stock tanks. Applications using diflubenzuron (Dimilin), only RAAT's ground applications with a 350 foot buffer would be implemented from stock tanks. Notification prior to treatments would be made to the Forest Service and FWS.

Determination: Based on the determined protection measures, proposed pesticides and the proposed rates of application, grasshopper treatments **may affect, not likely to adversely affect** the Northern leopard frog.

5.3 REPTILES

5.3.1 Mohave Desert tortoise, *Gopherus agassizii*

Status: Threatened (55 FR 12178, April 2, 1990) with critical habitat (59 FR 5820, February 8, 1994; 59 FR 9032, February 24, 1994).

Habitat and Distribution: Occurs in the creosote shadscale, blackbush, and Joshua tree series of mojave desert scrub, cactus, shadscale, and Joshua tree series of Mojave desert scrub. The Mojave population generally occupies desert scrub communities in basins and bajadas but is also found on rocky slopes. In Arizona, tortoises of the Mojave population are typically found below 1,220 m (4,000 ft).
RANGE: Historic: Occurred in a variety of desert communities in southeastern California, southern Nevada, northwestern Arizona, and southwestern Utah.
Current: It is still distributed throughout the historic range, but populations are fragmented and declining.

Assessment: Due to the fact that Carbaryl and Malathion are class 1 in Reptile toxicity group these pesticides will not be used in Desert Tortoise habitat for suppression of rangeland grasshoppers. Diflubenzuron (Dimilin) is a class 0 in Reptile toxicity group and would be the only pesticide that would be available for APHIS to use in Desert Tortoise habitat.

Protective measures: No treatments will occur in the designated critical habitat for the Mojave Desert tortoise. All designated habitat for this species will be excluded from action areas for the APHIS Rangeland Suppression Program.

Determination: Based on the determined protection measures excluding critical habitat, proposed pesticides and the proposed rates of application, grasshopper treatments **will have no effect** on the Mojave Desert tortoise and the Desert tortoise's critical habitat.

5.4 PLANTS

5.4.1 Brady pincushion cactus, *Pediocactus bradyi*

Status: Endangered (44 FR 61784, October 26, 1979) without critical habitat.

Habitat and Distribution: Grows on benches and terraces at 1,170-1,370 m (3,850-4,500 ft) elevation in the Navajoan Desert near Marble Gorge (Coconino County, Arizona). The substrate is composed of Kaibab limestone chips overlying soil derived from Moenkopi shale and sandstone outcrops. Dominant plant species in the community are shadescale (*Atriplex confertifolia*), snakeweed (*Gutierrezia sarothrae*), Mormon tea (*Ephedra viridis*), and desert trumpet (*Eriogonum inflatum*). The several known localities are all near Marble Gorge (Coconino County, Arizona). In suitable habitat near Marble Gorge. The species Recovery Plan states that although large areas of potential habitat have been surveyed, plants have only been located in about 10-20% of the surveyed areas.

Assessment: The 1995 Biological Opinion letter dated 10/3/95 to Mr. Bausch details the agreed-to measures for protecting the Brady pincushion cactus. Local APHIS has determined in Northern Arizona all occupied habitat will be excluded from treatment areas.

Protective measures: None. All occupied habitat is excluded from treatment areas.

Determination: Based on the determined protection measures, proposed pesticides and the proposed rates of application, grasshopper treatments **will have no effect** on the Brady pincushion cactus.

5.4.2 Sentry milk-vetch, *Astragalus cremnophylax var. cremnophylax*

Status: Endangered (55 FR 50184, December 5, 1990) without critical habitat.

Habitat and Distribution: Sentry milk-vetch grows on a white layer of Kaibab limestone with little (less than1.2 cm (0.5 in)) or no soil, in an unshaded opening in the piñon-juniper-cliffrose plant community above 1,219 m (4,000 ft) elevation. In these openings, sentry milk-vetch is the co-dominant plant with rock mat (*Petrophytum caespitosum*).
RANGE: Current: The two previously known populations of this variety occur on the South Rim of the Grand Canyon. A third population on the North Rim was recently discovered. A historic record indicates the variety may have occurred where the El Tovar hotel is presently located. Known populations occur in Coconino County, Arizona.
Potential: Open areas of the limestone pavement within the piñon-juniper-cliffrose plant community along the South Rim of the Grand Canyon or the east rim of Marble Gorge.

Assessment: The 1995 Biological Opinion letter dated 10/3/95 to Mr. Bausch accidentally omitted the Sentry milk-vetch. Protective measures for similar species were outlined in the 1995 BO letter for the following T&E species; *Astragalus tricarinatus, Astragalus lentiginosus var. sesquimetralis, Astragalus magdalenae var. peirsonii, Astragalus osterhoutii, Astragalus humillimus, Astragalus montii.* APHIS feels the protective measures outlined in the 1995 BO letter for the species listed above will be effective protective measures for the Sentry milk-vetch. Aerial applications of pesticides will not be used within 3 miles of Threatened and Endangered species occupied habitats. Within the 3 mile buffer, only carbaryl bait will be used. Local APHIS has determined in Northern Arizona all occupied habitat will be excluded from treatment areas.

Protective measures: None. All occupied habitat is excluded from treatment areas.

Determination: Based on the determined protection measures, proposed pesticides and the proposed rates of application, grasshopper treatments **will have no effect** on the Sentry milk-vetch.

5.4.3 Siler pincushion cactus, *Pediocactus sileri*

Status: Threatened (58 FR 68476, December 27, 1993) without critical habitat.

Habitat and Distribution: Grows on gypsiferous clay and sandy soils of the Moenkopi Formation. The rounded hills often support sparser vegetation than adjacent areas of different substrate. Habitat is characterized by desert scrub vegetation, in transitional areas between the Navajo Desert, Sagebrush Desert, and the Mojave Desert. Found at elevations between 850-1,650 m (2,800-5,400 ft), on all aspects of the hills and on slopes varying from 0-80 degrees.

RANGE: Current: Only several locations are known where relatively dense population clusters occur. Individual plants are widely separated in other areas of the Moenkopi that are marginally suitable for this species. All known localities occur in Kane and Washington counties, Utah, and in northern Mohave and northwestern Coconino counties, Arizona.

Potential: Surveys for this species are incomplete. Plants may be found wherever habitat conditions are met.

Assessment: The 1995 Biological Opinion letter dated 10/3/95 to Mr. Bausch details the agreed-to measures for protecting the Siler pincushion cactus. Aerial applications of pesticides will not be used within 3 miles of Threatened and Endangered species occupied habitats. Within the 3 mile buffer, only carbaryl bait will be used. Local APHIS has determined in Northern Arizona all occupied habitat will be excluded from treatment areas.

Protective measures: None. All occupied habitat is excluded from treatment areas.

Determination: Based on the determined protection measures, proposed pesticides and the proposed rates of application, grasshopper treatments **will have no effect** on the Siler pincushion cactus.

5.4.4 Welsh's milkweed, *Asclepias welshii*

Status: Threatened with critical habitat (52 FR 41435, October 28, 1987).

Habitat and Distribution: Open, sparsely vegetated semi-stabilized sand dunes and on the lee slopes of actively drifting sand dunes.
RANGE: Current: Several thousand individuals are known from a few concentrated areas on the Coral Pink Sand Dunes and the Sand Hills area of Kane County, Utah. Small populations are known from near Page, Coconino County, Arizona, and the Paria-Vermillion Cliffs Wilderness Area near the Utah/Arizona border in Kane County, Utah.
Potential: Southern Utah and northern Arizona where naturally occurring drifting sand dunes from Navajo sandstone occur.

Assessment: The 1995 Biological Opinion letter dated 10/3/95 to Mr. Bausch details the agreed-to measures for protecting the Welsh's milkweed. Aerial applications of pesticides will not be used within 3 miles of Threatened and Endangered species occupied habitats. Within the 3 mile buffer, only carbaryl bait will be used. In Northern Arizona all occupied habitat is excluded from treatment areas. Local APHIS has determined in Northern Arizona all occupied habitat will be excluded from treatment areas.

Protective measures: None. All occupied and critical habitat is excluded from treatment areas.

Determination: Based on the determined protection measures excluding critical habitat, proposed pesticides and the proposed rates of application, grasshopper treatments **will have no effect** on the Welsh's milkweed and the critical habitat of the Welsh's milkweed.

5.4.5 **Jones cycladenia**, *Cycladenia jonesii*

Status: Threatened (51 FR 16530, May 5, 1986) without critical habitat.

Habitat and Distribution: This species occurs between 1,338-1,829 m (4,390-6,000 ft) elevation in plant communities of mixed desertscrub, juniper, or wild buckwheat-Mormon tea. It is found on gypsiferous, saline soils of Cutler, Summerville, and Chinle Formations.
RANGE: Jones' Cycladenia are found in Glen Canyon National Recreation Area in the Purple Hills. In 1993 a new population was discovered near Colorado City and Cane Beds in Mohave County. Jones' Cycladenia are also found in the Canyonlands region of Utah.

Assessment: The 1995 Biological Opinion letter dated 10/3/95 to Mr. Bausch details the agreed-to measures for protecting the Jones cycladenia. Agreed measures in BO state aerial applications of pesticides will not be used within 3 miles of Threatened and Endangered species occupied habitats. Within the 3 mile buffer, only carbaryl bait will be used. Local APHIS has determined in Northern Arizona all occupied habitat will be excluded from treatment areas.

Protective measures: None. All occupied habitat is excluded from treatment areas.

Determination: Based on the determined protection measures, proposed pesticides and the proposed rates of application, grasshopper treatments **will have no effect** on the Jones cycladenia.

5.4.6 **Gierisch mallow**, *Sphaeralcea gierischii*

Status: Endangered with critical habitat (78 FR 49149 and 49165, August 13, 2013).

Habitat and Distribution: Gierisch mallow is only found on gypsum outcrops associated with the Harrisburg Member of the Kaibab Formation in northern Mohave County, Arizona and closely adjacent Washington County, Utah (Atwood and Welsh 2002, p. 161). The surrounding plant community is that of warm desertscrub (Mohave desertscrub). Little is known about the life history of this species, since it was only recently described. It is believed, to be a perennial because it is woody at the base and the same individuals have been observed for more than one year. It dies back to the ground during the winter and re-sprouts from the base during late winter and spring (January to March), depending on daytime temperatures and rainfall. It is not known how the flowers are pollinated, the pollination system (self-pollinated or obligate out crosser), seed dispersal mechanisms, or the conditions under which seeds germinate. Young plants have been observed on reclaimed areas within the gypsum mining area.
Historical Range/Distribution: There is no information on the historical range of this species. It is possible that the gypsum hills supported populations of Gierisch mallow before active mining (and removal of the gypsum) began, and there is also no information that the species occurred outside of its current range.
Current Range/Distribution: There are seven known populations restricted to less than 24.3 ha (60 ac) in Arizona and Utah, combined. The main populations in Arizona are located south of the Black Knolls, approximately 19.3 kilometers (km) (12 miles (mi)) southwest of St. George, Utah. There is one population approximately 4.8 km (3.0 mi) north of the main populations, on Arizona State trust lands. There is one population approximately 3.2 km (2 mi) north of the latter, on BLM lands in Utah. The Utah population is within 3.2 km (2 mi) of the Arizona/Utah

border and the Arizona populations are within 11.3 km (7 mi) of the Arizona/Utah border. Gypsum outcrops associated with the Harrisburg Member are scattered throughout BLM lands in northern Arizona and southern Utah. Extensive surveys were conducted in these areas because numerous other rare plant species are associated with these landforms. Gierisch mallow was found only in this particular area.

Assessment: On August 17, 2012 this species was proposed as an endangered species with critical habitat and was not a part of the 1995 Biological Opinion letter to Mr. Bausch. APHIS feels the protective measures for this species due to the small geographic distribution would be excluded from any potential treatments. No treatments will occur in this area.

Protective measures: The species geographic distribution described above excludes this species from treatment areas. No protective measures will be necessary. Known distribution areas will be excluded from rangeland grasshopper treatments.

Determination: Based on the determined protection measures, proposed pesticides and the proposed rates of application, grasshopper treatments **will have no effect** on the Gierisch mallow.

5.4.7 Fickeisen plains cactus, *Pediocactus peeblesianus fickeiseniae*

Status: Endangered (78 FR 60607; October 31, 2013) with proposed critical habitat (78 FR 40673, July 8, 2013).

Habitat and Distribution: The species is known to occur on shallow soils derived from exposed layers of Kaibab limestone. Most populations occur on canyon margins or well-drained hills in Navajoan Desert or Great Plains grassland at elevations of 1,219-1,524 m (4,000-5,000 ft).
Historic Range: Unknown but probably similar to the current distribution.
Current Range: It is known to occur in widely scattered small populations from the vicinity of Gray Mountain in Coconino County, north and west to the Arizona Strip in Coconino and Mohave counties. It may also occur near Joseph City in Navajo County.

Assessment: APHIS feels the protective measures outlined in the 1995 Biological Opinion letter dated 10/3/95 to Mr. Bausch details the agreed-to measures for protecting *Pediocactus bradyi, Pediocactus knowltonii and Pediocactus peeblesianus* var. *peeblesianus* would be sufficient for this candidate species. Local APHIS has determined in Northern Arizona all occupied habitat will be excluded from treatment areas.

Protective measures: None. All occupied habitat is excluded from treatment areas.

Determination: Based on the determined protection measures, proposed pesticides and the proposed rates of application, grasshopper treatments **will have no effect** on the Fickeisen plains cactus.

5.4.8 **Holmgren milk-vetch**, *Astragalus holmgrenorium*

Status: Endangered with critical habitat (71 FR 77972, December 27, 2006).

Habitat and Distribution: Shallow, sparsely vegetated soils derived primarily from the Virgin limestone member of the Moenkopi Formation. Species is a principal member of a warm-desert shrub vegetative community at 823 to 854 m (2,700 to 2,800 ft) elevation. The species is found under limestone ridges and along draws in gravelly clay hills.
RANGE: Historic: Mohave Desert endemic in Southwestern Utah and Northwestern Arizona.
Current: Only three populations are known: the primary population exists on the Arizona (Mohave County) and Utah (Washington County) border, and the other two occur in Washington County, Utah. All populations are within 15 km (9 miles) of St. George, Utah.

Assessment: Holmgren milk-vetch, *Astragalus holmgrenorium* was listed as Endangered without critical habitat (66 FR 49560, September 28, 2001) and with critical habitat (71 FR 77972, December 27, 2006). This was after the 1995 Biological Opinion letter dated 10/3/95 to Mr. Bausch. Protective measures for similar species were outlined in the 1995 BO letter for the following T&E species; *Astragalus tricarinatus, Astragalus lentiginosus var. sesquimetralis, Astragalus magdalenae var. peirsonii, Astragalus osterhoutii, Astragalus humillimus, Astragalus montii.* APHIS will exclude all occupied habitat of the Holmgren milk-vetch as outlined in Unit 1, Index map – Final Critical Habitat Holmgren milk-vetch (71 FR 78005 December 27, 2006) from rangeland treatment programs in Arizona.

Protective measures: None. All occupied and critical habitat is excluded from treatment areas.

Determination: Based on the assessment and exclusion of known critical habitat from any treatment areas, proposed pesticides and the proposed rates of application, grasshopper treatments **will have no effect** on the Holmgren milk-vetch and the critical habitat of the Holmgren milk-vetch.

Summary

APHIS has determined that the proposed action **will not affect**: the endangered Arizona cliff-rose (*Purshia subintegra*); endangered Arizona hedgehog cactus (*Echinocereus triglochidiatus* var. *arizonicus*); endangered Brady pincushion cactus (*Pediocactus bradyi*); endangered Fickeisen plains cactus (*Pediocactus peeblesianus fickeiseniae*) with critical habitat; endangered Gierisch mallow (*Sphaeralcea gierischii*) with critical habitat; endangered Holmgren milk-vetch, (*Astragalus holmgrenorium*) with critical habitat; threatened Jones cycladenia, (*Cycladenia jonesii*); endangered Sentry milk-vetch (*Astragalus cremnophylax var. cremnophylax*); threatened Siler pincushion cactus (*Pediocactus sileri*); threatened Welsh's milkweed (*Asclepias welshii*) with critical habitat; threatened Mojave Desert tortoise (*Gopherus agassizii*) with critical habitat.

APHIS has determined that the proposed action **may affect but is not likely to adversely affect**: the threatened Mexican spotted owl (*Strix occidentalis lucida*) with critical habitat; endangered Southwestern willow flycatcher (*Empidonax traillii extimus*) with critical habitat; endangered California condor (*Gymnogyps californianus*); threatened Western yellow-billed cuckoo (*Coccyzus americanus*) with proposed critical habitat,(final ruling expected sometime in 2015).

APHIS has determined that the proposed action for sensitive species of concern **may affect but not likely to adversely affect**: Northern leopard frog (*Lithobates pipiens*) (Arizona Game and Fish Department Species of Greatest Conservation Need).

6. Monitoring

Monitoring involves the evaluation of various aspects of the grasshopper suppression programs. There are three aspects of the programs that may be monitored. The first is the efficacy of the treatment. APHIS will determine how effective the application of an insecticide has been in suppressing the grasshopper population within a treatment area and will report the results in a Work Achievement Report to the Western Region.

The second area included in monitoring is safety. This includes ensuring the safety of the program personnel through medical monitoring conducted specifically to determine risks of a hazardous material. (See APHIS Safety and Health Manual (USDA, APHIS, 1998) available online at: www.aphis.usda.gov/mb/aseu/shes/shes-manual.html).

The third area of monitoring is environmental monitoring. APHIS Directive 5640.1 commits APHIS to a policy of monitoring the effects of Federal programs on the environment. Environmental monitoring includes such activities as checking to make sure the insecticides are applied in accordance with the labels, and that sensitive sites and organisms are protected. The environmental monitoring recommended for grasshopper suppression programs involves monitoring sensitive sites such as bodies of water used for human consumption or recreation or which have wildlife value, habitats of endangered and threatened species, habitats of other sensitive wildlife species, edible crops, and any sites for which the public has expressed concern or where humans might congregate (e.g., schools, parks, hospitals).

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8. Listing of Agencies and Persons Consulted

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Flagstaff, Arizona 86001

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Flagstaff, Arizona 86001

Shaula Hedwall, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service
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Brian J. Wooldridge, Fish and Wildlife Biologist, U. S. Fish and Wildlife Service
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Flagstaff, Arizona 86001

Barbara G. Phillips, PhD., Zone Botanist, USDA, Forest Service, Coconino National Forest
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Jill Oertley, Wildlife Biologist, USDA, Forest Service, Coconino National Forest
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Happy Jack, AZ 86024

Lisa Thornley, Natural Resource Specialist, BLM State Office
One North Central Avenue, Suite 800
Phoenix, Arizona 85004-4427

Whit Bunting, Lead Rangeland Management Specialist, BLM-Arizona Strip Field District Office
345 East Riverside Drive
St. George, Utah 84790

Lee Hughes, T&E Species Specialist, BLM, Arizona Strip Field Office
345 East Riverside Drive
St. George, Utah 84790

APPENDIX 1:

APHIS Rangeland Grasshopper and Mormon cricket Suppression Program
FY-2016 Treatment Guidelines
Version 2/11/2016

The objectives of the APHIS Rangeland Grasshopper and Mormon Cricket Suppression Program are to 1) conduct surveys in 17 Western States; 2) provide technical assistance to land managers; and 3) when funds permit, suppress economically damaging grasshopper and Mormon cricket outbreaks on Federal, Tribal, State, and/or private rangeland. The Plant Protection Act of 2000 provides APHIS the authority to take these actions.

General Guidelines for Grasshopper / Mormon cricket Treatments

1. All treatments must be in accordance with:
    a. the Plant Protection Act of 2000;
    b. applicable environmental laws and policies such as: the National Environmental Policy Act, the Endangered Species Act, the Federal Insecticide, Fungicide, and Rodenticide Act, and the Clean Water Act (including National Pollutant Discharge Elimination System requirements – if applicable);
    c. applicable state laws;
    d. APHIS Directives pertaining to the proposed action;
    e. Memoranda of Understanding with other Federal agencies.

2. Subject to the availability of funds, upon request of the administering agency or the agriculture department of an affected State, APHIS, to protect rangeland, shall immediately treat Federal, Tribal, State, or private lands that are infested with grasshoppers or Mormon crickets at levels of economic infestation, unless APHIS determines that delaying treatment will not cause greater economic damage to adjacent owners of rangeland. In carrying out this section, APHIS shall work in conjunction with other Federal, State, Tribal, and private prevention, control, or suppression efforts to protect rangeland.

3. Prior to the treatment season, conduct meetings or provide guidance that allows for public participation in the decision making process. In addition, notify Federal, State and Tribal land managers and private landowners of the potential for grasshopper and Mormon cricket outbreaks on their lands. Request that the land manager / land owner advise APHIS of any sensitive sites that may exist in the proposed treatment areas.

4. Consultation with local Tribal representatives will take place prior to treatment programs to fully inform the Tribes of possible actions APHIS may take on Tribal lands.

5. On APHIS run suppression programs, the Federal government will bear the cost of treatment up to 100 percent on Federal and Tribal Trust land, 50 percent of the cost on State land, and 33 percent of cost on private land. There is an additional 16.15% charged to any funds received by APHIS for federal involvement with suppression treatments.

6. Land managers are responsible for the overall management of rangeland under their control to prevent or reduce the severity of grasshopper and Mormon cricket outbreaks. Land managers are encouraged to have implemented Integrated Pest Management Systems prior to requesting a treatment. In the absence of available funding or in the place of APHIS funding, the Federal land management agency, Tribal authority or other party/ies may opt to reimburse APHIS for suppression treatments. Interagency agreements or reimbursement agreements must be completed prior to the start of treatments which will be charged thereto.

7. There are situations where APHIS may be requested to treat rangeland that also includes areas where crops are being grown (typically less than 10 percent of the treatment area). In those situations the crop owner pays the entire treatment costs on the croplands.

   NOTE: the insecticide being considered must be labeled for included crop as well as rangeland.

8. In some cases, rangeland treatments may be conducted by other federal agencies (e.g., Forest Service, Bureau of Land Management, or Bureau of Indian Affairs) or by non-federal entities (e.g., Grazing Association or County Pest District). APHIS may choose to assist these groups in a variety of ways, such as:
   a. loaning equipment(an agreement may be required):
   b. contributing in-kind services such as surveys to determine insect species, instars, and infestation levels;
   c. monitoring for effectiveness of the treatment;
   d. giving technical guidance.

9. In areas considered for treatment, State-registered beekeepers and organic producers shall be notified in advance of proposed treatments. If necessary, non-treated buffer zones can be established.

Operational Procedures

GENERAL PROCEDURES FOR ALL AERIAL AND GROUND APPLICATIONS

1. Follow all applicable Federal, Tribal, State and local laws and regulations in conducting grasshopper and Mormon cricket suppression treatments.

2. Notify residents within treatment areas, or their designated representatives, prior to proposed operations. Advise them of the control method to be used, proposed method of application, and precautions to be taken.

3. One of the following insecticides that are labeled for rangeland use can be used for a suppression treatment of grasshoppers and Mormon crickets:
    a) Carbaryl
        a. solid bait
        b. ultra low volume spray
    b) Diflubenzuron ultra low volume spay
    c) Malathion ultra-low volume spray

4. Do not apply insecticides directly to water bodies (defined herein as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers).

    Furthermore, provide the following buffers for water bodies:

    - 500-foot buffer with aerial liquid insecticide.
    - 200 foot buffer with ground liquid insecticide.
    - 200-foot buffer with aerial bait.
    - 50-foot buffer with ground bait.

5. Instruct program personnel in the safe use of equipment, materials and procedures; supervise to ensure procedures are properly followed.

6. Conduct mixing, loading, and unloading in an approved area where an accidental spill would not contaminate a water body.

7. Each aerial suppression program will have a Contracting Officer's Representative (COR) OR a Treatment Manager on site. Each State will have at least one COR available to assist the Contracting Officer (CO) in GH/MC suppression programs.

NOTE: A Treatment Manager is an individual that the COR has delegated authority to oversee the actual suppression treatment; someone who is on the treatment site and overseeing/coordinating the treatment and communicating with the COR. No specific training is required, but knowledge of the Aerial Application Manual and treatment experience is critical; attendance to the Aerial Applicators Workshop is very beneficial.

8. Each suppression program will conduct environmental monitoring as outlined in the current year's Environmental Monitoring Plan.

   APHIS will assess and monitor rangeland treatments for the efficacy of the treatment, to verify that a suppression treatment program has properly been implemented and assure that any environmentally sensitive sites were protected.

9. APHIS reporting requirements associated with grasshopper / Mormon cricket suppression treatments can be found in the APHIS Grasshopper Program Guidebook: http://www.aphis.usda.gov/import_export/plants/manuals/domestic/downloads/grasshopper.pdf

SPECIFIC PROCEDURES FOR AERIAL APPLICATIONS

1. APHIS Aerial treatment contracts will adhere to the current year's Statement of Work.

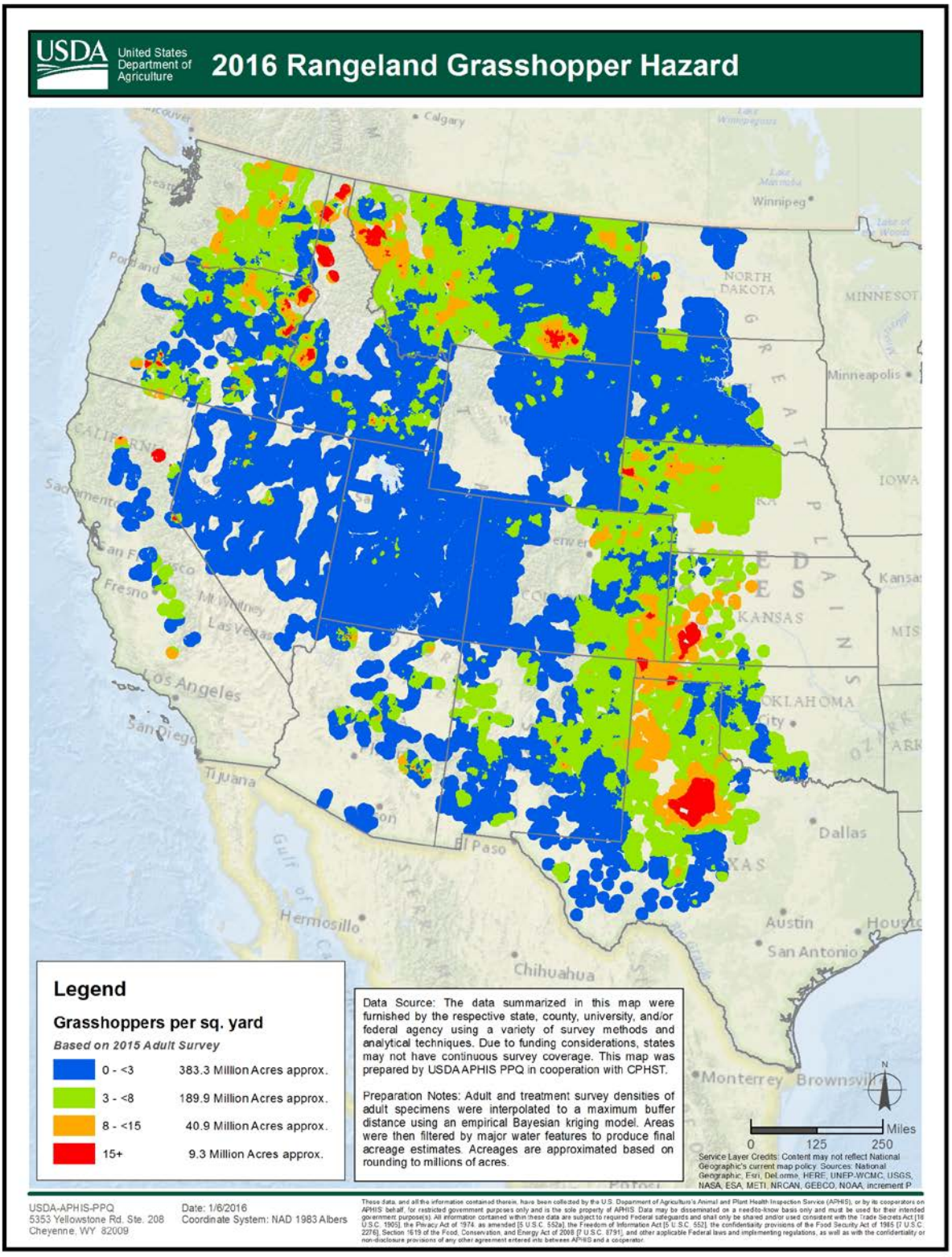
2. Minimize the potential for drift and volatilization by not using ULV sprays when the following conditions exist in the spray area:
   a. Wind velocity exceeds 10 miles per hour (unless state law requires lower wind speed);
   b. Rain is falling or is imminent;
   c. Dew is present over large areas within the treatment block;
   d. There is air turbulence that could affect the spray deposition;
   e. Temperature inversions (ground temperature higher than air temperature) develop and deposition onto the ground is affected.

3. Weather conditions will be monitored and documented during application and treatment will be suspended when conditions could jeopardize the correct spray placement or pilot safety.

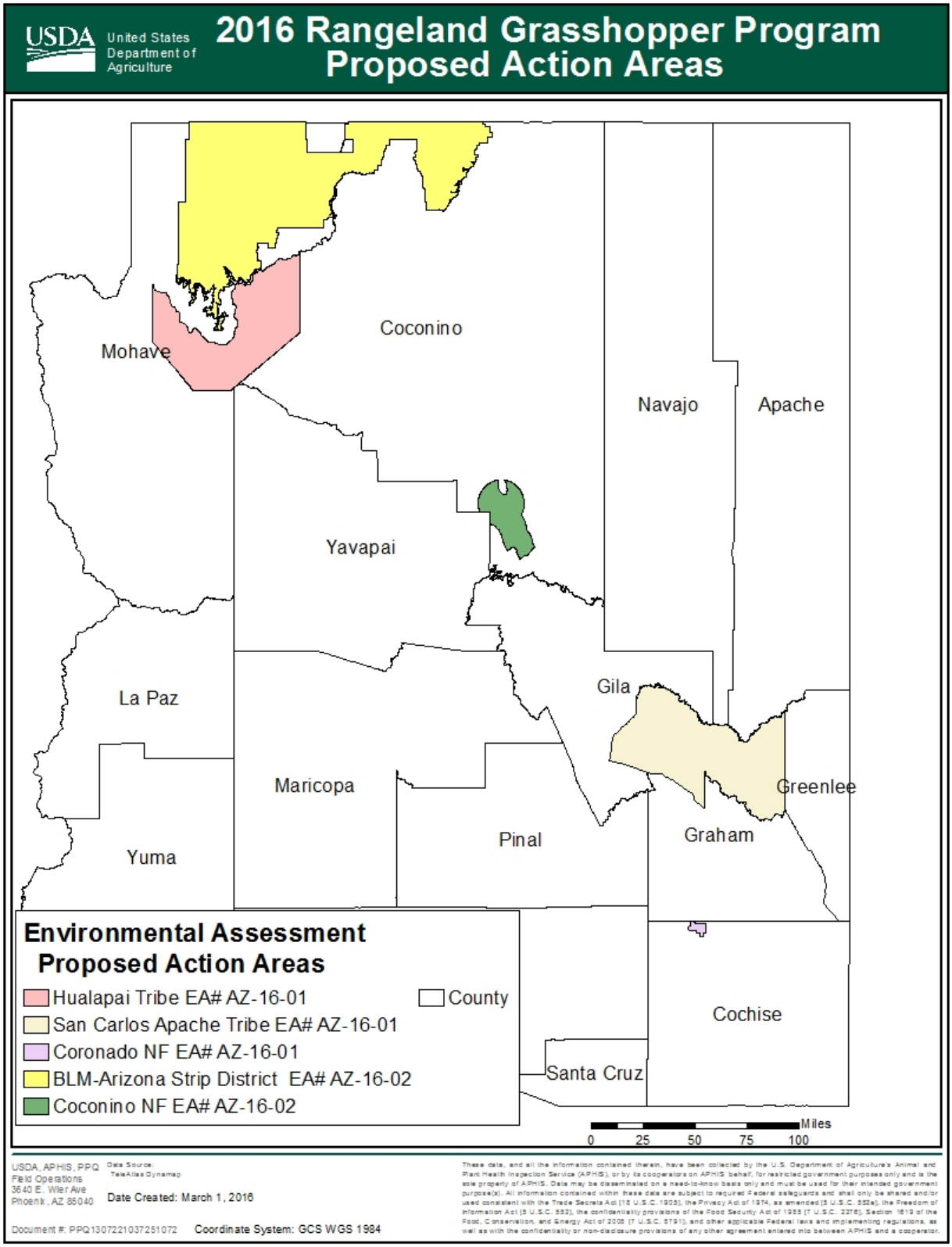
4. Application aircraft, if used, will fly at a median altitude of 1 to 1.5 times the aircraft's wingspan.

5. Whenever possible, plan aerial ferrying and turnaround routes to avoid flights over congested areas, water bodies, and other sensitive areas that are not to be treated.

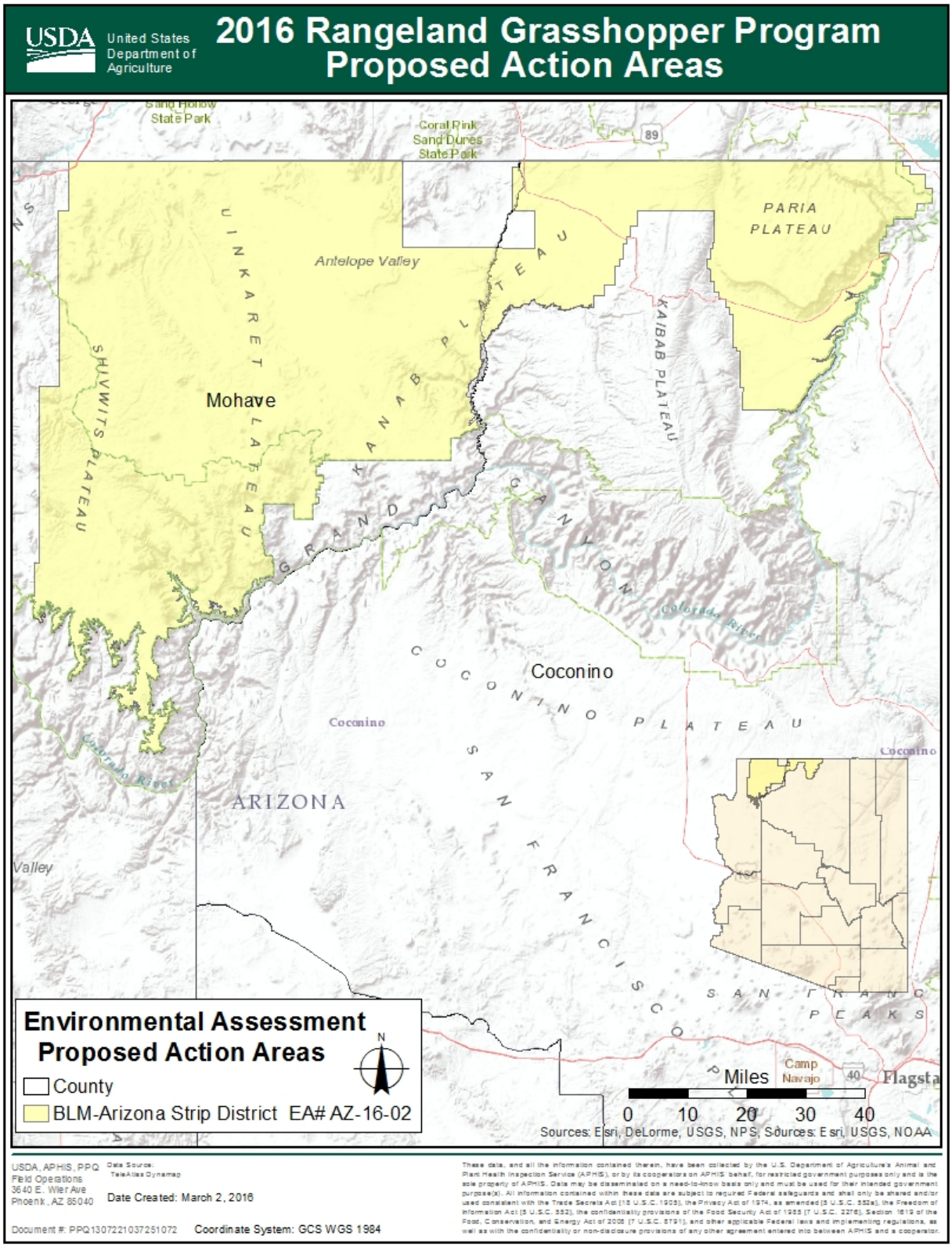
Appendix 2


USDA United States Department of Agriculture
2016 Rangeland Grasshopper Hazard
Legend
Grasshoppers per sq. yard
Based on 2015 Adult Survey
0 - <3 383.3 Million Acres approx.
3 - <8 189.9 Million Acres approx.
8 - <15 40.9 Million Acres approx.
15+ 9.3 Million Acres approx.
Data Source: The data summarized in this map were furnished by the respective state, county, university, and/or federal agency using a variety of survey methods and analytical techniques. Due to funding considerations, states may not have continuous survey coverage. This map was prepared by USDA APHIS PPQ in cooperation with CPHST.
Preparation Notes: Adult and treatment survey densities of adult specimens were interpolated to a maximum buffer distance using an empirical Bayesian kriging model. Areas were then filtered by major water features to produce final acreage estimates. Acreages are approximated based on rounding to millions of acres.
Miles
0 125 250
USDA-APHIS-PPQ
5353 Yellowstone Rd. Ste. 208
Cheyenne, WY 82009
Date: 1/6/2016
Coordinate System: NAD 1983 Albers

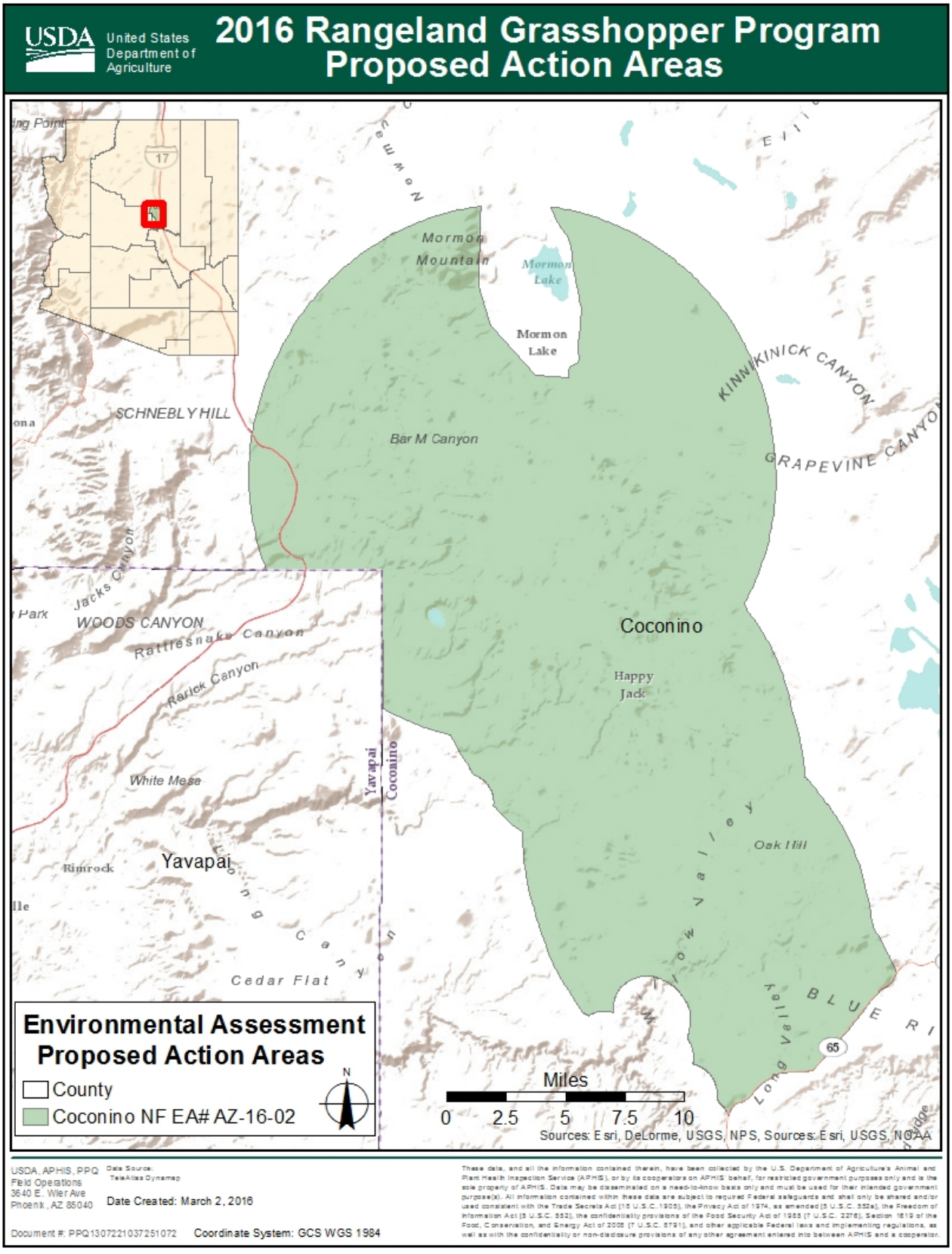
Appendix 3


USDA United States Department of Agriculture
2016 Rangeland Grasshopper Program
Proposed Action Areas
Mohave
Coconino
Navajo
Apache
Yavapai
La Paz
Gila
Maricopa
Greenlee
Pinal
Graham
Yuma
Cochise
Santa Cruz
Environmental Assessment
Proposed Action Areas
Hualapai Tribe EA# AZ-16-01
San Carlos Apache Tribe EA# AZ-16-01
Coronado NF EA# AZ-16-01
BLM-Arizona Strip District EA# AZ-16-02
Coconino NF EA# AZ-16-02
County
Miles
0 25 50 75 100
USDA, APHIS, PPQ
Field Operations
3640 E. Wier Ave
Phoenix, AZ 85040
Data Source:
TeleAtlas Dynamap
Date Created: March 1, 2016
Document #: PPQ1307221037251072
Coordinate System: GCS WGS 1984
These data, and all the information contained therein, have been collected by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), or by its cooperators on APHIS' behalf, for restricted government purposes only and is the sole property of APHIS. Data may be disseminated on a need-to-know basis only and must be used for their intended government purpose(s). All information contained within these data are subject to required Federal safeguards and shall only be shared and/or used consistent with the Trade Secrets Act [18 U.S.C. 1905], the Privacy Act of 1974, as amended [5 U.S.C. 552a], the Freedom of Information Act [5 U.S.C. 552], the confidentiality provisions of the Food Security Act of 1985 [7 U.S.C. 2276], Section 1619 of the Food, Conservation, and Energy Act of 2008 [7 U.S.C. 8791], and other applicable Federal laws and implementing regulations, as well as with the confidentiality or non-disclosure provisions of any other agreement entered into between APHIS and a cooperator.

Appendix 4


USDA United States Department of Agriculture
2016 Rangeland Grasshopper Program
Proposed Action Areas
Sand Hollow State Park
Coral Pink Sand Dunes State Park
89
PARIA PLATEAU
UINKARET PLATEAU
Antelope Valley
KAIBAB PLATEAU
SHIVWITS PLATEAU
Mohave
GRAND CANYON
Colorado River
Coconino
COCONINO PLATEAU
ARIZONA
SAN FRANCISCO PEAKS
Valley
Camp Navajo
40
Flagsta
Environmental Assessment
Proposed Action Areas
N
County
BLM-Arizona Strip District EA# AZ-16-02
Miles
0 10 20 30 40
Sources: Esri, DeLorme, USGS, NPS, Sources: Esri, USGS, NOAA
USDA, APHIS, PPQ
Field Operations
3640 E. Wier Ave
Phoenix, AZ 85040
Data Source:
TeleAtlas Dynamap
Date Created: March 2, 2016
Document #: PPQ1307221037251072
Coordinate System: GCS WGS 1984

Appendix 5


USDA United States Department of Agriculture
2016 Rangeland Grasshopper Program
Proposed Action Areas
Mormon Mountain
Mormon Lake
Mormon Lake
KINNIKINICK CANYON
GRAPEVINE CANYON
SCHNEBLY HILL
Bar M Canyon
Jacks Canyon
WOODS CANYON
Rattlesnake Canyon
Rarick Canyon
Coconino
Happy Jack
White Mesa
Yavapai
Coconino
Yavapai
Rimrock
Oak Hill
Cedar Flat
Long Valley
Long Valley
BLUE RI
65
Environmental Assessment
Proposed Action Areas
County
Coconino NF EA# AZ-16-02
N
Miles
0 2.5 5 7.5 10
Sources: Esri, DeLorme, USGS, NPS, Sources: Esri, USGS, NOAA
USDA, APHIS, PPQ
Field Operations
3640 E. Wier Ave
Phoenix, AZ 85040
Data Source:
TeleAtlas Dynamap
Date Created: March 2, 2016
Document #: PPQ1307221037251072
Coordinate System: GCS WGS 1984
These data, and all the information contained therein, have been collected by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), or by its cooperators on APHIS' behalf, for restricted government purposes only and is the sole property of APHIS. Data may be disseminated on a need-to-know basis only and must be used for their intended government purpose(s). All information contained within these data are subject to required Federal safeguards and shall only be shared and/or used consistent with the Trade Secrets Act [18 U.S.C. 1905], the Privacy Act of 1974, as amended [5 U.S.C. 552a], the Freedom of Information Act [5 U.S.C. 552], the confidentiality provisions of the Food Security Act of 1985 [7 U.S.C. 2276], Section 1619 of the Food, Conservation, and Energy Act of 2008 [7 U.S.C. 8791], and other applicable Federal laws and implementing regulations, as well as with the confidentiality or non-disclosure provisions of any other agreement entered into between APHIS and a cooperator.

APPENDIX 6:
FWS/NMFS Correspondence

United States Department of the Interior
Fish and Wildlife Service
Arizona Ecological Services Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 Fax: (602) 242-2513

In reply refer to:

AESO/SE
02EAAZ00-2016-I-0322
02EAAZ00-2016-SLI-0179
02EAAZ00-2016-SLI-0218

March 21, 2016

Mr. Dewey Murray, Domestic Program Coordinator
U. S. Department of Agriculture
Animal and Plant Health Inspection Service
3658 East Chipman Road
Phoenix, Arizona 85040

Dear Mr. Murray:

Thank you for your February 16, 2016, request for informal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act), received in our office on February 16, 2016. This letter documents our review of the Animal and Plant Health Inspection Service's (APHIS) 2016 Suppression Treatments for Infestations of Rangeland Grasshoppers and Mormon Crickets on the Bureau of Land Management (BLM) Arizona Strip, Mohave and Coconino counties, and on the Coconino National Forest, Coconino County, in compliance with section 7 of the Endangered Species Act of 1973 (Act) as amended (16 U.S.C. 1531 et seq.). APHIS requests our concurrence that the proposed project "may affect, but is not likely to adversely affect" the threatened Mexican spotted owl (*Strix occidentalis lucida*) and its critical habitat, and the experimental non-essential population of the endangered California condor (*Gymnogyps californianus*). We concur with your determinations and provide our rationales below. The same determination was made for the sensitive species northern leopard frog (*Lithobates pipiens*). There is no requirement under section 7 of the Act for you to consult on this species; however, we concur with your determination.

As of September 30, 2010, the Court dissolved the injunction that led to the bald eagle in the Sonoran Desert area being returned to the Endangered Species list in 2008. Therefore, nationwide the bald eagle is no longer on the Endangered Species list, and there is no need to consult under section 7 of the Act. However, we are providing our technical assistance with respect to compliance with the Bald and Golden Eagle Protection Act for bald eagles. Our documentation of APHIS' implementation of minimization measures to reduce the likelihood of take is included in Appendix A.

You also concluded there would be no effect to the threatened Mojave desert tortoise (*Gopherus agassizii*) and its critical habitat, endangered Arizona cliffrose (*Purshia subintegra*), endangered Brady pincushion cactus (*Pediocactus bradyi*), endangered Sentry milk-vetch (*Astragalus cremnophylax var. cremnophylax*), threatened Siler pincushion cactus (*Pediocactus sileri*), threatened Welsh's milkweed (*Asclepias welshii*) and its critical habitat, threatened Jones cycladenia (*Cycladenia jonesii*), endangered Holmgren milk-vetch (*Astragalus holmgrenorium*) and its critical habitat, endangered Gierisch mallow (*Sphaeralcea gierischii*) and its critical habitat, and the endangered Fickeisen plains cactus (*Pediocactus peeblesianus fickeiseniae*) and its proposed critical habitat. Species with no effect determinations do not require review from the FWS, and are not addressed further.

Description of the Proposed Action

A complete description of the proposed action is found in your BA and the accompanying maps. This information is included herein by reference.

The purpose of the proposed action is to suppress economically damaging grasshopper populations on rangeland. The treatment areas include rangeland within a nine mile radius of Brolliar Park and a six mile radius along Forest Highway 4 on the Coconino National Forest, and rangeland on the Arizona Strip in Mohave and Coconino Counties on lands managed by the BLM. Maps of the treatment areas are included in section 7.0 of the BA. All treatment areas are located within rangelands. The suppression action involves a single application of one insecticide early in the life cycle of the target grasshopper species, which include *Aulocara elliotti* and *Melanoplus sanguinipes*. The application time frame is scheduled to begin in April 2016. The insecticides are diflubenzuron (Dimilin®2L) and carbaryl, only one of which will be used per application. The chemical control methods are the use of ultra-low volume (ULV) sprays of both insecticides and carbaryl in bait formulation, using ground or aerial equipment. Insecticides will be applied at conventional rates and complete area coverage, or at rates using reduced agent area treatments (RAATS) or modified RAATS. APHIS will employ buffer zones, within which no pesticide applications will occur, and other conservation measures from the nine biological opinions issued by the FWS for the APHIS control program in 18 western states, and subsequently consolidated in an October 3, 1995, letter from the FWS - Mountain Prairie Region, to the Deputy Director, APHIS. The APHIS will also employ buffer zones and other conservation measures from "Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and Wildlife Service" (USFWS 2007) for species not covered in the aforementioned consultations or whichever buffer is greater. All bodies of water are buffered to prevent contamination, and persistence of insecticides in the environment is limited (maximum half-life in soil is 28 days; six days in water). APHIS will confer with FWS five days before applications and implementation of any protective measures recommended by the local FWS office.

DETERMINATION OF EFFECTS

We concur with your determinations that the proposed action "may affect, but is not likely to adversely affect" the Mexican spotted owl and its critical habitat, California condor, and northern leopard frog for the reasons described below.

Mexican spotted owl and critical habitat

- The proposed action will occur near and/or adjacent to several Mexican spotted owl Protected Activity Centers (PACs) during the breeding season (March 1 through August 31). APHIS will exclude the use of aerial treatments occurring in any forested areas or in designated critical habitat. Ground treatments near areas where spotted owls are known to forage (e.g., Brolliar Park area) will use the RAATS method. APHIS will use all-terrain vehicles or other ground-based methods to apply the chemical over a maximum of two days. Therefore, we believe that potential noise disturbance resulting from insecticide application will be insignificant and discountable to breeding spotted owls in the action area.

- The likelihood of any direct or indirect exposure of Mexican spotted owls to insecticides is extremely low because application will be targeted and the insecticides are expected to be taken up quickly by grasshoppers. In addition, all USFWS (2007) conservation measures for specific insecticides will be implemented, ensuring that any exposure would be insignificant.

- No key habitat components of Mexican spotted owl habitat or primary constituent elements of designated critical habitat will be impacted by the proposed action.

California condor

- No treatments will occur near release sites or in any areas or over terrain considered habitat for nesting or roosting by condors. APHIS will observe a 0.25 mile buffer from currently occupied nests, roosts, or release sites for ground applications, and a 1.5 mile buffer will be applied for aerial applications.

- If flights in the vicinity of a nest are necessary, applicators would maintain a minimal altitude of 3,000 feet near the nest and ensure that pesticide sprayers or spreaders are shut-off.

- The likelihood of any direct or indirect exposure of California condors to insecticides is extremely low because application will be targeted and the insecticides are expected to be taken up quickly by grasshoppers; therefore, any effects to this species are assumed to be discountable.

Northern leopard frog

- Potential habitat for the northern leopard frog exists in the treatment area primarily in the form of stock tanks. Buffers and other conservation measures from USFWS (2007) will be applied to all stock tanks and other bodies of water. Other conservation measures include avoiding application of pesticides before, during, or after precipitation.

- APHIS will apply only RAAT's ground applications of carbaryl bait (pellets) and implement a 100-ft buffer from stock tanks. Only RAAT's ground applications with a 350-ft buffer for applications of diflubenzuron would be implemented near stock tanks.

- Because of these buffers and conservation measures, the likelihood of any indirect exposure of northern leopard frogs to insecticides is extremely low; the magnitude of any exposure would not be detectable due to dilution in water and degradation of the insecticide. Insecticides will not be applied during periods when northern leopard frogs may be foraging away from water (e.g., around rainfall events). Therefore, any effects to this species are assumed to be discountable and insignificant.

In keeping with our trust responsibility to American Indian Tribes, when we enter into consultation with agencies not in the Departments of Interior or Commerce on a proposed action that may affect Indian lands, Tribal trust resources, or Tribal rights, we encourage you to invite the affected Tribe and Bureau of Indian Affairs to participate in the consultation process and, by copy of this letter, are notifying the Kaibab Band of Paiute Indians.

Please note that some projects may potentially impact species that are protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712). Prohibitions under the MBTA include the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except as specifically authorized by the FWS. If you think migratory birds will be affected by this project, we recommend seeking our Technical Assistance to identify available conservation measures that you may be able to incorporate into your project. More information on the MBTA and available permits can be retrieved from http://www.fws.gov/migratorybirds and http://www.fws.gov/migratorybirds/mbpermits.html.

Thank you for your continued coordination. No further section 7 consultation is required for this project at this time. Should project plans change, or if information on the distribution or abundance of listed species or critical habitat becomes available, this determination may need to be reconsidered. In all future correspondence on this project, please refer to the consultation number 02EAAZ00-2016-I-0322. We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department.

Should you require further assistance or if you have any questions, please contact Shaula Hedwall (928-556-2118) or Brian J. Wooldridge (928-556-2106) in our Flagstaff office.

Sincerely,

Brenda H. Smith

for Steven L. Spangle
Field Supervisor

cc (electronic):
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Regional Supervisor, Arizona Game and Fish Department, Flagstaff, AZ
Honorable Chairperson, Kaibab Band of Paiute Indians, Fredonia, AZ
District Ranger, Flagstaff Ranger District, Flagstaff, AZ
District Biologist, Flagstaff Ranger District, Flagstaff, AZ
District Manager, Arizona Strip District Office, St. George, UT
William Austin, Fish and Wildlife Service, Flagstaff, AZ
Brian Wooldridge, Fish and Wildlife Service, Flagstaff, AZ
Greg Beatty, Fish and Wildlife Service, Phoenix, AZ

LITERATURE CITED

U.S. Fish and Wildlife Service, Region 2, Environmental Contaminants Program. 2007. Recommended protection measures for pesticide applications in Region 2 of the U.S. Fish and Wildlife Service. Albuquerque, NM. 205 pp.

APPENDIX A – TECHNICAL ASSISSTANCE

This appendix contains recommendations to APHIS to reduce the likelihood of take of bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*) from implementation of the proposed 2014 Suppression Treatments for Infestations of Rangeland Grasshoppers and Mormon Crickets Project.

The final rule to remove the bald eagle from the Federal List of Threatened and Endangered Species was published in the Federal Register on July 9, 2007, and took effect on August 8, 2007. However, bald and golden eagles continue to be protected by the Bald and Golden Eagle Protection Act (Eagle Act). The Eagle Act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking eagles, including their parts, nests, or eggs. "Take" is defined under the Eagle Act as "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" eagles. Disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based upon the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior (USDI 2007).

APHIS and FWS jointly developed the following conservation measures to minimize impacts to bald eagles in the project area (Lake Mary bald eagle breeding area) and to golden eagles. These measures are consistent with the strategies identified in the Conservation Assessment and Strategy for the Bald Eagle in Arizona (Driscoll et al. 2006). We agree that implementation of the following measures will reduce the likelihood of take.

Bald eagle and golden eagle

1. No treatments will occur within one mile of Lake Mary.

2. APHIS will include a one-mile radius no fly-over and treatment-free buffer around occupied eagle nests.

3. To protect foraging areas, application of diflubenzuron will not occur within 2.5 miles upstream and downstream of a nesting site and within 0.25 miles of waters used as foraging areas.

LITERATURE CITED

Driscoll, J.T., K.V. Jacobsen, G.L. Beatty, J.S. Canaca, and J.G. Koloszar. 2006. Conservation assessment and strategy for the bald eagle in Arizona. Nongame and Endangered Wildlife Program Technical Report 173. Arizona Game and Fish Department, Phoenix, Arizona.

U.S. Department of the Interior (USDI), Fish and Wildlife Service. 2007. Protection of Eagles and Authorizations under the Bald and Golden Eagle Protection Act for Take of Eagles; Final Rule. Federal Register 72(107):31132-31140. June 5, 2007.

APPENDIX 7:
Public Comments and Response
No Public Comments

Table 1. Representative Species

Plants:

SHRUBS
Artemisia tridentata
Chrysothamnus viscid~jlorus
Eriogonum microthecum
Xanthocephalum sarothrae
Prunus andersonii
Purshia lridentata
Tetradymia canescens
Tetradvmia glabrata
Leptodactylon pungens
Chrysothamnus nauseosus
Ephedra viridis
Ephedra nevadensis
Grayia spinosa
Ceratoides lanata
Atriplex canescens

SUCCULENTS
Opuntia polyacantha

GRASSES
Agropyron spicaturn
Bromus tectorum
Oryzopsis hymenoides
Poa canbyi
Poa secunda
Sitanion hystrix
Stipa thurberiana
Elymus cinereus
Stipa columbiana
Bouteloua gracilis
Agropyron smithii
Poa longiligula
Hilaria jamesii
Sporobolus airoides
Sporobolus cryptandrus
Stipa speciosa
Stipa comata

FORBS
Astragalus spp.
Calochortus spp
Castelleja spp.
Caenactis douglasii
Crepis acuminata
Epilobium paniculatum
Lomatium spp.
Mentzelia albicaulis
Penstemon spp.
Phlox gracilis
Viola beckwithii
Zigadenus paniculatus
Phlox dffusa
Lupinus caudatus
Erigeron purnilis
Cryptantha jamesii
Polygonum nurtallii
Aster spp.
Gilia spp.
Erigeron spp.
Townsendia spp.
Sphaeralcea spp

Mammals:

cliff chipmunk (T*amias dorsalis*)
white-throated woodrat (*Neotoma albigula*)
mule deer (*Odocoileus hemionus*)
brush mouse (*Peromyscus boylei*)
Silky Pocket Mouse (*Perognathus flavus hopiensis*)
rock mouse (*P. difficilis*)
white-footed mouse (*P. leucopus*)
eastern cottontail (*Sylvilagus floridanus holzeri*)
Rocky Mountain elk (*Cervus elaphus)*
Pronghorn antelope (*Antilocapra americana)*

Birds:

rufous-crowned sparrow (*Aimophila ruficeps*)
scrub jay (*Aphelocoma coerulescens*)
canyon wren (*Catherpes mexicanus*)
rufous-sided towhee (*Pipilo erythrophthalmus*)
brown towhee (*P. fuscus*)
bushtit (*Psaltriparus minimus*)
black-chinned sparrow (*Spizella atrogularis*)
burrowing owl (*Athene cunicularia*)
Wild turkey (*Meleagris gallopavo merriami)*
Pygmy nuthatch (*Sitta pygmaea)*
Lucy's warbler (*Vermivora luciae)*
Yellow-breasted chat (*Icteria virens)*
Lincoln's sparrow (*Melospiza lincolnii)*
crissal thrasher (*Toxostoma dorsale*)
Pygmy nuthatch (*Sitta pygmaea)*
Cooper's hawk (*Accipiter cooperii*)
northern sage sparrow (*Amphispiza helli nevadensis*)
desert black-throated sparrow (*Amphispiza bilineata deserticola*)
golden eagle (*Ayuila chrysaetos canadensis*)
long-eared owl (*Asio otus wilsonianus*)
red-tailed hawk (*Buteo jamaicensis*)
Swainson's hawk (*Buteo swainsoni*)

western turkey vulture (*Cathartes aura teter*)
nighthawk (*Chordeiles minor*)
marsh hawk (*Circus cyaneus hudsonicus*)
American raven (*Corvus corax sinulatus*)
pinion jay (*Cyanocephalus cyanocephalus*)
Brewer's blackbird (*Euphagus c.vnnocephalus cyanocephalus*)
prairie falcon (*Falco mexicanus*)
Sonoran Desert bald eagle (*Haliaeetus leucocephalus leucocephalus*)
Great Basin shrike (*Lanius ludovicianus nevadensis*)
western mockingbird (*Mimus polyglottos leucopterus*)
green-tailed towhee (*Oberkolseria chlorura*)
sage thrasher (*Oreoscoptes montanus*)
slate-colored fox sparrow (*Passerella iliaca schistacea*)
Nuttall's poor-will (*Phalaenoptilus nuttalii nuttallii*)
American magpie (*Pica pica hudsonia*)
western gnatcatcher (*Polioptila caerulea amoenissima*)
western vesper sparrow (*Pooecetes gramineus confinis*)
rock wren (*Salpinctes obsoletus obsoletus*)
say phoebe (*Sayornis saya saya*)
broad-tailed hummingbird (*Selasphorus platycercus platycercus*)
mountain bluebird (*Sialia currucoides*)
Brewer's sparrow (*Spizella breweri breweri*)
western chipping sparrow (*Spizella passerina arizonae*)
kingbird (*Tvrannus verticalis*)
western mourning dove (*Zenaidura macroura marginella*)
white-crowned sparrow (*Zonotrichia Ieucophrys*)

Amphibians and reptiles:

glossy snake (*Arizona elegans*)
Western rattlesnake (*Crotalus viridis*)
Arizona alligator lizard (*Gerrhonotus kingi*)
night snake (*Hypsiglena torquata*)
Sonoran mountain kingsnake (*Lampropeltis pyromelana*)
southwestern blind snake (*Leptotyphlops humilis*)
Sonora whipsnake (*Masticophis bilineatus*)
desert striped whipsnake (*M. taeniatus*)
western fence lizard (*Scleroporus occidentalis*)
eastern fence lizard (*S. undulates*)
western blackhead snake (*Tantilla planiceps*)
Sonoran lyre snake (*Trimorphodon biscutatus lambda*)
Texas lyre snake (*T. b. vilkinsoni*)
side-blotched lizard (*Uta stansburiana*)
Arizona night lizard (*Zantusia arizonae*)
whip-tail lizard (*Cnemidophorus tessellatus tessellates*)
striped racer (*Coluher taeniatus taeniatus*)
Great Basin rattle snake (*Crotalus viridus lutosus*)
collared lizard (*Crotaphytus collaris baileyi*)
desert horned toad (*Phrynosoma platyrhinos*)
gopher snake (*Pituophis catenijer deserticola*)
sagebrush lizard (*Sceloporus graciosus graciosus*)
Brown-shouldered uta (*Uta stanshuriana stansburiana*)