Site-Specific Environmental Assessment

Rangeland Grasshopper and Mormon Cricket Suppression Program

Box Elder, Davis, Tooele and Utah Counties
Utah

EA Number: UT-05-16

Prepared by:

Animal and Plant Health Inspection Service
Plant Protection and Quarantine
1860 W. Alexander Street, Suite B
West Valley City, Utah 84119

February 2016

Table of Contents

I. Need for Proposed Action l
A. Purpose and Need Statement. l
B. Background Discussion 2
C. About this Process 4

II. Alternatives 4
A. No Action Alternative 5
B. Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative 5
C. Reduced Agent Area Treatments (RAATs) Alternative 6

III. Affected Environment 6
A. Description of Affected Environment 6
B. Site-Specific Considerations 8
1. Human Health 8
2. Nontarget Species 9
3. Socioeconomic Issues 9
4. Cultural Resources and Events 11
5. Special Considerations for Certain Populations 12

IV. Environmental Consequences 14
A. Environmental Consequences of the Alternatives 14
1. No Action Alternative 14
2. Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative 15
3. Reduced Agent Area Treatments (RAATs) Alternative 18
B. Other Environmental Considerations 20
1. Cumulative Impacts 20
2. Executive Order No. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations 20
3. Executive Order No. 13045, Protection of Children from Environmental Health Risks and Safety Risks 21
4. Executive Order 13186, Responsibilities of Federal Agencies to protect Migratory Birds 22
5. Endangered Species Act 22
6. Environmental Monitoring 23

V. Literature Cited 24

VI. Listing of Agencies and Persons Consulted 26

Appendices

Appendix 1: FY-2016 Guidelines for Treatment of Rangelands for Grasshopper and Mormon Crickets, USDA APHIS PPQ Western Region 29

Appendix 2: Map of Affected Environment. 38

Appendix 3: FWS Correspondence 39

Table 1- County List of Utah's Federally Listed Threatened (T), Endangered (E), and Candidate (C) species.

Table 2- Utah's State Listed Species by County.

Table 3- Mitigation Measures- For listed/proposed T&E Species (T&E Spp. Determinations for Utah APHIS GH/MC Suppression Projects).

Site-Specific Environmental Assessment
Rangeland Grasshopper and Mormon Cricket Suppression Program
Box Elder, Davis, Tooele and Utah Counties

I. Need for Proposed Action

A. Purpose and Need Statement

An infestation of grasshoppers and/or Mormon crickets (hereafter referred to collectively as grasshoppers) may occur in Box Elder, Davis, Tooele and Utah Counties, Utah. The Animal and Plant health Inspection Service (APHIS) is evaluating the situation to determine if action is necessary to suppress the infestation to protect rangeland ecosystems and to counter the potential for the pest to spread across rangelands or into surrounding crops and communities. APHIS and Utah Department of Agriculture and Food are proposing a cooperative program to suppress infestations. 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 beginning in Box Elder, Davis, Tooele and Utah Counties, Utah.

Populations of grasshoppers that trigger the need for a suppression program are normally considered on a case-by-case basis. There is no specific population level that triggers APHIS participation. Participation here 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 and/or Mormon crickets. The benefits of treatments include the suppressing of over abundant Mormon crickets and/or grasshopper populations to lower adverse impacts to range plants and adjacent crops. Such would decrease the economic impact to local agricultural operations and permit normal range plant utilization by wildlife and livestock. Some populations that may not cause substantial damage to native rangeland may require treatment due to the secondary suppression benefits resulting from the high value of adjacent crops and damage to revegetation programs.

The goal of the proposed suppression program analyzed in this EA is to reduce grasshopper populations below an economic infestation level in order to protect rangeland ecosystems and/or cropland adjacent to rangeland.

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.

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

B. 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, a 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).

The Utah Agricultural Code, Section 4-35, provides for certain actions authorized by this "Insect Infestation Emergency Control Act." It authorizes the Utah Commissioner of Agriculture to appoint members to a Decision and Action Committee, who are directly affected by and involved in the current insect infestation emergency. The committee establishes a system of priorities for any insect infestation emergency, and members of USDA, APHIS, PPQ in Utah currently serve on the committee and are being asked to help address the grasshopper/Mormon cricket problem which this document analyzes.

The Commissioner of Agriculture, with the consent of the governor of Utah, has declared that this infestation jeopardizes property and resources and has designated, with the help of APHIS surveys, the areas affected. He has initiated operations to control the problem in those designated areas and has requested APHIS to enter into a cooperative agreement with the Utah Department of Agriculture and Food in order to cooperatively attack the infestations and mitigate consequences related thereto.

APHIS and the Forest Service (FS) signed a Memorandum of Understanding (MOU) detailing cooperative efforts between the two groups on suppression of grasshoppers and Mormon crickets on national forest system lands (Document #08-8100-0573-MU September 08, 2008). This MOU clarifies that APHIS will prepare and issue to the public site-specific environmental documents that evaluate potential impacts associated with proposed measures to suppress economically damaging grasshopper and Mormon cricket populations. The MOU also states that these documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from the Forest Service.

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 national forest land is necessary. The FS must also approve a Pesticide Use Proposal (Form FS-2100-2) 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.

APHIS (Animal & Plant Health Inspection Service) and the Bureau of Land Management (BLM) signed a Memorandum of Understanding (MOU) Document #09-8100-0807-MU February 2009 detailing cooperative efforts between the two groups on suppression of grasshoppers.This MOU clarifies that APHIS will prepare and issue to the public site-specific environmental documents that evaluate potential impacts associated with 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 BLM.

Further, the MOU 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 document and BLM approves the Pesticide Use Proposal.

In June 2010, APHIS and the Bureau of Indian Affairs (BIA) signed a Memorandum of Understanding (MOU) detailing cooperative efforts between the two groups concerning suppressing of grasshoppers on BIA system lands (Document# 10-8100-0941-MU, June 14, 2010). This MOU clarifies that APHIS would 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 would be prepared under the APHIS NEPA-implementing procedures with cooperation and input from the BIA. The MOU further states that the responsible BIA official would request in writing the inclusion of appropriate lands in the APHIS suppression project when treatment on BIA-administered lands is necessary. According to the provisions of the MOU, APHIS can begin treatments after APHIS issues an appropriate document and the BIA requests the project in writing.

C. 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 treatment in Box Elder, Davis, Tooele and Utah Counties. 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 Box Elder, Davis, Tooele and Utah Counties 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.

II. **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, and (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 USDA, APHIS, PPQ, 1860 W. Alexander St., #B, West Valley, UT 84119.

The 2002 EIS is intended to support 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. 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 and Mormon cricket suppression are used in accordance with all 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 the APHIS' *FY-2003 Guidelines for Treatment of Rangelands for Grasshopper and Mormon Crickets, USDA APHIS PPQ Western Region, March 21, 2002* (Guidelines), included as Appendix 1 to this EA.

A. 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.

B. 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 traditionally have 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% 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 non-target 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 IV of this document.

C. Reduced Agent Area Treatments (RAATs) Alternative

Alternative C, RAATs, is a grasshopper suppression method in which the rate of insecticide is reduced from conventional levels, and/or 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,
- 10.0 pounds of 2 or 5% carbaryl bait applied by skipping multiple swaths (2 or more),
- 1.0 fluid ounce of diflubenzuron applied in alternate or every third swath(s).

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 IV of this document.

III. Affected Environment

A. Description of Affected Environment

The proposed suppression program area included in the EA encompasses 10,745,192 acres (16,789 sq. miles) within northwestern Utah. This represents 20% of the land in Utah. Approximately 54.4% of the land within the four-county area is classified as federal; 5.4% of the acreage is state and the remaining 40.1% of the land is private. The four-county area consists of foothills, higher elevation mountain ranges, lowland areas of native and improved rangeland, arid desert lowlands, short isolated mountain ranges, irrigated pastures, croplands and orchards.

Almost all of Box Elder County lies within the Great Basin. The area is semi-arid with an average precipitation of 8 to 12 inches per year at lower elevations and 16-30 inches at mountain elevations. The length of the growing season is related to elevation, averaging 100-130 days. The climate is characterized by low relative humidity and precipitation, rapid evaporation, generally clear skies

and daily and annual fluctuations in temperatures, i.e. cold winters, hot summers and days generally at least twenty degrees warmer than nights.

Elevation within Box Elder County ranges from 4,212 ft. at the surface of the Great Salt Lake to 9,046 ft. at Ingham Peak in the northwestern portion of Box Elder County. Soils are clay and generally fine textured with poor drainage near the Great Salt Lake. Extreme aridity and sparse vegetation permit critical, natural wind erosion. Higher elevation soils contain more sand and silt and are more susceptible to water erosion. The soils range from non-saline to very strongly saline, and some are moderately to strongly alkaline.

Native vegetation types within Box Elder County are cold, desert shrub to woodland communities, including saltbush and greasewood. Greasewood, rabbitbrush and sagebrush dominate the lower elevations, and pinyon-juniper are common on the intermediate slopes. The moister canyons and northern exposures contain stands of intermediate slopes. The moister canyons and northern exposures contain stands of cottonwood, box elder, and mountain maple. Higher elevation, moist sites contain some aspen, Douglas fir and spruce. Gambel oak is common on higher elevations. Salt grass, cheat grass, mixed native grass and forb communities are common throughout the county; however, there is a decided lack of vegetation in the black sage type.

Most of Davis County is also in the Great Basin Physiograph Province. Davis County consists largely of lake terraces that were formed by prehistoric Lake Bonneville and alluvial fans adjacent to the Wasatch Mountains. Elevations range from 4,220 to 5,220 ft., with some as high as 9,700 ft. Antelope Island is a large remnant of a block-faulted mountain in the Great Salt Lake.

The climate of Davis County ranges from dry sub-humid to moist sub-humid. Average annual rainfall is 12 to 20 inches in the valleys and averages 30 to 50 inches in the higher elevations. Most of the precipitation occurs from November through April in the form of snow and spring rains. The climate is warm and dry in the summer and cold, but not severe, in the winter. The growing season is long enough for most crops, especially orchard fruits.

Davis County soils near the Great Salt Lake are on undrained flats in a closed basin. They have a high salt content and consist of very alkaline sediments. These clay areas are subject to extreme wind erosion. Thick, dark, relatively fertile mollisols occur in the lake terraces and foothills. These well-drained upland soils are able to support agriculture, rangeland, recreation, and wildlife habitat. Antelope Island is characterized by thin, light-colored, alkaline aridisols suitable for limited grazing, recreation and wildlife habitat.

Native vegetation in Davis County ranges from perennial grasses and shrubs in the sagebrush association, through a transitional shadscale association between the saline desert area and the sagebrush zone of the foothill-lake terrace area.

Forested stands of aspen, maple and conifers occurs at the highest elevations. Rangelands are used to graze cattle, sheep, and horses. Sagebrush association occurs on the western side of Antelope Island. Saline desert covers the remaining portion of the island. Seventy percent of the island is considered suitable for grazing. Native bunch grasses are being reseeded to improve the range for wildlife and a state-managed buffalo herd.

Tooele and Utah Counties also lie within the Great Basin, an area devoid of external drainage. The soils of the area are mainly mollisols and aridisols, with smaller pockets of playa and entisols. The mollisols are at higher elevations and are relatively fertile. Aridisols, occurring at lower elevations, are thin soils that can be strongly alkaline and may have cropping potential if irrigated. Native vegetation ranges from desert shrubs including greasewood, salt bushes and shad scale, with a dominance of sagebrush steep vegetation mixed with pinyon-juniper as the elevation increases. The wet, north slopes of the mountains contain stands of conifers, mountain shrubs, aspen and Douglas fir. In addition, there are various noxious weeds which may at times be treated by landowner/manager(s).

Agricultural areas within Box Elder, Davis, Tooele and Utah Counties include native rangeland, improved pasture, dryland wheat, barley and irrigated cropland (i.e. alfalfa, onions, hay, potatoes, tomatoes and fruit orchards).

Within Box Elder, Davis, Tooele and Utah Counties, surface water resources consist of the Great Salt Lake, Willard Bay, Bear River, Raft River, Weber River, Davis-Weber Canal, Utah Lake, Mona Reservoir, Jordan River, some intermittent live streams, ponds, stock tanks and troughs, seeps and springs. Stream habitat is generally fair to good condition, while the reservoirs and other water resources provide adequate water for wildlife, livestock, irrigation and domestic use. These and all other waters are protected with buffer zones for water outlined in the operations procedures. (See Appendix 2 for relevant maps.)

B. Site-Specific Considerations

1. Human Health

The major population centers within Box Elder, Davis, Tooele and Utah Counties are sparse with the exception of those found in Davis, Tooele and Utah Counties. The total population of the four counties is approximately 643,948 (nearly 30% entire population of Utah).

Potential exposures to the general public from traditional 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. Program use of carbaryl, malathion and

Dimilin has occurred routinely in many past programs, and there is a lack of any adverse health efforts reported from these projects. Therefore, routine safety precautions are anticipated to continue to provide adequate protection of worker health. Immunotoxic effects from carbaryl and malathion exposure are generally expected at concentrations much higher than those from grasshopper/Mormon cricket applications, but individuals with allergic or hypersensitive reactions to the insecticides or other chemicals in the formulated product could be affected. These individuals will be advised to avoid treatment areas at the time of application until the insecticide has time to dry on the treated vegetation.

2. Nontarget Species

The Utah Division of Wildlife Resources (DWR) January 1992 (revised) list of native Utah Species of Special Concern is attached (see table 2). Some of the species listed in that attachment are listed by the U.S. Fish and Wildlife Service as threatened, endangered, or proposed threatened or endangered species. These species are found in various locations throughout the state, but no distribution map is available. The list is provided to inform the reader that there are species of concern throughout the state. It also emphasizes the necessity for strict adherence to proper application procedures and associated mitigation measures to avoid unacceptable impacts to wildlife.

Several wildlife species within Box Elder, Davis, Tooele and Utah Counties, as well as statewide, that are of concern to the Utah Division of Wildlife Resources are: white-faced ibis, long-billed curlew, western snowy plover, mountain plover, snowy plover, American white pelican, double-crested cormorant, Caspian tern, purple martin, Williamson's sapsucker, grasshopper sparrow, osprey, Lewis' woodpecker, western bluebird, ferruginous hawk, Swainson's hawk and burrowing owl. These species' populations are either declining or are limited in their distribution.

Upland game birds which occur in the area include: sage grouse, ring-necked pheasant, ruffed and blue grouse, chukar and Hungarian partridge, sharp-tailed grouse, mourning dove and quail. Shorebirds, seagulls, waders and other waterfowl occur in wetland and mash habitats. Salt marshes around the Great Salt Lake serve as magnet for waterfowl migrating over the region's vast areas of mountain and desert country. State waterfowl management areas in Farmington bay, Howard Slough and Ogden Bay provide excellent food and cover.

Mule deer, black bear, cougar, bobcat, coyote, elk, bighorn sheep, wild horses, antelope and deer occupy portions of the combined four-county area as well. Plans are underway to introduce antelope, elk and bighorn sheep to Antelope Island State Park in Davis County. A unique genetic strain of buffalo is also intensively managed at Antelope Island State Park.

3. Socioeconomic Issues

Recreation use is moderate over most of the affected area. There are several dispersed camping sites. Hunting seasons increase recreation use in the form of dispersed camping and general hunting activity. Hunting season occurs later in the year during a time when cricket populations have begun to dwindle such that fewer insects are present. Hunters probably will not be affected. ATV use is fairly prevalent throughout.

The presence of high densities of grasshoppers or Mormon crickets will result in fewer people engaging in recreational activities during the spring and summer within the affected areas. High insect densities in a campsite detract considerably from the quality of the recreational experience. Crickets tend to get into unsecured tents and food.

The quality of the recreational experience for ATV users and horseback riders also will be indirectly impaired by high densities of grasshoppers and/or crickets. Such numbers crossing roads and trails are killed by vehicle traffic, leaving windrows of dead insects in the travel way as well as providing a vehicular safety hazard by leaving slick residues on local roads.

People who normally recreate in areas that are heavily infested will likely relocate to areas that are not infested. Displacement of users will be more of an inconvenience to the public than an actual effect on the recreational values of the area. Displacement will also increase pressure on other public lands as people move to new locations to camp and to engage in other recreational activities. Social capacity tolerances will be impacted. The potential for user conflict will increase, in particular as motorized recreationists displace to other already heavily used areas. Such locations will experience more pressure and may experience site degradation. Areas currently not impacted or used by dispersed campers may become subjected to use and development as people look for areas for recreation which are not infested with insects.

Small towns near the affected areas receive limited business from recreationists who visit public lands. Many local gas stations/public stores rely fairly heavily on summer business to support their operations.

Livestock grazing is one of the main uses of most of the affected area, which provides summer range for ranching operations.Permittees may run cattle, sheep and/or horses for a season that runs generally from the first of June to the end of September, weather and vegetation conditions permitting.

A substantial threat to the animal productivity of these rangeland areas is the proliferation of grasshopper/Mormon cricket populations. These insects have been serious pests in the western states since early settlement. Weather

conditions favoring the hatching and survival of large numbers of insects can cause outbreak populations, resulting in damage to vegetation. The consequences may reduce grazing for livestock and result in loss of food and habitat for wildlife.

Livestock grazing on public lands contributes important cultural and social values to the area. Intertwined with the economic aspects of livestock operations are the lifestyles and culture that have co-evolved with Western ranching. Rural social values and lifestyles, in conjunction with the long heritage of ranching and farming continue to this day, dating back to the earliest pioneers in Utah, who shaped the communities and enterprises that make up much of the state. The rural Western lifestyle also contributes to tourism in the area, presenting to travelers a flavor of the West through tourist-oriented goods and services, photography of sheep bands or cattle in pastoral settings and scheduled events.

Ranchers displaced from public lands due to early loss of forage from insect damage will be forced to search for other rangeland, to sell their livestock prematurely or to purchase feed hay. This will affect other ranchers (non-permittees) by increasing demand, and consequently, cost for hay and/or pasture in the area. This will have a beneficial effect on those providing the hay or range, and a negative impact on other ranchers who use these same resources throughout the area: In addition, grazing on private lands resulting from this impact will compound the effects to vegetation of recent drought conditions over the last six years (e.g., continual heavy utilization by grasshoppers/crickets, wildlife and wildfire), resulting in longer-term impacts (e.g., decline or loss of some preferred forage species) on grazing forage production on these lands.

The lack of treatment would result in the eventual magnification of grasshopper/Mormon cricket problems resulting in increased suppression efforts, increased suppression costs and the expansion of suppression needs onto lands where such options are limited. For example, control needs on crop lands where chemical options are restricted because of pesticide label restrictions. Under the no action alternative, farmers would experience economic losses. The suppression of grasshoppers and/Mormon crickets in the affected area would have beneficial economic impacts to local landowner, farmers and beekeepers. Crops near infested lands would be protected from devastating migrating hordes, resulting in higher crop production; hence, increased monetary returns.

4. Cultural Resources and Events

Federal and state lands that are part of the region's visual and cultural resources include the Caribou, Manti-La Sal, Sawtooth, Uinta, and Wasatch National forests; Skull Valley and Washakie Indian Reservations; Bear River National Migratory Bird Refuge and Fish Springs National Wildlife Refuge; Timpanogos

Cave National Monument; Mt. Nebo, Mt. Timpanogos, Lone Peak and Desert Peak Wilderness areas, and Timpi Springs, Locomotive Springs, Salt Creek Public Shooting Grounds, Harold S. Crane, Howard Slough and Farmington Bay Waterfowl Management Areas.

A broad variety and number of activities have occurred, are occurring or will occur throughout the area of concern that affect cultural resources. These activities and any cumulative impacts associated with them will occur regardless of whether or not grasshoppers/Mormon crickets are treated.

Use of motorized equipment off existing roads could impact surface artifacts by damaging them or displacing them in their overall juxtaposition with other artifacts. Maintaining the integrity of a historical site is important to understanding the significance of the site and the artifacts found therein. Non-treatment of infested land will likely later result in more intensive and extensive treatment of that infested land. Most of the non-public lands that will be affected have already been heavily disturbed and any artifacts on them likely impacted. Consequently, it is unlikely that additional Sevin XLR bait treatments will result in additional impacts on cultural properties.

With no treatment of grasshoppers or crickets on public lands, aerial application of insecticides off public lands will likely increase. Though this should not disturb or displace cultural artifacts, carrying agents in the spray could damage artifacts (USDA, APHIS EIS, 2002, p. 71). However, most if not all of the areas likely to be treated have been heavily disturbed in the past, and any artifacts on them likely impacted. Consequently, it is unlikely that these aerial treatments will result in additional impacts on cultural properties.

Motorized vehicles (pick-up trucks and/or ATV's) may be used to treat portions of the affected areas. This will create a risk of impacting cultural properties. The risk is small given that the off-road use of vehicles will create only minor soil disturbance, and the areas involved are not likely to contain significant sites of which public officials are not already aware. Known sites will be avoided to mitigate impacts. Any sites located during treatment activities will be reported, then avoided during continuing operations. Past similar grasshopper/cricket treatments throughout the state have not resulted in any known impacts to cultural properties.

In addition to the treatments proposed under this alternative, a broad variety and number of activities throughout the project area could affect, or have affected, cultural resources. These activities and any cumulative impacts associated with them will occur, regardless of whether or not grasshoppers/crickets are treated. No direct, indirect or change in cumulative impacts on cultural resources in the area will occur due to implementation of the treatment alternative.

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 BLM, Forest Service or other appropriate land management agency on a local level to protect these areas of special concern. APHIS also will 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, such as sundances, on tribal lands.

5. Special Considerations for Certain Populations

a. 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.

The human population at most sites in grasshopper programs is diverse and lacks any special characteristics that implicate greater risks of adverse effects for any minority or low-income populations. A demographic review in the APHIS EIS 2002 revealed certain areas with large populations, Spanish speaking populations and some with large American Indian tribal populations. Low-income farmers and ranchers would comprise, by far, the largest group affected by APHIS program efforts in this area of concern.

When planning a site-specific action related to grasshopper/Mormon cricket infestations, APHIS considers the potential for disproportionately high and adverse human health or environmental impacts of its actions on minority and low-income populations before any proposed action. In doing so, APHIS program managers will work closely with representatives of these populations in the locale of planned actions through public meetings.

APHIS intervention to locally suppress damaging insect infestations will stand to greatly benefit, rather than harm, low-income farmers and ranchers by helping them to control insect threats to their livelihood. Suppressing grasshopper or Mormon cricket infestations on adjacent public or private rangelands will increase inexpensive available forage for their livestock and will

significantly decrease economic losses to their crop lands by invading insects. Such would obviate the need to perform additional expensive crop pesticide treatments or to provide supplemental feed to their livestock which would further impact low-income individuals.

In past grasshopper programs, the U.S. Department of the Interior's (USDI) Bureau of Land Management or Bureau of Indian Affairs (BIA) have notified the appropriate APHIS State Plant Health Director when any new or potentially threatening grasshopper infestation is discovered on BLM lands or tribal lands held in trust and administered by BIA. Thus, APHIS has cooperated with BIA when grasshopper programs occur on Indian tribal lands. For local Indian populations, APHIS program managers will work with BIA and local tribal councils to communicate information to tribal organizations and representatives when programs have the potential to impact the environment of their communities, lands or cultural resources. In past grasshopper/cricket programs, APHIS has worked cooperatively with American Indian groups and will continue to do so in the future.

b. 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).

Treatments used for grasshopper programs are primarily conducted on open rangelands where children would not be expected to be present during treatment or enter during the restricted entry period after treatment. Based on review of the insecticides and their use in programs, the risk assessment concludes that the likelihood of children being exposed to insecticides from a grasshopper or Mormon cricket program is very slight and that no disproportionate adverse effects to children are anticipated over the negligible effects to the general population.

IV. 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 that include insecticide application are: (1) the potential effects of the three pesticide options on human health (including subpopulations that might be at increased risk); and (2) impacts of pesticides on non-target organisms (including threatened and endangered species). Assessments of the relative risk of each pesticide option are discussed in detail in the 2002 EIS document.

A. Environmental Consequences of the Alternatives

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

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 or lost to erosion.

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.

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 possible 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 could be reduced if exposed to diflubenzuron, but these decreases would be expected to be temporary given the quick dilution rate of Dimilin in water bodies and the rapid regeneration 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 a suggestive 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 to 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 decreased 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 non-target 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).

3. Reduced Area Agent Treatments (RAATs) Alternative

Under Alternative 3, either the insecticide carbaryl, diflubenzuron or malathion would be used at a reduced rate and/or over reduced areas of coverage. Rarely would APHIS apply more than a single treatment to an area per year. The insecticide application rate under the RAATs strategy may be reduced 50 - 67 percent from the conventional rates for carbaryl and malathion and 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.

Carbarylwill most likely affect non-target 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. CarbarylULV 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. Carbarylbait also has minimal potential for direct effects on birds and mammals. Field studies indicated that bee populations did not decline after carbaryl bait treatments, and American kestrels were unaffected by bait applications made at a RAATs rate. Using alternating swaths will furthermore reduce adverse effects because organisms that are in untreated swaths will be mostly unexposed to carbaryl.

Carbarylapplied 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 could be reduced if exposed to diflubenzuron, but these decreases should be temporary given the quick dilution rate of Dimilin in water bodies and the rapid regeneration time of many aquatic invertebrates.

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 non-target organisms than would occur in blanket treatments. Birds in RAATs areas were not substantially affected. Should malathion applied at RAATs rates enter water, it may 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).

B. Other Environmental Considerations

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."

The Bureau of Land Management could apply herbicides for the control of federal noxious weeds throughout some of the potential grasshopper/Mormon cricket suppression areas. The timing of such treatments should not coincide, so there would be little reason to suspect that any adverse synergistic chemical effects would occur. In any event, before any APHIS program, discussions will be held with land-managing officials to ensure that the two programs would not cause increased injurious effects to any treatment area.

Private agricultural entities could apply herbicides or insecticides to their cropland during times which could coincide with APHIS programs. APHIS' policy requires that grasshoppers/crickets may only be treated on private rangelands, so that cumulative impacts would not result.

2. Executive Order No. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

The human population at most sites in grasshopper programs is diverse and lacks any special characteristics that implicate greater risks of adverse effects for any minority or low-income populations. A demographic review in the APHIS EIS 2002 revealed certain areas with large populations, Spanish-speaking populations and some with large American Indian tribal populations. Low-income farmers and ranchers would comprise, by far, the largest group affected by APHIS program efforts in this area of concern.

When planning a site-specific action related to grasshopper/Mormon cricket infestations, APHIS considers the potential for disproportionately high and adverse human health or environmental impacts of its actions on minority and low-income populations before any proposed action. In doing so, APHIS program managers will work closely with representatives of these populations in the locale of planned actions through public meetings.

APHIS intervention to locally suppress damaging insect infestations will stand to greatly benefit, rather than harm, low-income farmers and ranchers by helping them to control insect threats to their livelihood. Suppressing grasshopper or Mormon cricket infestations on adjacent public or private range lands will increase inexpensive available forage for their livestock and will significantly decrease economic losses to their crop lands by invading insects. Such would obviate the need to perform additional expensive crop pesticide treatments or to provide supplemental feed to their livestock which would further impact low-income individuals.

In past grasshopper programs, the U.S. Department of the Interior's (USDI) Bureau of Land Management or Bureau of Indian Affairs (BIA) or tribal liasons have notified the appropriate APHIS State Plant Health Director when any new or potentially threatening grasshopper infestation is discovered on BLM lands or tribal lands held in trust and administered by BIA. Thus, APHIS has cooperated with BIA and tribal leaders when grasshopper programs occur on

Indian tribal lands. For local Indian populations, APHIS program managers will work with BIA and local tribal councils to communicate information to tribal organizations and representatives when programs have the potential to impact the environment of their communities, lands or cultural resources. In past grasshopper/cricket programs, APHIS has worked cooperatively with American Indian groups and will continue to do so in the future.

3. Executive Order No. 13045, Protection of Children from Environmental Health Risks and Safety Risks

Treatments used for grasshopper programs are primarily conducted on open rangelands where children would not be expected to be present during treatment or enter during the restricted entry period after treatment. Based on review of the insecticides and their use in programs, the risk assessment of the 2002 APHIS EIS concludes that the likelihood of children being exposed to insecticides from a grasshopper or Mormon cricket program is very slight and that no disproportionate adverse effects to children are anticipated over the negligible effects to the general population.

Impacts on children will be minimized by the implementation of the 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 treatment). Refer to label recommendations related to restricted entry period.

- No treatments will occur over congested urban areas. For all flights over congested areas, the contractor must submit a plan to the appropriate FAA 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 fen-ying 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 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.

Based on the analysis and the protection measures, we have determined that there will be no impact on children within any potential treatment zones in the areas of concern.

4. 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.

5. Endangered Species Act

APHIS is consulting with the U. S. Fish and Wildlife Service (USFWS) to discuss Section 7 consultation as required by the Endangered Species Act of 1973. The mitigation measures from the consultations are listed in the appendix tables. APHIS has also consulted with the Utah Division of Wildlife Resources (UDWR). Included in Appendix 3 is the listing of "Federally Listed and Proposed Endangered, Threatened and Candidate Species and Habitat in Utah by County" (Table 1). Also included are "Utah's State Listed Species by County" (Table 2).

The 2005 biological opinion issued by the USFWS in Utah lists the mitigations to be followed by APHIS when conducting a program to suppress grasshoppers with carbaryl bait and diflubenzuron. This list is included in Appendix 3 (Table 3). Mitigation measures for the use of carbaryl bait and diflubenzuron for new listings (since 2005) of endangered, threatened and proposed species which have been included during informal Section 7 consultation are also included in Appendix 3 (Table 3) based upon local consultation with the USFWS .

APHIS is not required to develop mitigation measures for candidate or other species of concern but will follow the requesting land managing agency's sensitive species policy. Local program consultation with the requesting agency will determine if and when mitigation measures might be implemented during a suppression program.

The most recent national biological opinion on the grasshopper program issued by FWS was for the 1996 program. APHIS prepared a biological assessment for the 1998 program, but no biological opinion was prepared because control

programs were not anticipated that year. In following years, no biological assessment was prepared since control programs were not anticipated. A national biological assessment for the Rangeland Grasshopper and Mormon Cricket Suppression Program is currently under way, but the process for its completion and consideration by FWS will not be concluded in time for the 2015 season. In order to comply with the section 7 requirements APHIS conducts ongoing informal consultations with FWS, locally. The 1996 biological opinion and 1998 biological assessment will be used as a basis for these local consultations and are incorporated into this EA by reference.

6. Environmental 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 applications 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/mbl/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).

V. Literature Cited

Adams, J.S., Knight, R.L., McEwen, L.C., and George, T.L., 1994. Survival and growth of nestling vesper sparrow exposed to experimental food reductions. The Condor 96:739-748.

Beyers, D.W.., Farmer, M.S., and Sikoski, P.J., 1995. Effects of rangeland aerial application of Sevin-4-0il® on fish and aquatic inverterbrate drift in the Little Missouri River, North Dakota. Archives of Environmental Contamination and Toxicology 28:27-34.

Catangui, M.A., Fuller, B.W., and Walz, A.W., 1996. Impact of Dimilin® on nontarget arthropods and its efficacy against rangeland grasshoppers. *In* U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 1996. Grasshopper Integrated Pest Management User Handbook, Tech. Bul. No. 1809. Sec. VII.3. Washington, DC.

Dobroski, C.J., O'Neill, E.J., Donohue, J.M., and Curley, W.H., 1985. Carbaryl: a profile of its behavior in the environment. Roy F. Weston, Inc., West Chester, PA, and V.J. Ciccone and Associates, Inc., Woodbridge, VA.

Eisler, R., 2000. Handbook of chemical risk assessment: health hazards to humans, plants, and animals. Lewis Publishers, New York.

Emmett, B.J., and Archer, B.M, 1980. The toxicity of diflubenzuron to honey bee *(Apis melifera* L.) Colonies in apple orchards. Plant Pathology 29:637-183.

EPA - see U.S. Environmental Protection Agency

Hazardous Substances Database, 1990. On-line database. National Library of Medicine, Bethesda, MD.

HSDB - see Hazardous Substances Database

Mayer, F.L., Jr, and Ellersieck, M.C., 1986. Manual of acute toxicity: interpretation and data base for 410 chemicals and 66 species of freshwater animals. Resource Publication 160. Department of the Interior, Fish and Wildlife Service, Washington, DC.

McEwen, L.C., Althouse, C.M., and Peterson, B.E., 1966a. Direct and indirect effects of grasshopper integrated pest management (GHIPM) chemicals and biologicals on nontarget animal life. In U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 1996. Grasshopper

Integrated Pest Management User Handbbok, Tech. Bul. No. 1809. Sec. III.2. Washington, D.C.

McEwen, L.C., Petersen, B.E., and Althouse, C.M., 1996b. Bioindicator species for evaluation potential effects of pesticides on threatened and endangered wildlife, In U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 1996. Grasshopper Integrated Pest Management User Handbook, Tech. Bul. No. 1809. Sec II.7. Washington, D.C.

Opdycke, J.C., Miller, R.W., and Menzer, R.E., 1982. Metabolism and fate of diflubenzuron in swine. Journal of Agricultural Food and Chemistry 30:1223-1227.

Quinn, M.A., 1996. Impact of control programs on nontarget arthropods. *In* U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 1996. Grasshopper Integrated Pest Management User Handbook, Tech. Bul. No. 1809. Sec. III.3. Washington, DC.

Schroeder, W.J., Sutton, R.A., and Beavers, L.B., 1980. *Diaprepes abbreviatus:* Fate of diflubenzuron and effect on nontarget pest and beneficial species after application to citrus for weevil control. J. Econ. Entomol. 73:637-638.

Tsuda, T., Aoki, S., Kojima, M., and Harada, H., 1989. Bioconcentration and excretion of diazinon, IBP, malathion, and fenitrothion by willow shiner. Toxicology and Environmental Chemistry 24:185-190.

USDA – see U.S. Department of Agriculture

U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 1998. Safety and health manual. Safety, Health, and Environmental Staff, Riverdale, MD. February 28, 1998. [online] available: http://www.aphis.usda.gov/mb/aseu/shes/shes-manual.html

U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 1999. APHIS Directive 5600.3, Evaluating APHIS programs and activities for ensuring protection of children from environmental health risks and safety risks. September 3, 1999. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Riverdale, MD. [online] available: http://www.aphis.usda.gov /library/directives.

U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 2002. Rangeland Grasshopper and Mormon Cricket Suppression program. Final environmental 96 Impact Statement – 2002. Literature referenced but not cited listed in 2002 FEIS http://www.aphis.usda.gov/library/directives.

U.S. Environmental Protection Agency, 1993. Carcinogenicity peer review of carbaryl, 1-napthyl n-methylcarbamate. MRID 421889-01, 02. Memorandum from Ray Landolt, Toxicological Branch II, October 7, 1993, 35 pp

U.S. Environmental Protection Agency, 2000. Cancer Assessment Document #2. Evaluation of the carcinogenic potential of malathion. Report of the 12 April 2000 meeting and its 29 attachments. April 28, 2000. U.S. Environmental Protection Agency, Washington, DC.

VI. Listing of Agencies and Persons Consulted

A. Bureau of Land Management

Bonebrake, Becky, Wildlife Biologist, Cedar City, UT Field Office

Brown, Jack, Emergency Stabilization Rehab Coordinator, UT State Office

Bass, Alan, Rangeland Management Specialist, UT State Office

Curtis, Paul, Range Management Specialist, Monticello, UT Field Office

Dragt, William, Former Lead Rangeland Management Specialist, Salt Lake, UT Field Office

Egerton, Craig, Renewable Resources Team Leader, Cedar City, UT Field Office

Ivory, Karl, Rangeland Management Specialist, Price, UT Field Office

Leany, Kim, Rangeland Management Specialist, Saint George, UT Field Office

Nebeker, Glenn, Former Assistant Field Manager, Fillmore, UT Field Office

Smith, Verlin, Resource Manager, UT State Office

Williams, Burke, Natural Resource Specialist, Richfield, UT Field Office

B. Utah Department of Agriculture and Food

Burfitt, Clint, Former State Survey Entomologist

Blackham, Leonard, Former Commissioner of

Agriculture Hougaard, Robert, Director of Plant

C. USDA, APHIS

Brown, Charles L., National Grasshopper Program Manager

King, Robert, Utah State Plant Health Director

McNary, Timothy, Former Senior Western Regional Program Manager

D. USDA, Forest Service

Karp, Peter, Uinta National Forest Supervisor

DePietro, Marlene, Uinta N.F. Rangeland Mgmt. Specialist

Erickson, Mary, Former Fishlake National Forest Supervisor

Barnhurst, Dale, Fillmore District Ranger

Pope, Reese, Uinta N.F. Ecosystem Group Leader

E. USDI, Fish and Wildlife Service

Converse, Yvette, Former Fisheries Biologist

England, Larry, Former Threatened & Endangered Species Specialist

Romin, Laura, T. and E. Supervisor

Waddell, Bruce, Environmental Contaminants Specialist

F. Utah Division of Wildlife Resources

Bonebrake, Bruce, Upland Game Manager, Southern Region

Olsen, David, Former State Upland Game Program

Coordinator Southerland, Dennis, Central Region Biologist

G. Utah State University Extension Service

Nelson, Mark, Beaver

Cooper, Troy, Duchesne

Iron, Chad, Iron

Banks, Jeff, Juab

Wilde, Trent, Millard

Gale, Jody, Sevier County Agriculture Agent

Greenhalgh, Linden, Tooele

H. Utah County Commissioners

I. Whatcott, Bart, Millard County Topham, Gordon, Sevier County

Rees, Suzanne, Box Elder County

I. State Legislators

Okerlund, Ralph, Senator, District 24

Noel, Michael, Representative, District 73

J. Federal Legislators

Bishop, Robert, Representative, District 1

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 effected.

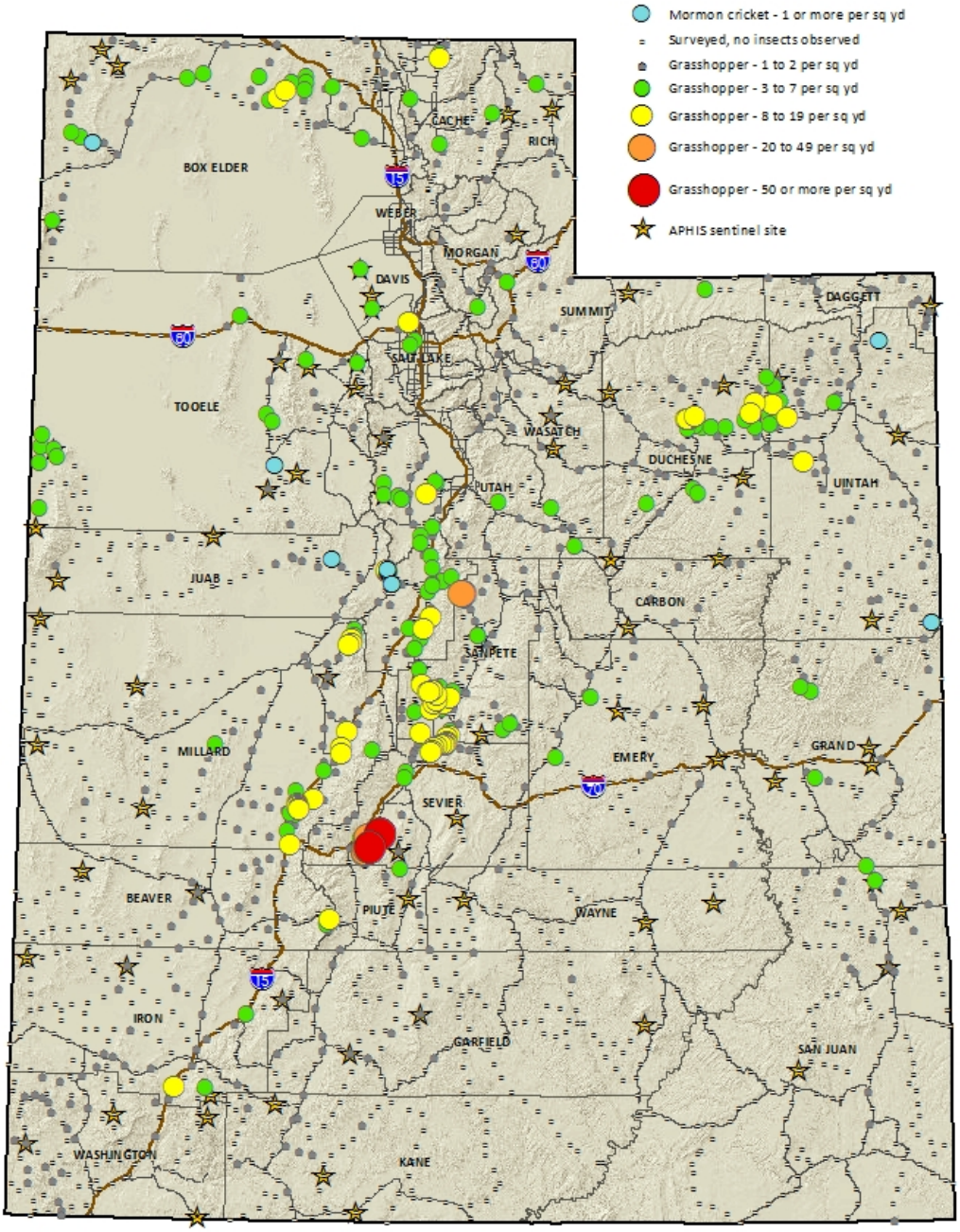
3. Weather conditions will be monitored and documented during application and treatment will be suspended when conditions could jeopardize the correct spray placement or pilot safety.

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: Map of Affected Environment
2015 Rangeland Grasshopper Hazard Map

2015 Grasshopper and Mormon Cricket Survey



APPENDIX 3: FWS Correspondence

Table 1- County List of Utah's Federally Listed Threatened (T), Endangered (E), and Candidate (C) Species.

Table 2- Utah's State-Listed Species by County

Table 3- Mitigation Measures- For listed/proposed T&E Species (T&E Species Determinations for Utah APHIS GH/MC Suppression Projects) – from 2005-2015 APHIS USFWS Local Consultation).

TABLE 1

Utah's Federally (US F&WS) Listed

Threatened (T), Endangered (E), and Candidate (C) Plant Species

Common Name	Scientific Name	Status	County of Occurrence
Monocot Plants:			
Family Cyperaceae			
Navajo Sedge	*Carex specuicola*	T	San Juan.
Family Orchidaceae			
Ute Ladies'-tresses	*Spiranthes diluvialis*	T	Daggett, Duchesne, Juab, Garfield, Tooele, Uintah, Utah, Wasatch, & Wayne. Formerly Salt Lake & Weber.
Dicot Plants:			
Family Apocynaceae			
Jones Cycladenia	*Cycladenia humilis var jonesii*	T	Emery, Garfield, Grand, & Kane.
Family Asclepiadaceae			
Welsh's Milkweed	*Asclepias welshii*	T	Kane.
Family Asteraceae			
Last Chance Townsendia	*Townsendia aprica*	T	Emery, Sevier, & Wayne.
Family Brassicaceae			
Barneby Ridge-cress	*Lepidium barnebyanum*	E	Duchesne.
Kodachrome Bladderpod	*Lesquerella tumulosa*	E	Kane.
Clay Reed-mustard	*Schoenocrambe argillacea*	T	Uintah.
Barneby Reed-mustard	*Schoenocrambe barnebyi*	E	Emery & Wayne.
Shrubby Reed-mustard	*Glaucocarpum suffrutescens*	E	Duchesne & Uintah.
Ostler Peppergrass	*Lepidium ostleri*	C	Beaver.
Family Cactaceae			
San Rafael Cactus	*Pediocactus despainii*	E	Emery & Wayne.
Siler Pincushion Cactus	*Pediocactus sileri*	T	Kane & Washington.
Winkler Pincushion Cactus	*Pediocactus winkleri*	T	Emery & Wayne.
Pariette Cactus	*Sclerocactus brevispinus*	T	Duchesne & Uintah.
Uinta Basin Hookless Cactus	*Sclerocactus wetlandicus*	T	Carbon, Duchesne, & Uintah.
Wright Fishhook Cactus	*Sclerocactus wrightiae*	E	Emery, Sevier, & Wayne.
Family Fabaceae			
Deseret Milkvetch	*Astragalus desereticus*	T	Utah.
Shivwits or Shem Milkvetch	*Astragalus ampullarioides*	E	Washington.
Holmgren Milkvetch	*Astragalus holmgreniorum*	E	Washington.
Heliotrope Milkvetch	*Astragalus montii*	T	Sanpete & Sevier.
Goose Creek Milkvetch	*Astragalus anserinus*	C	Box Elder.
Frisco Clover	*Trifolium friscanum*	C	Beaver & Millard.
Family Hydrophyllaceae			
Clay Phacelia	*Phacelia argillacea*	E	Utah.
Family Malvaceae			
Gierisch Mallow	*Sphaeralcea gierischii*	C	Washington.
Family Papaveraceae			
Dwarf Bearclaw-poppy	*Arctomecon humilis*	E	Washington.
Family Polygonaceae			
	Eriogonum corymbosum var.		

Niles's Wild Buckwheat	*nilesii*	C	Kane, Washington.
Frisco Buckwheat	*Eriogonum soredium*	C	Beaver.

Family Primulaceae

Maguire Primrose	*Primula maguirei*	T	Cache.

Family Ranunculaceae

Autumn Buttercup	*Ranunculus aestivalis*	E	Garfield.

Family Scrophulariaceae

Graham Beardtongue	*Penstemon grahamii*	T Proposed	Carbon, Duchesne, & Uintah.
White River Beardtongue	*Penstemon scariosus var albifluvis*	C	Uintah.

Utah's Federally Listed
Threatened (T), Endangered (E), and Candidate (C) Invertebrate Species

Common Name	Scientific Name	Status	County of Occurrence
Mollusks:			
Kanab Ambersnail	*Oxyloma kanabense*	E	Kane.
Insects:			
Coral Pink Sand Dunes Tiger Beetle	*Cicindela limbata albissima*	C	Kane.

Utah's Federally Listed
Threatened (T), Endangered (E), and Candidate (C) Vertebrate Species

Common Name	Scientific Name	Status	County of Occurrence
Amphibians:			
Relict Leopard Frog	*Rana onca*	C Extirpated	Formerly Washington.
Fishes:			
Lahontan Cutthroat Trout	*Oncorhynchus clarkii henshawi*	T	Introduced in Box Elder.
Humpback Chub	*Gila cypha*	E	Carbon, Emery, Garfield, Grand, San Juan, Uintah, & Wayne. Possibly Duchesne. Formerly Daggett & Kane.
Bonytail	*Gila elegans*	E	Carbon, Emery, Garfield, Grand, San Juan, Uintah, & Wayne. Possibly Duchesne. Formerly Daggett & Kane.
Least Chub	*Iotichthys phlegethontis*	C	Box Elder, Davis, Iron, Juab, Millard, Salt Lake, Tooele & Utah.
Virgin Chub	*Gila seminuda*	E	Washington.
Colorado Pikeminnow	*Ptychocheilus lucius*	E	Carbon, Daggett, Emery, Garfield, Grand, San Juan, Uintah, & Wayne. Possibly Duchesne. Formerly Kane.
Woundfin	*Plagopterus argentissimus*	E	Washington.
June Sucker	*Chasmistes liorus*	E	Utah. Introduced in Box Elder, Salt Lake, & Weber.
Razorback Sucker	*Xyrauchen texanus*	E	Carbon, Emery, Garfield, Grand, San Juan, Uintah, & Wayne. Possibly Duchesne. Formerly Daggett & Kane.
Reptiles:			
Desert Tortoise	*Gopherus agassizii*	T	Washington.
Birds:			
California Condor	*Gymnogyps californianus*	E Experimental	Visits Southern Utah from Northern Arizona. Formerly Beaver & Iron. Formerly
Whooping Crane	*Grus americana*	E Extirpated	passed through E Utah.
Yellow-billed Cuckoo	*Coccyzus americanus*	C	Occurs or possible in all counties.
Mexican Spotted Owl	*Strix occidentalis lucida*	T	Emery, Garfield, Iron, Kane, San Juan, Washington, & Wayne. Possibly Carbon & Grand.
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E	Kane, San Juan & Washington.
Greater Sage-grouse	*Centrocercus urophasianus*	C	Occurs or possible in all counties.
Gunnison Sage-grouse	*Centrocercus minimus*	C	Grand & San Juan.

Mammals:			
Utah Prairie-dog	*Cynomys parvidens*	T	Beaver, Garfield, Iron, Kane, Millard, Piute, Sanpete, Sevier, & Wayne.
Gray Wolf	*Canis lupus*	E	Formerly found throughout Utah.
Brown (Grizzly) Bear	*Ursus arctos*	T Extirpated	Formerly found throughout Utah.
Black-footed Ferret	*Mustela nigripes*	E Experimental	Unconfirmed sightings persist from Carbon, Daggett, Duchesne, Emery, Grand, Rich, San Juan, & Summit. Introduced as experimental non-essential in Uintah.
Canada Lynx	*Lynx canadensis*	T	Daggett, Duchesne, Summit, Uintah, & Wasatch. Formerly Sanpete. Possibly Cache, Morgan, Rich, Salt Lake, Utah, & Weber.

DEFINITIONS

A taxon that is listed by the U.S. Fish and Wildlife Service as "endangered" with the possibility of worldwide extinction.

E Experimental An "endangered" taxon that is considered by the U.S. Fish and Wildlife Service to be "experimental and non-essential" in its designated use areas in Utah.

E, T, or C Extirpated An "endangered," "threatened," or "candidate" taxon that is "extirpated" and considered by the U.S. Fish and Wildlife Service to no longer occur in Utah.

E or T Proposed A taxon "proposed" to be listed as "endangered" or "threatened" by the U.S. Fish and Wildlife Service.

A taxon that is listed by the U.S. Fish and Wildlife Service as "threatened" with becoming endangered.

A taxon for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threats to justify it being a "candidate" for listing as endangered or threatened.

TABLE 2

Utah
Department of Natural Resources
Division of Wildlife Resources

Utah Sensitive Species List

March 29, 2011

This list has been prepared pursuant to Utah Division of Wildlife Resources Administrative Rule R657-48. By rule, wildlife species that are federally listed, candidates for federal listing, or for which a conservation agreement is in place automatically qualify for the *Utah Sensitive Species List*. The additional species on the *Utah Sensitive Species List*, "wildlife species of concern," are those species for which there is credible scientific evidence to substantiate a threat to continued population viability. It is anticipated that wildlife species of concern designations will identify species for which conservation actions are needed, and that timely and appropriate conservation actions implemented on their behalf will preclude the need to list these species under the provisions of the federal Endangered Species Act. Please see Appendix A for the rationale behind each wildlife species of concern designation.

Fishes

Federal Candidate Species

Least Chub*	*Iotichthys phlegethontis*

Federally Threatened Species

Lahontan Cutthroat Trout (introduced)	*Oncorhynchus clarkii henshawi*

Federally Endangered Species

Humpback Chub	*Gila cypha*
Bonytail	*Gila elegans*
Virgin Chub	*Gila seminuda*
Colorado Pikeminnow	*Ptychocheilus lucius*
Woundfin	*Plagopterus argentissimus*
June Sucker	*Chasmistes liorus*
Razorback Sucker	*Xyrauchen texanus*

Conservation Agreement Species*

Bonneville Cutthroat Trout	*Oncorhynchus clarkii utah*
Colorado River Cutthroat Trout	*Oncorhynchus clarkii pleuriticus*
Virgin spinedace	*Lepidomeda mollispinis mollispinis*
Roundtail Chub	*Gila robusta*
Bluehead Sucker	*Catostomus discobolus*
Flannelmouth Sucker	*Catostomus latipinnis*

Wildlife Species of Concern

Northern Leatherside Chub	*Lepidomeda copei*
Southern Leatherside Chub	*Lepidomeda aliciae*
Desert Sucker	*Catostomus clarkii*
Yellowstone Cutthroat Trout	*Oncorhynchus clarkii bouvieri*
Bear Lake Whitefish	*Prosopium abyssicola*
Bonneville Cisco	*Prosopium gemmifer*
Bonneville Whitefish	*Prosopium spilonotus*
Bear Lake Sculpin	*Cottus extensus*

*Least chub is a Federal Candidate Species and a Conservation Agreement Species.

Amphibians

Federal Candidate Species

Relict Leopard Frog (extirpated)	*Rana onca*

Federally Threatened Species

(None)

Federally Endangered Species

(None)

Conservation Agreement Species

Columbia Spotted Frog	*Rana luteiventris*

Wildlife Species of Concern

Western Toad	*Bufo boreas*
Arizona Toad	*Bufo microscaphus*
Great Plains Toad	*Bufo cognatus*

Reptiles

Federal Candidate Species

(None)

Federally Threatened Species

Desert Tortoise	*Gopherus agassizii*

Federally Endangered Species

(None)

Conservation Agreement Species

(None)

Wildlife Species of Concern

Zebra-tailed Lizard	*Callisaurus draconoides*
Western Banded Gecko	*Coleonyx variegatus*
Desert Iguana	*Dipsosaurus dorsalis*
Gila Monster	*Heloderma suspectum*
Common Chuckwalla	*Sauromalus ater*
Desert Night Lizard	*Xantusia vigilis*
Sidewinder	*Crotalus cerastes*
Speckled Rattlesnake	*Crotalus mitchellii*
Mojave Rattlesnake	*Crotalus scutulatus*
Cornsnake	*Elaphe guttata*
Smooth Greensnake	*Opheodrys vernalis*
Western Threadsnake	*Leptotyphlops humilis*

Birds

Federal Candidate Species

Yellow-billed Cuckoo	*Coccyzus americanus*
Greater Sage-grouse	*Centrocercus urophasianus*
Gunnison Sage-grouse*	*Centrocercus minimus*

Federally Threatened Species

Mexican Spotted Owl	*Strix occidentalis lucida*

Federally Endangered Species

California Condor (experimental)	*Gymnogyps californianus*
Whooping Crane (extirpated)	*Grus americana*
Southwestern Willow Flycatcher	*Empidonax traillii extimus*

Conservation Agreement Species*

Northern Goshawk	*Accipiter gentiles*

Wildlife Species of Concern

Bald Eagle	*Haliaeetus leucocephalus*
Grasshopper Sparrow	*Ammodramus savannarum*
Short-eared Owl	*Asio flammeus*
Burrowing Owl	*Athene cunicularia*
Ferruginous Hawk	*Buteo regalis*
Black Swift	*Cypseloides niger*
Bobolink	*Dolichonyx oryzivorus*
Lewis's Woodpecker	*Melanerpes lewis*
Long-billed Curlew	*Numenius americanus*
American White Pelican	*Pelecanus erythrorhynchos*
Three-toed Woodpecker	*Picoides tridactylus*
Sharp-tailed Grouse	*Tympanuchus phasianellus*
Mountain Plover	*Charadrius montanus*

*Gunnison sage-grouse is a Federal Candidate Species and a Conservation Agreement Species.

Mammals

Federal Candidate Species

(None)

Federally Threatened Species

Utah Prairie-dog	*Cynomys parvidens*
Brown/Grizzly Bear (extirpated)	*Ursus arctos*
Canada Lynx	*Lynx canadensis*

Federally Endangered Species

Black-footed Ferret (experimental, non-essential in Duchesne and Uintah counties)	*Mustela nigripes*
Gray Wolf	*Canis lupus*

Conservation Agreement Species

(None)

Wildlife Species of Concern

Preble's Shrew	*Sorex preblei*
Townsend's Big-eared Bat	*Corynorhinus townsendii*
Spotted Bat	*Euderma maculatum*
Allen's Big-eared Bat	*Idionycteris phyllotis*
Western Red Bat	*Lasiurus blossevillii*
Fringed Myotis	*Myotis thysanodes*
Big Free-tailed Bat	*Nyctinomops macrotis*
Pygmy Rabbit	*Brachylagus idahoensis*
Gunnison's Prairie-dog	*Cynomys gunnisoni*
White-tailed Prairie-dog	*Cynomys leucurus*
Silky Pocket Mouse	*Perognathus flavus*
Dark kangaroo Mouse	*Microdipodops megacephalus*
Mexican Vole	*Microtus mexicanus*
Kit Fox	*Vulpes macrotis*

Mollusks

Federal Candidate Species

(None)

Federally Threatened Species

(None)

Federally Endangered Species

Kanab Ambersnail
Oxyloma kanabense

Conservation Agreement Species

(None)

Wildlife Species of Concern

California Floater

Anodonta californiensis
Western Pearlshell

Margaritifera falcata

Southern Tightcoil	*Ogaridiscus subrupicola*
Eureka Mountainsnail	*Oreohelix eurekensis*
Lyrate Mountainsnail	*Oreohelix haydeni*
Brian Head Mountainsnail	*Oreohelix parawanensis*
Deseret Mountainsnail	*Oreohelix peripherica*
Yavapai Mountainsnail	*Oreohelix yavapai*
Cloaked Physa	*Physa megalochlamys*
Utah Physa	*Physella utahensis*
Wet-rock Physa	*Physella zionis*
Longitudinal Gland Pyrg	*Pyrgulopsis anguina*
Smooth Glenwood Pyrg	*Pyrgulopsis chamberlini*
Desert Springsnail	*Pyrgulopsis deserta*
Otter Creek Pyrg	*Pyrgulopsis fusca*
Hamlin Valley Pyrg	*Pyrgulopsis hamlinensis*
carinate Glenwood Pyrg	*Pyrgulopsis inopinata*
Ninemile Pyrg	*Pyrgulopsis nonaria*
Bifid Duct Pyrg	*Pyrgulopsis peculiaris*
Bear Lake Springsnail	*Pyrgulopsis pilsbryana*
Black Canyon Pyrg	*Pyrgulopsis plicata*
Sub-globose Snake Pyrg	*Pyrgulopsis saxatilis*
Southern Bonneville Pyrg	*Pyrgulopsis transversa*
Northwest Bonneville Pyrg	*Pyrgulopsis variegate*

Table 3

THREATENED & ENDANGERED SPECIES DETERMINATIONS FOR UTAH APHIS 2016 GRASSHOPPER/MORMON CRICKET SUPPRESSION PROJECTS

1. California condor (*Gymnogyps californianus*): California condors were released as part of Recovery Program efforts in northern Arizona beginning in the late 1990's. Sightings of the birds that were released have since been made almost statewide. Condors prefer mountainous country at low and moderate elevations, especially rocky and brushy areas near cliffs. California condors eat carrion, usually feeding on large items such as dead sheep, cattle and deer. Due to their foraging habits and preferences, the proposed APHIS grasshopper/Mormon cricket suppression program is unlikely to affect California condors. In addition, condors to date are occasional and temporary visitors to the state and are unlikely to contact suppression activities.

2. Canada lynx (*Lynx canadensis*): The preferred habitat of the Canada lynx is montane coniferous forest. The proposed APHIS suppression program will have no effect on or cause no jeopardy to any population of Canada lynx since projects will avoid known or historic species habitat areas.

3. Black-footed ferret (*Mustela nigripes*): Possibly found in Carbon, Daggett, Duchesne, Emery, Grand, Rich, San Juan, Summit and Uintah Counties. Black-footed ferrets live in underground prairie dog burrows and eat prairie dogs as their primary food source. The black-footed ferret is, therefore, closely associated with prairie dog towns. For this reason, the major threat to the species is the decimation of prairie dog colonies through plague, poisoning and habitat loss. The only known population occurs in Coyote Basin, Uintah County. Direct toxic effects from carbary bait are low since plant-based baits are not sought-after food items for ferrets. Indirect effects by consumption of contaminated insects or prairie dogs might occur. Though prairie dogs may ingest carbaryl bait, and therefore, transfer that consumed carbaryl to a predator like the ferret, the potential for adverse effects remains low due to the unlikelihood of encountering significant quantities. Ten pounds of 2 percent active ingredient per acre maximum application rates preclude ingestion of sufficient toxin by insects or prairie dogs, themselves, to cause undesirable effects to ferrets. Direct toxic effects from Dimilin are low since diflubenzuron is slightly to very slightly toxic to mammals (Maas *et al.*, (1981). There would be few if any indirect effects from the use of Dimilin. The proposed APHIS suppression program is not likely to adversely affect this species. PROTECTIVE MEASURES: No aerial application of Dimilin within 1 mile and no ground applications within 0.25 mile of the edge of identified habitat.

4. Gray Wolf (*Canis lupus*): Potentially could be found at any given time, depending upon their transient nature, throughout Utah. Direct toxic effects from carbaryl bait are low since wolf foraging habits preclude the likelihood of ingestion. Wolves may consume insects; therefore, indirect effects from carbaryl bait are remotely possible, but large quantities of contaminated insects would have to be consumed for such to occur. Rapid decomposition rates of dead insects, quickly making them unpalatable as food items, coupled with low application rates, minimize the risk of adverse effects on wolves from carbaryl bait treatments. Direct toxic effects from Dimilin are low since diflubenzuron is slightly to very slightly toxic to mammals (Maas *et al.,* (1981). There would be no indirect effects from the use of Dimilin. The proposed

APHIS suppression program would not likely adversely affect this species. PROTECTIVE MEASURES: None.

5. Utah prairie dog (*Cynomys parvidens*): Found in Beaver, Garfield, Iron, Kane, Millard, Piute, Sanpete, Sevier and Wayne Counties. Direct toxic effects from carbaryl bait are moderate since prairie dogs may ingest it. However, 10 pounds per acre maximum application rates preclude ingestion of sufficient toxin to create behavioral anomalies, let alone mortality, due to the unlikelihood of encountering significant quantities. Since prairie dogs may consume insects, indirect effects from carbaryl bait are possible, but large quantities of contaminated insects would have to be consumed for such to occur. Rapid decomposition rates of dead insects, quickly making them unpalatable as food items, coupled with low application rates, minimize the risk of adverse effects on prairie dogs from carbaryl bait treatments. Direct toxic effects from Dimilin are low since diflubenzuron is slightly to very slightly toxic to mammals (Maas *et al.,* (1981). There would be no indirect effects from the use of Dimilin. The proposed APHIS suppression program would not likely adversely affect this species. PROTECTIVE MEASURES: Avoid using any pesticide within 1 mile of occupied and historic habitat.

6. Gunnison Sage-Grouse (*Centrocercus minimus*): Found in Grand and San Juan Counties. Male Gunnison sage-grouse conduct an elaborate display when trying to attract females on breeding grounds, or leks in the spring. Nesting begins in mid-April and continues into July. Gunnison sage-grouse require a variety of habitats such as large expanses of sagebrush with a diversity of grasses and forbs and healthy wetland and riparian ecosystems. It requires sagebrush for cover and fall and winter food. Direct toxic effects from carbaryl bait are low (Peach *et al.,* 1994), but there may be minimal indirect effects since the young of this species depend upon arthropod groups for food. The use of carbaryl baits temporarily may lower the insect food base in the immediate area, though certainly not sufficiently to create adverse consequences to immature sage-grouse. Direct toxic effects from Dimilin are low since diflubenzuron is slightly to very slightly toxic to birds, but there may be minimal indirect effects such as a slight reduction in available prey items. The proposed APHIS suppression program will not likely adversely affect this species. PROTECTIVE MEASURES: No ground/aerial application will occur within 1 mile of known leks between March and July. Otherwise, no ground/aerial applications within 100/500 ft. of the edge of occupied habitat.

7. Mexican spotted owl (*Strix occidentalis lucida*): Possibly found in Carbon, Emery, Grand, Garfield, Iron, Kane, San Juan, Washington and Wayne Counties. In Utah spotted owls occupy and nest in rocky canyon habitats. Nests are located on cliffs and in caves. Mexican spotted owls feed mainly on small rodents, but also consume rabbits and other small vertebrates, including birds, reptiles and insects. Direct toxic effects from carbaryl bait are low since owls do not directly ingest it and since they do not depend on arthropod groups for food or seed dispersal. (George *et al*., 1992). Indirect toxic effects from carbaryl bait are low due to low application rates (10 pounds per acre or less) and small bait particle sizes, which preclude birds and small mammals from encountering sufficient quantities of toxin to cause adverse consequences to them or to owls which might consume them. APHIS only applies baits to areas of high grasshopper or Mormon cricket densities (8 or more per square yard), so any bait treatment is quickly and nearly totally consumed by the insects. Any remaining bait rapidly degrades from exposure to the elements (dew and higher soil pH's). Birds and rodents may prey upon debilitated insects, but rapid decomposition rates quickly make dead insects unpalatable. That, coupled with low application rates, makes it unlikely that spotted owls would be adversely

affected by eating birds or small mammals that may prey upon insects debilitated by carbaryl bait treatments. APHIS ground baiting protocol excludes treatment near the canyon habitats that spotted owls use for nesting. Direct and indirect toxic effects from Dimilin are also low since diflubenzuron is slightly to very slightly toxic to birds (Wilcox and Coffey, 1978). The proposed APHIS suppression program will not likely adversely affect this species. PROTECTIVE MEASURES: No aerial application will occur within 1 mile of suitable nesting habitat, and ground applications will be no closer than 0.25 mile to nesting habitat.

8. Southwestern willow flycatcher (*Empidonax traillii extimus*): Possibly found in Kane, San Juan and Washington Counties. The southwestern willow flycatcher utilizes dense riparian habitats. Forage items include insects, seeds and berries. Direct toxic effects from carbaryl bait are low (Peach *et al.,* 1994), but there may be minimal indirect effects since this species depends on arthropod groups for food. The use of carbaryl baits may temporarily lower the insect food base in the immediate area, though certainly not sufficiently to create adverse consequences to flycatchers. Direct toxic effects from Dimilin are low since diflubenzuron is slightly to very slightly toxic to birds, but there may be minimal indirect effects such as a slight reduction in available prey items. The proposed APHIS suppression program will not likely adversely affect this species. PROTECTIVE MEASURES: No aerial application will occur within 1 mile of suitable nesting habitat, and ground applications will be no closer than 0.25 mile to nesting habitat.

9. Yellow-billed Cuckoo (*Coccyzus americanus*): Found throughout Utah. The yellow-billed cuckoo uses wooded habitat with dense cover and water nearby. Its nests in the West are often placed in willows along streams and rivers, with nearby cottonwoods serving as foraging sites. They sometimes lay their eggs in other birds' nests. Cuckoos feed on insects (especially caterpillars), spiders, frogs, lizards, fruits and seeds. Direct toxic effects from carbaryl bait are low (Peach *et al.,* 1994), but there may be minimal indirect effects since this species depends upon arthropod groups for food. The use of carbaryl baits may temporarily lower the insect food base in the immediate area, though certainly not sufficiently to create adverse consequences to cuckoos. Direct toxic effects from Dimilin are low since diflubenzuron is slightly to very slightly toxic to birds, but there may be minimal indirect effects such as a slight reduction in available prey items. The proposed APHIS suppression program will not likely adversely affect this species. PROTECTIVE MEASURES: No aerial application will occur within 1000 ft. and no ground application will occur within 500 ft. of the edge of known locations of yellow-billed cuckoos or their critical habitat.

10. Bonytail (*Gila elegans*): Found in Carbon, Emery, Garfield, Grand, Kane, San Juan, Tooele, Uintah, Wayne and possibly Duchesne and formerly Daggett Counties. Bonytail are opportunistic feeders, eating insects, zooplankton, algae and higher plant matter. Although bonytail spawning in the wild is now rare, spawning occurs in the spring and summer over gravel substrate. Most bonytail are now produced in hatcheries and released into the wild as adults. Direct toxic effects from carbaryl bait are low since APHIS ground applicators remain at least 50 feet from water which precludes any bait from entering a water body, even during and after heavy rains. Carbaryl rapidly decomposes in the presence of water and soils with higher pH's. Indirect effects from carbaryl bait are also low. Insects that ingest the bait are incapacitated by it within a matter of a minute or so; therefore, few could hop or fly into water bodies after bait consumption (APHIS personal experience). The use of bait near streams would not likely create an unnatural influx of contaminated grasshoppers or crickets into the water, so that fish might prey on them. Direct toxic effects from diflubenzuron are also low since it is only slightly toxic to

fish (Willcox and Coffey, 1978; Julin and Sanders, 1978). Indirect effects from either carbaryl bait or Dimilin are minimal due to APHIS's standard practice of maintaining 50 foot buffers with ground applications of bait and 500 foot buffers with aerial sprays around water. The proposed APHIS suppression program will not likely adversely affect this species. PROTECTIVE MEASURES: No aerial applications within 1 mile of habitat or no ground treatments within 500 feet of habitat.

11. Colorado pikeminnow (*Ptychocheilus lucius*): Found in Carbon, Daggett, Emery, Garfield, Grand, San Juan, Uintah, Wayne and possibly Duchesne and formerly Kane Counties. Colorado pikeminnows are primarily piscivorous (they eat fish), but smaller individuals also eat insects and other invertebrates. The species spawns during the spring and summer over riffle areas with gravel or cobble substrate. Eggs are randomly broadcast onto the bottom, and usually hatch in less than one week. The proposed APHIS suppression program will not likely adversely affect this species. Direct and indirect toxic effects and PROTECTIVE MEASURES same as # 10.

12. Greenback cutthroat trout (*Oncorhynchus clarki stomias*): Found in San Juan County. The greenback cutthroat trout is a member of the Salmonidae family and is a subspecies of *O. clarki*. The subspecies feeds on aquatic insects as well as terrestrial invertebrates. It spawns in the spring in riffle areas when water temperatures reach 5-8 degrees C. It requires clear, swift-flowing mountain streams with cover such as low, overhanging banks and vegetation. The proposed APHIS suppression program will not likely adversely affect this species. Direct and indirect toxic effects and PROTECTIVE MEASURES same as # 10.

13. Humpback chub (*Gila cypha*): Found in Carbon, Daggett, Emery, Garfield, Grand, San Juan, Uintah, Wayne and possibly Duchesne and formerly Kane Counties. Humpback chub primarily eat insects and other invertebrates, but algae and fishes are occasionally consumed. The species spawns during the spring and summer in shallow, backwater areas with cobble substrate. Young humpback chub remain in these slow, shallow, turbid habitats until they are large enough to move into white-water areas. The proposed APHIS suppression program will not likely adversely affect this species. Direct and indirect toxic effects and PROTECTIVE MEASURES same as # 10.

14. Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*): The Lahontan cutthroat trout is a race of the cutthroat trout native to the Lahontan Basin of Oregon, California, and western Nevada. It has been introduced and become established in the Pilot Peak Range of western Box Elder County, Utah. Like other cutthroat races, the Lahontan cutthroat is an opportunistic feeder, with the diet of small individuals dominated by invertebrates, and the diet larger individuals composed primarily of fish. The proposed APHIS suppression program will not likely adversely affect this species. Direct and indirect toxic effects and PROTECTIVE MEASURES same as # 10.

15. June sucker (*Chasmistes liorus*): Found in Box Elder, Salt Lake, Utah and Weber Counties. June suckers are members of the sucker family, but they are not bottom feeders. The jaw structure of the June sucker allows the species to feed on zooplankton in the middle of the water column. June sucker adults leave Utah Lake and swim up the Provo River to spawn in June of each year. Spawning occurs in shallow riffles over gravel or rock substrate. Fertilized eggs sink to the stream bottom, where they hatch in about four days. The proposed APHIS suppression program will not likely adversely affect this species. Direct and indirect toxic effects and PROTECTIVE MEASURES same as # 10.

16. Virgin chub (*Gila seminuda*): Found in Washington County. Virgin chub are opportunistic feeders, consuming zooplankton, aquatic insect larvae, other invertebrates, debris and algae. Interestingly, the diet of many adults is composed primarily of algae, whereas the diets of younger fish contain more animal matter. The species spawns during late spring and early summer over gravel or rock substrate. The proposed APHIS suppression program will not likely adversely affect this species. Direct and indirect toxic effects and PROTECTIVE MEASURES same as # 10.

17. Woundfin (*Plagopterus argentissimus*): Found in Washington County, the species is now restricted to the Virgin River system. Woundfin diets are quite varied, consisting of insects, insect larvae, other invertebrates, algae, and detritus. The species spawns during the spring in swift shallow water over gravel substrate. The proposed APHIS suppression program will not likely adversely affect this species. Direct and indirect toxic effects and PROTECTIVE MEASURES same as # 10.

18. Razorback sucker (*Xyrauchen texanus*): Found in Carbon, Daggett, Emery, Garfield, Grand, San Juan, Uintah, Wayne and possibly Duchesne and formerly Kane Counties. The razorback sucker eats mainly algae, zooplankton and other aquatic invertebrates. The species spawns from February to June, and each female may deposit over 100,000 eggs during spawning. The proposed APHIS suppression program will not likely adversely affect this species. Direct and indirect toxic effects and PROTECTIVE MEASURES same as # 10.

19. Desert tortoise (*Gopherus agassizii*): Found in Washington County. Within its range, the desert tortoise can be found near water in deserts, semi-arid grasslands, canyon bottoms and rocky hillsides. Desert tortoises often construct burrows in compacted sandy or gravelly soil. Females nest under a large shrub or at the mouth of a burrow and lay one to three clutches of two to fourteen eggs from May to July; eggs hatch in late summer or fall. Burrows, which may contain many tortoises at once, are used for hibernation during cold winter months. The typical diet of the desert tortoise consists of perennial grasses, cacti, shrubs and other plant material. Historically APHIS has never received a request to treat in areas inhabited by desert tortoises, but if asked to do so, there would exist the threat of direct take by running over small tortoises with ground equipment. Direct toxic effects from the use of carbaryl bait are unknown, but the tortoises would not likely consume the bait at low application rates (10 pounds per acre) and given the small size and consistency of bait particles. Indirect effects are low since they do not depend on insects for food. No information was located about diflubenzuron's toxicity to reptiles, but it is likely that it is low, based on the selective nature of its toxic mode of action (i.e., it interferes with the synthesis of chitin in those organisms that produce exoskeletons). The relative toxicity of diflubenzuron to reptiles is expected to be similar to that of mammals and birds (APHIS EIS, 2002). Indirect effects are also expected to be low since desert tortoises do not depend on insects for food. It is unlikely that grasshoppers or Mormon cricket populations would ever reach outbreak levels and require APHIS treatments in desert tortoise habitat. The proposed APHIS suppression program will not likely adversely affect this species. PROTECTIVE MEASURES: No aerial or ground applications will occur in the Beaver Dam Slope, the Tortoise Preserve or other occupied habitats of Washington County. If APHIS does receive a request to treat using ground equipment, then APHIS would re-consult with the USFWS.

20. Kanab ambersnail (*Oxyloma kanabense*): Found in Kane County. Pilsbry (1948), in the type description of this taxon, noted that it was found "on a wet ledge among rocks and cypripediums." Clarke (1991) reported the habitat of the Three Lakes population as a marsh dominated by *Typha* in its wettest portion. Grasses, *Carex*, violets, plantains and alders were also present. The densest snail aggregations were found under fallen *Typha* stalks, at the edges of thick *Typha* stands. The snails were also frequently observed just within the mouths of vole burrows. The presence of standing water appeared to be important to their local distribution. Clarke (1991) found that the habitat of the small population that existed along Kanab Creek also included *Mimulus guttatus*, *Dodocatheon pauciflorum*, *Aquilegia micrantha*, a tall grass species and *Juncus*. Direct toxic effects of carbaryl bait are high, but mitigation measures would insure that this species would not come in contact with the toxin. Indirect effects are low since the susceptible insects are not likely food items. Direct toxic effects from Dimilin are none to slight - the median lethal concentration of diflubenzuron in water to the snail is greater than 125 mg/L (Willcox and Coffey, 1978) - especially given the low application rates and the self-imposed water/spring buffers of APHIS programs. Indirect effects are also expected to be low since susceptible insects are not likely food items. The proposed APHIS suppression program will not likely adversely affect this species. PROTECTIVE MEASURES: No aerial applications within 1 mile of occupied habitat, and no ground treatments within 500 feet of occupied habitat.

21. Autumn buttercup (*Ranunculus aestivalis*): Found in Garfield County. Autumn buttercup produces abundant yellow flowers that can be seen from late-July to early October. It is found in low, herbaceous, wet meadow communities on islands of drier peaty hummocks, and sometimes in open areas, at elevations ranging from 1940 to 1965 meters. There are no direct toxic effects from carbaryl bait to this species. Indirect effects to plant pollinators from the use of carbaryl bait are low since insects must consume the bait in order to succumb to it. Target insects are unlikely pollinators of this species. There are no direct toxic effects from Dimilin, and the indirect effects to pollinators from the use of diflubenzuron are low since it is not toxic to adult insects. APHIS's low application rate of one ounce per acre, coupled with the practice of treating not more than every other swath, preclude significant adverse impacts to larval insects as well. Only insect nymphs that undergo incomplete metamorphosis (i.e., grasshoppers/crickets) manifest significant adverse effects at the low doses of APHIS projects. The proposed APHIS program will not likely adversely affect this species. PROTECTIVE MEASURES: No aerial applications within 3 miles of occupied habitat, and no ground treatments within 300 feet of occupied habitat.

22. Barneby reed-mustard (*Schoenocrambe barnebyi*): Found in Emery and Wayne Counties. Specimens have a branched woody base that gives rise to purple veined, white, or lilac flowers from late April to early June. Barneby reed-mustard grows in xeric, fine textured soils on steep eroding slopes of the Moenkopi and Chinle formations. It grows in sparsely-vegetated sites in mixed desert shrub and pinyon-juniper communities, at elevations ranging from 1460 to 1985 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect toxic effects and PROTECTIVE MEASURES same as # 21.

23. Barneby ridge-cress (*Lepidium barnebyanum*): Found in Duchesne County. This species grows in cushion-shaped tufts, has a thickened, branched woody base and produces abundant white to cream colored flowers that bloom in May and June. It grows along semi-barren ridges in pinyon-juniper woodlands, at elevations ranging from 1860 to 1965 meters. The proposed APHIS

program will not likely adversely affect this species. Direct and indirect toxic effects and PROTECTIVE MEASURES same as # 21.

24. Clay phacelia (*Phacelia argillacea*): Found in Utah County. It is a narrow endemic to Spanish Fork Canyon, Utah County, Utah. A member of the waterleaf family, it has a scorpion tale-like inflorescence that continues, as it unrolls, to produce blue to violet flowers from June to August. This species is a winter annual and is found in fine textured soil and fragmented shale derived from the Green River Formation. It grows on barren, precipitous hillsides in sparse pinyon-juniper and mountain brush communities, at elevations ranging from 1840 to 1881 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect toxic effects and PROTECTIVE MEASURES same as # 21.

25. Clay reed-mustard (*Schoenocrambe argillacea*): Found in Uintah County. It is a plant that occurs in the Uinta Basin, Uintah County, Utah. A member of the mustard family, this species is a hairless perennial with a stout, woody base. It produces lilac to white, purple-veined flowers that bloom from mid-April through mid-May. Shrubby reed-mustard grows on the Evacuation Creek Member of the Green River Formation, where it is on substrates consisting of at-the-surface bedrock, scree, and fine-textured soils. It occurs on precipitous slopes in mixed desert shrub communities, at elevations ranging from 1439 to 1765 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

26. Deseret milkvetch (*Astragalus desereticus*): Found in Utah County. This plant occurs at a single site in Utah County, Utah. A member of the bean family, this species is a perennial herb with gray-silvery leaves four to five cm long and white to pinkish petals with evident lilac-colored keel-tips. It blooms from late April to early June. Deseret milkvetch grows exclusively on sandy-gravelly soils weathered from conglomerate outcrops of the Moroni Formation. It likes steep south and west (rarely north) facing slopes and does well on larger, west-facing road-cuts. It is grows in an open pinyon-juniper-sagebrush community, at elevations ranging from 1645 to 1740 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

27. Dwarf bear-poppy (*Arctomecon humilis*): Found in Washington County. This plant is a narrow endemic to (occurs only in) Washington County, Utah. A member of the poppy family, this species is a perennial herb that produces abundant white flowers. The flowers bloom from mid-April through May, and are quite showy next to the red soils in which the plant grows. Dwarf bearclaw-poppy is found on gypsiferous clay soils derived from the Moenkopi Formation. It occurs on rolling low hills and ridge tops, often on barren, open sites in warm desert shrub communities, at elevations ranging from 700 to 1402 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

28. Gierisch mallow (*Sphaeralcea gierischii*): Found in Washington County. A member of the mallow family, this species is a flowering perennial which is only found on gypsum outcrops associated with the Harrisburg Member of the Kaibab Formation in northern Mojave County, AZ and Washington County, UT. It has a woody base and dies back to the ground during the winter and re-sprouts from the base during late winter and spring depending on daytime temperatures and rainfall. How its flowers are pollinated, seed-dispersal mechanisms and the conditions

under which seeds germinate are not yet known. Young plants have been observed on reclaimed portions within gypsum mining areas. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

29. Graham beardtongue (*Penstemon grahamii*): Found in Carbon, Duchesne and Uintah Counties. It is endemic to (occurs only in) the Uinta Basin in Carbon County, Duchesne County and Uintah County, Utah, and in immediately adjacent Rio Blanco County, Colorado. A member of the figwort family, this species is a perennial herb that is 5 to 20 cm tall, with thick leathery leaves, and large, tubular, light to deep lavender flowers that bloom from late May to early June. Graham beardtongue grows on semi-barren knolls, ridges and steep slopes in a mix of fragmented shale and silty clay soils closely associated with the Mahogany zone (oil shale bearing) of the Green River Formation. It grows in sparsely vegetated communities of pinyon-juniper, desert shrub and Salina wildrye, at elevations ranging from 1430 to 2060 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

30. Heliotrope milkvetch (*Astragalus montii*): Found in Sanpete and Sevier Counties. This is a plant that occurs on the southern Wasatch Plateau in Sanpete County and Sevier County, Utah. A member of the bean family, this species is a dwarf tufted perennial herb with pink purple petals that have white wing-tips. It blooms from June to August. Heliotrope milkvetch grows in barren areas on shallow and very rocky soils derived from Flagstaff Limestone, at elevations ranging from about 3230 to 3322 meters. It grows in subalpine communities of cushion plants and other low-growing species that are scattered within more extensive conifer, tall-forb, and grass communities. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

31. Holmgren milkvetch (*Astragalus holmgreniorum*): Found in Washington County. It occurs in Washington County, Utah, and in immediately adjacent Mohave County, Arizona. A member of the bean family, this species is a dwarf, tufted, stemless perennial herb. It has pinkish-purple flowers with unique white-tipped wings; it blooms in April and May. Holmgren milkvetch grows in topographic sites where water runoff occurs and where the soil surface is covered by a stony or gravelly erosional pavement. The soils are derived from the Moenkopi Formation. Holmgren milkvetch grows in warm desert shrub communities, at elevations ranging from 805 to 914 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

32. Jones cycladenia (*Cycladenia humilis var. jonesii*): Found in Emery, Garfield, Grand and Kane Counties. This plant is restricted to the canyonlands of the Colorado Plateau in Emery County, Garfield County, Grand County, and Kane County, Utah, as well as in immediately adjacent Coconino County, Arizona. A member of the dogbane family, this species is a rhizomatous herb with round, somewhat succulent leaves, and small rose-pink hairy flowers that bloom from mid-April to early June. Jones' cycladenia grows in gypsiferous soils that are derived from the Summerville, Cutler, and Chinle formations; they are shallow, fine textured, and intermixed with rock fragments. The species can be found in Eriogonum-ephedra, mixed desert shrub, and scattered pinyon-juniper communities, at elevations ranging from 1219 to 2075 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

33. Kodachrome bladderpod (*Lesquerella tumulosa*): Found in Kane County. It is a plant that is a narrow endemic to (it occurs only in) Kane County, Utah. A member of the mustard family, this species is a perennial herb that forms densely matted and depressed mounds. It has a many-branched woody base with persistent leaf bases, has star-shaped hairs, and produces yellow flowers that bloom in May and early June. Kodachrome bladderpod is found on shallow soils that are fine textured, intermixed with shale fragments, and derived from the Winsor Member of the Carmel Formation. Kodachrome bladderpod grows on bare shale knolls and slopes in scattered pinyon-juniper communities, at elevations ranging from 1719 to 1845 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

34. Last Chance townsendia (*Townsendia aprica*): Found in Emery, Sevier and Wayne Counties. This plant is a member of the sunflower family, and is a stemless perennial herb with flower heads submersed in its ground-level leaves. The flowers bloom in late April and May, and have yellow to golden petals. Last Chance townsendia is found in clay, clay-silt, or gravelly clay soils derived from the Mancos Formation; these soils are often densely covered with biological soil crusts. The species grows in salt desert shrub and pinyon-juniper communities, at elevations ranging from 1686 to 2560 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

35. Maguire primrose (*Primula maguirei*): Found in Cache County. plant that is a narrow endemic to (it occurs only in) Logan Canyon, Cache County, Utah. A member of the primula family, this species is a perennial herb with broad, spatula-shaped leaves. Stems are approximately four to fifteen cm tall, with each bearing one to three showy rose to lavender-colored flowers that bloom in late April and May. Maguire primrose is found on either north-facing or well shaded south-facing moss covered sites on damp ledges, in crevices, and on over-hanging rocks along the walls near the bottom of the canyon. It grows at elevations ranging from 1550 to 2012 meters. The propose APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

36. Pariette cactus (*Sclerocactus brevispinus*): Found in Duchesne and Uintah Counties. A member of the cactus family, this taxon is a Uinta Basin endemic in northeast Utah, Duchesne County. It is known from "a series of small scattered populations…near Myton (Heil and Porter (1994)." It inhabits "stoney, gravelly, low hilly terrain, growing with desert grasses or low vegetation (Hochstätter 1993)"; the soils on which it grows are derived from the Uinta Formation (Specht, pers. comm. 2005). The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

37. San Rafael cactus (*Pediocactus despainii*): Found in Emery and Wayne Counties. A member of the cactus family, this species is a small, subglobose to ovoid cactus with usually solitary stems; the crown of the stem is at or very near ground level. Its flowers are born near the tip of the stem, are yellow bronze to peach bronze, rarely pink in color, and bloom during April and May. San Rafael cactus is found in fine textured soils rich in calcium derived from the Carmel Formation and the Sinbad Member of the Moenkopi Formation. It occurs on benches, hill tops, and gentle slopes in pinyon-juniper and mixed desert shrub-grassland communities, at elevations ranging from 1450 to 2080 meters. The proposed APHIS program will not likely

adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

38. Shivwitz or Shem milkvetch (*Astragalus ampullarioides*): Found in Washington County. It occurs in only Washington County, Utah. A member of the bean family, Shivwits milkvetch is a perennial herb. Specimens are 20 to 45 cm tall, each with an underground, branching woody base and an erect flower stalk bearing yellow-white flowers that bloom from late April to early June. Shivwits milkvetch grows on the unstable clay soil of Chinle Shale in warm desert shrub and pinyon-juniper communities, at elevations ranging from 872 to 1116 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

39. Shrubby reed-mustard (*Schoenocrambe suffrutescens*): Found in Duchesne and Uintah Counties. A member of the mustard family, this species is a perennial clump-forming herb that produces yellow flowers that bloom from May through June. Shrubby reed-mustard grows along semi-barren, white-shale layers of the Green River Formation (Evacuation Creek Member), where it is found in xeric, shallow, fine textured soils intermixed with shale fragments. It grows in mixed desert shrub and pinyon-juniper communities, at elevations ranging from 1554 to 2042 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

40. Siler pincushion cactus (*Pediocactus sileri*): Found in Kane and Washington Counties. It is a plant that occurs in adjacent Coconino and Mohave counties, Arizona; the center of its distribution is in Mohave County. A member of the cactus family, this species is a small, globose cactus with solitary, occasionally clustered, stems typically 10 cm tall (as great as 45 cm), and spines that become white with age. Its flowers are yellow with purple veins, and bloom during March and April. Siler pincushion cactus is found on the white, occasionally red, gypsiferous and calcareous sandy or clay soils derived from the various members of the Moenkopi Formation. It is sometimes found, however, on the nearly identical Kaibab Formation. Siler pincushion cactus occurs on rolling hills, often with a badlands appearance, in warm desert shrub, sagebrush-grass, and, at its upper limits, pinyon-juniper communities, at elevations ranging from 805 to 1650 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

41. Uintah basin hookless cactus (*Sclerocactus wetlandicus*): Found in Carbon, Duchesne and Uintah Counties, Utah and in Delta, Garfield, Mesa, and Montrose counties, Colorado. A member of the cactus family, this species is a perennial herb with a commonly solitary, egg-shaped, three to twelve cm long stem that produces pink flowers late from April to late May. Uinta Basin hookless cactus is found on river benches, valley slopes, and rolling hills of the Duchesne River, Green River, and Mancos formations. It is found in xeric, fine textured soils overlain with cobbles and pebbles, growing in salt desert shrub and pinyon-juniper communities, at elevations ranging from 1360 to 2000 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

42. Ute ladies'-tresses (*Spiranthes diluvialis*): Found in Daggett, Duchesne, Garfield, Juab, Salt Lake, Tooele, Uintah, Utah, Wasatch, Wayne and formerly Weber County. It also occurs in the states of Colorado, Idaho, Montana, Nebraska, Nevada, Washington, and Wyoming. A member of the orchid family, this species is a perennial herb with a flowering stem, 20-50 cm tall that arises

from a basal rosette of grass-like leaves. The flowers are ivory-colored, arranged in a spike at the top of the stem, and bloom mainly from late July through August. Ute ladies'-tresses is found in moist to very wet meadows, along streams, in abandoned stream meanders, and near springs, seeps, and lake shores. It grows in sandy or loamy soils that are typically mixed with gravels. In Utah, it ranges in elevation from 1311 to 2134 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

43. Welsh's milkweed (*Asclepias welshii*): Found in Kane County, Utah as well as in immediately adjacent Coconino County, Arizona. A member of the milkweed family, this species is a stout, rhizomatous perennial herb with large oval leaves and spherical clusters of flowers that are cream-colored with pink-tinged centers. It blooms from June to August. Welsh's milkweed grows on dunes derived from Navajo Sandstone. It is found in sagebrush, juniper, and ponderosa pine communities, at elevations ranging from 1542 to 1993 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

44. Winkler cactus (*Pediocactus winkleri*): Found in Emery and Wayne Counties. A member of the cactus family, this species is a small, subglobose cactus with solitary or clumped stems; the crown of the stem is at or very near ground level. Its flowers are born near the tip of the stem, are peach to pink in color, and bloom late March to May. Winkler pincushion cactus is found in fine textured soils derived from the Dakota Formation and the Brushy Basin Member of the Morrison Formation. It occurs on benches, hill tops, and gentle slopes on barren, open sites in salt desert shrub communities, at elevations ranging from 1490 to 2010 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

45. Wright fishhook cactus (*Sclerocactus wrightiae*): Found in Emery, Sevier and Wayne Counties. A member of the cactus family, this species is a perennial herb with a solitary, hemispheric, ribbed, 6 to 12 cm tall stem that produces nearly-white to pink flowers from late April through May. Wright fishhook cactus is found in soils that range from clays to sandy silts to fine sands, typically in areas with well developed biological soil crusts. Wright fishhook cactus grows in salt desert shrub and widely scattered pinyon-juniper communities, at elevations ranging from 1305 to 1963 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects and PROTECTIVE MEASURES same as # 21.

46. Navajo sedge (*Carex specuicola*): Found in San Juan County, Utah, and in immediately adjacent Coconino County, Arizona. A member of the sedge family, this species is a loosely tufted perennial, 25 to 40 cm tall, with grass-like leaves that droop downward. Its flowers, seen in late June and July, are arranged in spikes, two to four spikes per stem. Navajo sedge is restricted to seep, spring, and hanging garden habitats in Navajo Sandstone, at elevations ranging from 1150 to 1823 meters. The proposed APHIS program will not likely adversely affect this species. Direct and indirect effects of treatment are the same as # 20. PROTECTIVE MEASURES: No aerial applications within 3 miles of occupied habitat and no ground applications within 300 feet of springs, seeps and hanging gardens.

FINDING OF NO SIGNIFICANT IMPACT
FOR
BOX ELDER, DAVIS, TOOELE AND UTAH COUNTIES
COUNTIES 2016 APHIS RANGELAND GRASSHOPPER
MORMON CRICKET SUPPRESSION PROGRAM
ENVIRONMENTAL ASSESSMENT NO: UT-05-16

The U.S. Department of Agriculture, Animal and Plant Health Inspection Service (APHIS) has prepared an environmental assessment (EA) that analyzes alternatives for suppressing grasshopper and Mormon cricket outbreaks on rangeland in Box Elder, Davis, Tooele and Utah Counties, Utah. The EA, incorporated by reference in this document, is available for review at USDA, APHIS, PPQ, 1860 W. Alexander St., #B West Valley, UT 84119 and APHIS, 4700 River Road, Riverdale, MD 20737-1228.

The EA includes an analysis of the potential impacts of three alternatives: (1) No Action, (2) Insecticide Applications at Conventional Rates and Complete Area Coverage, and (3) Reduced Agent Area Treatments (RAATs). The alternative methods analyzed included chemical control by malathion, carbaryl and diflubenzuron sprays, carbaryl ground and aerial bait, and no action. The environmental impacts of each method and potential mitigation measures are described in the attached Environmental Assessment (EA). The operational procedures and mitigation measures identified in the attached EA would ensure that no significant adverse environmental impacts other than those identified in the APHIS EIS 2002 would occur to the human environment. The alternative selected is the Reduced Agent Area Treatments (RAATs).

Reasons for the finding of no significant impact include:

1. Human Health: Potential exposures to the general public from traditional 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. Program use of carbaryl, malathion and diflubenzuron has occurred routinely in many past programs, and there is a lack of any adverse health effects reported from these projects.

2. Nontargets: 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).

3. Threatened, endangered or proposed species would not be adversely affected under any alternative. No unstable or limited range wildlife population would be adversely affected.

The Box Elder, Davis, Tooele and Utah Counties analysis has disclosed the following species of concern in the vicinity of the treatment areas: Unita Basin Hookless Cactus, Graham Beardtoungue, Humpback Chub, Bonytail, Colorado Pikeminnow, Razorback Sucker, Mexican Spotted Owl, Black-footed Ferret (unconfilmed), Jones Cycladenia, Maguire Daisy, Last Chance Townsend, San Rafael Cactus, Winkler Fishhook Cactus, California condor, Gunnison sage-grouse, Southwestern Willow Flycatcher (possibly), Navajo Sedge, and Gray wolf (historically), Clay Phacelia, Canda Lynx.

The location of these species or their habitat, rate of spray, spray materials to be used and protection and mitigation measures will be discussed with the local land managers prior to commencement of any treatment to ensure that no adverse effects to these species or their habitat from the treatment project occur. We are also in consultation with U.S. Fish and Wildlife and once APHIS receives a concurrence letter from them, we will provide an addendum to this EA.

4. Socioeconomic issues have been considered and are addressed in the body of the EA. It is determined that grasshopper treatment would not adversely affect socioeconomic issues.

5. Cultural resources and events have been considered and are addressed in the body of the EA. It is determined that grasshopper treatment would not adversely affect cultural resources and events.

6. Executive Orders – 12898 (low income and minorities), 14045 (children), and 14186 (migratory birds).

The time between the receipt of a request for treatment and the start of a suppression program is very short. In order to inform the public and give them time to submit comments on the proposed program, APHIS is making this EA available at this time. Once a treatment request is received and it has been determined that a suppression program will take place, APHIS will extensively examine the treatment site to determine if environmental issues exist that were not covered in the EA. If changes need to be made to the EA or FONSI, APHIS will prepare an addendum to the EA describing the changes and/or additional site-specific issues that were not covered in the EA. This addendum will be provided to all parties that commented on the EA.

Based on the analysis of potential environmental impacts contained in the EA, the implementation of the treatment guidelines (containing the operational procedures) and the protection measures for endangered and threatened species, I have determined that the proposed suppression program will not significantly impact the quality of the human environment.

2-17-16
Date

Dawn E. Holzer
Acting State Plant Health Director