Site-Specific Environmental Assessment

Rangeland Grasshopper and Mormon Cricket Suppression Program

Box Elder, Davis, Tooele and Utah Counties
Utah

EA Number: UT-05-04

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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 4/01/03 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 Commission of Agriculture, with the consent of the governor of Utah, has declared that this infestation is presently an emergency situation which 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.

In May 2002, 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 #02-IA-11132020-106, May 29, 2002). 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.

In February 2003, APHIS (Animal & Plant Health Inspection Service) and the Bureau of Land Management (BLM) signed a Memorandum of Understanding (MOU) 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.

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 have traditionally been used by APHIS. The insect growth regulator, diflubenzuron, is also included in this alternative. Applications would cover all treatable sites within the infested area (total or blanket coverage) per label directions. The application rates under this alternative are as follows:

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

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

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

C. Reduced Agent Area Treatments (RAATs) Alternative

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

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

The area not directly treated (the untreated swath) under the RAATs approach is not standardized. In the past, the area infested with grasshoppers that remains untreated has ranged from 20 to 67 percent. The 2002 EIS analyzed the reduced pesticide application rates associated with the RAATs approach but assumed pesticide coverage on 100 percent of the area as a worst-case assumption. The

reason for this is there is no way to predict how much area will actually be left untreated as a result of the specific action requiring this EA. Rather than suppress grasshopper populations to the greatest extent possible, the goal of this alternative is to suppress grasshopper populations to a desired level.]

The potential environmental effects of application of carbaryl, diflubenzuron, and malathion under this alternative are discussed in detail in the 2002 EIS (Environmental Consequences of Alternative 3: Reduced Agent Area Treatments (RAATs), pp. 49–57). A description of anticipated site-specific impacts from this proposed treatment may be found in Part 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 fur 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, western yellow-billed cuckoo, 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 Utah. 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 four 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 nontarget 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 Apossible human carcinogen@ (EPA, 1993). However, it is not considered to pose any mutagenic or genotoxic risk.

Potential exposures to the general public from conventional application rates are infrequent and of low magnitude. These low exposures to the public pose no risk of direct toxicity, carcinogenicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. The potential for adverse effects to workers are negligible if proper safety procedures are followed, including wearing the required protective clothing. Carbaryl has been used routinely in other programs with no reports of adverse health effects. Therefore, routine safety precautions are expected to provide adequate worker health protection.

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

Carbaryl will most likely affect nontarget 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 nontarget organisms than sprays (Quinn, 1996).

Should carbaryl enter water, there is the potential to affect the aquatic invertebrate assemblage, especially amphipods. Field studies with carbaryl concluded that there was no biologically significant effect on aquatic resources,

although invertebrate downstream drift increased for a short period after treatment due to toxic effects (Beyers *et al*., 1995). Carbaryl is moderately toxic to most fish (Mayer and Ellersieck, 1986).

Diflubenzuron

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

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

Because diflubenzuron is a chitin inhibitor that disrupts insects from forming their exoskeleton, organisms without a chitinous exoskeleton, such as mammals, fish, and plants are largely unaffected by diflubenzuron. In addition, adult insects, including wild and cultivated bees, would be mostly unaffected by diflubenzuron applications (Schroeder *et al*., 1980; Emmett and Archer, 1980). Among birds, nestling growth rates, behavior data, and survival of wild American kestrels in diflubenzuron treated areas showed no significant differences among kestrels in treated areas and untreated areas (McEwen *et al*., 1996b). The acute oral toxicity of diflubenzuron to mammals ranges from very slight to slight. Little, if any, bioaccumulation of diflubenzuron would be expected (Opdycke *et al*., 1982).

Diflubenzuron is most likely to affect immature terrestrial insects and early life stages of aquatic invertebrates (Eisler, 2000). While this would reduce the prey base within the treatment area for organisms that feed on insects, adult insects, including grasshoppers, would remain available as prey items. Many of the aquatic organisms most susceptible to diflubenzuron are marine organisms that would not be exposed to rangeland treatments. Freshwater invertebrate populations would be reduced if exposed to diflubenzuron, but these decreases would be expected to be temporary given the rapid regeneration 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 nontarget insects within a treatment area. Large reductions in some insect populations would be expected after a malathion treatment under Alternative 2. While the number of insects would be diminished, there would be some insects remaining. The remaining insects would be available prey items for insectivorous organisms, and those insects with short generation times may soon increase.

Malathion is highly toxic to some fish and aquatic invertebrates; however, malathion concentrations in water, as a result of grasshopper treatments, are

expected to be low presenting a low risk to aquatic organisms, especially those organisms with short generation times.

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

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

Carbaryl

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

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

Direct toxicity of carbaryl to birds, mammals, and reptiles is unlikely in swaths treated with carbaryl under a RAATs approach. Carbaryl bait also has minimal potential for direct effects on birds and mammals. Field studies indicated that bee populations did not decline after carbaryl bait treatments, 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.

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

Diflubenzuron

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

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

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

Malathion

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

Potential risks to workers are negligible if proper safety procedures are adhered to, including the use of required protective clothing. Malathion has been used routinely in other programs with no reports of adverse health effects. The low

exposures to malathion from program applications are not expected to pose any carcinogenic risks to workers or the general public.

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

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

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) 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.

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 ferrying and turnaround routes to avoid flights over congested areas, bodies of water, and other sensitive areas that are not to be treated.

Aerial Application of Dry Insecticidal Bait

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

Ultra-Low-Volume 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 has met 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 1995 biological opinion issued by the USFWS lists the mitigations to be followed by APHIS when conducting a program to suppress grasshoppers with insecticides other than diflubenzuron. This list is included in Appendix 3 (Table 3). Mitigation measures for the use of malathion and carbaryl for new listings (since 1995) of endangered, threatened and proposed species that have not been included in formal Section 7 consultation are also included in Appendix 3 (Table 4) 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 biological assessment for the Rangeland Grasshopper and Mormon Cricket Suppression Program is currently under way, but the process for it's completion and consideration by FWS will not be concluded in time for the 2003 season. In order to comply the section 7 requirements APHIS or the cooperating Federal land managing agency will conduct 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. 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/mb/aseu/shes/shes-manual.html).

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

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VI. Listing of Agencies and Persons Consulted

A. Bureau of Land Management

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

Brown, Jack, Riparian/Fire Rehab Coordinator, UT State Office

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

Edwards, Robert, Natural Resource Specialist, Cedar City, UT Field Office

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

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

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

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

B. Utah Department of Agriculture and Food

Bianco, Ed, State Entomologist

Peterson, Cary, Commissioner of Agriculture

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APPENDIX I

FY-2004
Guidelines for Treatment of Rangeland
for the Suppression of Grasshoppers and Mormon Crickets

Suppression Treatment on Federally Managed Rangeland

Subject to available funding, the United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA-APHIS-PPQ) may contribute to the control of grasshoppers and Mormon crickets on federal rangeland in three ways: (1) conduct field surveys, (2) provide technical assistance to land managers, and (3) participate in suppression treatments when requested and necessary. In situations when traditional practices of land managers fail to maintain grasshopper and Mormon cricket populations below outbreak levels, USDA-APHIS-PPQ at the request of the Federal land management agency or Tribal authority, when appropriate, and subject to available funding may conduct suppression treatments on federally managed rangeland or rangeland held in Trust by the federal government.

Rangeland eligible for cooperative suppression treatments for grasshoppers include: (1) large rangeland blocks (i.e., $\geq$10,000 acres) that if treated would protect forage as well as prevent re-infestation from immigrant grasshoppers; (2) incipient populations ("hot spots") of grasshoppers that if treated would prevent a wider spread of outbreaks; and (3) Federal or Trust land borders that if treated would prevent the movement of damaging populations of grasshoppers to adjacent private agricultural land. Rangeland cooperative suppression treatments for Mormon crickets may be conducted on a small or large scale. The final determination of whether a cooperative suppression treatment on federal rangeland is warranted will be made by USDA-APHIS-PPQ, upon receipt of the land manager's written request and based on the best available information.

Suppression Treatments on State and Private Rangeland

Subject to available funding, the USDA-APHIS-PPQ may contribute to the suppression of grasshoppers and Mormon crickets on State and private rangeland in three ways: (1) conduct field surveys, (2) provide technical assistance to landowners, and (3) participate in suppression treatments when requested and necessary. In situations when traditional practices of land managers fail to maintain grasshopper and Mormon cricket populations below outbreak levels, USDA-APHIS-PPQ at the request of the State Department of Agriculture and subject to available funding may conduct suppression programs on State and private rangeland.

State and private rangeland eligible for cooperative suppression treatments for grasshoppers include: (1) large rangeland blocks (i.e., $\geq$10,000 acres) that if treated would protect forage as well as prevent re-infestation from immigrant grasshoppers; and (2) incipient populations ("hot spots") of grasshoppers that if treated would prevent a wider spread of outbreaks. State and private rangeland cooperative suppression treatments for Mormon crickets may be conducted on a small or large scale. However, USDA-APHIS-

PPQ will not participate in cooperative suppression programs for grasshoppers and Mormon crickets on private cropland, except when deemed necessary to maintain the integrity of a large spray block. The final determination of whether a cooperative suppression treatment on State and private rangeland is warranted will be made by USDA-APHIS-PPQ, upon receipt of the State's written request and based on the best available information.

General Guidelines for Suppression Programs on Rangeland

1. Cooperative suppression treatments will be completed in accordance with the Plant Protection Act (PPA) of 2000 and Agency policy. Suppression treatments will follow guidelines within the Environmental Impact Statement (EIS), Site-Specific Environmental Assessment (EA), Section 7 Consultation of the Endangered Species Act, 2004 Environmental Monitoring Plan, pesticide label, and the 2004 Guidelines stated herein.

2. The Grasshopper Program will follow all requirements of the National Environmental Protection Act (NEPA). Environmental Assessments (EAs) for suppression treatments on rangeland will be completed in accordance with National and/or local Memoranda of Understanding (MOUs) between USDA-APHIS-PPQ and the Federal land management agencies and/or Tribes. Prior to treatments and per Section 7 Consultation, USDA-APHIS-PPQ and/or the Federal land manager and/or Tribe will consult locally with U.S. Fish & Wildlife Service (USFWS) and/or National Oceanic and Atmospheric Administration (NOAA) Fisheries in situations where: (1) threatened or endangered species occur in the area, or (2) pesticides or application procedures utilized have not been addressed in the Programmatic Biological Opinion of 1995 or in other Opinions. Upon completion of the EA, the State Plant Health Director of USDA-APHIS-PPQ or his/her designee will, if appropriate, sign a Finding of No Significant Impact (FONSI), after which suppression treatments may commence.

3. The Federal Government will bear 100% of the cost of treatment on federally managed or Trust land, up to 50% of the cost on State land, and up to 33% of costs on private land. The Federal Government's participation in the cost share is contingent on allocation and availability of funds. First, USDA-APHIS-PPQ will conduct or fund surveys from the congressional appropriation, then may conduct suppression treatments with any remaining funds, if requested. Additional sources of support for suppression treatments may include Contingency funds, Commodity Credit Corporation (CCC) funds, Land Management Agencies' funds, or other funding resources.

4. 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. USDA-APHIS-PPQ and/or its designated cooperator may conduct suppression treatments on Federal/Tribal lands if requested in writing by the Federal land manager and/or Tribal authority for Trust lands.

5. USDA-APHIS-PPQ, when requested by the land manager, may conduct border treatments on Federal or Trust rangeland in situations when damaging populations of grasshoppers and Mormon crickets threaten private agricultural land. Border treatments can only be justified when the potential for damage from grasshoppers and Mormon crickets migrating into private agricultural lands constitutes a legitimate and justifiable threat.

6. At the written request of the respective State Department of Agriculture, USDA-APHIS-PPQ and/or the designated cooperator may conduct cooperative suppression programs on State and/or private rangeland, as permitted by regulation and available funding.

7. In the absence of available USDA-APHIS-PPQ funding, the Federal land management agency, Tribal authority or other party may opt to reimburse USDA-APHIS-PPQ for suppression treatments. Interagency agreements or reimbursement agreements must be completed prior to the start of treatments.

8. For rangeland programs conducted by the Federal government, USDA-APHIS-PPQ and/or cooperating personnel (i.e., cooperative agreement) will provide overall direction and monitoring of aircraft calibration, pesticide inventory and application, and will maintain records of pesticides used and acres treated.

9. 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). USDA-APHIS-PPQ may choose to assist these groups in a variety of ways, such as: (1) loaning equipment; (2) providing materials and pesticides; and (3) and contributing in-kind services such as surveys, determination of insect species and instars, and treatment monitoring. A cooperative agreement is needed when the assistance by USDA-APHIS-PPQ represents significant monetary value (e.g., providing pesticide or loaning equipment). Finally, the USDA-APHIS-PPQ State Plant Health Director is responsible for ensuring that any cooperative treatments on State or private rangeland adhere to the cost-share ratios in the PPA and National Environmental Protection Act (NEPA), as applicable.

10. Prior to initiating treatments funded by or through USDA-APHIS-PPQ, the State Plant Health Director's office will prepare a Detailed Work Plan and a Work Checklist (including a map), which then must be approved by the USDA-APHIS-PPQ Western Regional Office. In addition, the USDA-APHIS-PPQ State office will provide a weekly update to the Regional Office on acres treated and pesticides used. Upon completion of each grasshopper or Mormon cricket suppression program, the USDA-APHIS-PPQ State office will prepare a summary for the Federal land manager or Tribal authority and will submit a Work Achievement Report to the Western Regional Office.

13. Beekeepers should be notified in advance of proposed rangeland treatments so that they can move their bees before a suppression program begins. Observation aircraft may be used to check for bees in the proposed area. Registered bee locations must be

documented on the treatment map. Non-treated buffer zones should be determined for pollinators (e.g., alkali, leafcutter or honey bees) based on the EA and the pesticide labels [See 2004 Operational Procedures below].

12. In accordance with the EIS, the following pesticides may be used for rangeland treatments of grasshoppers and Mormon crickets: Sevin XLR Plus, carbaryl bait, Dimilin 2L, and malathion ULV. All pesticides must be used in accordance with the label, NEPA documents, Biological Opinion, local Section 7 Consultation, 2004 Operational Procedures, and any pertinent local decisions that are more restrictive.

13. Treatment contracts will adhere to the 2004 Prospectus.

2004 Operational Procedures

GENERAL PROCEDURES FOR ALL AERIAL AND GROUND APPLICATIONS

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

2. Hold public meetings well in advance of proposed programs. Arrange for public notifications to encourage public input into the decision making process.

3. Notify Federal, State and Tribal land managers and private cooperators of grasshopper and Mormon cricket infestations on their lands. Describe estimated boundaries, severity of the infestation, and treatment options. This notification will request the land manager to advise USDA-APHIS-PPQ of any sensitive areas (e.g., parks, recreation areas, etc.) that may exist in the proposed treatment areas.

4. Obtain request, in writing, from land managers or landowners for suppression treatments to be undertaken on their land.

5. Notify residents within treatment areas, or their designated representatives, prior to proposed operations. Advise them of control method to be used, proposed method of application, and precautions to be taken. Follow label requirements pertaining to a restricted entry period.

6. Avoid residences and other premises whose occupants are opposed to their property being treated. In cases when State law requires treatment but landowners or occupants are opposed to the treatments, USDA-APHIS-PPQ will cooperate to the extent possible and as authorized by Federal and State laws.

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

8. USDA-APHIS-PPQ employees who plan, supervise, recommend or perform pesticide treatments must be certified under the USDA-APHIS-PPQ Pesticide Applicator Certification Plan. They are also required to fulfill any additional qualifications or pesticide use requirements of the State wherein they perform these duties.

9. Strictly follow all EPA and State approved label instructions for insecticides.

10. 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 insecticides; 200-foot buffer with aerial bait; and 50-foot buffer with ground bait.

11. Require unprotected workers to stay out of treated areas, according to the label re-entry requirements or until the insecticide has dried, whichever period is longer.

12. Protective clothing and equipment will be worn and used by all pilots, loaders, and field personnel, as specified on the label.

13. All insecticide containers must be stored and disposed of properly according to the label. Rinse solution for drums may be used as diluent in preparing spray tank mixes, or it may be collected and stored for subsequent disposal in accordance with label instructions. Use one of the following disposal methods (in order of preference):

    a. Use full service contracts and require the contractor to properly store and dispose of pesticide containers.

    b. Require chemical companies, distributors, or suppliers to accept the triple-rinsed containers.

    c. Crush and/or puncture the empty triple-rinsed containers, report on Form AD-112 to Property Services, Field Servicing Office, Minneapolis, MN, and dispose of as scrap metal.

    d. Other suitable methods as approved locally in concurrence with Safety, Health and Environmental Security (SHES; Bill Benson, 301-734-5577).

~~14.~~ Conduct mixing, loading, and unloading in an approved area where an accidental spill would not contaminate a water body. In the event of an accidental spill, follow the procedures set forth in PPQ Guidelines for Managing Pesticide Spills (USDA APHIS, *Treatment Manual*, 1996, pages 11.17-11.26) and the 1996 Aerial Application Manual (4.37-4.39).

15. It may be useful to notify local law enforcement agencies and fire officials of pesticide storage areas and treatment blocks.

16. All APHIS project personnel will have baseline cholinesterase tests before the first application of AChe inhibiting insecticides, such as organophosphates or carbamates (i.e., no testing required for dimilin usage), and on a routine basis as described in the *APHIS Safety and Health Manual*. It is recommended that contract, State, and private project personnel also participate in a cholinesterase monitoring program.

17. Endangered Species (also see operational procedures listed under each control method in the EIS).

    a. Formal consultation will be accomplished with the U.S. Fish and Wildlife Service (USFWS) or the National Oceanic and Atmospheric Administration (NOAA) Fisheries at the national level or designated points of contact. The USFWS Portland Regional Office has been designated as the official contact for formal consultation. Communications at the local level with the USFWS or the

NOAA Fisheries will be conducted to address activities outside the National Biological Opinion.

b. State-listed endangered and threatened species, Federal candidate species, and other sensitive areas will be addressed in the site-specific EA.

18. For rangeland programs conducted by the Federal government, USDA-APHIS-PPQ will conduct efficacy monitoring. For blocks of 10,000 acres or less, 20 sites shall be established and grasshopper densities estimated before and after treatment (at present, visual kill checks can be done for Mormon crickets). For blocks over 10,000 acres, add one additional site for each 1,000 acres.

SPECIFIC PROCEDURES FOR AERIAL APPLICATIONS

1. Aircraft, dispersal equipment and pilots that do not meet all contract requirements of the 2004 Prospectus will not be allowed to operate on the Program.

2. Use Global Positioning System (GPS) coordinates, or shape files if available, for pilot guidance on the parameters of the spray block. Ground flagging or markers should accompany GPS coordinates when necessary in delineating the project area and in omitting areas from treatment (e.g., boundaries and buffers for bodies of water, habitats of protected species, etc.).

3. Utilize two-way communication equipment for appropriate field personnel. Communication will be available for continuous contact between pilots and the COR.

4. Pre-spray reconnaissance flights or ground orientation trips may be conducted to ensure that pilots are familiar with program area boundaries, buffers, and areas that are not to be treated.

5. Make the following available to relevant personnel in advance of any treatment: stock safety kits, pesticide spill kits, thermometers, flagging material, wind gauges, spray-deposit samplers and daily aircraft records.

6. No treatments will occur over congested urban areas. 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.

7. To minimize drift and volatilization, do not conduct aerial applications when any of the following conditions exist in the treatment area: wind velocity exceeds 10 miles per hour (unless lower wind speed required under State law); air turbulence could seriously affect the normal spray pattern; and temperature inversions could lead to off-site movement of spray. Also, suspend aerial applications when the following weather conditions occur and will seriously impede pesticide efficiency: rain (present or imminent), fog, or wet foliage.

8. Weather conditions at the treatment area will be monitored by trained personnel before and during application. Operations will be suspended at any time that weather conditions could jeopardize the safe and/or effective placement of the spray on target areas.

9. Weather plays an important role in aerial application. Winds may displace the pesticide within the target area. High temperatures combined with low humidity may cause fine sprays to evaporate and drift away without reaching the target. The best weather for spraying is usually from dawn through mid-morning. A simple indicator of time-to-quit is soil/air temperature difference. The soil temperature should be taken by placing the thermometer probe on an unshaded site while shading the thermometer for three minutes before reading. Air temperature should be taken five feet above the surface, in the open but with the thermometer shaded. When the soil temperature rises above the air temperature, the spray pattern normally starts breaking up at which time treatment operations should cease. Constant monitoring of the spray deposit pattern is the best method of determining the effects of weather factors.

10. Do not apply while school buses are operating in the treatment area. Do not apply within 500 feet of schools or recreational facilities.

11. Protection of Bees:
    a. When off-season or early-season planning indicates an area may require treatment, send early notification letters and maps of the proposed treatment areas to all registered apiarists in the State or near the area.
    b. Pre-spray reconnaissance flights may be conducted to ensure that honey bees and other bees used as commercial crop pollinators have been moved or protected. If bees remain, ensure that the beekeeper received notice of the impending treatment and that the program is conducted in accordance with State law.
    c. If a treatment is planned within four miles of areas where alkali or leaf cutter bees are being used for increasing the yield of alfalfa seed, monitor wind conditions and use dye cards as spray samplers to ensure that spray drift does not reach these areas.
    d. Do not apply dimilin, carbaryl or malathion to any blooming crops or allow it to drift onto blooming crops if commercial bees are visiting the area.

12. When using aerial bait, do not apply the bait directly to water bodies (defined as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers), and provide a 200-foot buffer.

SPECIFIC PROCEDURES FOR GROUND APPLICATIONS (BAIT and LIQUIDS)

1. Do not apply ground bait directly to water bodies (defined as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers). Furthermore, provide a 50-foot buffer.

APPENDIX 2: Maps of Affected Environment

Maps included:

2004 Rangeland Grasshopper hazard map
2004 Rangeland Mormon cricket density map
Area 4 Map of Juab, Millard, Piute, Sanpete and Sevier Counties, Utah
Map of State of Utah showing BLM managed lands

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