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# Final Environmental Assessment Rangeland Grasshopper and Mormon Cricket Suppression Program

Churchill, Humboldt, Pershing, and Washoe Counties, Nevada
EA Number: NV-21-01

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## Acronyms and Abbreviations

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| ac | acre |
| a.i. | active ingredient |
| AChE | acetylcholinesterase |
| APHIS | Animal and Plant Health Inspection Service |
| BCF | bioconcentration factor |
| BLM | Bureau of Land Management |
| CEQ | Council of Environmental Quality |
| CFR | Code of Federal Regulations |
| EA | environmental assessment |
| e.g. | example given (Latin, exempli gratia, "for the sake of example") |
| EIS | environmental impact statement |
| E.O. | Executive Order |
| FONSI | finding of no significant impact |
| FR | Federal Register |
| FS | Forest Service |
| g | gram |
| ha | hectare |
| HHERA | human health and ecological risk assessments |
| i.e. | in explanation (Latin, id est "in other words.") |
| IPM | integrated pest management |
| lb | pound |
| MBTA | Migratory Bird Treaty Act |
| MOU | memorandum of understanding |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NIH | National Institute of Health |
| ppm | parts per million |
| PPE | personal protective equipment |
| PPQ | Plant Protection and Quarantine |
| RAATs | reduced agent area treatments |
| S&T | Science and Technology |
| ULV | ultra-low volume |
| U.S.C. | United States Code |
| USDA | United States Department of Agriculture |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Services |

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**Final Site-Specific Environmental Assessment**

**Rangeland Grasshopper and Mormon Cricket Suppression Program Churchill, Humboldt, Pershing, and Washoe Counties, Nevada**

# I. Need for Proposed Action

## *A. Purpose and Need Statement*

An infestation of grasshoppers or Mormon crickets may occur in Nevada, specifically Churchill, Humboldt, Pershing, and Washoe Counties. The Animal and Plant Health Inspection Service (APHIS) and Nevada Department of Agriculture (NDA) may, upon request by land managers or State departments of agriculture, conduct treatments to suppress grasshopper infestations as part of the Rangeland Grasshopper and Mormon Cricket Suppression Program (program). The term "grasshopper" used in this environmental assessment (EA) refers to both grasshoppers and Mormon crickets, unless differentiation is necessary.

Populations of grasshoppers that trigger the need for a suppression program are normally considered on a case-by-case basis. Participation is based on potential damage such as stressing and/or causing the mortality of native and planted range plants or adjacent crops due to the feeding habits of large numbers of grasshoppers. The benefits of treatments including the suppressing of over abundant 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 economical infestation levels in order to protect rangeland ecosystems or cropland adjacent to rangeland.

This EA analyzes potential effects of the proposed action and its alternatives. This EA applies to a proposed suppression program that would take place from March to September in Churchill, Humboldt, Pershing, and Washoe counties.

This EA is prepared in accordance with the requirements under the National Environmental Policy Act of 1969 (NEPA) (42 United States Code § 4321 *et. seq.*) and the NEPA procedural requirements promulgated by the Council on Environmental Quality, United States Department of Agriculture (USDA), and APHIS. A decision will be made by APHIS based on the analysis presented in this EA, the results of public involvement, and consultation with other agencies and individuals. A selection of one of the program alternatives will be made by APHIS for the 2021 Control Program for Churchill, Humboldt, Pershing, and Washoe counties.

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## *B. Background Discussion*

Rangelands provide many goods and services, including food, fiber, recreational opportunities, and grazing land for cattle (Havstad et al., 2007; Follett and Reed, 2010). Grasshoppers and Mormon crickets are part of rangeland ecosystems, serving as food for wildlife and playing an important role in nutrient cycling. However, grasshoppers and Mormon crickets have the potential to occur at high population levels (Belovsky et al., 1996) that result in competition with livestock and other herbivores for rangeland forage and can result in damage to rangeland plant species.

In rangeland ecosystem areas of the United States, grasshopper populations can build up to economic infestation levels[1] 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 needed to prevent grasshopper migration to cropland adjacent to rangeland. In most circumstances, APHIS is not able to accurately predict specific treatment areas and treatment strategies months or even weeks before grasshopper populations reach economic infestation levels. The need for rapid and effective response when an outbreak occurs limits the options available to APHIS to inform the public other than those stakeholders who could be directly affected by the actual application. The emergency response aspect is why site-specific treatment details cannot be known, analyzed, and published in advance.

The site-specific data used to make treatment decisions in real time is gathered during spring nymph surveys. The general site-specific data include: grasshopper densities, species complex, dominant species, dominant life stage, grazing allotment terrain, soil types, range conditions, local weather patterns (wind, temp., precipitation), slope and aspect for hatching beds, animal unit months (AUM's) present in grazing allotment, forage damage estimates, number of potential AUM's consumed by grasshopper population, potential AUM's managed for allotment and value of the AUM, estimated cost of replacement feed for livestock, rotational time frame for grazing allotments, number of livestock in grazing allotment. Baseline thresholds for Mormon crickets are two per square yard and grasshoppers are eight per square yard, though neither of those thresholds guarantees justification for treatment alone. These are all factors that are considered when determining the economic infestation level.

APHIS surveys grasshopper populations on rangeland in the Western United States, provides technical assistance on grasshopper management to land owners and managers, and may cooperatively suppress grasshoppers when direct intervention is requested by a Federal land management agency or a State agriculture department (on behalf of a State or

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

local government, or a private group or individual). APHIS' enabling legislation provides, in relevant part, that 'on request of the administering agency or the agriculture department of an affected State, the Secretary, to protect rangeland, shall immediately treat Federal, State, or private lands that are infested with grasshoppers or Mormon crickets'… (7 U.S.C. § 7717(c)(1)). The need for rapid and effective response 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 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 damage caused by grasshopper populations in Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. During November 2019, APHIS published an updated EIS to incorporate the available data and analyze the environmental risk of new program tools. The risk analysis in the 2019 EIS is incorporated by reference.

Nevada Revised Statutes 561.245 provides authority to cooperate with and enter into contracts or agreements with the Federal government. Nevada Revised Statutes 555.2605 – 555.470 are laws on the custom application of pesticides and restricted use pesticides. These contain the requirements for a license to apply pesticides and certification to use and sell restricted use pesticides.

In October 2015, APHIS and the Bureau of Land management (BLM) signed a Memorandum of Understanding (MOU) detailing cooperative efforts between the two groups on the suppression of grasshoppers on BLM system lands (Document # 15-8100-0870-MU, October 15, 2015). This MOU clarifies that APHIS would 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 would be prepared under the APHIS NEPA implementing procedures with cooperation and input from BLM.

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

In September 2016, APHIS and the Bureau of Indian Affairs (BIA) signed a Memorandum of Understanding (MOU) detailing cooperative efforts between the two groups on the suppression of grasshoppers on BIA system lands. 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 implementation 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 land is necessary The BIA must also prepare a Pesticide Use Proposal for APHIS to treat infestations. According to the provisions of the MOU, APHIS can begin treatments after APHIS issues an appropriate decision document and BIA prepares and approves the Pesticide Use Proposal.

In November 2019, APHIS and the Forest Service (FS) signed a Memorandum of Understanding (MOU) detailing cooperative efforts between the two groups on the suppression of grasshoppers on FS system lands (Document # 19-8100-0573-MU, November 06, 2019). This MOU clarifies that APHIS would prepare and issue to the public site-specific environmental documentations 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 implementation procedures with cooperation and input from the FS.

The MOU further states that the responsible FS official would request in writing the inclusion of appropriate lands in the APHIS suppression project when treatment on FS land is necessary The FS must also prepare 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 prepares and approves the Pesticide Use Proposal.

APHIS supports the use of Integrated Pest Management (IPM) principles in the management of grasshoppers and Mormon Crickets. APHIS provides technical assistance to Federal, Tribal, State and private land managers including the use of IPM. However, implementation of on-the-ground IPM activities is limited to land management agencies and Tribes, as well as private landowners. In addition, APHIS' authority under the Plant Protection Act is to treat Federal, State and private lands for grasshoppers and Mormon cricket populations. APHIS' technical assistance occurs under each of the three alternatives proposed in the EIS.

In addition to providing technical assistance, APHIS completed the Grasshopper Integrated Pest Management (GIPM) project. One of the goals of the GIPM is to develop new methods of suppressing grasshopper and Mormon cricket populations that will reduce non-target effects. RAATs are one of the methods that has been developed to reduce the amount of pesticide used in suppression activities and is a component of IPM. APHIS continues to evaluate new suppression tools and methods for grasshopper and Mormon cricket populations, including biological control, and as stated in the EIS, will implement those methods once proven effective and approved for use in the United States.

## *C. About This Process*

The NEPA 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 act swiftly with respect to those requests. Surveys help to determine general areas, among the millions of acres where harmful grasshopper infestations may occur in the spring of the following year. Survey data provides the best estimate of future grasshopper populations, while short-term climate or environmental factors change where the specific treatments will be needed. Therefore, examining specific treatment areas for environmental risk analysis under NEPA is typically not possible. 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.

Intergovernmental agreements between APHIS and cooperators with Tribal Nations may preclude disclosure of Tribal information to the public without the consent of the Tribal Administrator. Individuals may request information on the specific treatment areas on Tribal Lands from the individual Tribal Nations.

Public involvement under the CEQ Regulations for Implementing the Procedural Provisions of NEPA distinguishes federal actions with effects of national concern from those with effects primarily of local concern (40 CFR 1506.6). The grasshopper and Mormon cricket suppression program EIS was published in the Federal Register (APHIS-2016-0045), and met all applicable notice and comment requirements for a federal action with effects of national concern. This process provided individuals and national groups the ability to participate in the development of alternatives and provide comment. Our subsequent state-based actions have the potential for effects of local concern, and we publish them according to the provisions that apply to federal actions with effects primarily of local concern. This includes the USDA APHIS NEPA Implementation Procedures, which allows for EAs and findings of no significant impact (FONSIs) where the effects of an action are primarily of regional or local concern, to normally provide notice of publication in a local or area newspaper of general circulation (7 CFR 372.7(b)(3)). These notices provide potentially locally affected individuals an additional opportunity to provide input into the decision-making process. Some states, including Nevada, also provide additional opportunities for local public involvement, such as public meetings. In addition, when an interested party asks to be informed APHIS ensures their contact information is added to the list of interested stakeholders.

APHIS uses the scoping process to enlist land managers and the public to identify alternatives and issues to be considered during the development of a grasshopper or Mormon cricket suppression program. Scoping was helpful in the preparation of the draft EAs. The process can occur formally and informally through meetings, conversations, or written comments from individuals and groups.

The current EIS provides a solid analytical foundation; however, it may not be enough to satisfy NEPA completely for actual treatment proposals. The program typically prepares a Draft EA tiered to the current EIS for each of the 17 Western States, or portion of a state, that may receive a request for treatment. The Draft EA analyzes aspects of environmental quality that could be affected by treatments in the area where grasshopper outbreaks are anticipated. The Draft EA will be made available to the public for a 30-day comment period. When the program receives a treatment request and determines that treatment is necessary, the specific site within the state will be evaluated to determine if environmental factors were thoroughly evaluated in the Draft EA. If all environmental issues were accounted for in the Draft EA, the program will prepare a Final EA and FONSI. Once the FONSI has been finalized copies of those documents will be sent to any parties that

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submitted comments on the Draft EA, and to other appropriate stakeholders. To allow the program to respond to comments in a timely manner, the Final EA and FONSI will be posted to the APHIS website. The program will also publish a notice of availability in the same manner used to advertise the availability of the Draft EA.

# II. Alternatives

To engage in comprehensive NEPA risk analysis APHIS must frame potential agency decisions into distinct alternative actions. These program alternatives are then evaluated to determine the significance of environmental effects. The 2002 EIS presented three alternatives: (A) No Action; (B) Insecticide Applications at Conventional Rates and Complete Area Coverage; and (C) Reduced Agent Area Treatments (RAATs), and their potential impacts were described and analyzed in detail. The 2019 EIS was tiered to and updated the 2002 EIS. Therefore the 2019 EIS considered the environmental background or 'No Action' alternative of maintaining the program that was described in the 2002 EIS and Record of Decision. The 2019 EIS also considered an alternative where APHIS would not fund or participate in grasshopper suppression programs. The preferred alternative of the 2019 EIS allowed APHIS to update the program with new information and technologies that not were analyzed in the 2002 EIS. Copies of the complete 2002 and 2019 EIS documents are available for review at 8775 Technology Way, Reno, NV 89521. These documents are also available at the Rangeland Grasshopper and Mormon Cricket Program web site, http://www.aphis.usda.gov/plant-health/grasshopper.

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

This Final EA analyzes the significance of environmental effects that could result from the alternatives described below. These alternatives differ from those described in the 2019 EIS because grasshopper treatments are not likely to occur in most of Churchill, Humboldt, Pershing, and Washoe counties and therefore the environmental baseline should describe a no treatment scenario.

## *A. No Suppression Program Alternative*

Under Alternative A, the No Action alternative, APHIS would not conduct a program to suppress grasshopper infestations within Churchill, Humboldt, Pershing, and Washoe counties. 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 or Reduced Agent Area Treatments with Adaptive Management Strategy (Preferred Alternative)*

Under Alternative B, the Preferred Alternative, APHIS would manage a grasshopper treatment program using techniques and tools discussed hereafter to suppress outbreaks. The insecticides available for use by APHIS include the U.S. Environmental Protection Agency (USEPA) registered chemicals carbaryl, diflubenzuron, and malathion. These chemicals have varied modes of action. Carbaryl and malathion work by inhibiting acetylcholinesterase (enzymes involved in nerve impulses) and diflubenzuron inhibits the formation of chitin by insects. APHIS would make a single application per treatment season to a treatment area and could apply insecticide at an APHIS rate conventionally used for grasshopper suppression treatments, or more typically as reduced agent area treatments (RAATs). APHIS selects which insecticides and rates are appropriate for suppression of a grasshopper outbreak based on several biological, logistical, environmental, and economical criteria. The identification of grasshopper species and their life stage largely determines the choice of insecticides used among those available to the program. RAATs are the most common application method for all program insecticides, and only rarely do rangeland pest conditions warrant full coverage and higher rates.

Typically, the decision to use diflubenzuron, the pesticide most commonly used by the program, is determined by the life stage of the dominant species within the outbreak population. Diflubenzuron can produce 90 to 97% grasshopper mortality in nascent populations with a greater percentage of early instars. If the window for the use of diflubenzuron closes, as a result of treatment delays, then carbaryl or rarely malathion are the remaining control options. Certain species are more susceptible to carbaryl bait, and sometimes that pesticide is the best control option.

The RAATs strategy is effective for grasshopper suppression because the insecticide controls grasshoppers within treated swaths while conserving grasshopper predators and parasites in swaths not directly treated. RAATs can decrease the rate of insecticide applied by either using lower insecticide concentrations or decreasing the deposition of insecticide applied by alternating one or more treatment swaths. Both options are most often incorporated simultaneously into RAATs. Based on the total percent coverage of a treatment area, either carbaryl, diflubenzuron, or malathion could be considered under this alternative at the following application rates:

- 8.0-16.0 fluid ounces (0.25-0.50 pound active ingredient (lb a.i.)) of carbaryl ULV spray per acre;
- 2.0-10.0 pounds (0.04-0.20 lb a.i.) of 2 percent carbaryl bait per acre;
- 2.0-10.0 pounds (0.10-0.50 lb a.i.) of 5 percent carbaryl bait per acre;
- 0.75 or 1.0 fluid ounce (0.012-0.016 lb a.i.) of diflubenzuron per acre; or
- 4.0-8.0 fluid ounces (0.31-0.62 lb a.i.) of malathion per acre.

The width of the area not directly treated (the untreated swath) under the RAATs approach is not standardized. The proportion of land treated in a RAATs approach is a complex function of the rate of grasshopper movement, which is a function of developmental stage, population density, and weather (Narisu et al., 1999, 2000), as well as the properties of the

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insecticide (insecticides with longer residuals allow wider spacing between treated swaths). Foster et al. (2000) left 20 to 50% of their study plots untreated, while Lockwood et al. (2000) left 20 to 67% of their treatment areas untreated. Currently the grasshopper program typically leaves 50% of a spray block untreated for ground applications where the swath width is between 20 and 45 feet. For aerial applications, the skipped swath width is typically no more than 20 feet for malathion, 100 feet for carbaryl and 200 feet for diflubenzuron. The selection of insecticide and the use of an associated swath widths is site dependent. Rather than suppress grasshopper populations to the greatest extent possible, the goal of this method is to suppress grasshopper populations to less than the economic infestation level.

Contractors use of Trimble GPS Navigation or equivalent system equipment is used to navigate and capture shapefiles of the treatment areas. All sensitive sites are buffered out of the treatment area using flagging which is highly visible to the applicator. All sensitive sites are reviewed in the daily briefing with APHIS personnel including the applicator working on the treatment site.

Typical treatment designs in Nevada have historically used 1.0 fl. oz. of Diflubenzuron per acre with 50% coverage. Dependent on the size of the treatment and the aircraft capabilities, previous treatments had spacing of 150-foot swath widths alternating between treated and untreated swaths.

Insecticide applications at conventional rates and complete area coverage, is an approach that APHIS has used in the past but is currently uncommon. Under this alternative, carbaryl, diflubenzuron, or malathion would cover all treatable sites within the designated treatment block per label directions. The application rates under this alternative are typically at the following application rates:

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

The potential generalized environmental effects of the application of carbaryl, diflubenzuron, and malathion, under this alternative are discussed in detail in the 2019 EIS. A description of anticipated site-specific impacts from this alternative 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 17,466,675 acres (27,292 sq. mi.) within north western Nevada. Approximately 85% of the land area is classified as Federal with the remainder State and private lands. Most of the area is high desert and mountain country. The lowest elevation is approximately 4,000 feet and Mount Rose, located within Washoe County, is the highest elevation at 10,785 feet. A map of the program suppression area is attached hereto as Appendix B. The actual program area that may be treated will be determined by surveys done in early spring.

The area is semi-arid and the majority of precipitation falls from October to June, as a result of Pacific storms. The precipitation varies from 4 inches a year in the valleys to over 20 inches a year in the mountains. Normally, the area is snow free from June to October, but snow can occur at any time. The soils are in climatic groups including desert, semi desert, upland mountain and high mountain with some irrigated soils. Agriculture areas include native and improved rangeland, pasture and cropland. Treatment guidelines in Appendix A would be followed to provide the least effect on soils.

Major waterways include, but are not limited to: Carson River, Humboldt River, Little Humboldt River, Quinn River, Kings River, Martin Creek and Truckee Rivers. In addition, there are other important smaller streams. Lakes, reservoirs and playas include: Onion Valley Reservoir, Knott Creek Reservoir, Big Springs Reservoir, Bilk Creek Reservoir, Chimney Reservoir, Blue Lake, Summit Lake, High rock Lake, Gridley Lake, Button Lake, Humboldt Lake, Toulon Lake, Rye Patch reservoir, Lake Tahoe, and Pyramid Lake.

Recreation activities vary considerably throughout the area. Primary activities include hunting, fishing, off-road vehicle use, hiking, backpacking, rockhounding and horseback riding. Related uses are camping, sightseeing, photography and nature study. Overall, primary use is low except in developed recreation sites and along major reservoirs. Major recreational areas in this Region include: Rye Patch Reservoir, Blue Lake, Onion Valley Reservoir, Knott Creek Reservoir, Big Springs Reservoir, Chimney Reservoir, Dufurreno Ponds, Bilk Creek Reservoir, and the Humboldt River. The water resources provide water for wildlife, wild horses/burros, and domestic livestock use as well as habitat for wildlife.

The Fallon National Wildlife Refuge, Stillwater National Wildlife Refuge and the Charles Sheldon National Wildlife Refuge are located in the assessment area. The Humboldt-Toiyabe National Forest is also within the area.

The principle rangeland vegetation in the area is: Bitterbrush, Big Sagebrush, Indian ricegrass, Winterfat, Greasewood, Horsebrush, Rabbitbrush, Paintbrush, Perennial bunchgrasses, and Blue grasses.

## *B. Site-Specific Considerations*

### 1. Human Health

Population centers within the district include the towns of Fallon, Winnemucca, Lovelock, McDermitt, Orovada, Golconda, Imlay, Empire, Gerlach and Reno. No ULV aerial applications of malathion, carbaryl, or diflubenzuron would be conducted over these congested areas. The major schools are located within the city limits of these towns. The population of the four counties is approximately 508,100 (U.S. Census Bureau, March 2018).

Six Indian Reservations exist within the boundaries of the district. They are Fort McDermitt Indian Reservation, Summit Lake Indian Reservation, Reno-Sparks Indian Colony (Hungry Valley), Walker River Indian Reservation, Fallon Indian Reservation and Pyramid Lake Indian Reservation.

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Potential exposures to the general public from traditional application rates are infrequent and of low magnitude. 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. Therefore, routine safety precautions as listed on chemical labels would 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 applications, but individuals with allergic or hypersensitive reactions to the insecticides or other chemicals in the formulated product could be affected. These individuals would be advised to avoid treatment areas at the time of application until the insecticides has time to dry on the treated vegetation.

## 2. Nontarget Species

Proposed treatment areas have been tentatively identified in Northern Nevada. There are species of concern in some of the treatment blocks. Should other areas warrant treatment, the local land managers will be consulted.

### a) Migratory Birds

The U.S. Fish and Wildlife Service (USFWS) list of migratory bird species in Nevada is attached (Appendix C – Table 1). Migratory bird species of concern will be addressed through local consultation with land managers and USFWS.

### b) Endangered Species

The U.S. Fish and Wildlife Service (USFWS) list of endangered, threatened, candidate and proposed species of concern in Nevada is attached (Appendix C – Table 1).

Species for Federal listing state-listed species, and/or other sensitive species identified by state or federal agencies within the area include: Columbia Spotted frog, Greater sage-grouse, Yellow-Billed Cuckoo, Bald Eagle, Desert dace, Lahontan cutthroat trout, Warner sucker, cui-ui, Carson wandering skipper, Steamboat buckwheat and Weber Ivesia.

### c) Bald and Golden Eagles

Bald and golden eagles are known to occur in the proposed treatment areas. Bald and golden eagle populations and their nesting sites will be identified prior to treatment through local consultation with land managers and USFWS.

### d) Additional Species of Concern

Game species known to occur within the general areas proposed for spraying include Bighorn sheep, mule deer, pronghorn antelope, mountain lion, cottontail rabbit mourning dove, sage grouse, chucker, Hungarian partridge and several species of waterfowl. A number of cold and warm water game fish occur in the various lakes, streams and reservoirs in the area. Wild horses and burros are managed by the BLM on numerous herd management areas throughout the proposed suppression program area. It is anticipated that aerial control programs will not be in areas where populations of wild horses/burros are found.

A diversity of non-game wildlife occurs in the area (birds, reptiles, amphibians, and mammals) including wild horses. The greatest abundance and diversity of most species occurs in riparian and wetland habitat types.

## 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 grasshopper populations have begun to dwindle, thus fewer are present. Hunters probably would not be affected. ATV use is fairly prevalent throughout. The presence of high densities of grasshoppers would result in fewer people engaging in recreational activities during the spring and summer within the affected areas. High grasshopper densities in the campsite detract considerably from the quality of the recreational experience. Grasshoppers tend to get into unsecured tents and food. The quality of the recreational experience for ATV users and horseback riders would also be indirectly impaired by high densities of grasshoppers. Large quantities of grasshoppers crossing roads and trails are killed by vehicle traffic, leaving windrows of dead grasshoppers 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 would likely relocate them to areas that are not infested. Displacement of users would be more of an inconvenience to the public than an actual effect on the recreational values of the area. Displacement would 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 would be impacted. The potential for user conflict would increase, in particular as motorized recreationists displace to other already heavily used areas. Such locations would experience more pressure and may experience site degradation. Areas currently not impacted or used by dispersed campers may become subject to use and development as people look for areas for recreation which are not infested with grasshoppers. 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 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 grasshoppers 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 and 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 Nevada, who shaped the communities and enterprises that make up much of Nevada. 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 grasshopper damage would be forced to search for other rangeland, to sell their livestock prematurely or to purchase feed hay. This would affect other ranchers (non-permittees) by increasing demand, and consequently, cost for hay and/or pasture in the area. This would 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 would compound the effects to vegetation of recently drought conditions over the last four years (e.g.., continual heavy utilization by grasshoppers, 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 problems resulting in increased suppression efforts, increased suppression costs and the expansion of suppression needs onto lands where such operations 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 in the affected area would have beneficial economic impacts to local landowners, 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 public lands that are part of the Region's visual and cultural resources include the Humboldt-Toiyabe National Forest, Black Rock Desert, High Rock Canyon Emigrant Trails, National conservation area and associated 10 wilderness areas including Rye Patch State Recreation Area, Charles Sheldon and Fallon National Wildlife Refuges, Stillwater and Humboldt Wildlife Management Areas, and Santa Rosa Paradise Peak wilderness area. There are numerous wilderness study areas, administered by the BLM in the proposed suppression program area.

A broad variety and number of activities have occurred, are occurring or would occur throughout the area of concern that affects cultural resources. These activities and any cumulative impacts associated with them would occur regardless of whether or not grasshoppers 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 would likely later result in more intensive and extensive treatment of that infested land. Most of the non-public lands that would be affected have already been heavily disturbed and any artifacts on them likely impacted. Consequently, it is unlikely that additional carbaryl bait treatments would result in additional impacts on cultural properties.

With no treatment of grasshoppers on public lands, aerial application of insecticides off public lands would likely increase. 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 would 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 would create a risk of impacting cultural properties. The risk is small given that the off-road use of vehicles would 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 would be avoided to mitigate impacts. Any sites located during treatment activities would be reported, and avoided during continuing operations. Past similar grasshopper 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 would occur, regardless of whether or not grasshoppers are treated. No direct, indirect or change in cumulative impacts on cultural resources in the area would 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 would confer with BLM, Forest Service or other appropriate land management agency or cultural resource specialists on a local level to protect these areas of special concern. APHIS also would 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 risk of adverse effects for any minority or low-income populations. A demographic review of the proposed project area 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 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 would work closely with representatives of these populations in the locale of planned actions through public meetings.

**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 those 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 the 2019 review of the three insecticides and their use in programs, the risk assessment concludes that the likelihood of children being exposed to insecticides from a grasshopper 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 and 2019 EIS. The specific impacts of the alternatives are highly dependent upon the particular action and location of infestation. The principal concerns associated with the alternatives are: (1) the potential effects of insecticides on human health (including subpopulations that might be at increased risk); and (2) impacts of insecticides on nontarget organisms (including threatened and endangered species).

APHIS has written human health and ecological risk assessments (HHERAs) to assess the insecticides and use patterns that are specific to the program. The risk assessments provide an in-depth technical analysis of the potential impacts of each insecticide to human health; and non-target fish and wildlife along with its environmental fate in soil, air, and water. The assessments rely on data required by the USEPA for pesticide product registrations, as well as peer-reviewed and other published literature. The HHERAs are heavily referenced in the EIS and this Draft EA. These Environmental Documents can be found at the following website: http://www.aphis.usda.gov/plant-health/grasshopper.

## A. *Environmental Consequences of the Alternatives*

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

### 1. No Suppression Program Alternative

Under this alternative, APHIS would not conduct a program to suppress grasshoppers. If APHIS does not participate in any grasshopper suppression program, Federal land management agencies, State agriculture departments, local governments, private groups or individuals, may not effectively combat outbreaks in a coordinated effort. Without the technical assistance and coordination that APHIS provides during grasshopper outbreaks, the uncoordinated programs could use insecticides that APHIS considers too environmentally harsh. Multiple treatments and excessive amount of insecticide could be applied in efforts to suppress or even locally eradicate grasshopper populations. There are approximately 100 pesticide products registered by USEPA for use on rangelands and against grasshoppers (Purdue University, 2018). 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. However, the environmental impacts could be much greater than under the APHIS led suppression program alternative due to lack of treatment knowledge or coordination among the groups.

The potential environmental impacts from the No Action alternative, where other agencies and land managers do not control outbreaks, stem primarily from grasshoppers consuming vast amounts of vegetation in rangelands and surrounding areas. Grasshoppers are generalist feeders, eating grasses and forbs first and often moving to cultivated crops. High grasshopper density of one or several species and the resulting defoliation may reach an economic threshold where the damage caused by grasshoppers exceeds the cost of controlling the grasshoppers. Researchers determined that during typical grasshopper infestation years, approximately 20% of forage rangeland is removed, valued at a dollar adjusted amount of $900 million. This value represents 32 to 63% of the total value of rangeland across the western states (Rashford et al., 2012). Other market and non-market values such as carbon sequestration, general ecosystem services, and recreational use may also be impacted by pest outbreaks in rangeland.

Vegetation damage during serious grasshopper outbreaks may be so severe that all grasses and forbs are destroyed; thus, plant growth is impaired for several years. Rare plants may be consumed during critical times of development such as during seed production, and loss of important plant species, or seed production may lead to reduced biological diversity of the rangeland habitats, potentially creating opportunities for the expansion of invasive and exotic weeds (Lockwood and Latchininsky, 2000). When grasshoppers consume plant cover, soil is more susceptible to the drying effects of the sun, making plant roots less capable of holding soil in place. Soil damage results in erosion and disruption of nutrient cycling, water infiltration, seed germination, and other ecological processes which are important components of rangeland ecosystems (Latchininsky et al., 2011).

When the density of grasshoppers reaches economic infestation levels, grasshoppers begin to compete with livestock for food by reducing available forage (Wakeland and Shull, 1936; Belovsky, 2000; Pfadt, 2002; Branson et al., 2006; Bradshaw et al., 2018). Ranchers could offset some of the costs by leasing rangeland in another area and relocating their livestock, finding other means to feed their animals by purchasing hay or grain, or selling their livestock. Ranchers could also incur economic losses from personal attempts to control grasshopper damage to rangeland. Local communities could see adverse economic impacts to the entire area. Grasshoppers that infest rangeland could move to surrounding croplands. Farmers could incur economic losses from attempts to chemically control grasshopper populations or due to the loss of their crops. The general public could see an increase in the cost of meat, crops, and their byproducts.

## 2. Insecticide Applications at Conventional Rates or Reduced Agent Area Treatments with Adaptive Management Strategy

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 typically occur at half the conventional application rates following the RAATs strategy. APHIS would apply a single treatment per treatment season to affected rangeland areas to suppress grasshopper outbreak populations by a range of 35 to 98 percent, depending upon the insecticide used.

### a) Carbaryl

Carbaryl is a member of the N-methyl carbamate class of insecticides, which affect the nervous system via cholinesterase inhibition. Inhibiting the enzyme acetylcholinesterase (AChE) causes nervous system signals to persist longer than normal. While these effects are desired in controlling insects, they can have undesirable impacts to non-target organisms that are exposed. The APHIS HHERA assessed available laboratory studies regarding the toxicity of carbaryl on fish and wildlife. In summary, the document indicates the chemical is highly toxic to insects, including native bees, honeybees, and aquatic insects; slightly to highly toxic to fish; highly to very highly toxic to most aquatic crustaceans, moderately toxic to mammals, minimally toxic to birds; moderately to highly toxic to several terrestrial arthropod predators; and slightly to highly toxic to larval amphibians (USDA APHIS, 2018a). However, adherence to label requirements and additional program measures designed to prevent carbaryl from reaching sensitive habitats or mitigate exposure of non-target organisms will reduce environmental effects of treatments.

The offsite movement and deposition of carbaryl after treatments is unlikely because it does not significantly vaporize from the soil, water, or treated surfaces (Dobroski et al., 1985). Temperature, pH, light, oxygen, and the presence of microorganisms and organic material are factors that contribute to how quickly carbaryl will degrade in water. Hydrolysis, the breaking of a chemical bond with water, is the primary degradation pathway for carbaryl at pH 7 and above. In natural water, carbaryl is expected to degrade faster than in laboratory settings due to the presence of microorganisms. The half-lives of carbaryl in natural waters varied between 0.3 to 4.7 days (Stanley and Trial, 1980; Bonderenko et al., 2004). Degradation in the latter study was temperature dependent with shorter half-lives at higher temperatures. Aerobic aquatic metabolism of carbaryl reported half-life ranged of 4.9 to 8.3 days compared to anaerobic (without oxygen) aquatic metabolism range of 15.3 to 72 days (Thomson and Strachan, 1981; USEPA, 2003). Carbaryl is not persistent in soil due to multiple degradation pathways including hydrolysis, photolysis, and microbial metabolism. Little transport of carbaryl through runoff or leaching to groundwater is expected due to the low water solubility, moderate sorption, and rapid degradation in soils. There are no reports of carbaryl detection in groundwater, and less than 1% of granule carbaryl applied to a sloping plot was detected in runoff (Caro et al., 1974).

Acute and chronic risks to mammals are expected to be low to moderate based on the available toxicity data and conservative assumptions that were used to evaluate risk. There is the potential for impacts to small mammal populations that rely on terrestrial invertebrates for food. However, based on the toxicity data for terrestrial plants, minimal risks of indirect effects are expected to mammals that rely on plant material for food. Carbaryl has a reported half-life on vegetation of three to ten days, suggesting mammal exposure would be short-term. Direct risks to mammals from carbaryl bait applications is expected to be minimal based on oral, dermal, and inhalation studies (USDA APHIS, 2018a).

A number of studies have reported no effects on bird populations in areas treated with carbaryl (Buckner et al., 1973; Richmond et al., 1979; McEwen et al., 1996). Some applications of formulated carbaryl were found to cause depressed AChE levels (Zinkl et al., 1977; Gramlich, 1979); however, the doses were twice those proposed for the full coverage application in the grasshopper program.

While sublethal effects have been noted in fish with depressed AChE, as well as some impacts to amphibians (i.e. days to metamorphosis) and aquatic invertebrates in the field due to carbaryl, the application rates and measured aquatic residues observed in these studies are well above values that would be expected from current program operations. Indirect risks to amphibian and fish species can occur through the loss of habitat or reduction in prey, yet data suggests that carbaryl risk to aquatic plants that may serve as habitat, or food, for fish and aquatic invertebrates is very low.

Product use restrictions appear on the USEPA-approved label and attempt to keep carbaryl out of waterways. Carbaryl must not be applied directly to water, or to areas where surface water is present (USEPA, 2012c). The USEPA-approved use rates and patterns and the additional mitigations imposed by the grasshopper program, such as using RAATs and application buffers, where applicable, further minimize aquatic exposure and risk.

The majority of rangeland plants require insect-mediated pollination. Native, solitary bee species are important pollinators on western rangeland (Tepedino, 1979). Potential negative effects of insecticides on pollinators are of concern because a decrease in their numbers has been associated with a decline in fruit and seed production of plants. Laboratory studies have indicated that bees are sensitive to carbaryl applications, but the studies were at rates above those proposed in the program. The reduced rates of carbaryl used in the program and the implementation of application buffers should significantly reduce exposure of carbaryl applications to pollinators. In areas of direct application where impacts may occur, alternating swaths and reduced rates (i.e., RAATs) would reduce risk. Potential negative effects of grasshopper program insecticides on bee populations may also be mitigated by the more common use of carbaryl baits than the ULV spray formulation. Studies with carbaryl bran bait have found no sublethal effects on adults or larvae bees (Peach et al., 1994, 1995).

Carbaryl can cause cholinesterase inhibition (i.e., overstimulate the nervous system) in humans resulting in nausea, headaches, dizziness, anxiety, and mental confusion, as well as

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convulsions, coma, and respiratory depression at high levels of exposure (NIH, 2009a; Beauvais, 2014). USEPA classifies carbaryl as “likely to be carcinogenic to humans” based on vascular tumors in mice (USEPA, 2007, 2015a, 2017a).

USEPA regulates the amount of pesticide residues that can remain in or on food or feed commodities as the result of a pesticide application. The agency does this by setting a tolerance, which is the maximum residue level of a pesticide, usually measured in parts per million (ppm), that can legally be present in food or feed. USEPA-registered carbaryl products used by the grasshopper program are labeled with rates and treatment intervals that are meant to protect livestock and keep chemical residues in cattle at acceptable levels (thereby protecting human health). While livestock and horses may graze on rangeland the same day that the land is sprayed, in order to keep tolerances to acceptable levels, carbaryl spray applications on rangeland are limited to half a pound active ingredient per acre per year (USEPA, 2012c). The grasshopper program would treat at or below use rates that appear on the label, as well as follow all appropriate label mitigations, which would ensure residues are below the tolerance levels.

Adverse human health effects from the proposed program ULV applications of the carbaryl spray (Sevin® XLR Plus) and bait applications of the carbaryl 5% and 2% baits formulations to control grasshoppers are not expected based on low potential for human exposure to carbaryl and the favorable environmental fate and effects data. Technical grade (approximately 100% of the insecticide product is composed of the active ingredient) carbaryl exhibits moderate acute oral toxicity in rats, low acute dermal toxicity in rabbits, and very low acute inhalation toxicity in rats. Technical carbaryl is not a primary eye or skin irritant in rabbits and is not a dermal sensitization in guinea pig (USEPA, 2007). This data can be extrapolated and applied to humans revealing low health risks associated with carbaryl.

The Sevin® XLR Plus formulation, which contains a lower percent of the active ingredient than the technical grade formulation, is less toxic via the oral route, but is a mild irritant to eyes and skin. The proposed use of carbaryl as a ULV spray or a bait, use of RAATs, and adherence to label requirements, substantially reduces the potential for exposure to humans. Program workers are the most likely human population to be exposed. APHIS does not expect adverse health risks to workers based on low potential for exposure to carbaryl when applied according to label directions and use of personal protective equipment (PPE) (e.g., long-sleeved shirt and long pants, shoes plus socks, chemical-resistant gloves, and chemical-resistant apron) (USEPA, 2012c) during loading and applications. APHIS quantified the potential health risks associated with accidental worker exposure to carbaryl during mixing, loading, and applications. The quantitative risk evaluation results indicate no concerns for adverse health risk for program workers (http://www.aphis.usda.gov/plant-health/grasshopper).

Adherence to label requirements and additional program measures designed to reduce exposure to workers and the public (e.g., mitigations to protect water sources, mitigations to limit spray drift, and restricted-entry intervals) result in low health risk to all human population segments.

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### b) Diflubenzuron

Diflubenzuron is a restricted use pesticide (only certified applicators or persons under their direct supervision may make applications) registered with USEPA as an insect growth regulator. It specifically interferes with chitin synthesis, the formation of the insect's exoskeleton. Larvae of affected insects are unable to molt properly. While this effect is desirable in controlling certain insects, it can have undesirable impacts to non-target organisms that are exposed.

USEPA considers diflubenzuron relatively non-persistent and immobile under normal use conditions and stable to hydrolysis and photolysis. The chemical is considered unlikely to contaminate ground water or surface water (USEPA, 1997). The vapor pressure of diflubenzuron is relatively low, as is the Henry's Law Constant value, suggesting the chemical will not volatilize readily into the atmosphere from soil, plants or water. Therefore, exposure from volatilization is expected to be minimal. Due to its low solubility (0.2 mg/L) and preferential binding to organic matter, diflubenzuron seldom persists more than a few days in water (Schaefer and Dupras, 1977; Schaefer et al., 1980). Mobility and leachability of diflubenzuron in soils is low, and residues are usually not detectable after seven days (Eisler, 2000). Aerobic aquatic half-life data in water and sediment was reported as 26.0 days (USEPA, 1997). Diflubenzuron applied to foliage remains adsorbed to leaf surfaces for several weeks with little or no absorption or translocation from plant surfaces (Eisler, 1992, 2000). Field dissipation studies in California citrus and Oregon apple orchards reported half-live values of 68.2 to 78 days (USEPA, 2018). Diflubenzuron persistence varies depending on site conditions and rangeland persistence is unfortunately not available. Diflubenzuron degradation is microbially mediated with soil aerobic half-lives much less than dissipation half-lives. Diflubenzuron treatments are expected to have minimal effects on terrestrial plants. Both laboratory and field studies demonstrate no effects using diflubenzuron over a range of application rates, and the direct risk to terrestrial plants is expected to be minimal (USDA APHIS, 2018c).

Dimilin® 2L is labeled with rates and treatment intervals that are meant to protect livestock and keep residues in cattle at acceptable levels (thereby, protecting human health). Tolerances are set for the amount of diflubenzuron that is allowed in cattle fat (0.05 ppm) and meat (0.05 ppm) (40 CFR Parts 180.377). The grasshopper program would treat at application rates indicated on product labels or lower, which should ensure approved residues levels.

APHIS' literature review found that on an acute basis, diflubenzuron is considered toxic to some aquatic invertebrates and practically non-toxic to adult honeybees. However, diflubenzuron is toxic to larval honeybees (USEPA, 2018). It is slightly nontoxic to practically nontoxic to fish and birds and has very slight acute oral toxicity to mammals, with the most sensitive endpoint from exposure being the occurrence of methemoglobinemia (a condition that impairs the ability of the blood to carry oxygen). Minimal direct risk to amphibians and reptiles is expected, although there is some uncertainty due to lack of information (USDA APHIS, 2018c; USEPA, 2018).

Risk is low for most non-target species based on laboratory toxicity data, USEPA approved use rates and patterns, and additional mitigations such as the use of lower rates and RAATs that further reduces risk. Risk is greatest for sensitive terrestrial and aquatic invertebrates that may be exposed to diflubenzuron residues.

In a review of mammalian field studies, Dimilin® applications at a rate of 60 to 280 g a.i./ha had no effects on the abundance and reproduction in voles, field mice, and shrews (USDA FS, 2004). These rates are approximately three to 16 times greater than the highest application rate proposed in the program. Potential indirect impacts from application of diflubenzuron on small mammals includes loss of habitat or food items. Mice on treated plots consumed fewer lepidopteran (order of insects that includes butterflies and moths) larvae compared to controls; however, the total amount of food consumed did not differ between treated and untreated plots. Body measurements, weight, and fat content in mice collected from treated and non-treated areas did not differ.

Poisoning of insectivorous birds by diflubenzuron after spraying in orchards at labeled rates is unlikely due to low toxicity (Muzzarelli, 1986). The primary concern for bird species is related to an indirect effect on insectivorous species from a decrease in insect prey. At the proposed application rates, grasshoppers have the highest risk of being impacted while other taxa have a much reduced risk because the lack of effects seen in multiple field studies on other taxa of invertebrates at use rates much higher than those proposed for the program. Shifting diets in insectivorous birds in response to prey densities is not uncommon in undisturbed areas (Rosenberg et al., 1982; Cooper et al., 1990; Sample et al., 1993).

Indirect risk to fish species can be defined as a loss of habitat or prey base that provides food and shelter for fish populations, however these impacts are not expected based on the available fish and invertebrate toxicity data (USDA APHIS, 2018c). A review of several aquatic field studies demonstrated that when effects were observed it was at diflubenzuron levels not expected from program activities (Fischer and Hall, 1992; USEPA, 1997; Eisler, 2000; USDA FS, 2004).

Diflubenzuron applications have the potential to affect chitin production in various other beneficial terrestrial invertebrates. Multiple field studies in a variety of application settings, including grasshopper control, have been conducted regarding the impacts of diflubenzuron to terrestrial invertebrates. Based on the available data, sensitivity of terrestrial invertebrates to diflubenzuron is highly variable depending on which group of insects and which life stages are being exposed. Immature grasshoppers, beetle larvae, lepidopteran larvae, and chewing herbivorous insects appear to be more susceptible to diflubenzuron than other invertebrates. Within this group, however, grasshoppers appear to be more sensitive to the proposed use rates for the program. Honeybees, parasitic wasps, predatory insects, and sucking insects show greater tolerance to diflubenzuron exposure (Murphy et al., 1994; Eisler, 2000; USDA FS, 2004).

Diflubenzuron is moderately toxic to spiders and mites (USDA APHIS, 2018c). Deakle and Bradley (1982) measured the effects of four diflubenzuron applications on predators of *Heliothis* spp. at a rate of 0.06 lb a.i./ac and found no effects on several predator groups. This supported earlier studies by Keever et al. (1977) that demonstrated no effects on the arthropod predator community after multiple applications of diflubenzuron in cotton fields. Grasshopper integrated pest management (IPM) field studies have shown diflubenzuron to have a minimal impact on ants, spiders, predatory beetles, and scavenger beetles. There was no significant reduction in populations of these species from seven to 76 days after treatment. Although ant populations exhibited declines of up to 50 percent, these reductions were temporary, and population recovery was described as immediate (Catangui et al., 1996).

Due to its mode of action, diflubenzuron has greater activity on immature stages of terrestrial invertebrates. Based on standardized laboratory testing diflubenzuron is considered practically non-toxic to adult honeybees. The contact LD50 value for the honeybee, *Apis mellifera*, is reported at greater than 114.8 µg a.i./bee while the oral LD50 value was reported at greater than 30 µg a.i./bee. USEPA (2018) reports diflubenzuron toxicity values to adult honeybees are typically greater than the highest test concentration using the end-use product or technical active ingredient. The lack of toxicity to honeybees, as well as other bees, in laboratory studies has been confirmed in additional studies (Nation et al., 1986; Chandel and Gupta, 1992; Mommaerts et al., 2006). Mommaerts et al. (2006) and Thompson et al. (2005) documented sublethal effects on reproduction-related endpoints for the bumble bee, *Bombus terrestris* and *A. mellifera*, respectively, testing a formulation of diflubenzuron. However, these effects were observed at much higher use rates relative to those used in the program.

Insecticide applications to rangelands have the potential to impact pollinators, and in turn, vegetation and various rangeland species that depend on pollinated vegetation. Based on the review of laboratory and field toxicity data for terrestrial invertebrates, applications of diflubenzuron are expected to have minimal risk to pollinators of terrestrial plants. The use of RAATs provide additional benefits by using reduced rates and creating untreated swaths within the spray block that will further reduce the potential risk to pollinators.

APHIS reduces the risk to native bees and pollinators through monitoring grasshopper and Mormon cricket populations and making pesticide applications in a manner that reduces the risk to this group of nontarget invertebrates. Monitoring grasshopper and Mormon cricket populations allows APHIS to determine if populations require treatment and to make treatments in a timely manner reducing pesticide use and emphasizing the use of Program insecticides that are not broad spectrum. Historical use of Program insecticides demonstrate that diflubenzuron is the preferred insecticide for use. Over 90% of the acreage treated by the Program has been with diflubenzuron. Diflubenzuron poses a reduced risk to native bees and pollinators compared to liquid carbaryl and malathion applications.

Adverse human health effects from ground or aerial ULV applications of diflubenzuron to control grasshoppers are not expected based on the low acute toxicity of diflubenzuron and low potential for human exposure. The adverse health effects of diflubenzuron to mammals and humans involves damage to hemoglobin in blood and the transport of oxygen. Diflubenzuron causes the formation of methemoglobin. Methemoglobin is a form of hemoglobin that is not able to transport oxygen (USDA FS, 2004). USEPA classifies diflubenzuron as non-carcinogenic to humans (USEPA, 2015b).

Program workers adverse health risks are not likely when diflubenzuron is applied according to label directions that reduce or eliminate exposures. Adverse health risk to the general public in treatment areas is not expected due to the low potential for exposure resulting from low population density in the treatment areas, adherence to label requirements, program measures designed to reduce exposure to the public, and low toxicity to mammals.

### c) Malathion

Malathion is a broad-spectrum organophosphate insecticide widely used in agriculture on various food and feed crops, homeowner yards, ornamental nursery stock, building perimeters, pastures and rangeland, and regional pest eradication programs. The chemical's mode of action is through AChE inhibition, which disrupts nervous system function. While these effects are desired in controlling insects, they can have undesirable impacts to non-target organisms that are exposed to malathion. The grasshopper program currently uses the malathion end-use product Fyfanon® ULV AG, applied as a spray by ground or air.

Volatility is not expected to be a major pathway of exposure based on the low vapor pressure and Henry's Law constant that have been reported for malathion. The atmospheric vapor phase half-life of malathion is five hours (NIH, 2009b). Malathion's half-life in pond, lake, river, and other natural waters varied from 0.5 days to ten days, depending on pH (Guerrant et al., 1970), persisting longer in acidic aquatic environments. The reported half-life in water and sediment for the anaerobic aquatic metabolism study was 2.5 days at a range of pH values from 7.8 to 8.7 (USEPA, 2006). The persistence of malathion in soils depends primarily on microorganism activity, pH, and organic matter content. The persistence of malathion is decreased with microbial activity, moisture, and high pH (USEPA, 2016a) and the half-life of malathion in natural soil varies from two hours (Miles and Takashima, 1991) to 11 days (Neary, 1985; USEPA, 2006).

Malathion and associated degradates, in general, are soluble and do not adsorb strongly to soils (USEPA, 2000a). Inorganic degradation of malathion may be more important in soils that are relatively dry, alkaline, and low in organic content, such as those that predominate in the western program areas. Adsorption to organic matter and rapid degradation make it unlikely that detectable quantities of malathion would leach to groundwater (LaFleur, 1979). Malathion degradation products also have short half-lives. Malaoxon, the major malathion degradation product of toxicological concern, has half-lives less than one day in a variety of soil types (USEPA, 2016a). The half-life of malathion on foliage has been shown to range from one to six days (El-Refai and Hopkins, 1972; Nigg, 1986; Matsumara, 1985; USDA FS, 2008).

While livestock and horses may graze on rangeland the same day that the land is treated with malathion, the products used by the grasshopper program are labeled with rates and treatment intervals that are meant to protect livestock. Tolerances are set for the amount of malathion that is allowed in cattle fat (4 ppm), meat (4 ppm), and meat byproducts (4 ppm) (40 CFR Parts 180.111). The grasshopper program would treat at application rates indicated on product labels or lower, which would ensure approved residues levels. In addition, the program would make only one application a year.

USEPA found malathion moderately toxic to birds on a chronic basis, slightly toxic to mammals through dietary exposure, and acutely toxic to aquatic species (including freshwater as well as estuarine and marine species) (USEPA, 2000b, 2016b). Toxicity to aquatic vertebrates such as fish and larval amphibians, and aquatic invertebrates is variable based on test species and conditions. The data available on impacts to fish from malathion suggest effects could occur at levels above those expected from program applications. Consumption of contaminated prey is not expected to be a significant pathway of exposure for aquatic species based on expected residues and malathion's BCF (USEPA, 2016a; USDA APHIS, 2018d). Indirect effects to fish from impacts of malathion applications to aquatic plants are not expected (USDA APHIS, 2018d).

USEPA considers malathion highly toxic to bees if exposed to direct treatment on blooming crops or weeds. The Fyfanon® ULV AG label indicates not to apply product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area (USEPA, 2012a). Toxicity to other terrestrial invertebrates is variable based on the test organism and test conditions however malathion is considered toxic to most terrestrial invertebrates (USEPA, 2016b).

Indirect risks to mammals resulting from the loss of plants that serve as a food source would also be low due to the low phytotoxicity of malathion. The other possible indirect effect that should be considered is loss of invertebrate prey for those mammals that depend on insects and other invertebrates as a food source. Insects have a wide variety of sensitivities to malathion and a complete loss of invertebrates from a treated area is not expected because of low program rates and application techniques. In addition, the aerial and ground application buffers and untreated swaths provide refuge for invertebrates that serve as prey for insectivorous mammals and would expedite repopulation of areas that may have been treated.

APHIS expects that direct avian acute and chronic effects would be minimal for most species (USDA APHIS, 2018d). The preferred use of RAATs during application reduces these risks by reducing residues on treated food items and reducing the probability that they will only feed on contaminated food items. In addition, malathion degrades quickly in the environment and residues on food items are not expected to persist. Indirect effects on birds from the loss of habitat and food items are not expected because of malathion's low toxicity to plants and the implementation of RAATs that would reduce the potential impacts to invertebrates that serve as prey for avian species. Several field studies did not find significant indirect effects of malathion applications on avian fecundity (Dinkins et al., 2002; George et al., 1995; Howe, 1993; Howe et al., 1996; Norelius and Lockwood, 1999; Pascual, 1994).

Available toxicity data demonstrates that amphibians are less sensitive to malathion than fish. Program malathion residues are more than 560 times below the most sensitive acute toxicity value for amphibians. Sublethal effects, such as developmental delays, reduced food consumption and body weight, and teratogenesis (developmental defects that occur during embryonic or fetal growth), have been observed at levels well above those assessed from the program's use of malathion (USDA APHIS, 2018d). Program protection measures for aquatic water bodies and the available toxicity data for fish, aquatic invertebrates, and plants suggest low indirect risks related to reductions in habitat or aquatic prey items from malathion treatments.

Available data on malathion reptile toxicity suggest that, with the use of program measures, no lethal or sublethal impacts would be anticipated (USDA APHIS, 2015). Indirect risk to reptiles from the loss of food items is expected to be low due to the low application rates and implementation of preferred program measures such as RAATs (USDA APHIS, 2018d).

The risk to aquatic vertebrates and invertebrates is low for most species; however, some sensitive species that occur in shallow water habitats may be at risk. Program measures such application buffer zones, drift mitigation measures and the use of RAATs will reduce these risks.

Risks to terrestrial invertebrate populations are anticipated based on the available toxicity data for invertebrates and the broad spectrum activity of malathion (Swain, 1986; Quinn et al., 1991). The risk to terrestrial invertebrates can be reduced by the implementation of application buffers and the use of RAATs, which would reduce exposure and create refuge areas where malathion impacts would be reduced or eliminated. Smith et al. (2006) conducted field studies to evaluate the impacts of grasshopper treatments to non-target terrestrial invertebrates and found minimal impacts when making reduced rate applications with a reduced coverage area (i.e. RAATs) for a ULV end-use product of malathion. Impacts to pollinators have the potential to be significant, based on available toxicity data for honeybees that demonstrate high contact toxicity from malathion exposures (USDA APHIS, 2018d). However, risk to pollinators is reduced because of the short residual toxicity of malathion. In addition, the incorporation of other mitigation measures in the program, such as the use of RAATs and wind speed and direction mitigations that are designed to minimize exposure, reduce the potential for population-level impacts to terrestrial invertebrates.

Adverse human health effects from ULV applications of malathion to control grasshopper are not expected based on the low mammalian acute toxicity of malathion and low potential for human exposure. Malathion inhibits AChE in the central and peripheral nervous system with clinical signs of neurotoxicity that include tremors, salivation, urogenital staining, and decreased motor activity. USEPA indicates that malathion has "suggestive evidence of carcinogenicity but not sufficient to assess human carcinogenic potential" (USEPA, 2016c).

Adverse health risks to program workers and the general public from malathion exposure are also not expected due to low potential for exposure. APHIS treatments are conducted in rangeland areas consisting of widely scattered, single, rural dwellings in ranching communities, where agriculture is a primary industry. Label requirements to reduce exposure include minimizing spray drift, avoidance of water bodies and restricted entry interval. Program measures such as applying malathion once per season, lower application rates, application buffers and other measures further reduce the potential for exposure to the public.

### d) Reduced Area Agent Treatments (RAATs)

The use of RAATS is the most common application method for all program insecticides and would continue to be so, accept in rare pest conditions that warrant full coverage and higher rates. The goal of the RAATs strategy is to suppress grasshopper populations to a desired level, rather than to reduce those populations to the greatest possible extent. This strategy has both economic and environmental benefits. APHIS would apply a single application of insecticide per treatment season, typically using a RAATs strategy that decreases the rate of insecticide applied by either using lower insecticide spray concentrations, or by alternating one or more treatment swaths. Usually RAATs applications use both lower concentrations and skip treatment swaths. The RAATs strategy suppresses grasshoppers within treated swaths, while conserving grasshopper predators and parasites in swaths that are not treated.

The concept of reducing the treatment area of insecticides while also applying less insecticide per treated acre was developed in 1995, with the first field tests of RAATs in Wyoming (Lockwood and Schell, 1997). Applications can be made either aerially or with ground-based equipment (Deneke and Keyser, 2011). Studies using the RAATs strategy have shown good control (up to 85% of that achieved with a total area insecticide application) at a significantly lower cost and less insecticide, and with a markedly higher abundance of non-target organisms following application (Lockwood et al., 2000; Deneke and Keyser, 2011). Levels of control may also depend on variables such as body size of targeted grasshoppers, growth rate of forage, and the amount of coverage obtained by the spray applications (Deneke and Keyser, 2011). Control rates may also be augmented by the necrophilic and necrophagic behavior of grasshoppers, in which grasshoppers are attracted to volatile fatty acids emanating from cadavers of dead grasshoppers and move into treated swaths to cannibalize cadavers (Lockwood et al., 2002; Smith and Lockwood, 2003). Under optimal conditions, RAATs decrease control costs, as well as host plant losses and environmental effects (Lockwood et al., 2000; Lockwood et al., 2002).

The efficacy of a RAATs strategy in reducing grasshoppers is, therefore, less than conventional treatments and more variable. Foster et al. (2000) reported that grasshopper mortality using RAATs was reduced 2 to 15% from conventional treatments, depending on the insecticide, while Lockwood et al. (2000) reported 0 to 26% difference in mortality between conventional and RAATs methods. APHIS will consider the effects of not suppressing grasshoppers to the greatest extent possible as part of the treatment planning process.

RAATs reduces treatment costs and conserves non-target biological resources in untreated areas. The potential economic advantages of RAATs was proposed by Larsen and Foster (1996), and empirically demonstrated by Lockwood and Schell (1997). Widespread efforts to communicate the advantages of RAATs across the Western States were undertaken in 1998 and have continued on an annual basis. The viability of RAATs at an operational scale was initially demonstrated by Lockwood et al. (2000), and subsequently confirmed by Foster et al. (2000). The first government agencies to adopt RAATs in their grasshopper suppression programs were the Platte and Goshen County Weed and Pest Districts in Wyoming; they also funded research at the University of Wyoming to support the initial studies in 1995. This method is now commonly used by government agencies and private landowners in States where grasshopper control is required.

Reduced rates should prove beneficial for the environment. All APHIS grasshopper treatments using carbaryl, diflubenzuron, or malathion are conducted in adherence with USEPA-approved label directions. Labeled application rates for grasshopper control tend to be lower than rates used against other pests. In addition, use rates proposed for grasshopper control by APHIS are lower than rates used by private landowners.

## *B. Other Environmental Considerations*

### 1. Cumulative Impacts

Cumulative impact, as defined in the Council on Environmental Quality (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."

Potential cumulative impacts associated with the No Action alternative where APHIS would not take part in any grasshopper suppression program include the continued increase in grasshopper populations and potential expansion of populations into neighboring range and cropland. In addition, State and private land managers could apply insecticides to manage grasshopper populations however, land managers may opt not to use RAATs, which would increase insecticides applied to the rangeland. Increased insecticide applications from the lack of coordination or foregoing RAATs methods could increase the exposure risk to non-target species. In addition, land managers may not employ the extra program measures designed to reduce exposure to the public and the environment to insecticides.

Potential cumulative impacts associated with the Preferred Alternative are not expected to be significant because the program applies an insecticide application once during a treatment. The program may treat an area with different insecticides but does not overlap the treatments. The program does not mix or combine insecticides. Based on historical outbreaks in the United States, the probability of an outbreak occurring in the same area where treatment occurred in the previous year is unlikely; however, given time, populations eventually will reach economically damaging thresholds and require treatment. The insecticide application reduces the insect population down to levels that cause an acceptable level of economic damage. The duration of treatment activity, which is relatively short since it is a one-time application, and the lack of repeated treatments in the same area in the same year reduce the possibility of significant cumulative impacts.

Potential cumulative impacts resulting from the use of insecticides include insect pest resistance, synergistic chemical effects, chemical persistence and bioaccumulation in the environment. The program use of reduced insecticide application rates (i.e. ULV and RAATs) are expected to mitigate the development of insect resistance to the insecticides. Grasshopper outbreaks in the United States occur cyclically so applications do not occur to the same population over time further eliminating the selection pressure increasing the chances of insecticide resistance.

The insecticides proposed for use in the program have a variety of agricultural and non-agricultural uses. There may be an increased use of these insecticides in an area under suppression when private, State, or Federal entities make applications to control other pests. However, the vast majority of the land where program treatments occur is uncultivated rangeland and additional treatments by landowners or managers are very uncommon making possible cumulative or synergistic chemical effects extremely unlikely.

The insecticides proposed for use in the grasshopper program are not anticipated to persist in the environment or bioaccumulate. Therefore, a grasshopper outbreak that occurs in an area previously treated for grasshoppers is unlikely to cause an accumulation of insecticides from previous program treatments.

The Bureau of Land Management could apply herbicides for the control of federal noxious weeds throughout some of the potential grasshopper 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 would 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 the grasshoppers 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

Federal agencies identify and address the disproportionately high and adverse human health or environmental effects of their proposed activities, as described in E.O. 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 of the proposed project area 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 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 would work closely with representatives of these populations in the locale of planned actions through public meetings.

APHIS intervention to locally suppress damaging grasshopper infestations would stand to greatly benefit, rather than harm, low-income farmers and ranchers by helping them to control grasshopper threats to their livelihood. Suppressing grasshopper infestations on adjacent public or private rangelands would increase inexpensive available forage for their livestock and would significantly decrease economic losses to their crop lands by invading grasshoppers. 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 have notified the appropriate APHIS State Plant

Health Director when any new or potentially threatening grasshopper infestations 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 would 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 programs, APHIS has worked cooperatively with American Indian groups and would continue to do so in the future.

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

Federal agencies consider a proposed action's potential effects on children to comply with E.O. 13045, "Protection of Children from Environmental Health Risks and Safety Risks." This E.O. requires each Federal agency, consistent with its mission, to identify and assess environmental health and safety risks that may disproportionately affect children and to ensure 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).

APHIS' HHERAs evaluated the potential exposure to each insecticide used in the program and risks associated with these insecticides to residents, including children. The HHERAs for the proposed program insecticides, located at http://www.aphis.usda.gov/plant-health/grasshopper, suggest that no disproportionate risks to children, as part of the general public, are anticipated.

The human health risk assessment for the 2019 EIS analyzed the efforts of exposure to children from the three insecticides. Based on review of the insecticides and their use in the grasshopper program, the risk assessment concluded that the likelihood of children being exposed to insecticides is very slight and that no disproportionate adverse effects to children are anticipated over the negligible effects to the general population. Treatments are conducted on open rangelands where children would not be expected to be present during treatment or to enter should there be any restricted entry period after treatment.

Impacts on children would be minimized by the implementation of the Treatment Guidelines:

Aerial Broadcast Applications of Liquid Insecticides

- Notify all residents in treatment areas, or their designated representatives, prior to proposed operations. Advise them of the control method to be used, the proposed method of application, and precautions to be taken (e.g., advise parents to keep children and pets indoors during ULV treatment). Refer to label recommendations related to restricted entry period.

- No treatments would 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 the 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 in the protection measures, we have determined that there would likely be no significant impact within any potential treatment zone of the area of concern.

## 4. Tribal Consultation

Executive Order 13175 "Consultation and Coordination with Indian Tribal Governments," calls for agency communication and collaboration with tribal officials when proposed Federal actions have potential tribal implications. The Archaeological Resources Protection Act of 1979 (16 U.S.C. §§ 470aa-mm), secures the protection of archaeological resources and sites on public and tribal lands.

Prior to the treatment season, program personnel notify Tribal land managers of the potential for grasshopper and Mormon cricket outbreaks on their lands. Consultation with local Tribal representatives takes place prior to treatment programs to inform fully the Tribes of possible actions APHIS may take on Tribal lands. Treatments typically do not occur at cultural sites, and drift from a program treatment at such locations is not expected to adversely affect natural surfaces, such as rock formations and carvings. APHIS would also confer with the appropriate Tribal authority to ensure that the timing and location of a planned program treatment does not coincide or conflict with cultural events or observances on Tribal lands.

## 5. Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712) established a Federal prohibition, unless permitted by regulations, to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird or any part, nest, or egg of any such bird.

APHIS will support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or reducing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions. Impacts are minimized as a result of buffers to water, habitat, nesting areas, riparian areas, and the use of RAATs. For any given treatment, only a portion of the environment will be treated, therefore minimizing potential impacts to migratory bird populations.

## 6. Endangered Species Act

Section 7 of the Endangered Species Act (ESA) and its implementing regulations require Federal agencies to ensure their actions are not likely to jeopardize the continued existence of listed threatened or endangered species or result in the destruction or adverse modification of critical habitat. Numerous federally listed species and areas of designated critical habitat occur within the 17-State program area, although not all occur within or near potential grasshopper suppression areas or within the area under consideration by through this EA.

APHIS considers whether listed species, species proposed for listing, experimental populations, or critical habitat are present in the proposed suppression area. Before treatments are conducted, APHIS contacts the U.S Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) (where applicable) to determine if listed species are present in the suppression area, and whether mitigations or protection measures must be implemented to protect listed species or critical habitat.

APHIS completed a programmatic Section 7 consultation with NMFS for use of carbaryl, malathion, and diflubenzuron to suppress grasshoppers in the 17-state program area because of the listed salmonid (*Oncorhynchus* spp.) and critical habitat. To minimize the possibility of insecticides from reaching salmonid habitat, APHIS implements the following protection measures:

- RAATs are used in all areas adjacent to salmonid habitat
- ULV sprays are used, which are between 50% and 66% of the USEPA recommended rate
- Insecticides are not aerially applied in a 3,500 foot buffer zones for carbaryl or malathion, or applied within a 1,500 foot buffer zones for diflubenzuron along stream corridors
- Insecticides will not be applied when wind speeds exceed 10 miles per hour. APHIS will attempt to avoid insecticide application if the wind is blowing towards salmonid habitat
- Insecticide applications are avoided when precipitation is likely or during temperature inversions

APHIS determined that with the implementation of these measures, the grasshopper suppression program may affect, but is not likely to adversely affect listed salmonids or designated critical habitat in the program area. NMFS concurred with this determination in a letter dated April 12, 2010.

APHIS submitted a programmatic biological assessment for grasshopper suppression in the 17-state program area and requested consultation with USFWS on March 9, 2015. With the incorporation and use of application buffers and other operational procedures APHIS anticipates that any impacts associated with the use and fate of program insecticides will be insignificant and discountable to listed species and their habitats. Based on an assessment of the potential exposure, response, and subsequent risk characterization of program operations, APHIS concludes the proposed action is not likely to adversely affect listed species or critical habitat in the program area. APHIS has requested concurrence from the USFWS on these determinations. Until this programmatic Section 7 consultation with USFWS is completed, APHIS will conduct consultations with USFWS field offices at the local level.

APHIS considers the role of pollinators in any consultations conducted with the FWS to protect federally-listed plants. Mitigation measures, such as no treatment buffers are applied with consideration of the protection of pollinators that are important to a listed plant species.

APHIS personnel have been conferring with the U.S. Fish and Wildlife Service, Nevada Fish and Wildlife Office to discuss section 7 consultations as required by the Endangered Species Act of 1973 annually since 2007. On March 26, 2021, USFWS provided a letter of concurrence to APHIS personnel for the 2021, 2022, and 2023 treatment seasons attached in appendix D. Included in Appendix C is the U.S. Fish and Wildlife Service listing of Nevada endangered, threatened, proposed, and candidate species (Table 1).

The 1995 biological opinion issued by USFWS lists the mitigations to be followed by APHIS when conducting a suppression program to control grasshoppers with insecticides other than diflubenzuron. This list is included in Appendix C (Table 2). Mitigation measures for use of malathion and carbaryl for new listings (since 1995) of threatened, endangered and proposed species that have not been included in formal Section 7 consultation are also included in Appendix C (Table 3). Mitigation measures as required by USFWS for threatened, endangered, and proposed species incorporating the use of diflubenzuron on grasshopper suppression programs are included in Table 3.

APHIS is not required to develop mitigation buffer zones for candidate or other species of concern. The Columbia spotted frog (Great Basin population) (*Rana luteiventris*) and Greater Sage Grouse are species of concern and located within our proposed treatment areas for 2021. However, species of concern receive no legal protection under the Act, but consideration of these species will be discussed with the local land managers prior to any treatments to assist in conservation efforts. Agreed upon mitigation measures between USFWS, NDOW, NDA, and APHIS will be followed. Yearly local program consultations with the requesting agency would determine if mitigation measures would allow a suppression program to be done.

## 7. Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668–668c) prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. During the breeding season, bald eagles are sensitive to a variety of human activities. Grasshopper management activities could cause disturbance of nesting eagles, depending on the duration, noise levels, extent of the area affected by the activity, prior experiences that eagles have with humans, and tolerance of the individual nesting pair. Also, disruptive activities in or near eagle foraging areas can interfere with bald eagle feeding, reducing chances of survival. USFWS has provided recommendations for avoiding disturbance at foraging areas and communal roost sites that are applicable to grasshopper management programs (USFWS, 2007).

No toxic effects are anticipated on eagles as a direct consequence of insecticide treatments. Toxic effects on the principle food source, fish, are not expected because insecticide treatments will not be conducted over rivers or lakes. Buffers protective of aquatic biota are applied to their habitats to ensure that there are no indirect effects from loss of prey.

## 8. Additional Species of Concern

There may be species that are of special concern to land management agencies, the public, or other groups and individuals in proposed treatment areas. For example, the sage grouse populations have declined throughout most of their entire range, with habitat loss being a major factor in their decline.

Grasshopper suppression programs reduce grasshoppers and at least some other insects in the treatment area that can be a food item for sage grouse chicks. As indicated in previous sections on impacts to birds, there is low potential that the program insecticides would be toxic to sage grouse, either by direct exposure to the insecticides or indirectly through immature sage grouse eating moribund grasshoppers.

Because grasshopper numbers are so high in an outbreak year, treatments would not likely reduce the number of grasshoppers below levels present in a normal year. Should grasshoppers be unavailable in small, localized areas, sage grouse chicks may consume other insects, which sage grouse chicks likely do in years when grasshopper numbers are naturally low. By suppressing grasshoppers, rangeland vegetation is available for use by other species, including sage grouse, and rangeland areas are less susceptible to invasive plants that may be undesirable for sage grouse habitat.

Through an agreement between Nevada Department of Agriculture (NDA), Nevada Department of Wildlife (NDOW), USDA Plant Protection and Quarantine (PPQ), the Bureau of Land Management (BLM), and the United Stated Fish and Wildlife Service (USFWS) all parties agree to limit the use of insecticides within sage-grouse habitat for grasshopper and Mormon cricket control during times that would have the greatest chance of disturbing sage-grouse during critical nesting and brooding periods. For aerial applications of Dimilin, no applications will occur within three miles of active and pending sage grouse leks during the intervals of one hour before sunrise to two hours after sunrise, and from two hours before sunset to one hour after sunset between the months of March and May.

Ground applications will use specially formulated carbaryl baits to mitigate potential impacts to non-target species. No carbaryl bait will be applied within three miles of any active or pending sage grouse lek. Through consultation with NDOW and BLM, areas where crops, roads, or urban areas are to be protected, two track or other categories of roads may be utilized to distribute carbaryl bait within the sage grouse buffer zone, up to one mile from the area to be protected. If a lek is found within one mile from the protected area, further consultation will be had with NDOW and USFWS. Any ground baiting activity approved by NDOW and USFWS within the sage grouse buffer zone using carbaryl bait would also comply with the time frame constraints consistent with that of the aerial applications of Dimilin.

There are also biocontrol programs established by various land managers as well as county, state, and federal agencies. Nevada Department of Agriculture (NDA) works in conjunction with APHIS personnel through a cooperative agreement. NDA also maintains a healthy biocontrol program. All biocontrol sites are mapped and logged for relocation purposes. If a biocontrol site overlapped with a proposed treatment, APHIS and NDA would agree upon mitigation measures prior to beginning treatment. Biocontrol populations established by other land managers would be the responsibility of the land manager to identify to APHIS personnel during site specific consultation between APHIS and the land manager.

APHIS also implements several BMP practices in their treatment strategies that are designed to protect nontarget invertebrates, including pollinators. APHIS minimizes insecticide use by using lower than labeled rates for all Program insecticides, alternating swaths during treatment, making only one application per season and minimizing use of liquid broad-spectrum insecticides. APHIS also continues to evaluate new monitoring and control methods designed to increase the response to economically damaging populations of grasshoppers and Mormon crickets while protecting rangeland resources such as pollinators.

## 9. Fires and Human Health Hazards

Various compounds are released in smoke during wildland fires, including carbon monoxide (CO), carbon dioxide, nitrous oxides, sulfur dioxide, hydrogen chloride, aerosols, polynuclear aromatic hydrocarbons contained within fine particulate matter (a byproduct of the combustion of organic matter such as wood), aldehydes, and most notably formaldehyde produced from the incomplete combustion of burning biomass (Reisen and Brown, 2009; Burling et al., 2010; Broyles, 2013). Particulate matter, CO, benzene, acrolein, and formaldehyde have been identified as compounds of particular concern in wildland fire smoke (Reinhardt and Ottmar, 2004).

Many of the naturally occurring products associated with combustion from wildfires may also be present as a result of combustion of program insecticides that are applied to rangeland. These combustion byproducts will be at lower quantities due to the short half-lives of most of the program insecticides and their low use rates. Other minor combustion products specific to each insecticide may also be present as a result of combustion from a rangeland fire but these are typically less toxic based on available human health data (http://www.aphis.usda.gov/plant-health/grasshopper).

The safety data sheet for each insecticide identifies these combustion products for each insecticide as well as recommendations for PPE. The PPE is similar to what typically is used in fighting wildfires. Material applied in the field will be at a much lower concentration than what would occur in a fire involving a concentrated formulation. Therefore, the PPE worn by rangeland firefighters would also be protective of any additional exposure resulting from the burning of residual insecticides.

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### 10. Cultural and Historical Resources

Federal actions must seek to avoid, minimize, and mitigate potential negative impacts to cultural and historic resources as part of compliance with the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act of 1979, and NEPA. Section 106 of the NHPA requires Federal agencies to provide the Advisory Council on Historic Preservation with an opportunity to comment on their findings.

Consultation with the appropriate landowner, State Historic Preservation Office, National Trail's administrative office, or other appropriate agencies will be conducted when appropriate to ensure minimal impacts to cultural and historical resources in the proposed treatment areas.

# V. Literature Cited


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# VI. Listing of Agencies and Persons Consulted

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**Indicates past consultation*

Appendix A - APHIS Rangeland Grasshopper and Mormon Cricket Suppression Program

# FY-2021 Treatment Guidelines
# Version 02/05/2021

The objectives of the APHIS Rangeland Grasshopper and Mormon Cricket Suppression Program are to 1) conduct surveys in the Western States; 2) provide technical assistance to land managers and private landowners; 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, the agriculture department of an affected State, or private landowners, 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 / landowner 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% charge, however, on 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 small 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 the included crop as well as rangeland and current Worker Protection Standards must be followed by the applicator and private landowner.

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. providing 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 (ULV) spray
   B. Diflubenzuron ULV spray
   C. Malathion ULV 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 safety 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) <u>OR</u> a Treatment Manager on site. Each State will have at least one COR available to assist the Contracting Officer (CO) in GH/MC aerial 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 to assure that any environmentally sensitive sites are 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 (SOW).

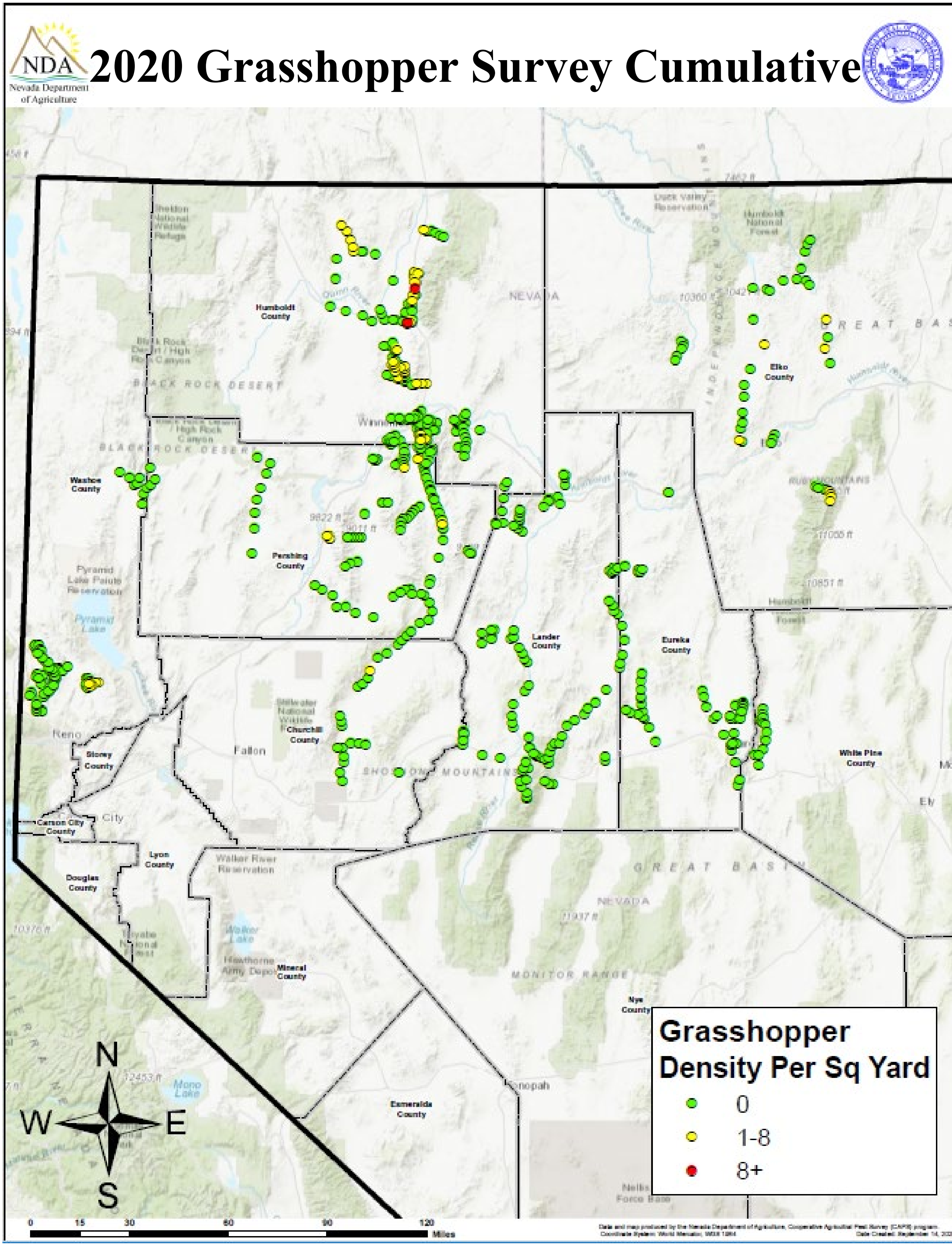
2. Minimize the potential for drift and volatilization by not using ULV sprays when the following conditions exist in the spray area:

    a. Wind velocity exceeds 10 miles per hour (unless state law requires lower wind speed);
    b. Rain is falling or is imminent;
    c. Dew is present over large areas within the treatment block;
    d. There is air turbulence that could affect the spray deposition;
    e. Temperature inversions (ground temperature higher than air temperature) develop and deposition onto the ground is affected.

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

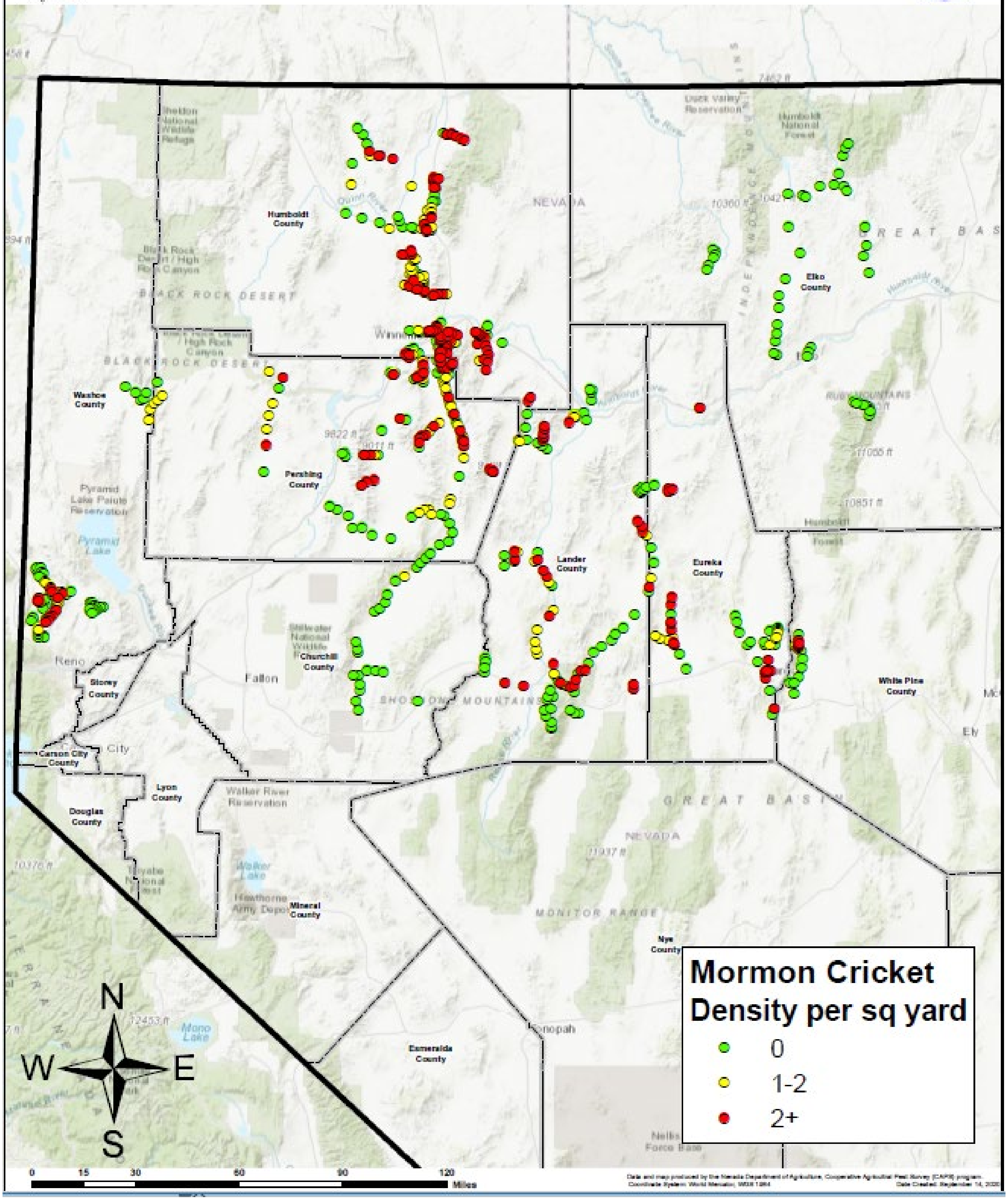
4. Application aircraft will fly at a median altitude of 1 to 1.5 times the wingspan of the aircraft whenever possible or as specified by the COR or the Treatment Manager.

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.



2020 Grasshopper Survey Cumulative
NDA
Nevada Department of Agriculture
Humboldt County
Washoe County
Pershing County
Churchill County
Lander County
Eureka County
Elko County
White Pine County
Storey County
Carson City County
Lyon County
Douglas County
Mineral County
Nye County
Esmeralda County
BLACK ROCK DESERT
Winnemucca
Reno
Fallon
SHOSHONE MOUNTAINS
GREAT BASIN
MONITOR RANGE
NEVADA
Tonopah
Ely
Grasshopper Density Per Sq Yard
0
1-8
8+
N
S
E
W
0 15 30 60 90 120 Miles

# 2020 Mormon Cricket Survey Cumulative



**Appendix C**
**Table 1**

United States Department of the Interior
FISH AND WILDLIFE SERVICE

Reno Fish And Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, NV 89502-7147
Phone: (775) 861-6300 Fax: (775) 861-6301
http://www.fws.gov/nevada/

Klamath Falls Fish And Wildlife Office
1936 California Avenue
Klamath Falls, OR 97601
Phone: (541) 885-8481 Fax: (541) 885-7837

In Reply Refer To: January 22, 2021

Consultation Code: 08ENVD00-2021-SLI-0131 and 01EOFW00-2021-SLI-0181
Event Code: 08ENVD00-2021-E-00387 and 01EOFW00-2021-E-00362
Project Name: NV-21-01

# Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Reno Fish And Wildlife Office**
1340 Financial Boulevard, Suite 234
Reno, NV 89502-7147
(775) 861-6300

**Klamath Falls Fish And Wildlife Office**
1936 California Avenue
Klamath Falls, OR 97601
(541) 885-8481

**Appendix C**
**Table 1**

# Project Summary

Consultation Code: 08ENVD00-2021-SLI-0131 and 01EOFW00-2021-SLI-0181

Event Code: 08ENVD00-2021-E-00387 and 01EOFW00-2021-E-00362

Project Name: NV-21-01

Project Type: AGRICULTURE

Project Description: Site Specific Environmental Assessment for Rangeland Grasshopper and Mormon Cricket Suppression Program in Churchill, Humboldt, Pershing, and Washoe counties in Nevada.

Project Location:

Approximate location of the project can be viewed in Google Maps: https:// www.google.com/maps/@40.536893,-118.64599196228937,14z


Counties: Churchill, NV | Humboldt, NV | Pershing, NV | Washoe, NV

**Appendix C**
**Table 1**

# Endangered Species Act Species

There is a total of 8 threatened or endangered species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## Amphibians

| NAME | STATUS |
|---|---|
| Sierra Nevada Yellow-legged Frog *Rana sierrae*<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/9529 | Endangered |

**Appendix C**
**Table 1**

## Fishes

| NAME | STATUS |
| --- | --- |
| Cui-ui *Chasmistes cujus*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/456 | Endangered |
| Desert Dace *Eremichthys acros*<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/7290 | Threatened |
| Lahontan Cutthroat Trout *Oncorhynchus clarkia henshawi*<br>No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3964 | Threatened |
| Warner Sucker *Catostomus warnerensis*<br>There is **final** critical habitat for this species. Your location overlaps the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/7832 | Threatened |

## Insects

| NAME | STATUS |
| --- | --- |
| Carson Wandering Skipper *Pseudocopaeodes eunus obscurus*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/674 | Endangered |

## Flowering Plants

| NAME | STATUS |
| --- | --- |
| Steamboat Buckwheat *Eriogonum ovalifolium var. williamsiae*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/413 | Endangered |
| Webber's Ivesia *Ivesia webberi*<br>There is **final** critical habitat for this species. Your location overlaps the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/4682 | Threatened |

**Appendix C**
**Table 1**

## Critical habitats

There are 3 critical habitats wholly or partially within your project area under this office's jurisdiction.

| NAME | STATUS |
| --- | --- |
| Desert Dace *Eremichthys acros* https://ecos.fws.gov/ecp/species/7290#crithab | Final |
| Warner Sucker *Catostomus warnerensis* https://ecos.fws.gov/ecp/species/7832#crithab | Final |
| Webber's Ivesia *Ivesia webberi* https://ecos.fws.gov/ecp/species/4682#crithab | Final |

**Appendix C**
**Table 1**

## USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

The following FWS National Wildlife Refuge Lands and Fish Hatcheries lie fully or partially within your project area:

| FACILITY NAME | ACRES |
|---|---|
| Anaho Island National Wildlife Refuge<br><br>**Anaho Island National Wildlife Refuge**<br>C/o Stillwater Nwr<br>1000 Auction Road<br>Fallon, NV 89406-2613<br>(775) 423-5128<br>https://www.fws.gov/refuges/profiles/index.cfm?id=84591 | 637 |
| Fallon National Wildlife Refuge<br><br>**Fallon National Wildlife Refuge**<br>C/o Stillwater Nwr<br>1000 Auction Road<br>Fallon, NV 89406-2613<br>(775) 423-5128<br>https://www.fws.gov/refuges/profiles/index.cfm?id=84592 | 17,900 |
| Sheldon National Wildlife Refuge<br><br>**Sheldon National Wildlife Refuge**<br>C/o Sheldon-hart Mountain Nwr Complex<br>P.O. Box 111<br>Lakeview, OR 97630-0107<br>(541) 947-3315<br>https://www.fws.gov/refuges/profiles/index.cfm?id=14621 | 576,000 |
| Stillwater National Wildlife Refuge Complex<br><br>**Stillwater National Wildlife Refuge Complex**<br>1020 New River Parkway, Suite 305<br>Fallon, NV 89406-2613<br>(775) 423-5128<br>https://www.fws.gov/refuges/profiles/index.cfm?id=84590 | 647 |

# Appendix C
## Table 1

| | |
|---|---|
| Marble Bluff Fish Research And Control Station | 82,400 |

**Marble Bluff Fish Research And Control Station**
P.O. Box 113
Nixon, NV 89424-0113
(775) 265-2425
https://www.fws.gov/offices/Directory/OfficeDetail.cfm?OrgCode=84241

**Appendix C**
**Table 1**

# Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON |
|---|---|
| Bald Eagle *Haliaeetus leucocephalus*<br>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.<br>https://ecos.fws.gov/ecp/species/1626 | Breeds Jan 1 to Aug 31 |
| Brewer's Sparrow *Spizella breweri*<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/9291 | Breeds May 15 to Aug 10 |

## Appendix C
## Table 1

| NAME | BREEDING SEASON |
| --- | --- |
| California Spotted Owl *Strix occidentalis occidentalis*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/7266 | Breeds Mar 10 to Jun 15 |
| Cassin's Finch *Carpodacus cassinii*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9462 | Breeds May 15 to Jul 15 |
| Clark's Grebe *Aechmophorus clarkii*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds Jan 1 to Dec 31 |
| Golden Eagle *Aquila chrysaetos*<br>This is a Bird of Conservation Concern (BCC) only in particularBird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/1680 | Breeds Dec 1 to Aug 31 |
| Green-tailed Towhee *Pipilo chlorurus*<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/9444 | Breeds May 1 to Aug 10 |
| Lesser Yellowlegs *Tringa flavipes*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9679 | Breeds elsewhere |
| Lewis's Woodpecker *Melanerpes lewis*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9408 | Breeds Apr 20 to Sep 30 |
| Long-billed Curlew *Numenius americanus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/5511 | Breeds Apr 1 to Jul 31 |
| Marbled Godwit *Limosa fedoa*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9481 | Breeds everywhere |

**Appendix C**
**Table 1**

| NAME | BREEDING SEASON |
|---|---|
| Olive-sided Flycatcher *Contopus cooperi*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/3914 | Breeds May 20 to Aug 31 |
| Pinyon Jay *Gymnorhinus cyanocephalus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9420 | Breeds Feb 15 to Jul 15 |
| Rufous Hummingbird *selasphorus rufus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/8002 | Breeds elsewhere |
| Sage Thrasher *Oreoscoptes montanus*<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/9433 | Breeds Apr 15 to Aug 10 |
| Sagebrush Sparrow *Artemisiospiza nevadensis*<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA | Breeds Mar 15 to Jul 31 |
| Virginia's Warbler *Vermivora virginiae*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9441 | Breeds May 1 to Jul 31 |
| White Headed Woodpecker *Picoides albolarvatus*<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/9411 | Breeds May 1 to Aug 15 |
| Willet *Tringa semipalmata*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds Apr 20 to Aug 5 |
| Williamson's Sapsucker *Sphyrapicus thyroideus*<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/8832 | Breeds May 1 to Jul 31 |

## Appendix C
## Table 1

| NAME | BREEDING SEASON |
| --- | --- |
| Willow Flycatcher *Empidonax traillii*<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/8832 | Breeds May 20 to Aug 31 |

**Appendix C**
**Table 2**

# Part I
# Grasshopper and Mormon Cricket Control Program Protection Measures Agreed to by APHIS to Protect Threatened, Endangered, or Proposed Species

## Mammals

| Common Name | Scientific Name | Listing Status | States |
|---|---|---|---|
| A. Black-footed ferret | *Mustela nigripes* | E, EXPN | CO, KS, MT, ND, NE, SD, UT, WY |

Program personnel will consult with applicable Federal and/or State agencies in regard to the presence of black-footed ferrets prior to beginning any control programs. Each documented and verified occurrence of interest to the program will be considered and plans for adequate protection adopted in consultation with the local Fish and Wildlife Service (Service) field offices.

| Common Name | Scientific Name | Listing Status | States |
|---|---|---|---|
| B. Utah prairie dog | *Cynomys parvidens* | T | UT |

Malathion and acephate will not be used within ¼ mile of any Utah prairie dog town.

| Common Name | Scientific Name | Listing Status | States |
|---|---|---|---|
| C. Hualapai Mexican vole | *Microtus mexicanus hualpaiensis* | E | AZ |

One-quarter mile no malathion or acephate treatment buffer around occupied areas. Contact the local Service office prior to program operations in Mohave County.

| Common Name | Scientific Name | Listing Status | States |
|---|---|---|---|
| D. Mexican long-nosed bat | *Leptonycteris nivalis* | E | NM, TX |
| Sanborn's long-nosed bat | *Leptonycteris sanborni* | No Data | No Data. AZ, NM ???? |
| Lesser long-nosed bat | *Leptonycteris curasoae yerbabuenae* | E | AZ, NM |

No jeopardy foreseen because of low risk from pesticides to be used and prey base not expected to be significantly effected. Unquantifiable anticipated incidental take as a result of off-road vehicles use for surveys and application of carbaryl bait. Reasonable and prudent measures and terms and conditions provided to reduce take of the species.

**Appendix C**
**Table 2**

<table>
<tr><th colspan="4">Birds</th></tr>
<tr><td>Common Name</td><td>Scientific Name</td><td>Listing Status</td><td>States</td></tr>
<tr><td>A. Whooping crane</td><td>Grus americana</td><td>E, EXPN</td><td>CO, ID, KS, MT, ND, NE, NM, OK, SD, TX, UT,WY</td></tr>
<tr><td colspan="4">APHIS shall ensure that no whooping cranes have wandered into a proposed spray treatment or bait treatment area.</td></tr>
<tr><td>B. Bald eagle</td><td>Haliaeetus leucocephalus</td><td>T</td><td>All 17 western States</td></tr>
<tr><td colspan="4">Maintain a 1-mile radius treatment-free zone (including <u>Nosema)</u> around active bald eagle eyries found on rivers or lakes with no flyovers of this area by contract pilots.<br><br>A 2.5 mile no-aerial ULV spray zone will be maintained upstream and downstream from the nest site as a forage area. This will include a 0.25 mile buffer along each side of the rivers.<br>Lakes will be protected by a 0.25 no-aerial ULV spray buffer if they are considered foraging areas of the bald eagle.</td></tr>
<tr><td>C. Peregrine falcon</td><td>Falco peregrinus anatum</td><td>DM</td><td>All 17 western States</td></tr>
<tr><td colspan="4">This species has been delisted but is being monitored for the first 5 years.</td></tr>
<tr><td>D. Northern aplomado falcon</td><td>Falco femoralis septentrionalis</td><td>E</td><td>TX</td></tr>
<tr><td colspan="4">APHIS will contact the local Service office at least 5 days prior to grasshopper program activities to determine if nesting sites are known and coordinate necessary measures to protect nests and foraging areas.</td></tr>
</table>

**Appendix C**
**Table 2**

| | | | |
|---|---|---|---|
| E. Piping plover | *Charadrius melodus* | T | CO, KS, MT, ND, NE, OK, SD, TX |
| No aerial ULV pesticides will be used within 0.25 mile of water bodies where piping plovers are known to nest.<br><br>Where carbaryl bran bait or Nosema is used, a 500-foot no-treatment zone around nesting areas of piping plovers should be maintained. Piping plover habitat will be determined in consultation with local Service field offices. | | | |
| F. Western snowy plover | *Charadrius alexandrinus nivosus* | T | CA, WA, OR |
| No aerial ULV pesticides should be applied within 0.25 mile of the edges of known snowy plover nesting areas. Carbaryl bran bait or Nosema may be used to within 500 feet of these areas. Within the 500 foot buffer, no treatments will be made. | | | |
| G. Interior least tern | *Sterna antillarum* | E | CO, KS, MT, ND, NE, NM, OK, SD, TX |
| No aerial ULV application should be applied 2.5 miles up and down river to prevent abandonment of nesting least tern colonies due to aircraft flyovers and a possible decrease of the fishery forage base due to accidental aquatic applications.<br><br>A 0.25 mile no aerial ULV application buffer on each side of the river and around other bodies of water containing least tern colonies also should be observed.<br><br>A 500 foot no treatment zone around nesting colonies also should be observed.<br>Interior least tern habitat will be determined in consultation with the local Service field offices. | | | |
| H. Yuma clapper rail | *Rallus longirostris yumanensis* | E | AZ, CA |
| Maintain a 0.25 mile no aerial ULV application buffer and a 500 foot no application buffer for carbaryl bran bait and Nosema around nesting and foraging areas. | | | |

| | | | |
|---|---|---|---|
| I. Black-capped vireo | *Vireo atricapillus* | E | KS, OK, TX |
| Before APHIS control programs are initiated in Oklahoma, a concerted effort should be made to identify nesting areas of this species. The Service recommends that APHIS personnel contact our Service field office in Tulsa, which can assist in identifying specific nesting habitat. The Department of Biology, Central State University, Edmond, OK also can provide further assistance in this effort. Contact the Austin, TX field office for actions near black-capped vireo habitat in Callahan and Taylor Counties, TX.<br><br>Exclusion of aerial ULV spray application in habitat normally used for foraging and nesting by this species as identified above. | | | |
| J. California brown pelican | *Pelecanus occidentalis californicus* | E | CA, OR, TX, WA |
| Maintain a 0.25 mile no aerial application buffer around established nests or roost sites. A 500 foot buffer will apply for carbaryl bran bait or <u>Nosema.</u> | | | |
| K. Southwestern willow flycatcher | *Empidonax traillii extimus* | E | AZ, CA, CO, NM, TX, UT |
| No ULV application of insecticides should occur within 0.25 mile of the edge of occupied habitat. A buffer of 500 feet should be maintained where no application of carbaryl bran bait or <u>Nosema</u> is applied. | | | |
| L. Mexican spotted owl | *Strix occidentalis lucida* | T | AZ, CO, NM, TX, UT |
| APHIS will confer with the local Service office at least 5 days prior to grasshopper control activities in any of the counties known to contain Mexican spotted owls in northeastern Arizona, southwestern Colorado, and Utah to determine if protective measures are needed. | | | |
| M. Cactus ferruginous pygmy-owl | *Glaucidium brasilianum cactorum* | E | AZ |
| APHIS will confer with the local Service office at least 5 days prior to any grasshopper program activities to determine if protective measures are needed. APHIS adopt the preprogram conference procedures. If it is determined during site specific conferences that the grasshopper control program may jeopardize the continued existence of this species or result in the adverse modification of the species' proposed critical habitat, the Service will offer advisory recommendations to avoid or minimize any adverse effects. | | | |

**Appendix C**
**Table 2**

| Fish | | | |
|---|---|---|---|
| **Group A** | | | |
| Common Name | Scientific Name | Listing Status | States |
| Bonytail chub | *Gila elegans* | E | AZ, CA, CO, NV, UT |
| Colorado pikeminnow (=squawfish) | *Ptychocheilus lucius* | E, EXPN | E = AZ, CA, CO, UT, WY. EXPN = AZ |
| Cui-ui | *Chasmistes cujus* | E | NV |
| Gila trout | *Oncorhynchus gilae* | E | AZ, NM |
| Greenback cutthroat trout | *Oncorhynchus stomias* | T | CO |
| Humpback chub | *Gila cypha* | E | AZ, CO, UT |
| Lahontan cutthroat trout | *Oncorhynchus clarkii henshawi* | T | CA, NV, OR, UT |
| Pallid sturgeon | *Scaphirhynchus albus* | E | KS, MT, ND, SD |
| Only carbaryl bran bait or Nosema (no aerial application of ULV pesticide) will be used within 0.25 mile of occupied habitats. | | | |
| **Group B** | | | |
| Apache trout | *Oncorhynchus apache* | T | AZ |
| Big Spring spinedace | *Lepidomeda mollispinis pratensis* | T | NV |
| Borax Lake-chub | *Gila boraxobius* | E | OR |
| Chihuahua chub | *Gila nigrescens* | T | NM |
| Desert dace | *Eremichthys acros* | T | NV |
| Foskett speckled dace | *Rhinichthys osculus ssp.* | T | OR |
| Gila topminnow (now includes Yaqui) | *Poeciliopsis occidentalis* | E | AZ, NM |
| Hiko White River springfish | *Crenichthys baileyi grandis* | E | NV |
| Hutton tui chub | *Gila bicolor spp.* | T | OR |
| June sucker | *Chasmistes liorus* | E | UT |
| Kendall Warm Springs dace | *Rhinichthys osculus thermalis* | T | WY |
| Little Colorado spinedace | *Lepidomeda vittata* | T | AZ |
| Modoc sucker | *Catostomus microps* | E | CA |
| Pahrump killifish (poolfish) | *Empetrichthys latos* | E | NV |

**Appendix C**
**Table 2**

| | | | |
|---|---|---|---|
| Pahranagat roundtail chub | *Gila robusta jordani* | E | NV |
| Pecos bluntnose shiner | *Notropis simus pecosensis* | T | NM |
| Pecos gambusia | *Gambusia nobilis* | E | NM, TX |
| Spikedace | *Meda fulgida* | T | AZ, NM |
| Virgin River chub | *Gila robusta seminuda* | E | AZ, NV, UT |
| Virgin spinedace<br>? Also listed under C? | *Lepidomeda mollispinis pratensis* | T | NV |
| Warner sucker | *Catostomus warnerensis* | T | OR |
| White River springfish | *Crenichthys baileyi balleyi* | E | NV |
| Woundfin | *Plagopterus argentissimus* | E, EXPN | E = AZ, NM, NV, UT<br>EXPN = AZ, NM |
| No aerial ULV application of malathion should be applied within 1 mile of occupied habitat. A 0.25 no-aerial ULV application of carbaryl and acephate also should be adhered to. | | | |
| Group C | | | |
| Arkansas River shiner | *Notropis girardi* | T | KS, NM, OK, TX |
| Ash Meadows Amargosa pupfish | *Cyprinodon nevadensis mionectes* | E | NV |
| Ash Meadows speckled dace | *Rhinichthys osculus nevadensis* | E | NV |
| Clover Valley speckled dace | *Rhinichthys osculus oligoporus* | E | NV |
| Delta smelt | *Hypomesus transpacificus* | T | CA |
| Desert pupfish | *Cyprinodon macularius* | E | AZ, CA |
| Devil's Hole pupfish | *Cyprinodon diabolis* | E | NV |
| Independence Valley speckled dace | *Rhinichthys osculus lethorporus* | E | NV |
| Leopard darter | *Percina pantherina* . | T | OK |
| Loach minnow | *Tiaroga cobitis* | T | AZ, NM |
| Lost River sucker | *Deltistes luxatus* | E | CA, OR |
| Railroad Valley springfish | *Crenichthys nevadae* | T | NV |
| Rio Grande silvery minnow | *Hybognathus amarus* | E | NM, TX |
| Shortnose sucker | *Chasmiste brevirostris* | E | CA, OR |
| Virgin spinedace<br>? Also listed under B? | *lepidomeda mollispinis pratensis* | T | NV |

| | | | |
|---|---|---|---|
| Warm Springs pupfish | *Cyprinodon nevadensis pectoralis* | E | NV |
| White sturgeon | *Acipenser transmontanus* | E | ID, MT |
| Yaqui topminnow (Now included with Gila topminnow) | *Poeciliopsis occidentalis sonoriensis* | E | AZ, NM |
| Buffers around areas of occurrence of 0.5 mile for the use of malathion and 0.25 mile for the use an aerially applied carbaryl and acephate. Within the buffers, only carbaryl bait or Nosema will be used. | | | |
| Group D | | | |
| Yaqui chub | *Gila purpurea* | E | AZ |
| Neosho madtom | *Noturus placidus* | T | KS, OK |
| Moapa dace | *Moapa coriacea* | E | NV |
| No aerial ULV application of malathion should be applied within 0.5 mile of the habitat. A 0.25 mile buffer should be applied for the use of acephate and carbaryl, and a 500 foot no-treatment zone should be used for carbaryl bran bait. | | | |
| Group E | | | |
| Razorback sucker | *Xyrauchen texanus* | E | AZ, CA, CO, NM, NV, UT, WY |
| Maintain a 0.25 mile no-aerial application buffer around known habitats. Within buffer, carbaryl bran bait or Nosema may be used within 500 feet of the water. | | | |
| Group F | | | |
| Sacramento splittail | *Pogonichthys* | T | CA |
| No aerial applications of malathion within 0.5 mile, or aerial applications of acephate or carbaryl within 0.25 mile of Suisun Bay and the San Francisco Bay-Sacramento-San Joaquin River estuary in Sacramento and San Joaquin Counties. Within this buffer, carbaryl bran bait or Nosema may be used within 500 feet of the water. | | | |

**Appendix C**
**Table 2**

| Reptiles | | | |
|---|---|---|---|
| Common Name | Scientific Name | Listing Status | States |
| A. Desert tortoise | *Gopherus agassizii* | T, SAT | AZ, CA, NV, UT |
| Malathion and acephate should not be applied in the Beaver Dam Slope of Washington County, Utah (both inside and outside of the designated critical habitat). | | | |
| B. Flat-tailed horned lizard | *Phrynosoma mcallii* | No Data | No Data |
| APHIS will maintain a 0.25 mile buffer for ULV aerial applications and a 500 foot buffer for carbaryl bran bait around known habitats. | | | |
| C. New Mexican ridge-nosed rattlesnake | *Crotalus willardi obscurus* | T | NM |
| If required to treat for grasshoppers above 6,000 foot elevation, local consultation with the Service will be conducted at least 5 days prior to grasshopper program activities to determine protection measures and specific areas that should be protected. | | | |

| Amphibians | | | |
|---|---|---|---|
| Common Name | Scientific Name | Listing Status | States |
| A. Wyoming toad | *Bufo hemiophrys baxteri* | E | WY |
| A 0.25 mile no-aerial ULV application buffer shall be maintained on each side of the Little Laramie River in Albany county, Wyoming.<br><br>To determine specific boundaries of the area, APHIS should contact the Helena, MT Endangered Species Field Office, as well as the Wyoming Game and Fish, prior to any control program within the historic range of the Wyoming toad. | | | |

| | | | |
|---|---|---|---|
| B. Sonora tiger salamander | *Ambystoma tigrinum stebbinsi* | E | AZ |
| APHIS should not make aerial applications of malathion within 0.5 mile of occupied habitat of the salamander. Buffers of 0.25 mile for acephate and carbaryl aerial applications also should be maintained, and within the buffers only carbaryl bran bait or Nosema should be used. | | | |
| C. California red-legged frog | *Rana aurora draytonii* | T | CA |
| No pesticides (acephate, carbaryl, carbaryl bran bait, or malathion) or Nosema should be applied within 1 mile of occupied habitat of the species. | | | |

# Crustaceans

| Common Name | Scientific Name | Listing Status | States |
|---|---|---|---|
| Shasta crayfish | *Pacifastacus fortis* | E | CA |
| Socorro isopod | *Thermosphaeroma thermosphilus* | E | NM |
| Vernal pool fairy shrimp | *Branchinecta lynchi* | T | CA, OR |
| No aerial ULV application of malathion or carbaryl should be applied within 1 mile ofthe habitat.<br><br>A 0.25 mile buffer should be applied for the use of acephate, and a 500 foot no-treatment zone should be used where carbaryl bran bait is used inside the no-spray buffer areas. | | | |

**Appendix C**
**Table 2**

<table>
<tr><th colspan="4">Snails</th></tr>
<tr><td>Common Name</td><td>Scientific Name</td><td>Listing Status</td><td>States</td></tr>
<tr><td>A. Bruneau Hot Springs snail</td><td>Pyrgulopsis bruneauensis</td><td>E</td><td>ID</td></tr>
<tr><td colspan="4">No pesticide should be broadcast aerially within 0.25 mile of Hot Creek in Owyhee County, Idaho. This is located at T. 8 S., R. 6 E, sections 2, 3, and 4; and T. 7 S., R. 6 E., sections, 33, 34, and 35.</td></tr>
<tr><td>B. Socorro springsnail</td><td>Pyrgulopsis neomexicana</td><td>E</td><td>NM</td></tr>
<tr><td>Alamosa springsnail</td><td>Tryonia alamosae</td><td>E</td><td>NM</td></tr>
<tr><td colspan="4">No pesticide shou1d be applied aerially within 0.25 mile of the habitat. A 500 foot buffer would apply to carbaryl bran bait and Nosema.</td></tr>
<tr><td>C. Ouachita rock pocketbook</td><td>Arkansia wheeleri</td><td>E</td><td>OK</td></tr>
<tr><td colspan="4">No aerial application of malathion or carbaryl within 0.25 mile of habitat or within 500 feet of water for aerial application of acephate.</td></tr>
<tr><td>D. Banbury Springs limpet or lanx</td><td>Lanx sp.</td><td>E</td><td>ID</td></tr>
<tr><td>Bliss Rapids snail</td><td>Taylorconcha serpenticola</td><td>T</td><td>ID</td></tr>
<tr><td>Idaho springsnail</td><td>Fontelicella idahoensis</td><td>E</td><td>ID</td></tr>
<tr><td>Kanab ambersnail</td><td>Oxyloma haydeni ssp. kanabensis</td><td>E</td><td>AZ, UT</td></tr>
<tr><td>Snake River physa snail</td><td>Physa natricina</td><td>E</td><td>ID</td></tr>
<tr><td>Utah valvata</td><td>Valvata utahensis</td><td>IE</td><td>ID</td></tr>
<tr><td colspan="4">Malathion should not be used within 0.5 mile of populations. A 0.25 mile buffer should be used for carbaryl and acephate, and a 500 foot buffer should be maintained for the use of carbaryl bran bait or Nosema.</td></tr>
</table>

**Appendix C**
**Table 2**

| Insects | | | |
|---|---|---|---|
| Common Name | Scientific Name | Listing Status | States |
| A. Pawnee montane skipper | *Hesperia leonardus montana* | T | CO |
| No aerial application of pesticides within 0.25 mile of habitat. | | | |
| B. American burying beetle | *Nicrophorus americanus* | E | NE, SD |
| Contact local office of the Service at least 5 days prior to program activities to determine specific habitat locations and develop adequate protection measures and treatment methods. | | | |
| C. Ash Meadows naucorid | *Ambrysus amargosus* | T | NV |
| No ground or aerial application of pesticides within 0.25 mile of critical habitat. | | | |

**Appendix C**
**Table 2**

| Plants | | | |
|---|---|---|---|
| Common Name | Scientific Name | Listing Status | States |
| Group A | | | |
| Arizona hedgehog cactus | *Echinocereus triglochidiatus var. arizonicus* | E | AZ |
| Aerial ULV application of pesticides will not be used within 0.25 of the occupied habitat. | | | |
| Group B | | | |
| Applegate's milk-vetch | *Astragalus applegatei* | E | OR |
| Arizona agave | *Agave arizonica* | E | AZ |
| Arizona cliffrose | *Purshia subintegra* | E | AZ |
| Arizona willow | *Salix arizonica* | No Data | No Data |
| Ash Meadows blazing-star | *Mentzelia leucophylla* | T | NV |
| Ash Meadows gumplant | *Grindelia fraxinopratensis* | T | CA, NV |
| Ash Meadows ivesia | *Ivesia kingii var. eremica* | T | NV |
| Ash Meadows milk-vetch | *Astragalus phoenix* | T | NV |
| Autumn buttercup | *Ranunculus acrifornis var.* | E | UT |
| Barneby reed-mustard | *Schoenocrambe barnebyi* | E | UT |
| Blowout penstemon | *Penstemon haydenii* | E | NE, WY |
| Brady pincushion cactus | *Pediocactus bradyi* | E | AZ |
| Clay-loving wild | *Eriogonum pelinophilum* | E | CO |
| Clay phacelia | *Phacelia argillacea* | T | UT |
| Clay reed-mustard | *Schoenocrambe argillacea* | T | UT |
| Cochise pincushion cactus | *Coryphantha robbinsorum* | T | AZ |
| Dudley Bluffs bladderpod | *Lesquerella congesta* | T | CO |

## Appendix C
## Table 2

| | | | |
|---|---|---|---|
| Dudley Bluffs twinpod | *Physaria obcordata* | T | CO |
| Dwarf bear-poppy | *Arctomecon humilis* | E | UT |
| Gypsum wild-buckwheat | *Eriogonum gypsophilum* | T | NM |
| Heliotrope milk-vetch | *Astragalus montii* | T | UT |
| Holy Ghost ipomopsis | *ipomopsis sancti-spiritus* | E | NM |
| Jones cycladenia | *Cycladenia humilis var. jonesii* | T | AZ, UT |
| Knowlton cactus | *Pediocactus knowltonii* | E | CO, NM |
| Kodachrome bladderpod | *Lesquerella tumulosa* | E | UT |
| Kuenzler hedgehog cactus | *Echinocereus fendleri var. kuenzleri* | E | NM |
| Last Chance townsendia | *Townsendia aprica* | T | UT |
| Lee pincushion cactus | *Coryphantha sneedii var. leei* | T | NM |
| Lloyd's hedgehog cactus | *Echinocereus lloydii* | DR (Delisted) | NM, TX |
| Maguire daisy | *Erigeron maguirei (var. maguirei)??* | T | UT |
| Malheur wire-lettuce | *Stephanomeria malheurensis* | E | OR |
| Mancos milk-vetch | *Astragalus humillimus* | E | CO, NM |
| Mead's milkweed | *Asclepias meadii* | T | KS |
| Mesa Verde cactus | *Sclerocactus mesa-verdae* | T | CO, NM |
| North Park phacelia | *Phacelia formosula* | E | CO |
| Oserhout milk-vetch | *Astragalus osterhoutii* | E | CO |
| Parish's alkali grass | *Puccinellia parishii* | No Data | No Data. CA, NM ????? |
| Peebles Navajo cactus | *Pediocactus peeblesianus var. peeblesianus* | E | AZ |
| Penland alpine fen mustard | *Eutrema penlandii* | T | CO |
| Penland beardtongue | *Penstemon penlandii* | T | CO |
| Rhizome (Zuni) fleabane | *Erigeron rhizomatus* | T | NM |
| Sacramento Mountains thistle | Cirsium vinaceum | T | NM |
| Sacramento prickly-poppy | *Argemone pleiacantha var. pinnatisecta* | E | NM |

**Appendix C**
**Table 2**

| | | | |
|---|---|---|---|
| San Rafael cactus | *Pediocactus despainii* | E | UT |
| Siler pincushion cactus | *Pediocactus (=Echinocactus = Utahia) sileri* | T | AZ, UT |
| Slender orcutt grass | *Orcuttia tenuis* | T | CA |
| Sneed pincushion cactus | *Coryphantha sneedii var. sneedii* | E | NM, TX |
| Sodaville milk-vetch | *Astragalus lentiginosus var. sesquimetralis* | No Data | No Data. NV ???? |
| Spring-loving/centaury | *Centaurium namophilum* | T | CA, NV |
| Steamboat buckwheat | *Eriogonum ovalifolium* | E | NV |
| Toad-flax cress | *Glaucocarpum suffrutescens* | No Data | No Data. UT ???? |
| Uinta basin hookless cactus | *Sclerocactus glaucus* | T | CO, UT |
| Ute ladies'-tresses | *Spiranthes diluvialis* | T | CO, ID, MT, NE, UT, WA, WY |
| Water howellia | *Howellia aquatilis* | T | CA, ID, MT, OR, WA |
| Welsh's milkweed | *Asclepias welshii* | T | AZ, UT |
| Western prairie fringed orchid | *Platanthera praeclara* | T | KS, ND, NE, OK |
| Winkler cactus | *Pediocactus winkleri* | T | UT |
| Wright's fishhook cactus | *Sclerocactus wrightae* | E | UT |
| Aerial application of pesticides will not be used within 3 miles of these species occupied habitats. Within the 3 mile buffer, only carbaryl bran bait or Nosema will be used. | | | |
| **Group C** | | | |
| Navajo sedge | *Carex specuicola* | T | AZ, UT |
| No applications of carbaryl bran bait within 200 feet of springs and no aerial application of ULV pesticides within 500 feet of springs of occupied habitat. | | | |
| **Group D** | | | |
| Amargosa niterwort | *Nitrophila mohavensis* | E | CA, NV |
| Ash Meadows sunray | *Enceliopsis nudicaulis var. corrugata* | T | NV |
| No applications of ULV insecticides will be made within 3 miles designated critical habitat. Within the 3 mile buffer, only carbaryl bran bait or Nosema will be used. | | | |

**Appendix C**
**Table 2**

| Group E | | | |
|---|---|---|---|
| Canelo Hills ladies'-tresses | *Spiranthes delitescens* | E | AZ |
| Huachuca water umbel | *Lilaeopsis schaffneriana* | E | AZ |
| No applications of ULV insecticides will be made within 3 miles of known populations. Within the 3 mile buffer, only carbaryl bran bait or Nosema will he used. Carbaryl bran bait will not be used within 20 yards of known populations of these species. | | | |

**Appendix C**
**Table 2**

| Part II<br>Species with "No Effect" or "No Jeopardy"<br>Determinations Without Buffers or Other Measures | | | |
|---|---|---|---|
| Mammals | | | |
| Common Name | Scientific Name | Listing Status | States |
| Gray wolf | *Canis lupus* | E | CO, ID, MT, ND, SD, WA, WY |
| Grizzly bear | *Ursus arctos horribilis* | T | CO, ID, MT, WA, WY |
| Mount Graham red squirrel | *Tamiasciurus hudsonicus grahamensis* | E | AZ |
| Woodland caribou | *Rangifer tarandus caribou* | E | ID, WA |
| Birds | | | |
| Aleutian Canada goose | *Branta canadensis leucopareia* | DM (Delisted) | CA, OR, WA |
| California condor | *Gymnogyps califonianus* | E, EXPN | E = CA<br>EXPN = AZ, UT |
| Marbled murrelet | *Brachyramphus marmoratus marmoratus* | T | CA, OR, WA |
| Northern spotted owl | *Strix occidentalis caurina* | T | CA, OR, WA |
| Red-cockaded woodpecker | *Picoides (=Dendrocopos) borealis* | E | OK, TX |

**Appendix C**
**Table 2**

| Fish | | | |
|---|---|---|---|
| Common Name | Scientific Name | Listing Status | States |
| Beautiful shiner | *Cyprinella formosa* | T | AZ, NM |
| Yaqui catfish | *Ictalurus pricei* | T | AZ |
| Insects | | | |
| Uncompahgre fritillary | *Boloria acrocnema* | E | CO |
| Plants | | | |
| MacFarlane's four-o'clock | *Mirabilis macfarlanei* | T | ID, OR |
| Maguire primrose | *Primula maguirei* | T | UT |
| Marsh sandwort | *Arenaria paludicola* | E | CA, OR, WA |
| San Francisco Peaks groundsel | *Senecio franciscanus* | T | AZ |
| Sentry milk-vetch | *Astragalus cremnophylax var. cremnophylax* | E | AZ |
| Todsen's pennyroyal | *Hedeoma todsenii* | E | NM |

# Appendix C
# Table 3

Local Mitigation Measures Agreed to by USFWS and APHIS PPQ in 2004

Table 2. General Direct md Indirect Effects of Proposed Insecticides and Proposed Avoidance/mitigation Measures for Non-target Listed Animal and Plant Species

| Non-Target Listed Species and Species Groups | Status | Toxicity Levels Direct Effects | | | Indirect Effects | Avoidance or Mitigation Measures | Counties[2] |
|---|---|---|---|---|---|---|---|
| | | Malathion | Carbaryl | Diflubenzuron | | | |
| **BIRDS** | | | | | | | |
| Southwestern willow flycatcher | E | N/A[3] | N/A[3] | Low | A,B,C | 3,10 | Clark, Lincoln, Nye |
| Bald Eagle | T | N/A[3] | N/A[3] | Low | No Indirect Effects | 5 | Carson City, Churchill, Clark, Douglas, Elko, Esmeralda, Eureka, Humboldt, Lander, Lincoln, Lyon, Mineral, Nye, Pershing, Storey, Washoe, White Pine |
| Yuma clapper rail[1] | E | Low | Low | Low | A,B,C | 7 | Clark |
| **REPTILE** | | | | | | | |
| Desert tortoise | T,CH | N/A[3] | N/A[3] | Slight | A,B,C | 1 | Clark, Esmeralda, Lincoln, Nye |
| **FISH** | | | | | | | |
| Warner sucker[1] | T, CH | Moderate to High | Moderate to High | Slight | A,B,C | 4 | Washoe |
| Cui-ui | E | N/A[3] | N/A[3] | Slight | A.B,C,F | 8 | Storey, Washoe |
| White River springfish | E, CH | N/A[3] | N/A[3] | Slight | A,B,C,F | 8 | Lincoln |
| Hiko White River springfish | E, CH | N/A[3] | N/A[3] | Slight | A.B,C,F | 8 | Lincoln, Mineral |
| Railroad Valley springfish | T, CH | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Mineral, Nye |
| Devils Hole pupfish | E | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Clark, Nye |
| Ash Meadows Amargosa pupfish | E, CH | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Nye |
| Warm Springs pupfish | E | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Nye |
| Pahrump poolfish | E | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Clark, White Pine |
| Desert dace | T, CH | N/A[3] | N/A[3] | Slight | A,B,C,F | 8 | Humboldt |
| Humpback chub | E | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Clark |
| Bonytail chub | E, CH | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Clark |
| Pahranagat roundtail chub | E | N/A[3] | N/A[3] | Slight | A,B,C,F | 8 | Lincoln |
| Virgin River chub | E, CH | N/A[3] | N/A[3] | Slight | A,B,C,F | 8 | Clark |
| White River spinedace[1] | E, CH | Moderate to High | Very High | Slight | A,B,C | 4 | Nye, White Pine |
| Big Spring spinedace | T, CH | N/A[3] | N/A[3] | Slight | A,B,C,F | 8 | Lincoln |
| Moapa dace | E | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Clark |

# Appendix C
# Table 3

Local Mitigation Measures Agreed to by USFWS and APHIS PPQ in 2004

Table 2. General Direct and Indirect Effects of Proposed Insecticides and Proposed Avoidance/mitigation Measures for Non-target Listed Animal and Plant Species

| Non-Target Listed Species and Species Groups | Status | Toxicity Levels Direct Effects | | | Indirect Effects | Avoidance or Mitigation Measures | Counties[2] |
|---|---|---|---|---|---|---|---|
| | | Malathion | Carbaryl | Diflubenzuron | | | |
| Lahontan cutthroat | T | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Carson City, Churchill, Clark, Douglas, Elko, Eureka, Humboldt, Lander, Lyon, Mineral, Nye, Storey, Washoe |
| Woundfin | E, CH | N/A[3] | N/A[3] | Slight | A,B,C,F | 8 | Clark |
| Colorado pikeminnow | E | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Clark |
| Independence Valley speckled dace | E | N/A[3] | N/A[3] | Slight | A,B,C,F | 8 | Elko |
| Ash Meadows speckled dace | E, CH | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Nye |
| Clover Valley speckled dace | E | N/A[3] | N/A[3] | Slight | A,B,C,E | 8 | Elko |
| Bull trout[1] | T | Moderate to High | Very High | Slight | A,B,C | 4 | Elko |
| Razorback sucker | E, CH | N/A[3] | N/A[3] | Slight | A,B,C | 8 | Clark |
| **INVERTEBRATES** | | | | | | | |
| Ash Meadows naucorid | T, CH | N/A[3] | N/A[3] | Very high larval stages | B,C | 4 | Nye |
| Carson wandering skipper[1] | E | Very High | Very High | Very high larval stages | B,C | 2 | Carson City, Washoe |
| **PLANTS** | | | | | | | |
| Ash Meadows milkvetch | T, CH | N/A[3] | N/A[3] | Moderate to Low | D,E | 6 | Nye |
| Spring-loving centaury | T, CH | N/A[3] | N/A[3] | Moderate to Low | D,E | 6 | Nye |
| Ash Meadows sunray | T, CH | N/A[3] | N/A[3] | Moderate to Low | D,E | 6 | Nye |
| Steamboat buckwheat | E | N/A[3] | N/A[3] | Moderate to Low | D,E | 6 | Washoe |
| Ash Meadows gumplant | T, CH | N/A[3] | N/A[3] | Moderate to Low | D,E | 6 | Nye |
| Ash Meadows ivesia | T, CH | N/A[3] | N/A[3] | Moderate to Low | D,E | 6 | Nye |
| Ash Meadows blazing star | T, CH | N/A[3] | N/A[3] | Moderate to Low | D,E | 6 | Nye |
| Amargosa niterwort | E, CH | N/A[3] | N/A[3] | Moderate to Low | D,E | 6 | Nye |
| Ute lady's tresses[1] | T | Very High | Very High | Moderate | D,E | 9 | Lincoln |

Local Mitigation measures Agreed to by USFWS and APHIS PPQ in 2004

Table 2. General Direct and Indirect Effects of Proposed Insecticides and Proposed Avoidance/mitigation Measures for Non-target Listed Animal and Plant Species

| Non-Target Listed Species and Species Groups | Status | Toxicity Levels Direct Effects | | | Indirect Effects | Avoidance or Mitigation | Counties[2] |
|---|---|---|---|---|---|---|---|
| | | Malathion | Carbaryl | Diflubenzuron | | | |

[1]Other listed/proposed species that occur in Nevada, but were not previously addressed in the 1987 BO for USDA-APHIS-PPQ's 1987 Rangeland Grasshopper Cooperative Management Program or its amendments.
[2]County(ies) where animal or plant species may be present.
[3]N/A = Not Applicable; applies to insecticides that were covered under the 1987 National programmatic BO or its amendments.
E = Endangered; T = Threatened; PT = Proposed Threatened; CH = Critical Habitat

Indirect Effects

A. General loss of prey.
B. Limited Mobility of young to move out of treated area during nesting season.
C. Ingestion of chemicals from vegetation and insects could affect survival or reproductive fitness.
D. Loss of important pollinators.
E. Loss of seed dispersal agents.
F. Exposure to chemicals from offsite transport via snow-melt or irrigation drainage.

Avoidance/Mitigation Measures

1. No aerial application of Diflubenzuron, malathion, or carbaryl within 1 mile of desert tortoise occupied habitat. In accordance with 1987 National programmatic BO for USDA-APHIS-PPQ's 1987 Rangeland Grasshopper Cooperative Management Program and its 1990 amendment, the USFWS's Southern Nevada Field Office will be given a 5 day notice prior to conducting aerial applications of insecticides in occupied desert tortoise habitat.
2. No aerial application of Diflubenzuron within 1 mile, or malathion or carbaryl within 0.25 mile of occupied habitat.
3. A buffer of 500 feet should be maintained where no application of carbaryl bran bait is applied.
4. No aerial application of Diflubenzuron or Malathion within 1 mile, or Carbaryl within 0.25 miles of occupied habitat.
5. Maintain a 1 mile radius treatment-free zone around active bald eagle eyries found on rivers or lakes with no flyovers of this area by contact pilots. A 2.5 mile no-aerial spray zone will be maintained upstream and downstream from the nest site as a forage area. This will include a 0.25 mile buffer along each side of the rivers. Lakes will be protected by a 0.25 mile no aerial spray buffer if they are considered foraging areas of the bald eagle.
6. Aerial application of Diflubenzuron will not be used within 3 miles of species occupied habitat.
7. No aerial application of Diflubenzuron within 1 mile or malathion or carbaryl within 0.25 mile of the edge of nesting and foraging habitat.
8. No aerial application of Diflubenzuron within 1 mile of occupied habitat.
9. No aerial application of insecticides within 3 miles of the species occupied habitat. Within the 3 mile buffer only carbaryl bran bait will be used.
10. No aerial application of Diflubenzuron within 1 mile or malathion or carbaryl within 0.25 mile of the edges of occupied habitat.

PROPOSED MONITORING PLAN

Our environmental monitoring team has developed a draft environmental monitoring plan for the proposed rangeland grasshopper/cricket suppression program. USDA-APHIS-PPQ Directives 5640 .1 dated April 19, 2002, directs the agency to fulfill the mandates of NEPA, ESA, the Federal Insecticide, Fungicide and Rodenticide Act, and other statutes that require monitoring the effects of their actions on the environment.

Environmental monitoring is an integral component of the avoidance/mitigation measures outline in the *PROPOSED AVOIDANCE/MITIAGAION MEASURES* section. The primary goal of this environmental monitoring plan is to provide data which can be used to evaluate the effectiveness of the avoidance/mitigation measures proposed to protect the listed species outlined in the *LISTED SPECIES* section.

The monitoring methods proposed for the rangeland grasshopper/cricket suppression program include monitoring aerial applications of the liquid and bait forms of the insecticides used and for drift at selected sensitive sites primarily by collecting dye card, water and vegetation samples.

**Amendment 1:**
**All mitigation measures agreed upon through local Sec 7 consultation shall apply, including but not limited to the 2021 Biological Assessment and subsequent concurrence.**

# United States Department of the Interior

**FISH AND WILDLIFE SERVICE**
Reno Fish and Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, Nevada 89502

March 26, 2021
File No. 2021-I-0183

Alana Wild
State Plant Health Director
United States Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine
8775 Technology Way
Reno, Nevada 89521

Subject: Proposed Nevada Rangeland Grasshopper/Mormon Cricket Suppression Program in Churchill, Elko, Nye, Eureka, Humboldt, Lander, Pershing, Washoe, and White Pine Counties, Nevada

Dear Ms. Wild:

This responds to your letter received on March 3, 2021, regarding the proposed Rangeland Grasshopper/Mormon Cricket Suppression Program on specific Federal and private lands in Nevada for 2021, 2022, and 2023. Your letter requested concurrence from the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973, as amended (ESA; 50 CFR §402.13), for your determination of may affect, not likely to adverselyaffect for 14 federally-listed species described in Table 1.

Table 1. Federally-listed species considered for the 2021, 2022, and 2023 suppression program (adapted from USDA 2021).

| Taxonomic Group | Species | Scientific Name | Status | Critical Habitat |
|---|---|---|---|---|
| Bird | Yellow-billed cuckoo (Western U.S. Distinct Population Segment) | *Coccyzus americanus* | Threatened | Proposed |
| Fish | Bull trout | *Salvelinus confluentus* | Threatened | Yes |
| Fish | Clover Valley speckled dace | *Rhinichthys osculus oligoporus* | Endangered | No |
| Fish | Cui-ui | *Chasmistes cujus* | Endangered | No |
| Fish | Desert dace | *Eremichthys acros* | Threatened | Yes |
| Fish | Independence Valley speckled dace | *Rhinichthys osculus lethoporus* | Endangered | No |
| Fish | Lahontan cutthroat trout | *Oncorhynchus clarkii henshawi* | Threatened | No |
| Fish | Pahrump poolfish | *Empetrichthys latos* | Endangered | No |
| Fish | Railroad Valley springfish | *Crenichthys nevadae* | Threatened | Yes |
| Fish | Warner sucker | *Catostomus warnerensis* | Threatened | Yes |
| Fish | White River Spinedace | *Lepidomeda albivallis* | Endangered | Yes |
| Invertebrate | Carson wandering skipper | *Pseudocopaeodes eunus obscurus* | Endangered | No |
| Plant | Steamboat buckwheat | *Eriogonum ovalifolium* var. *williamsiae* | Endangered | No |
| Plant | Webber's ivesia | *Ivesia webberi* | Threatened | Yes |

DESCRIPTION OF THE PROPOSED ACTION

According to your request for consultation, the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ) (USDA-APHIS PPQ, USDA 2021) is implementing grasshopper/cricket suppression programs for 17 western states. The purpose of the proposed action is to reduce competition with livestock for rangeland forage and to reduce damage to crops and rangeland ecosystems.

The USDA-APHIS-PPQ proposes using the following three insecticides in the suppression of grasshoppers (*Melanoplus* spp.) and Mormon crickets (*Anabrus simplex*) in the project area: (1) Carbaryl; (2) diflubenzuron (Dimilin® trade name for diflubenzuron); and (3) malathion. Carbaryl is a carbamate, broad-spectrum insecticide that acts through acetyl cholinesterase (AChE) inhibition (Smith 1987, Klaassen *et al*. 1986 as cited in USDA 2021). The AChE enzyme breaks down acetylcholine, a neurotransmitter that permits nerve impulses across thenerve synapse (USDA 2021).

Dimilin® is an insect growth regulator that affects the formation and/or deposition of chitin in an insect's exoskeleton. When an insect larva or nymph is exposed to Dimilin®, the exoskeleton is weakened and the larva/nymph is unable to successfully molt, which results in death (USDA 2021).

Malathion is an organophosphate, broad-spectrum insecticide that acts as an AChE inhibitor similar to carbaryl (USDA 2021). It acts as a contact insecticide and as a stomach poison (USDA 2021). Its quick action results in mortality before grasshoppers are able to mature and lay eggs (USDA 2021). The USDA-APHIS-PPQ proposes to use malathion only in an emergency (*i.e.*, late season adult infestation).

The proposed method for applying these insecticides in the project area in Nevada is by Reduced Agent Area Treatments (RAATs) in which the rate of insecticide application may be reduced from conventional levels, and/or treated swaths are alternated with swaths that are not directly treated. These insecticides are proposed to be applied either aerially or directly on the ground. The mode of action, effects to non-target species, application rates, and application methods for the three chemicals are discussed in the request for concurrence.

The Environmental Impact Statement Assessment; Rangeland Grasshopper and Mormon Cricket Suppression Program (USDA 2019) supersedes the Environmental Impact Statement (EIS; USDA 2002) and USDA-APHIS-PPQ's 1987 Rangeland Grasshopper Cooperative Management Program EIS for which the Service completed a national programmatic biological opinion in 1987 (File No. 6-RO-87-F-004). The biological opinion was amended, as necessary, through 1995 to address newly listed and proposed species. The USDA-APHIS-PPQ is working with the Service on a new programmatic biological opinion. However, in order to implement a grasshopper and cricket suppression program in Nevada in 2021, 2022, and 2023 and because the new national programmatic biological opinion is not yet complete, your agency has requested a Nevada-specific section 7 consultation.

<u>Proposed Treatment Areas in Nevada (Local Proposed Action)</u>

The USDA-APHIS-PPQ proposes to use the RAATs method to treat areas determined by spring surveys of Federal and private lands located within Churchill, Elko, Nye, Eureka, Humboldt, Lander, Pershing, Washoe, and White Pine Counties, Nevada, for the treatment of immature Mormon crickets as follows:

- Types of insecticide used: Dimilin® liquid form, carbaryl bait.
- Concentration of insecticide used: Dimilin® at 30 mL (1 oz.)/acre (ac., 20 oz. (887 mL)) water, 10 oz. (296 mL) of crop oil), carbaryl bait (5%) at 4.54 kg (10 lbs.)/ac.
- Application method used: aerially with Dimilin® and carbaryl bait, and carbaryl ground baiting with mounted spreaders off the back of pick-up trucks or all-terrain vehicles.
- Type of chemical control used: Dimilin® as an insect growth regulator, carbaryl bait as a contact and stomach poison.
- Implementation of malathion will occur only in an emergency (*i.e.*, late season adult infestation).

Additionally, environmental monitoring will be conducted whenever Dimilin® is used intreatment programs at sensitive sites with the following Standard Operating Procedures:

(1) Sensitive sites, such as lakes, ponds, streams, listed species sites, critical habitats, populated area, etc. will be located before aerial treatment begins and buffer zones will be mapped out; (2) dye cards will be set up around sensitive sites according to protocol; and (3) diflubenzuron samples will be taken pre-mix and post-mix to determine proper concentration levels.

EFFECTS OF THE PROPOSED ACTION ON LISTED SPECIES AND CRITICAL HABITAT

Fish

Federally-listed fish in the area of this consultation are identified in Table 1. Carbaryl is known to be moderately toxic to fish, but highly toxic to their primary prey base (aquatic and terrestrial invertebrates). Carbaryl incorporated into bran flakes or other solid media acts only upon ingestion by the organism and is considered to be more selective than other chemical control methods. This suppression method may offer a viable alternative when treatment is proposed in close proximity to listed species, water bodies, or other sensitive sites. Your request for concurrence states that there will be no aerial application of carbaryl bait within 152.4 meters (m) (500 feet (ft.)) of the edge of aquatic habitat occupied by federally-listed fish.

The ultra-low-volume (ULV) form of Dimilin® is non-toxic to fish, but is highly toxic to their primary prey base (aquatic and terrestrial invertebrates). Your request for concurrence states that there will be no aerial application of the ULV form of Dimilin® within 1.6 kilometers (km) (1 mile (mi)) of aquatic habitat occupied by federally-listed fish. There will be no application within 152.4 m (500 ft.) of lakes, reservoirs, ponds, intermittent and perennial streams and rivers, wetlands, and springs. Bait will not be placed near waterlines or intertidal areas.

Malathion is slightly to very highly toxic to fish and moderately to very highly toxic to aquatic invertebrates. Your request for concurrence states that there will be no ground application of malathion within 0.8 km (0.5 mi) and/or aerial application of malathion within 1.6 km (1 mi) of aquatic habitat occupied by federally-listed fish. Persistence of all three insecticides in water ranges from approximately 1 to 18 days, with malathion typically having the longest duration.

The buffers described above make it unlikely that insecticides will enter any occupied habitat or be transported downstream into occupied habitat or designated critical habitat.

Invertebrates

One federally-listed invertebrate, the Carson wandering skipper, has been identified within the area of this consultation (Table 1). Carbaryl bait is severely toxic to most terrestrial invertebrates if ingested. Carbaryl incorporated into bran flakes or other solid media acts only upon ingestion by the organism and is considered to be more selective than other chemical control methods.

Since the Carson wandering skipper is a nectar feeder in the adult stage, exposure to carbaryl bait should be minimal. The larval stage feeds on *Distichlis spicata* (salt grass) therefore, exposure to carbaryl bait should be minimal. There will be no aerial application of carbaryl bait within 152.4 m (500 ft.) of the edge of Carson wandering skipper habitat.

The ULV form Dimilin® is highly toxic to most terrestrial invertebrate larvae. Direct effects of the ULV application of Dimilin® to invertebrate larvae are increased due to the limited mobility to move out of the treated area during larval stages. There will be no aerial application of the ULV form of Dimilin® within 1.6 km (1 mi) of the edge of Carson wandering skipper habitat. There will be no spraying within 152.4 m (500 ft.) of lakes, reservoirs, ponds, intermittent and perennial streams and rivers, wetlands, and springs. Bait will not be placed near waterlines or intertidal areas.

Plants

Two federally-listed plants, *Eriogonum ovalifolium* var. *williamsiae* and *Ivesia webberi*, have been identified within the project area (Table 1). The three chemicals proposed for use are not toxic to plants; however, as discussed above, they are toxic to terrestrial invertebrate pollinators which many plants require for reproduction. There will be no application of carbaryl bait within 0.4 km (0.25 mi) from the edge of *Eriogonum ovalifolium* var. *williamsiae* or *Ivesia webberi*, habitat. There will be no aerial application of malathion, carbaryl, or the ULV form of Dimilin® within 4.8 km (3 mi) from the edge of *Eriogonum ovalifolium* var. *williamsiae* or *Ivesia webberi*, habitat. There will be no spraying within 152.4 m (500 ft.) of lakes, reservoirs, ponds, intermittent and perennial streams and rivers, wetlands, and springs. Bait will not be placed near waterlines or intertidal areas.

Birds

The yellow-billed cuckoo is a federally-listed species that is present in the project area. This species is a riparian dependent species and is a migratory bird species with protection under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703 *et seq*.).

There will be no application of carbaryl bait within 152.4 m (500 ft.) of the edge of known yellow-billed cuckoo locations and their proposed critical habitat. There will be no aerial application of the ULV form of Dimilin® within 304.8 m (1,000 ft.) of the edge of known yellow-billed cuckoo locations and their proposed critical habitat, and a 152.4 m (500 ft.) ground buffer will be used at the edge of known locations and their proposed critical habitat. To protect the species from ULV of carbaryl or malathion, a 152.4 m (500 ft.) ground buffer and a 402.3 m (1,320 ft.) aerial buffer is designated from the edge of known yellow-billed cuckoo locations and its proposed critical habitat. There will be no spraying within 152.4 m (500 ft.) of reservoirs, lakes, ponds, intermittent and perennial streams and rivers, springs and wetlands. Bait will not be placed near waterlines or intertidal areas.

Insectivorous birds have the highest potential for exposure to diflubenzuron. They may be exposed to Dimilin® treatments, and then consume considerable quantities of grasshoppers, other rangeland invertebrates and/or plants that contain diflubenzuron. However, studies have shown that vertebrates have a negligible risk of adverse toxicological effects from full coverage treatments. The assessment described in Table B-7 of the EIS (USDA 2019) demonstrates that diflubenzuron accumulation at traditional full coverage rates is many orders of magnitude below a lethal dose.

REPORTING OF 2018, 2019, and 2020 ACTIVITIES

The Service received your summary of 2018, 2019, and 2020 years activities, and the treatments are summarized below.

2018

There were no activities reported for 2018.

2019

There were 162 treatments conducted in Nevada federal lands during the 2019 season. Of those 162 treatments, 161 were ground treatments and 1 aerial treatment. Ground treatments were conducted using carbaryl based Eco Bran 5% bait, where a total of 5,613 pounds were dispersed on 10,196 acres within Humboldt, Pershing, Lander, and Eureka counties. The aerial treatment occurred on a total of 2,434 acres using 30 mL (1 oz.) of Dimilin® per acre and treating 4,870 acres using 50% RAATs skipping every other pass.

2020

There were 34 treatments conducted in Nevada federal lands during the 2020 season. Of these, 10 were in Eureka County, 9 in Humboldt County, 8 in Pershing County, 6 in Washoe County, and 1 in Lander County. There were 5 treatments that targeted both Mormon crickets and grasshoppers, while 29 treatments targeted only Mormon crickets. All were ground treatments using 5 percent carbaryl bait, the most selective of the three proposed pesticides. All treatment locations did not contain or were not within the designated buffer zones of any known populations of federally-listed species or designated critical habitat. As such, the 2020 treatments did not adversely affect federally-listed species or critical habitat.

CONCLUSION

The Service concurs that implementation of the Nevada Rangeland Grasshopper and Mormon Cricket Suppression Program in 2021, 2022, and 2023, as proposed, may affect, but is not likely to adversely affect the federally-listed species identified in Table 1. Furthermore, the Service concurs there will be no adverse modification or destruction of critical habitat for bull trout, Warner sucker, desert dace, White River spinedace, or *Ivesia webberi* or of proposed critical habitat for yellow-billed cuckoo. The

Service bases its concurrence on USDA-APHIS-PPQ's commitment to implement the avoidance/ minimization measures and monitoring plan as described, in addition to the results of past monitoring reports that show the effectiveness of these measures. In order for the Service to assess whether avoidance/minimization measures were successful in protecting federally-listed species, we request that you provide our office with a summary of the results of both the effectiveness and operator compliance monitoring from the 2021, 2021, and 2023 suppression activities. We would like to receive this summary prior to beginning of the 2024 grasshopper and cricket suppression program and your request for section 7 consultation.

This concludes informal consultation under 50 CFR § 402.13 of our interagency regulations governing section 7 of the ESA. This informal consultation does not authorize the incidental take of federally-listed species nor does it authorize the adverse modification or destruction of critical habitat. This informal consultation may be superseded by a future national programmatic consultation. The USDA-APHIS-PPQ should consult with the Service under section 7 of the ESA if new areas (other than the Federal lands within the areas analyzed) are proposed to be treated, the proposed action or habitat conditions are changed, a new species is listed/proposed or critical habitat designated, or new information reveals effects of the agency action on listed/proposed species or critical habitat that were not addressed in this consultation.

CONSERVATION RECOMMENDATIONS:

Although USDA-APHIS-PPQ proposes only to use malathion in emergencies, due to its toxicity to most terrestrial invertebrates we recommend the following minimization measure for Carson wandering skipper be included as it has in previous consultation requests: "There will be no aerially applied malathion within 0.4 km (0.25 mi) of the edge of Carson wandering skipper habitat."

The Service appreciates USDA-APHIS-PPQ's efforts to minimize impacts to the following species which are not federally-listed, but were once candidate species: Columbia spotted frog *(Rana luteiventris*) (Great Basin Distinct Population Segment); greater sage-grouse (*Centrocercus urophasianus*); and *Astragalus anserinus* (Goose Creek milkvetch). While the ESA does not apply to these species, we appreciate your continued efforts to consider these three species during project planning and your commitment to minimization measures as implemented in previous years to assist in further conservation efforts for these species.

Your continued commitment to the following conservation measures for Columbia spotted frogs, as in previous consultations, will help minimize impacts to this species: (1) A 15.2 m (50 ft.) buffer for potential Columbia spotted frog habitat for carbaryl bait; (2) a 152.4 m (500 ft.) buffer for potential Columbia spotted frog habitat for aerial application of carbaryl and diflubenzuron; and (3) for known Columbia spotted frog habitat, USDA-APHIS-PPQ will consult with the Service and Bureau of Land Management land managers prior to any treatment to agree upon mitigation measures on a case-by-case basis. The Service continues to work with partners to conserve this species and a conservation agreement/strategy has been developed for both the Toiyabe [Nevada Department of Wildlife (NDOW) 2003a] and Northeast (NDOW 2003b) subpopulations of the Columbia spotted frog. Copies of these conservation agreements are available from our office.

We also appreciate your continued adherence to the updated and signed May 2016 document titled: "Use of Insecticides within Sage-grouse Habitat in Nevada for Mormon Cricket and Grasshopper Suppression," during treatments. Your efforts to have discussions with the local land managers prior to any treatments have also assisted conservation of this species.

Lastly, we appreciate your continuing implementation of the following conservation measures for Astragalus anserinus: (1) Same protection buffers as the *Eriogonum ovalifolium* var. *williamsiae* and *Ivesia webberi* such that there would be no application of carbaryl bait within 0.4 km (0.25 mi) from the edge of its habitat; and (2) no aerial application of malathion, carbaryl, or the ULV form of Dimilin® within 4.8 km (3 mi) from the edge of its habitat.

Please reference File No. 2021-I-0183 in future correspondence concerning this consultation. If you have any questions regarding this informal consultation, please contact Kaylan Hager or myself at (775) 861-6300. Please note, we now accept official correspondence at RFWOmail@fws.gov.

Sincerely,

MARC JACKSON Digitally signed by MARC JACKSON
Date: 2021.03.26
12:04:39 -07'00'

Marc Jackson
Field Supervisor

cc:
State Entomologist, Nevada Department of Agriculture, Sparks, Nevada
Western Region Fisheries Supervisor, Nevada Department of Wildlife, Reno, Nevada Section
7/HCP Coordinator, Ecological Services, Region 10, Fish and Wildlife Service,
Sacramento, California

Literature Cited

Nevada Department of Wildlife (NDOW). 2003a. Conservation Agreement and Strategy for theColumbia Spotted Frog (*Rana luteiventris*)-Great Basin Population Nevada-Toiyabe Subpopulation, September 2003. Reno, Nevada. Interagency document. 43 pp.

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U.S. Department of Agriculture-Animal Plant and Health Inspection Service-Plant Protection and Quarantine (USDA-APHIS-PPQ). 2021. Request for Concurrence to USDA-APHIS-PPQ's Determination that the Proposed 2021, 2022, and 2023 Nevada Rangeland Grasshopper/Mormon Cricket Suppression Program Will Not Adversely Affect Listed Species on Federal and Private Lands in Nevada. 32 pp.

U.S. Department of Agriculture-Animal Plant and Health Inspection Service-Plant Protection and Quarantine (USDA-APHIS-PPQ). 2019. Rangeland Grasshopper and Mormon CricketSuppression Program Environmental Impact Statement. Washington, D.C. 88 pp. plus appendices.

**Appendix E – Public Comments and APHIS Responses**

1. **The EAs Fail to Disclose Treatment Request Locations and Do Not Adequately Describe the Affected Environment or Analyze Impacts to the Affected Environment**

APHIS claims that its grasshopper suppression efforts are akin to an "emergency." For example, the following is stated in the EAs:

*"The need for rapid and effective response when an outbreak occurs limits the options available to APHIS to inform the public other than those stakeholders who could be directly affected by the actual application. The emergency response aspect is why site-specific treatment details cannot be known, analyzed, and published in advance."*

In this age of information, when the entire world can be informed of a decision via the push of a button, such an explanation for failing to inform the public--in advance--of treatment locations, acres, and methods falls rather flat. As APHIS explains in the EAs, APHIS only conducts treatments after receiving requests. Moreover it is our understanding that a state's treatment requests must be submitted for funding approval to headquarters in Washington D.C., and that this budget requesting work occurs during the winter. Therefore, this information must exist in APHIS files, and there is no valid reason for not disclosing more specific treatment maps, together with an estimate of acres to be treated and likely method and chemical -- in the Draft EA and certainly by the Final EA. After all, treatments commonly occur within weeks after the Final EA is published, so APHIS doesn't start planning for these after the Final EA.

Instead, as published, the Draft EAs provide almost no information in the way of solid information about where, how, and when the treatments may actually occur within the counties covered under the EAs, during the year 2021. As a result, it is impossible to determine if applications might occur to sensitive areas or species locations within the specified counties. Similarly, the scale of potential applications is left out. Without a description of the average size of treatments in this state and the range over say, the last 25 years, we don't know how to assess the potential impact of the treatments.

This lack of transparency about the location of actual treatment areas, particularly on public lands, is a disservice to the public and prevents the public from reviewing sufficient information to be able to gauge the justification for and the risks involved in the suppression effort. Furthermore, as a result of the lack of specificity in the EA, it is impossible to determine whether effects would actually be significant or not.

Obviously, final treatment decisions should hinge on a firm understanding of nymphal densities as well as other conditions related to the economic threshold, as described by APHIS, and it could be that APHIS would decide not to treat an area that was included in a budget request. Nonetheless, in order to adequately inform the public, describe the affected environment, and project impacts, APHIS should provide the treatment request areas with the EA, even if actual treatments end up less than these.

*Treatment requests are received before the survey season begins. The request from BLM is normally received in January to March. The EA's do not fail to disclose the treatment request locations. The land managers request that treatments can occur within any location within the action areas described in the EA's. The EA's describe the action areas which may have populations which require suppression. Any populations outside these action areas will not be treated. The commenter requests the exact pastures to be treated, this will not be described in the EA. The exact pastures which may require treatment on public lands will not be described exactly in the EA due to the fact that the exact location is only known after the nymphal survey has taken place, this also was described last year. The commenter seems to be dictating to the agency how to conduct the surveys and the suppression activities. The EA's describe that any pastures within the action area which have outbreak populations could be pastures that could be treated. What the commenter wants is the EA to be finalized only after the exact pasture has been delimited, then have the EA's go out for public comment at that time. If this was the case, no outbreak populations would ever be treated. The life cycle of the nymphal stages can develop every 5-12 days depending on the temperature. The commenter had similar comments in the 2020 EA's. Please see the APHIS responses to comments 1, 2, 3, 4, 5, 6, 8, 54, 92,93, 97, 100 and 159 in the 2020 EA's.*

2. **APHIS includes only a single action alternative and fails to analyze other reasonable alternatives, such as buying substitute forage for affected leaseholders. In addition, the single action alternative combines conventional and RAATs applications in one alternative, while the consequences do not fully explore and explain the relative impacts of these two methods.**

As described in the 2019 EIS, potential outcomes of forage loss on a leaseholder's plot of land, should it be untreated, could be the rancher seeking to buy alternative sources of forage, leasing alternative lands, or selling livestock. The EIS did not fully evaluate these options, so it is important that the EAs go further. For example, a reasonable alternative that could be examined would be for the federal government to subsidize, fully or partially, purchased hay. But in its current form, the EA includes no discussion of a reasonable alternative such as this.

Instead, the EAs contain a single action alternative that encompasses suppression treatments using either the "conventional" method (i.e. full rates, blanket coverage) or the RAATs method (i.e. reduced rates, skipped swaths). Given that these two options are combined into a single alternative the consequences section should be careful to fully analyze the impact of the treatments at the conventional rates with blanket coverage. However in many cases APHIS focuses simply on the RAATs method and has does not discuss impact from the "conventional" method. As an example, this language is included for the discussion of carbaryl impacts on pollinators: *"In areas of direct application where impacts may occur, alternating swaths and reduced rates (i.e., RAATs) would reduce risk."* In other cases, APHIS provides an assessment but does not indicate if its risk conclusion applies to the conventional method and the RAATs method, or one or the other.

*The APHIS grasshopper suppression program draws its authority from the Plant Protection Act of 2000 (7 U.S.C § 7717). The statute authorizes APHIS to authority to exclude, eradicate, and control plant pests, including grasshoppers. Specifically, language in the PPA provides authority* *for APHIS to protect rangeland from "economic infestation" of grasshoppers. In its recent EIS updating the program (APHIS 2019), the Agency describes its determination of an economic infestation as follows:*

> *The "level of economic infestation" 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 a treatment.*

*The Plant Protection Act of 2000 does not give authority to APHIS to purchase replacement feed for ranchers, but rather only provides funding when available to suppress outbreak populations of grasshoppers to save forage.*

*The commenter is correct that APHIS believes the use of RAATs mitigates the risk to non-target insects including pollinators. However, APHIS does not solely rely on the reduced deposition of pesticides in the untreated swaths to determine the potential harmful effects of grasshopper treatments will not cause significant impacts. The environmental consequences risk analysis of carbaryl and diflubenzuron treatments using conventional methods (total area coverage and higher application rates) is provided on pages 16-22 of the 2021 EAs. Additional descriptions of APHIS' analysis methods and discussion of the toxicology can be found in the 2019 EIS.*

3. **Impacts are described as "reduced" in many portions of the environmental consequences section but APHIS rarely describes "reduced" in comparison to anything else.**

<u>APHIS liberally employs relative language to create an impression of low risk. For example, in numerous locations in the environmental consequences section of the EAs, APHIS described risk as "reduced." Reduced compared to what, exactly? The inexactness and lack of specificity of such statements make the EAs of little utility for a citizen trying to determine the actual predicted impacts of insecticide spray on large blocks of Western rangelands.</u>

*The comment is a vague critique of the risk analysis provided by APHIS in the EAs. Often in the EA the term Reduced Agent Area Treatment (RAAT), typically described as the RAATs treatment method, is used. Compared to conventional blanket applications of pesticide, the RAATs strategy uses a reduced rate by alternating treatment swaths in a spray block, reducing application rates, or both.*

4. **APHIS has not demonstrated that treatments in Nevada in 2021 meet the "economic infestation level." No site-specific data is presented in the EA that justifies the treatment based on the "economic infestation level."**

The APHIS grasshopper suppression program draws its authority from the Plant Protection Act of 2000 (7 U.S.C § 7717). The statute authorizes APHIS to authority to exclude, eradicate, and control plant pests, including grasshoppers. Specifically, language in the PPA provides authority for APHIS to protect rangeland from "economic infestation" of grasshoppers. In its recent EIS updating the program (APHIS 2019), the Agency describes its determination of an economic infestation as follows:

*The "level of economic infestation" 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 a treatment.*

Such a measure is in accordance with general IPM principles that treatments should only occur if it is judged that the cost of the treatment is less than the revenues expected to be received for the product.

One would expect that APHIS would have undertaken such an analysis in the EIS or the site-specific EAs—or at least model it—so as to determine whether the treatments might be justified because they have reached a "level of economic infestation." Yet none of the variables are discussed in the EAs at all, nor is site-specific data presented for any of these, and the reader is left to simply assume that all treatments obviously meet the economic threshold.

On public lands, from a taxpayer point of view, it makes sense that—as the grasshopper suppression effort is a federally supported program—costs of the treatment **to** the taxpayer should be compared to the revenues received **by** the taxpayer for the values being protected (livestock forage) on public lands.

Typical costs per acre can be obtained from previous treatments. For example, according to an Arizona 2017 Project Planning and Reporting Worksheet for DWP# AZ-2017-02 Revision #1 (Post treatment report) the cost of treatment amounted to $8.72/treated acre, or $3.99/"protected acre."1 In 2019, similar post-treatment reports report the costs as $9.39 per treated acre and $4.41 per "protected acre". Note that these costs summaries only include what appear to be the direct costs of treatment (i.e. salaries and per diem of the applicators, chemical, etc.). Administrative costs do not appear to be included in these cost estimates, nor do nymph or adult survey costs.

Information from a FAIRS Report (obtained through FOIA, not from APHIS' environmental documents) for aerial applications in Wyoming appear to indicate that aerial contracts cost between $9.76-$14.61/acre. However, the report is not easy to interpret and it is unclear if these are correct costs/acre.

In determining whether a treatment is economically justified, one must ask what is the revenue expected to be received for the product? CARMA, the model used by APHIS to determine if a treatment should occur, does not show the number of acres of rangeland that it takes to support one animal unit-month (AUM). However, in Utah, a similar state, it takes between 1-30 acres, depending on the site. Currently, on federal BLM and Forest Service lands, the US taxpayer receives $1.35 per AUM. As a rough estimation, taking a theoretical carrying capacity of 10 acres per AUM, (which is likely more productive than many areas of the state), and calculating the value of the forage per acre as paid to the American taxpayer, the US taxpayer receives an estimated $0.14 per acre for the forage value on BLM or USFS federal rangelands in 2021.

Given that the direct costs of grasshopper treatments to the taxpayer in Western States NEappear to range from $3.99 up to $14.61/acre, it is clear that the economic threshold is nowhere near being met. The program makes no economic sense from the point of view of the taxpayer.

1 The first figure applies to the cost for areas directly sprayed, the latter figure calculates a larger “protected acre” figure assuming that treatment effects radiate out into untreated swaths. This report was obtained through a FOIA request.

*Please see APHIS’ response to comment 1 above.*

*This comment is similar in nature to comments in the 2020 EA, please see the APHIS responses to comments 3, 4, 5, 6, 7, 8 from the 2020 EA’s. The analysis provided by the commenter assumes all lands treated by APHIS in Nevada are public. This is not the case. Due to the nature of the land ownership in Nevada being checkered board, private lands are often included in treatments in order for treatments to make biological sense. The private landowners pay a direct portion of treatment costs as well as a cost share with the Nevada Department of Agriculture. Therefore, the assumptions made in the analysis provided by the commenter are an overestimate to the taxpayer. The value of the forage is not based only on the grazing fees assessed by BLM or FS. There are a range of additional costs associated with replacement feed, the cost of hay, the cost to ship the hay, the cost and labor to move the hay to the rangeland, the cost of moving the cattle from the grazing allotments, the cost to provide or build a hay barn to store the hay, etc. The replacement feed costs in Nevada greatly out way any treatment costs accrued by the agency. Furthermore, the Plant Protection Act of 2000 does not give authority to APHIS to purchase replacement feed for ranchers, only provides funding when available to suppress outbreak populations of grasshoppers to save forage. In Nevada there are no overhead or Administrative costs associated with the ground treatment costs provided by APHIS. The administrative costs associated with contractors providing aerial treatments are minimal due the funds provided by the state for nymphal surveys, pre treatment efforts, and permanent staffing hours not included in the costs. In Nevada only the direct costs are associated with the ground treatment costs and those are covered by the Nevada Department of Agriculture. The IPM Manual prepared by USDA discusses the cost benefit analysis for grasshopper suppression programs.*

5. **APHIS relies too heavily on broad assertions that untreated swaths will mitigate risk. Untreated swaths are presented as mitigation for pollinators and refugia for beneficial insects, but drift from ULV treatments into untreated swaths at typical aircraft heights is not fully disclosed, while studies are mischaracterized.**

This EA and the EIS claim that the use of untreated swaths will mitigate impacts to natural enemies, bees, and other wildlife. For example:

● Final EIS p. 34: *"With less area being treated, more beneficial grasshoppers and pollinators will survive treatment."*
● Final EIS P. 57: "*The use of RAATS provide additional benefits by creating reduced rates and/or untreated swaths within the spray block that will further reduce the potential risk to pollinators."*
● Final EIS p. 26. *"Studies using the RAATs strategy have shown good control (up to 85% of that achieved with a traditional blanket insecticide application) at a significantly lower cost and less insecticide, and with a markedly higher abundance of non-target organisms following application (Lockwood et al., 2000; Deneke and Keyser, 2011).*
● Nevada 2021 EAs: *"Based on the review of laboratory and field toxicity data for terrestrial invertebrates, applications of diflubenzuron are expected to have minimal risk to pollinators of terrestrial plants. The use of RAATs provide additional benefits by using reduced rates and creating untreated swaths within the spray block that will further reduce the potential risk to pollinators."*

However, the width of the skipped swaths is not designated in advance in the EAs, and there is no minimum width specified.

APHIS' citation of a study by Lockwood et al. (2000) to claim that RAATS treatments result in "a markedly higher abundance of non-target organisms following application" appears to be far too rosy an assessment. We note that:

• The study authors make clear that reduced impact to non-target arthropods was "*presumably due to the wider swath spacing width* [which measured 30.5 and 60 m in the study]"**.** Obviously, these swath widths are on the high end of what could be used under the EAs.
• APHIS leaves out one of the key findings of the study: For carbaryl, the RAATs treatment showed *lower* abundance and biomass of non-targets after treatment compared to the blanket treatments on one of the two ranches at the end of the sampling period (28 days). Also, on both ranches, abundance and biomass reached their lowest points at the end of the study after treatment with carbaryl, so we don't know how long it took for recovery to occur.

Moreover, many features of the study several features of the study make it less than useful for predicting impacts under APHIS' current program. We note that:

• This study only investigated RAATs effects to non-targets for carbaryl, malathion, and fipronil, not on diflubenzuron.
• In addition, the study measured highest wind speeds at 6.0 mph, well below the maximum rate allowed under the operating guidelines indicated in the 2021 Treatment

Guidelines (10 mph for aerial applications, no maximum wind speed specified for ground applications).

• The experimental treatment areas in the study (243 ha or 600 acres) were quite small compared to aerial treatment sizes that occur in reality (minimum 10,000 acres for aerial treatments). This could have allowed for recolonization from around the edges that would result in more rapid recovery, compared to a real-world treatment, some of which measure tens of thousands of acres.

APHIS also cited Deneke and Kyser (2011) to justify its statement that RAATs results in a "markedly higher abundance of non-target organisms following application." Deneke and Kyser's publication is an extension publication, not a research publication, and contains absolutely no data to show that RAATs conserves non-targets.

Neither the EAs nor the 2019 EIS presented estimated environmental concentrations (EECs) in the untreated swaths and simply included statements that untreated swaths would reduce risk to nontargets. To fully understand expected environmental concentrations in treated swaths, it is important to have a clear assessment of drift under the conditions that occur under the APHIS grasshopper program. While APHIS' 2019 EIS described its use of a quantitative analysis of drift anticipated from ULV aerial applications (see HHERA for diflubenzuron) to estimate deposition into **aquatic areas**, the information presented in the EIS and HHERA is insufficient to fully understand expected environmental concentrations **in untreated swaths**. To better understand this issue, we looked more closely at several drift analyses and studies to better understand the potential for drift.

a) EPA (2018) in its most recent ecological risk assessment for diflubenzuron, included a low volume aerial drift analysis using the model AgDrift. EPA assumed a volume mean diameter (VMD) of 90 µm [note that this is approximately 2/3 of the VMD used in the APHIS analysis]. Under EPA's analysis, the drift fraction comprises 19% at 150 ft. However, this analysis is likely not helpful for most aerial APHIS grasshopper program applications, as the EPA analysis is based on a boom height of 10 feet while APHIS aerial release heights are typically much higher.

b) Schleier et al. (2012) performed field studies to measure environmental concentrations of ground-based ULV-applied insecticides. Sites contained little vegetative structure and a flat topography. The authors observed that an average of 10.4% of the insecticides sprayed settled out within 180 m (591 ft.) of the spray source. According to the authors, these results are similar to measurements in other studies of ground-based ULV applications using both pyrethroid and organophosphate insecticides, which found 1 to 30% of the insecticide sprayed deposits on the ground within 100 m (328 ft) of the spray source.

c) According to information APHIS provided to NMFS in a 2010 Biological Assessment (obtained through a FOIA request), actual aerial release heights are likely to be in the area of 75' above the ground (APHIS 2010). Modeling of drift using aerial methods and a 75' release height was conducted using the model AgDISP in this BA; modeling using ground methods was conducted using the model AgDRIFT. In both cases the droplet size was set as "very fine to fine" which corresponds to a Volume Mean Diameter (VMD) of 137.5 um.

Outputs from the models are very difficult to interpret from the information in the BA which is only presented as a chart with the y-axis at a scale too coarse to adequately interpret the results and decline at different points distant from the spray. However, for the aerial diflubenzuron application, it appears that the model predicts deposition at point zero (below the treated swath) to be approximately 1 mg/m2. APHIS states subsequently that the model predicts deposition at 500 feet to measure 0.87 mg/m2. Translated into lb/acre this means a deposition of 0.009 lb/A at point zeroand0.0078lb/acre at 500 foot distance, with approximately a straight line of decreasing deposition between those two points.[2]

According to drift experts, the most important variables affecting drift are droplet size, wind speed, and release height (Teske et al.2003).In analyzing these three drift analyses, we note that neither the Dimilin2L label nor the Sevin XLRPlus label requires a minimum dropletsize for ULV applications on grasslands and non-crop areas, for the control of grasshoppers and Mormon crickets. However, other uses of ULV technology for pest control assume much smaller droplet sizes than what APHIS has assumed (VMDof 137.5). For example, for ULV applications used in adult mosquito control operations, VMD measures between 8 and 30µm and 90% of the droplet spectrum should be smaller than 50µm (Schleieret al.2012). EPA estimates VMD for ULV applications as 90µm (USEPA 2018).

The EPA analysis is of very limited utility based on the release height, as pointed out above. And while itis helpful to have found the APHIS AgDISP analysis, we believe it—and the EIS and EAs that appear to rely on it—likely underestimates drift, and the resulting risk to non-targets within skipped swaths, as a result of several factors:

- •The APHIS AgDISP analysis only analyzed deposition at the lower end of the application rate corresponding to 0.75 lb/acre (0.012 lb/A) rather than the upper end of the application rate that corresponds to 1 oz/acre (0.016lb/A)which is a rate often specified in contracts.
- •The APHIS aerial AgDISP analysis was conducted with a VMD of 137.5, far larger than those predicted for other ULV analyses. APHIS never explains exactly why.
- •The number of flight lines are not specified in the input, yet according to the AgDrift user guide, "*the application area (swath width multiplied by the number of flight lines) can potentially have a major impact*" on drift (Teske et al. 2003).
- •APHIS Program operational guidelines (included as an appendix in the EAs) do not specify any minimum or maximum droplet size therefore it is unknown what nozzles are actually being used and what droplet sizes are actually being emitted.

In conclusion, APHIS has not presented evidence that its RAATs method, even with skipped swaths 200 feet, will "provide additional benefits" or significantly increase the survival of pollinators or other beneficials within the treated blocks. Given the enormous size of many treated blocks (a minimum size for treatment is typically 10,000 acres, while treatment blocks of 100,000-150,000 acres are not uncommon in some states) and the limited mobility and small home ranges of many terrestrial invertebrates, it is essential that AHIS conduct a rigorous

<u>assessment of drift into untreated swaths and compare that to toxicity endpoints for representative species.</u>

*The commenter is correct that APHIS believes the use of RAATs mitigates the risk to non-target insects including pollinators. However, APHIS does not solely rely on the reduced deposition of pesticides in the untreated swaths to determine the potential harm of grasshopper treatments will not cause significant impacts. The environmental consequences risk analysis of carbaryl and diflubenzuron treatments using conventional methods (total area coverage and higher application rates) is provided on pages 16-22 of the 2021 EAs. Additional descriptions of APHIS' analysis methods and discussion of the toxicology can be found in the 2019 EIS.*

*The commenter has expressed concern that APHIS' analysis modelling drift does not use the same variables values as similar analysis conducted by the US EPA. APHIS must explain that the EPA analysis is for general use of ULV pesticides while APHIS' analysis is based on multiple conservative estimations of operational procedures and variables for the grasshopper program. The commenter also cites a study (Schleier et al., 2012) and asserts the insecticide drift modelled and measured by the authors for ultra-low volume mosquito treatments are representative of the potential drift between treated and untreated swaths during a grasshopper suppression treatment using the RAATs method. APHIS disagrees with the commenter's understanding of the study based on the text of the article that states, "Ground-based ULV applications used for adult mosquito management are very different than agricultural pesticide applications because the nozzles produce an aerosol (droplets < 100 μm) and are pointed at a + 45° angle from the horizon. Ultra-low-volume applications used for adult mosquito management are most effective when the insecticide remains airborne and moves through the target area; in contrast, applications for agricultural pests are designed to minimize the movement of droplets (Hiscox et al., 2006)."*

*The commenter appreciates the graphical representation of spray drift provided by APHIS for the purpose of estimating pesticide deposition at various distances from the treated swath. The graphs are intended to explain how APHIS derived no-treatment distances for buffers intended to prevent harm to species protected by the Endangered Species Act. APHIS does not assert that spray drift is reduced to zero in untreated swaths, and that is not represented by the graphs or assumed by the risk analysis cited by the commenter (APHIS EAs, EIS, HHERAs). If the commenter agrees the graphs are reasonable representations of spray drift and wishes to extrapolate the modeling to deposition resulting from APHIS' use of the RAATs method, the exponential drop of pesticide deposition close to the release point is more informative.*

*For Nevada treatments, the typical skip swath width is described on pages 8 of the 2021 EA's. Because the majority of treatments in Nevada are with respect to Mormon crickets, as the treatment area increases there is more feasibility in doing larger skip swaths (e.g. 33% treated area compared to 50%) due to the mobile nature of Mormon crickets. This not only saves on direct treatment costs, but it also provides larger untreated refuge areas even in the case of incidental drift.*

*The skip swath size in the studies are relevant to Nevada treatments. For larger treatments, a class C or D aircraft is required and a standard treatment width would be 150 feet.*

*This means that skip swaths at 50% coverage would be 150 feet and at 33% coverage up to 300 feet. The latter method would have a larger skip than the largest measured in the study but would only be applied on the largest scale infestation, specifically for Mormon crickets, to minimize impacts to nontarget across such a large landscape.*

*Ground treatments are restricted to two track or better roads and significantly limit ground coverage and treatments are focused in already disturbed areas (e.g. ATVs, equestrians, off road vehicles, construction).*

*For the safety of the applicator, it is a practice in Nevada not to treat when the wind is blowing greater than 10MPH to avoid potential exposure as well as minimize incidental drift. Regular environmental measurements (wind speed, wind direction, air temp) are taken before and during a treatment. The minimum swath width for treatments has been described in past EA's as well as on page 8 of the 2021 EA. The swath width has been described in detail in the above discussion. Typically, the swath width that is skipped is the swath width of the treated swath. This again was described in the 2020 EA, please see comments, 10, 12, 14, 19, 20, 21, 23, 24, 25, 28, 41 of the 2020 EA.*

6. **The EAs understate the risks of the insecticides diflubenzuron for exposed bees and other invertebrates.**

The EAs list two insecticide options (diflubenzuron and carbaryl), and states that the choice of which to use will be site-specific, without being clear about how that choice of insecticide is made. Still, according to the EIS, diflubenzuron was used on 93% of all acres treated between 2006 and 2017 and the Program used malathion only once since 2006.

The EAs indicate that under the preferred Alternative, diflubenzuron would be potentially be applied at 0.75 or 1.0 fluid ounce per acre (0.012-0.016 lb a.i./ac), with the potential for skipped widths under RAATS.[2] At the 0.016 lb ai/ac rate, BeeREX calculates the expected environmental concentration (EEC) in pollen and nectar from direct foliar overspray as 1.76 mg/kg, which is equivalent to 1760 ppb. At the lower application rate (0.012 lb ai/ac), BeeREX calculates the expected environmental concentration (EEC) in pollen and nectar from direct foliar overspray as 1.32 mg/kg, which is equivalent to 1320 ppb.[3]

Diflubenzuron is an insect growth regulator and functions by disrupting synthesis of chitin, a molecule necessary to the formation of an insect's cuticle or outer shell. An insect larva or nymph exposed to diflubenzuron is unable to successfully molt and thus dies. Chitin is not limited to insect cuticles, but is also, for example, a component of mollusk radula, fish scales and fungi cell walls.

The risk assessment included for diflubenzuron (attached to the 2019 EIS) makes little to no mention of an important attribute of this insect growth regulator that EPA (in its 2018 Ecological Risk Assessment) does point out. Namely: "*Chitin synthesis is particularly important in the early life stages of insects, as they molt and form a new exoskeleton in various growth stages. Thus, aquatic guideline tests, (or terrestrial invertebrate acute tests), which typically run for 48 hours, may not capture a molting stage, and thus underrepresent acute toxicity. Single doses may cause* *mortality, if received at a vulnerable time. Consequently, conclusions from RQs based on acute toxicity studies for invertebrates may not fully represent actual risk*."

While insect growth regulators are often considered "selective", pollinators such as native bees and butterflies have no inherent protection against diflubenzuron and will be vulnerable to injury and death if exposed.

Given its toxicity to juveniles, rather than adults, the relevant laboratory toxicity data that should be reported in the EA is larval LC50 or LD50 data. However, while the EAs disclose that diflubenzuron would result in greater activity on immatures, APHIS leaves out key information, such as the expected environmental concentration (EEC) from application, and how those concentrations compare to toxicity levels for immatures. After all, for bees, pollen collected by adults during breeding season (which coincides, for many species, with grasshopper spray windows) will mean exposure to developing larvae of bees, who may consume contaminated pollen placed in the nest by adults.

Forced to do this analysis ourselves, we located this relevant information elsewhere. For honey bees (the surrogate species for risk assessment in the absence of other data), USEPA (2018) reported a chronic 21-day ED50 and NOAEL of 0.012 and <0.0064 µg a.i./larva, respectively. Utilizing these values in BeeREX (EPA's model that calculates risk quotients for bees) and assuming an application rate of 0.016 lb ai/ac, BeeREX calculates an acute dietary risk quotient of 18.13 and a chronic dietary risk quotient of 33.99. (A threshold value is 1.0.) Risk quotients this high above 1.0 indicate a high concern for exposed bees.

However, APHIS discounted the risk of diflubenzuron to pollinators as follows:
*Based on the review of laboratory and field toxicity data for terrestrial invertebrates, applications of diflubenzuron are expected to have minimal risk to pollinators of terrestrial plants.*

APHIS goes further by citing Mommaerts et al. (2006), noting that reproductive effects were observed on bumble bees in this study, but claims that these effects were observed at much higher use rates than those used in the program. Unfortunately, this is incorrect. Mommaerts et al. (2006) conducted dose- response assays and found that exposure to diflubenzuron resulted in reproductive effects in *Bombus terrestris*, with only the doses at at 0.001 (one thousandth) of maximum field recommended concentrations (MFRC) in pollen and 0.0001 (one ten thousandth) in sugar water resulting in effects statistically similar to controls. The MFRC for diflubenzuron is listed in the study as 288 mg/L (equivalent to 288,000 ppb). At 1/10,000 of this level, diflubenzuron effects would be similar to controls only at levels at or below 28.8 ppb while at 1/1000 of this level, diflubenzuron "no effect" concentrations would be equivalent to 288 ppb.

Recall that the EECs for diflubenzuron under the program are expected to range from 1320 ppb to 1760 ppb (RAATs rate, full rate, respectively). The Mommearts study thus shows the **opposite** of what APHIS claims – that the effective dose for reproductive effects would be expected at the EECs anticipated for diflubenzuron at RAATS rates used in grasshopper suppression. This raises concern that the application of diflubenzuron at the specified RAATS rates may cause severe impacts to bumble bee reproduction within treated areas.

Moreover, APHIS points out that the alfalfa leafcutting bee (*Megachile rotundata*) and the alkali bee (*Nomia melanderi*) are both considered more susceptible than honey bees or *Bombus to* diflubenzuron. Additionally the EIS discloses that under some circumstances, Dimilin may be quite persistent; field dissipation studies in California citrus and Oregon apple orchards reported half-live values of 68.2 to 78 days. Rangeland persistence is unfortunately not available, but diflubenzuron applied to plants remains adsorbed to leaf surfaces for several weeks.
2 It is worth noting out that the low end of this range (0.12 lb ai/ac) is still double what APHIS presented as the "average" RAATS rate in the Final EIS (p. 35).
[3] APHIS presents no information in the EA that indicates the EECs would be any less than this, therefore these values are assumed to be the correct EECs within treated swaths at these two rates.

***Recommendation:*** Faced with significant and concerning pollinator declines, APHIS should take into account the risk to native bees and butterflies from these treatments. At a minimum, APHIS should be conducting a more thorough and accurate analysis on the impacts of selected pesticides to pollinators and other beneficial insects. Research findings do portend worrying results for native pollinators and other beneficial insects exposed in the treated areas, even for diflubenzuron. APHIS should constrain its treatments to take into account pollinator conservation needs, and improve its monitoring capability to try to understand what non-target effects actually occur as a result of the different treatments.

*Please see the APHIS responses to comments 10, 12, 14, 19, 20, 25, 28 and 41 in the 2020 EA's.*

*The commenter asserts the EA does not provide information on the possible effects of diflubenzuron and carbaryl sprays on bees and pollinators. That information is provided on pages 17 and 21. The Draft EA is tiered to more extensive analysis in the 2019 EIS (page 45-46 and 55-57) and the HHERAs for Carbaryl (page 21 and 44) and Diflubenzuron (pages 13-14, 29-30) that addresses risk to pollinators including bees and their larval stages.*

*The commenter's risk quotient (RQ) analysis compares their calculated estimated environmental concentration (EEC, from the BeeREX Tier 1 risk screening tool) to the dietary* $LC_{50}$ *and NOAEL. The residues are based on T-REX, an EPA terrestrial plant residue model, that is used to estimate exposure to food items consumed by birds and mammals. In the case of BeeREX they use residues that would be expected from direct application onto long grass. These values would not be anticipated to occur on pollen. Additionally, nectar pesticide residues may be as much as an order of magnitude below levels that would occur on pollen (EFSA, 2017).*

*The BeeREX model assumes that pesticide residues are equal in pollen and nectar. It is unclear how the commenter used effect concentrations expressed in mg/L (cited in the literature) to mg/kg which is not a direct conversion. APHIS invites them to share their modelling assumptions and inputs. APHIS notes that as is appropriate for a Tier 1 risk screening tool, BeeREX is very conservative method for estimating residues on pollen and nectar.*

*APHIS conducted a thorough risk analysis based on published toxicological studies for carbaryl and diflubenzuron and that analysis is provided in the HHERAs. The commenter asserts that*

*APHIS incorrectly evaluated the exposure data presented in the Mommaerts et al. study of chitin synthesis inhibitors, including diflubenzuron. The researchers exposed bees via a contact application of 288 mg/L aqueous concentration which was topically applied to the dorsal thorax of each worker with a micropipette. Bumblebees also ingested orally sugar/water treated with the same concentration of diflubenzuron solution over a period of 11 weeks. Pollen was sprayed with the same concentration of diflubenzuron until saturation and then supplied to the nests. The bumble bees were not restricted in how much of these contaminated solutions they could consume.*

*APHIS's review of the study did not identify findings of effects caused by diflubenzuron at the concentrations represented above by the commenter, "Mommaerts et al. (2006) conducted dose-response assays and found that exposure to diflubenzuron resulted in reproductive effects in Bombus terrestris, with only the doses at 0.001 (one thousandth) of maximum field recommended concentrations (MFRC) in pollen and 0.0001 (one ten thousandth) in sugar water resulting in effects statistically similar to controls." The researchers instead estimated mean* $LC_{50}$ *concentrations based on the chronic exposure routes described above. These were 25 mg a.i/L dermal contact, 0.32 mg a.i/L ingested sugar-water, and 0.95 mg a.i/L pollen. The researchers noted, "In practice, bumblebees will rarely be exposed to such high concentrations, but these experiments have been undertaken to evaluate with certainty the safety and compatibility of compounds with bumblebees." They elaborated, "the present authors agree that, before making final conclusions, it is necessary that the laboratory-based results are validated with risk assessments for these insecticides in field related conditions."*

*APHIS believes conversion and comparison of program applied foliar spray rates to the concentrations of the solutions applied in this study would rely on unrealistic exposure scenarios. An exposure scenario where pollinators are exposed continuously for 11-weeks is not expected to occur in the APHIS grasshopper and Mormon cricket suppression program. In field applications diflubenzuron levels would decline over the 11-week exposure period due to degradation, flowering plants that have diflubenzuron residues would no longer be available for foraging by pollinators as flowers naturally die and do not provide pollen and nectar, and other plants would bloom after application without residues of diflubenzuron.*

*APHIS recognizes that there may be exposure and risk to some pollinators at certain times of the application season from liquid insecticide applications used to control grasshopper and Mormon cricket populations. APHIS reduces the exposure and risk to pollinators by using rates well below those labeled for use by EPA. Current labeling for grasshopper treatments also allows multiple applications per season. APHIS uses one application per treatment season further reducing the risk to pollinators when compared to the current number of applications that can be made in a year to rangeland.*

7. **APHIS never analyzes the possibility that its suppression effort may actually worsen future outbreaks of grasshoppers**

<u>Prior to chemical suppression of grasshoppers in the Americas, grasshoppers were regulated primarily by natural processes, including natural enemies such as birds, predatory insects, diseases, and even competition with other grasshoppers.</u>

Chemical suppression of grasshoppers runs the very real risk of disrupting these important natural regulation processes, potentially setting the stage for worsened outbreaks in the future. This is not an idle thought – this possibility has explored by respected grasshopper researchers in a number of publications. For example, see Joern (2000) who discussed this information and concluded that large-scale grasshopper control may contribute to grasshopper problems. An analysis of adjoining Montana and Wyoming counties supported this analysis, showing that where large-scale chemical control was not regularly applied, acute problems rapidly disappeared and long intervening periods of low grasshopper density persisted. Conversely, in places where a history of control existed, chronic, long-term increases in grasshopper populations were observed (Lockwood et al. 1988).

Lockwood et al. (1996-2000) explored identified infested areas, their sizes and what happened to them in subsequent years. Data was presented for 15 untreated and 4 untreated areas. Of these, only two untreated areas grew in size in their 2nd year, and most winked out by the 2nd year, not reappearing by the 3rd year. This is powerful evidence that not treating is a viable decision, or that treating is not warranted in the first year, at least for small infestations, and at least if the goal is to minimize the chance that an outbreak/hotspot would result in something worse in the following year.

APHIS rationalizes its program, often stretching science to the point beyond where it is credible. For example, APHIS cites a study by Catangui et al. (1996-2000) which investigated the effects of Dimilin on non-target arthropods at concentrations similar to those used in the rangeland grasshopper suppression program. In APHIS' characterization, the study showed that treatment with Dimilin should be of no concern since applications resulted in "minimal impact on ants, spiders, predatory and scavanger beetles." However, APHIS does not disclose that the plots studied by Catangui measured only 40 acres. This is a far cry from the ground treatments normally measuring thousands of acres or the aerial treatments measuring a minimum of ten thousand acres that are seen in the actual grasshopper suppression program. Small treated plots of 40 acres can be quickly recolonized from the edges. Large treated plots are quite a different story.

Quinn et al. (1993) examined the co-occurrence of nontarget arthropods with specific grasshopper nymphal and adult stages and densities. The study reported that nymphs of most dominant grasshopper species were associated with Carabidae, Lycosidae, Sphecidae and Asilidae, all groups known to prey on grasshoppers. The authors state that "*the results suggest that insecticides applied to rangeland when most grasshoppers are middle to late instars6 will have a **maximum impact on nontarget arthropods**.*" [Emphasis added]

Large scale treatment effects on ground beetles were investigated by Quinn et al. 1991. While this study was more akin to real-life treatments in the design, and found that initial large effects on ground beetles had disappeared by the 2nd year, this study did not investigate diflubenzuron, only malathion, carbaryl bait. The authors also state that "*the lack of a carryover effect in the second year is most likely due to the timing of grasshopper control treatments…adult ground beetles probably were very active several weeks before the treatment date and may have already* *reproduced before treatments were applied. Insects may also have immigrated into the evaluation plots after treatment."*

Since diflubenzuron would kill juvenile stages of insects and is more persistent than either malathion or carbaryl, it could have quite a different effect than these two chemicals. Therefore this study cannot be relied upon to insinuate that recovery would be similar to recovery under a carbaryl or malathion treatment.

Researchers even warned about the potential for treatments to worsen outbreaks in the Grasshopper IPM handbook. In Section IV.8 (Recognizing and Managing Potential Outbreak Conditions) Belovsky et al. cautioned:

> *"Pest managers need to consider more than the economic value of lost forage production or the outcry of individual ranchers. Grasshopper control might provide short-term relief but worsen future problems in these environments. From GHIPM findings (see VII.14), it appears that grasshopper populations in these environments have a high potential for being limited by natural enemies. Pesticide applications that reduce grasshopper numbers could also reduce natural enemy numbers directly by outright poisoning of the invertebrate natural enemies, or indirectly by lowering the numbers of vertebrate predators as their invertebrate prey are reduced. Therefore, the ultimate result of control efforts could be an increase in grasshopper numbers for the future, as they are released from the control of natural enemies."*

*The commenter again refers to comments addressed in the 2020 EA's. Please see response to comment 20 from the 2020 EA's.*

*The commenter assumes that there is widespread treatments in Nevada. This is not the case. The treatments only occur in relatively small isolated areas or pastures within grazing allotments. Most, if not all, treatments occur near roadways and developed areas already impacted by previous and current land uses. Treatments that occurred in 2019, a year that saw a dramatic rise in Mormon cricket populations, covered less than 13,000 acres and in 2020 only 434 acres were treated. This decrease occurred because treatments were delayed or canceled entirely while responding to public comments from the Xerces Society and the Center for Biological Diversity. The outbreak saw localized pockets ranging from 60 to 150 second instar Mormon crickets per square yard in areas just south of highway 80 outside of Winnemucca. Ranchers, county commissioners, and private landowners desperately sought assistance as large amounts of forage were lost that could have been saved otherwise. City pools were clogged and closed; houses incurred property damage as the infestation grew and crickets scaled structures eating any forage available and even paint chippings off homes; and highway 80, along with many other smaller roadways, was at risk of hazardous conditions from migratory cricket bands being run over and creating slick surfaces that could cause accidents, particularly when coupled with rain showers. Private landowners cannot treat public lands where the Mormon crickets hatch prior to migrating into urban areas and the surrounding rangelands.*

*Localized treatments on rangeland between the mountain ranges and canyons which where the crickets commonly hatch from could have prevented increased treatments from private landowners with higher chemical application rates and chemicals for which non-target species* *are less tolerant of. The commenter assumes without APHIS' involvement in treating outbreak populations, no treatments will occur. In reality, lack of APHIS involvement can result in more chemicals being applied on private land with less restrictions to buffers and sensitive species coupled harsher chemicals being released into the environment. In recent public meetings, private landowners eagerly supported the use of Malathion on their own lands in the wake of APHIS' lack of treatments. This is a chemical that Nevada APHIS personnel would be very unlikely to consider applying outside of imminent danger to the human population. Localized treatments done by APHIS on BLM or other public lands can mitigate Mormon cricket populations by impacting the areas which where the immatures hatch before they migrate into town, on private rangeland, or across major highways.*

*The commenter assumes APHIS will treat when requested. There have been years when the land managers have requested treatments, but because the populations did not merit treatments therefore no treatments did occur. The commenter failed to provide the methodology used in the research cited. Also, the commenter failed to describe if the outbreaks were gradient or eruptive in the research cited. Berryman (2008) describes in detail the population dynamics of these two types of outbreaks and methods to address these types of outbreaks. The commenter must understand that outbreaks reoccur to some degree due to favorable ecological factors and grasshopper populations respond. Consequently, grasshopper treatments may reoccur in the same vicinity.*

*The commenter cites research conducted in Montana and Wyoming which there are ecological differences between Nevada and those Northern States. Also, the research cited did not indicate that RAAT's methodology was used or not used during that research period of time. Research conducted in Nevada would be of more value especially if conducted in similar habitats, elevations, climates, ecoregions etc.*

8. **APHIS fails to meaningfully analyze the risk to grassland birds, many of which are declining.**

McAtee (1953) examined 40,000 bird stomachs and reported that >200 spp prey on grasshoppers. Such avian predators of grasshoppers include species often seen in Western areas, such as kestrel, and meadowlark. Avian predators of grasshoppers also include grassland birds in decline, that merit special consideration, including sage-grouse, Swainson's hawk, long-billed curlew, sage thrasher, and others.

According to McEwen (1987), grasshoppers are especially important for the raising of young by the majority of bird species. McEwen et al. (1996) cites a number of resources in stating that bird predation commonly reduces grasshopper densities on rangeland by 30-50 percent.

Despite this strong linkage between grasshoppers and the health of rangeland bird communities, APHIS only analyzes the direct toxic effect of insecticidal treatments to birds, and fails to analyze the indirect effects from loss of forage to these declining bird species.

*The commenter assumes that there is widespread treatments in Nevada. This is generally not the case, with treatments occurring in localized areas or pastures within grazing allotments.*

*Birds are highly motive predators and will search for prey in areas with the treatment blocks where APHIS does not spray pesticides. For example, the skip swaths where the RAATs method is employed or within protective buffers established around water resources or other sensitive sites.*

*In Nevada, BLM, APHIS, NDA, NDOW, and USFWS operate under a Memorandum of Understanding when treating near sage grouse habitat. The outlined mitigation measures in the MOU are put into place to minimize the impacts to foraging leks which utilize grasshopper and Mormon crickets in their diets. A three-mile buffer around active and pending lek sites provides ample forage for sage grouse leks.*

*While the additional species mentioned (Swainson's hawk, long-billed curlew, or sage thrasher) are listed under the Migratory Bird Treaty Act, none have been identified as needing additional mitigation measured during consultation with USFWS. Land managers, Nevada Department of Agriculture, or Nevada Department of Wildlife also have not identified any at risk, or even populations at all, that require supplementary mitigation measures.*

9. **It is unrealistic to assume that APHIS can comply with mitigation measures designed to protect bees on pesticide labels.**

APHIS claims that it will adhere to applicable mitigations designed to protect bees that are found on product labels. For example, the Final EIS categorically states that "Product use restrictions and suggestions to protect bees appear on US EPA approved product labels and are followed by the grasshopper program. Mitigations such as not applying to rangeland when plants visited by bees are in bloom, notifying beekeepers within 1 mile of treatment areas at least 48 hours before product is applied, limiting application times to within 2 hours of sunrise or sunset when bees are least active, appear on product labels such as Sevin® XLR Plus. Similar use restrictions and recommendations do not appear on bait labels because risks to bees are reduced. APHIS would adhere to any applicable mitigations that appear on product labels."

It should be remembered that bumble bees fly earlier and later in the day than honey bees and limiting application times to within 2 hours of sunrise or sunset may not be protective. In addition, while diflubenzuron is toxic to larval and developing forms of numerous insects, it appears that Lepidoptera (butterflies and moths, many of which are at-risk as emphasized in Xerces' comment letter from 2020) are more sensitive to diflubenzuron, as a group, than most other taxa (Eisler 1992).

The Dimilin 2L label instructs the user to "minimize exposure of the product to bees" and to "minimize drift of this product on to beehives or to off-site pollinator attractive habitat."
The Sevin XLR Plus label instructs applicators: "Do not apply this product to target crops or weeds in bloom."

However, if treated habitat is flowering and bees are active (as would be anticipated during any of the proposed treatment months), it is not clear how applications for grasshopper/Mormon cricket control can avoid blooming plants in the treated areas or minimize exposure to bees.

Except for reduced rates and/or untreated swath widths, the EAs are silent on how it will avoid impact to pollinators. It has already been shown that within sprayed areas, risk quotients at expected application rates would be well above 1.0. Leaving skipped widths is also not a full solution at expected widths since, due to drift, untreated swaths are highly likely to be exposed to levels above risk quotients (see above comment).

In cropland areas, applicators sometimes minimize exposure to bees by applying at night. From examination of some of the flight records from past grasshopper treatments, it is clear that this is not the norm for the program, at least for aerial treatments.

*The commenter made similar comments addressed in the 2020 EA's. Please see the APHIS responses to comments 10, 12, 14, 19, 20, 25, 28 and 41 in the 2020 EA's.*

*The commenter is correct that APHIS believes the use of RAATs mitigates the risk to non-target insects including pollinators and bees. APHIS does not believe the adherence to product use restrictions mitigates all harm to these species. Instead APHIS has analyzed the benefits of relatively small grasshopper treatments against the potential for significant impacts to bee populations within the large area covered by the EAs. The environmental consequences risk analysis of carbaryl and diflubenzuron treatments is provided on pages 16-22 of the 2021 EAs. Additional descriptions of APHIS' analysis methods and discussion of the toxicology can be found in the 2019 EIS.*

**10. The EA lacks analyses of effects as well as effect calls for species listed under the Endangered Species Act.**

According to the EAs, programmatic consultation with the US Fish and Wildlife Service on species listed under the Endangered Species Act was initiated in 2015, but is not yet complete. The backup is for APHIS to consult at the local level, a process that was apparently not complete at the time of publication of the Draft EA.
The EAs include Appendix C, which contains among other information, an Official Species List from USFWS dated 1/22/21. The list includes candidate species, but not the monarch butterfly, which has recently been added as a candidate.

In addition, Appendix C contains two lengthy tables (Table 2, undated and Table 3, dated 2004) apparently from earlier programmatic consultation efforts. These tables include species from outside the project area, thus the applicable mitigations that pertain to this EA are difficult to find and understand. It would be quite difficult for any applicator to integrate the requirements in these tables without specific directions and maps. In addition, the general operational guidelines make no mention of the enhanced buffers required by NMFS, or the buffers or other specific requirements from USFWS imposed to protect listed, proposed, or candidate species.

How will those species' protected locations be identified (for example, in some cases the instruction is to avoid application to "occupied habitat")? How will such locations, buffer widths, and any specific instructions (i.e. use of carbaryl bait only) for some species be mapped and communicated to applicators?

No concurrence letter is included. Due to the absence of such concurrence at this stage, it is incumbent upon APHIS to disclose its determinations for all species and the measures it plans to implement to avoid impacts to listed species in the Final EA

*APHIS appreciates the commenter's careful review of the protected species lists provided in the Draft EA. APHIS has provided the most current ESA consultation documents in Appendix D in the Final EA for the 2021 treatment season. The commenter's concern that treatment applicators could be confused by vague descriptions of the protection measures in the EA is misplaced. APHIS prepares detailed maps of treatment blocks that include no-spray buffers and other operational details (I.e. no fly zones) for applicators. APHIS agrees that without concurrence from the services on the findings of our consultation the potential for significant impacts will not have been fully evaluated in the final EA and FONSI. However, the agency's compliance with the Endangered Species Act follows a different timeline from the preparation of our NEPA documents. In accordance with APHIS' NEPA implementing regulations the agency may determine the FONSI is contingent on completion of ongoing ESA consultations.*

*See also comments 30, 32, 40 and APHIS' responses in the 2020 EA's.*

11. **Within the last year, the monarch butterfly has been designated a candidate species under the Endangered Species Act, but the EAs contain no information about impacts to or consultation for this species.**

No information is available about the potential for effects to the monarch butterfly, recently designated a Candidate species under the Endangered Species Act. On December 15, 2020, the U.S. Fish and Wildlife Service announced that listing the monarch butterfly under the Endangered Species Act is warranted, but precluded by other priorities, making the monarch a candidate species. The Official Species List in Appendix C from US Fish and Wildlife Service does include other candidate species and explicitly states: "Species on this list should be considered in an effects analysis for your project." Therefore it appears to be an oversight that monarchs have not been included. APHIS must address the oversight and analyze impact to the monarch under the alternatives prior to implementing the action alternative.
In fall 2018 and fall 2019, the annual Xerces Western Monarch Thanksgiving Count showed that the population hit a new low: volunteers counted under 30,000 monarchs—less than 1% of the population's historic size.

Habitat suitability modeling for monarch butterfly in the counties covered by this EA shows there are concentrations of potentially highly suitable monarch habitat in Nevada potentially subject to grasshopper suppression this year (Dilts et al. 2018). In 2016 and 2017, the U.S. Department of Agriculture National Resources Conservation Service's (NRCS) developed regional Monarch Butterfly Wildlife Habitat Evaluation Guides, and discouraged placement of monarch breeding habitat within 38 m (125 ft.) of crop fields treated with herbicides or insecticides (NRCS 2016).

<u>The risk of carbaryl applications may be unacceptably high for lepidoptera, including the monarch, based on data from Abivardi et al. (1999) as explained earlier in this comment letter.</u>

*The Monarch butterfly was listed as a candidate species on December 15, 2020. The U.S. Fish and Wildlife Service's (USFWS) 12-month status review determined that it was "warranted but precluded". The Endangered Species Act (ESA) provides for a "warranted-but-precluded" finding when the Service does not have enough resources to complete the listing process, because the agency must first focus on higher-priority listing rules. "Warranted-but-precluded" findings require subsequent review each year until the agency undertakes a proposal or makes a not-warranted finding. APHIS is not required by ESA Section 7 consultations to consult on species that have been precluded from being listed as threatened and endangered (T&E) species.*

*The 2021 USFWS official species list in the Environmental Assessments (EA's) (NV-21-01, NV-21-02, NV-21-03, and NV-21-04) for the rangeland action were provided to inform the reader of the ongoing ESA Section 7 consultations with U.S. Fish and Wildlife Service. The USFWS does not give concurrence for candidate species. As of this time, it has not been listed as a species of concern by any land managers requesting treatments, the USFWS, NDOW, or NDA.*

*According to iNaturalist Southwest Monarch Study, data for 2020, there were no Nevada observations. In 2019, there were two observations just northeast of Las Vegas in Clark county. Clark county is not included in the scope of any of the Nevada EAs.*

*The commenter cited an article by the National Resource Conservation Service (NRCS) (2016) for Monarch Butterfly Wildlife Habitat Evaluation Guides, but these guides deal with crop lands not rangelands. According to USDA NCRS (2020), the NRCS agency's primary geographic focus for monarch habitat has been in Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Ohio, Oklahoma, Texas, and Wisconsin, the primary eastern monarch migration corridor in a 10-state area of the central U.S (USDA NRCS, 2020).*

*On August 26, 2014, a petition to protect the Monarch Butterfly under the ESA was submitted on behalf of the Center for Biological Diversity, Xerces Society, Center for Food Safety, and Dr. Lincoln Brower. In this petition under the factors and the justification listed ," The ESA states that a species shall be determined to be endangered or threatened based on any one of five factors (16 U.S.C. § 1533 (a)(1)): 1) the present or threatened destruction, modification, or curtailment of its habitat or range; 2) overutilization for commercial, recreational, scientific, or educational purposes; 3) disease or predation; 4) the inadequacy of existing regulatory mechanisms; and 5) other natural or manmade factors affecting its continued existence ". The monarch is threatened by all five of these factors and thus warrants protection under the Act. The petition failed to describe in any manner, under the factors listed in the petition if any decline of milkweed populations occurred in rangeland habitats. All descriptions under the factors described delt with decline of populations in cropland settings due to the heavy use of chemicals to control pests to crops. One cannot assume that the level of chemicals being used in cropland settings is equal to chemicals or if any are being used in open rangeland settings. No data or justification to any decline, increase in populations of milkweed or if any milkweed is even present on rangelands was given.*

*Monarchs require milkweed for both oviposition and larval feeding. The correct phenology, or timing, of both monarchs and nectar plants and milkweed is important for monarch survival (USFWS, 2020). The ecological requirements of a healthy monarch population are summarized by Redford et al. (2011). In order to be self-sustaining, a population must be demographically, genetically, and physically healthy without the following ecological requirements sufficient seasonally and geographically specific quantity and quality of milkweed, breeding season nectar, migration nectar, and overwintering resources to support large healthy population sizes can occur.*

*Milkweed poisons cattle and other livestock. The toxic agents are cardiac glycosides. To be poisoned, cattle can eat as little as 1.0 percent of their body weight in broad-leafed milkweed; amounts as low as 0.15 percent have poisoned sheep and goats (Clayton, 2021).*

*Due to this factor, rangeland with milkweed would be at risk to cattle foraging. As noted in the Description of Affected Environment of the Nevada EAs, there are no milkweed species listed in the general species of plants within the grazing allotment action areas to date. In Nevada, the Monarch Butterfly has not been collected in sweep net samples during Nymphal or Adult surveys for grasshopper/Mormon cricket.*

*APHIS recognizes that there may be exposure and risk to some pollinators at certain times of the application season from carbaryl liquid insecticide applications used to control grasshopper and Mormon cricket populations. APHIS reduces the exposure and risk to pollinators by using rates well below those labeled for use by EPA. Current labeling for grasshopper treatments also allows multiple applications per season. APHIS uses one application per season further reducing the risk to pollinators when compared to the current number of applications that can be made in a year to rangeland.*

*See also comment and response to comment 82 of the 2020 EA's.*

12. **Carbaryl has been analyzed on listed species nationwide with widespread "likely to adversely affect" determinations –but no mention of this or mitigation for its harmful effects is found in the EAs.**

The EAs do not mention a recent nationwide consultation effort on carbaryl's effect to listed species. In its Biological Evaluation that it forwarded to the Services, EPA determined that carbaryl is likely to adversely affect nearly all listed species nationwide (see https://www.epa.gov/endangered-species/draft-national-level-listed-species-biological-evaluation-carbaryl), including listed species in Nevada. In addition, the US Fish and Wildlife Service recently determined that malathion is likely to adversely affect the vast majority of listed species across the country.

Such determinations by EPA and the Services are cause for a high level of concern. At a minimum, one would expect to find disclosure of these determinations and inclusion of mitigation for carbaryl's and malathion's harmful effects to listed species. Instead, no mention is made.

*The commenter made the same comment in 2020, please see the APHIS responses to comment 17 in the 2020 EA's.*

13. **Vulnerable pollinators and arthropods as a group are put at risk by the proposed action, despite widespread reports of insect decline and affirmative federal obligations for federal agencies put into place several years ago.**

The majority of Nevada is home to around 1,000 species of native bees (McKnight et al. 2018, Figure 1). Perhaps this is not surprising since the majority of rangeland plants require insect-mediated pollination. Native, solitary bee species are important pollinators on western rangeland. Hence, pollinators are important not only for their own sake but for the overall diversity and productivity of native rangelands, including listed plant species. However, this essential role that pollinators play in the conservation of native plant communities is given very short shrift in the EAs.

Many of the pollinators that call Nevada home are already considered at-risk. See lists of at risk pollinators found in Nevada in Attachments 1 and 2 from our comment letter submitted in 2020, (these comments are also attached to our 20201 email submitting this comment letter). Unfortunately, pollinators are just a piece of a larger ominous development facing insects as a whole. Recent reports suggest that insects are experiencing a multicontinental crisis that is apparent as reductions in abundance, diversity, and biomass (Forister et al. 2019).

Despite this very real crisis in biodiversity, the EAs do not disclose which, if any, invertebrates within the geographic area are listed as sensitive by federal land management agencies or as Species of Conservation Concern, or whether the state of Nevada designates any invertebrates as species of greatest conservation need.

APHIS stands to worsen the plight of pollinators and of insects as a group through implementation of its grasshopper suppression program as described in the EAs. In particular, the status of at-risk native bees and at-risk native butterflies may worsen as a result of insecticide treatments for grasshopper control.
In addition, the EAs make no mention of the fact that there are affirmative obligations incumbent on federal agencies with regard to protection of pollinators, regardless of whether they are federally listed. Federal documents related to pollinator health include:

- the 2014 Presidential Memorandum -- Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators
- the National Strategy to Promote the Health of Honey Bees and Other Pollinators
- the Pollinator-Friendly BMPs for Federal Lands
- the Pollinator Research Action Plan

Under the Presidential Memorandum executive departments are directed as follows:

- Executive departments and agencies shall, as appropriate, take immediate measures to support pollinators during the 2014 growing season and thereafter. These measures may include planting pollinator-friendly vegetation and increasing flower diversity in plantings, limiting mowing practices, and avoiding the use of pesticides in sensitive pollinator habitats through integrated vegetation and pest management practices.

Under the Pollinator-Friendly BMPs for Federal Lands, federal agencies are directed to:

- Determine the types of pollinators in the project area and their vulnerability to pesticides, taking into consideration pesticide chemistry, toxicity, and mode of action. Consult local Cooperative Extension or state departments of agriculture for more information.
- Minimize the direct contact that pollinators might have with pesticides that can cause harm and the contact that they might have with vegetation sprayed with pesticides that are toxic to pollinators. Try to keep portions of pollinator habitat free of pesticide use.
- Plan timing and location of pesticide applications to avoid adverse effects on pollinator populations. Apply pesticides that are harmful to pollinators when pollinators are not active or when flowers are not present.

And the National Strategy to Promote the Health of Honey Bees and Other Pollinators includes as a one of three key goals:

- Restore or enhance 7 million acres of land for pollinators over the next 5 years through Federal actions and public-private partnerships.

*APHIS reduces the risk to native bees and pollinators through monitoring grasshopper and Mormon cricket populations and making pesticide applications in a manner that reduces the risk to this group of nontarget invertebrates. Monitoring grasshopper and Mormon cricket populations allows APHIS to determine if populations require treatment and to make treatments in a timely manner reducing pesticide use and emphasizing the use of Program insecticides that are not broad spectrum. Historical use of Program insecticides demonstrate that diflubenzuron is the preferred insecticide for use. Over 90% of the acreage treated by the Program has been with diflubenzuron. Diflubenzuron poses a reduced risk to native bees and pollinators compared to liquid carbaryl and malathion applications. In addition, APHIS used RAATs to treat approximately 99% of the acres historically treated by the Program. When using the RAATs method APHIS applies pesticides below the labeled rates further reducing the amount of insecticide used by the program. APHIS also emphasizes the use of carbaryl bait, where applicable, as a means to suppress pest populations while protecting native bees and pollinators. Grasshopper suppression treatments typically occur in the early morning when pollinators are less active. These methods of applications have been shown to mitigate harm to nontarget invertebrates.*

*Please refer to the response for comment number 38 in the 2020 EAs as well as comments 5, 6, 8, 9, 10, and 11 in the 2021 EA listed above.*

**14. Freshwater mussels are at risk across the country and need particular attention.**

The Dimilin label indicates that the product is toxic to mollusks. The Sevin XLR Plus label indicates that the product is extremely toxic to aquatic invertebrates.
Nationally, more than 90 mussel species are federally listed as endangered and threatened, and more than 70% are thought to be in decline. About 32 species are thought to have already gone

extinct. In the western U.S., populations of western pearlshell, California floater, and western ridged mussel are all in decline, especially in Arizona, California, Montana, and Utah.

The 2019 EIS includes an aquatic residue analysis but does not take the next risk assessment step of comparing its residue analysis to known toxicity endpoints for freshwater mussels or other aquatic invertebrates.

*All bodies of water are buffered according to APHIS Treatment guidelines and the protective measures agreed upon during the consultation process. If the land manager requests a greater buffer distance around water or other sensitive sites APHIS follows that request.*

*APHIS believes the buffers for aquatic habitats are protective of the freshwater mussels the commenter has identified. Implementation of the proposed buffers along with the other mitigation measures will provide protection of mussel food items as well as any freshwater fish hosts that are required for transformation of glochidia to juvenile mussels.*

*The commenter gave the same comment in the 2020 EA's. Please see APHIS response to comment 42 in the 2020 EA's.*

15. **The EAs are silent on buffers around stock tanks. These can be important reservoirs of biodiversity, even as they may be better known for being home to many non-native species.**

The EAs do not identify any buffers that will be observed to prevent pesticide overspray or drift into these habitats. Studies of these habitats (Hale et al. 2014; Hasse and Best 2020) have shown that stock ponds/tanks are important surrogate habitats for native species, and can be equivalent to natural habitats in terms of total abundance and richness of aquatic invertebrates.

*Stock tanks are given the same buffer as any other surface water.*

*The commenter gave the same comment in the 2020 EA's. Please refer to APHIS response to comment 43 of the 2020 EA.*

16. **APHIS includes no information about whether an NPDES permit has been obtained, and what provisions it includes.**

APHIS includes no information about whether an NPDES permit has been obtained, and what provisions it includes. As described on the Dimilin 2L label, diflubenzuron is susceptible to runoff, and could result in discharges to surface water. Under the Clean Water Act, discharges require permit coverage under the National Pollutant Discharge Elimination System.

*APHIS complies with the Clean Water Act as administered by the Nevada Division of Environmental Protection. An NPDES permit is required if pollutants are discharged from a point source into waters of the United States. The Nevada Division of Environmental Protection, the issuing body of NPEDS permits in Nevada, concurs that an NPEDS permit is not required based on the scope of the program.*

*APHIS employs several mitigation measures intended to mitigate offsite transport of pesticides to sensitive habitats, including waterbodies. APHIS reduces the potential for drift and volatilization by not using ultra-low volume (ULV) sprays when the following conditions exist in the spray area:*

- *Wind velocity exceeds 10 miles per hour (unless state law requires lower windspeed)*
- *Rain is falling or is imminent*
- *Dew is present over large areas within the treatment block*
- *There is air turbulence that could affect the spray deposition*

*APHIS also does not apply insecticides directly to water bodies such as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers. APHIS also follows all other label restrictions designed to protect aquatic habitats. Furthermore, APHIS uses 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*

**17. Special status lands**

<u>The EAs do mention the presence of various special status lands. However, there is no mention of impacts to or any specific protections to be accorded to special status lands such as Wilderness areas, Wilderness study areas, National Monuments, Research Natural Areas, National Wildlife Refuges, and/or designated or proposed Areas of Critical Environmental Concern within potential treatment areas.</u>

*The commenter gave the same comment in the 2020 EA's. Please refer to APHIS response to comment 50 of the 2020 EA's*

**18. Cumulative effects analysis**

<u>The EA does not adequately disclose the locations where spraying has occurred in the past, nor did the APHIS 2019 EIS.</u>

<u>In the EA, APHIS states that cumulative effects "are not significant" partly because the probability of an outbreak occurring in the same area as a previous outbreak is unlikely. However, no information is presented to support this. Also, APHIS does not disclose the scale of treatments in any of those years, nor the impact of those treatments. APHIS places emphasis on the fact that its policy dictates that only one treatment a year is conducted, but does not address nearby impacts on private or state lands where more than one treatment may be conducted, which could contribute to cumulative impacts. In addition, ecological impacts can be severe even if a repeat treatment is unlikely if treatment results in adverse effects to a species confined to a small range, already in decline, or both.</u>

*Cumulative impacts, as defined by the Council on Environmental Quality (CEQ), is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR § 1508.7). Potential overlap of APHIS grasshopper suppression treatments are unlikely to result in significant cumulative impacts because the program applied pesticides are not persistent in the environment year to year. Grasshopper treatments conducted by state agencies or private landowners are unlikely to overlap where APHIS has conducted a treatment program. Potential environmental effects resulting from treatments conducted by other entities outside of APHIS treatment blocks will not contribute to potential cumulative significant impacts by APHIS as defined by CEQ. APHIS provided a more thorough analysis of potential cumulative impacts in the 2019 EIS for the grasshopper program. If there is any evidence of treatments made by personnel not affiliated with the program, that land will not be treated to avoid unknown cumulative impacts from the actions and it will be reported to the land manager.*

*APHIS addressed similar comments in the 2020 EA's. Please refer to APHIS' responses to comments 84, 85, 86, 87, 88, 89, 90, 91 and 92 of the 2020 EA's.*

19. **For APHIS and its cooperative land management agencies, building resilience into the system should be the key goal.**

APHIS does not identify how it coordinates with land management agencies, such as the BLM, to address site-specific sensitive issues such as sage grouse, Resource Management Plan requirements, limitations on special status lands, etc. Due to the spatial specificity of such issues, the national MOUs simply cannot adequately address such concerns.

Unfortunately APHIS also makes no mention in the EAs of what is most sorely needed: cooperation and planning with land managers to take appropriate steps to prevent the types of grasshopper and cricket outbreaks that are now dealt with by chemical controls. We believe that APHIS and its land management partners need to invest in longer-term strategic thinking regarding grasshopper management on Western rangelands. Building resilience into the system should be the key goal.

According to the Rangeland Management section of the Grasshopper IPM handbook, high diversity in canopy structure and plant species composition tends to support high diversity in grasshopper species and this diversity and composition tend to provide stability and to suppress pest species that exploit disturbance.

Emphasizing cultural techniques through appropriate grazing management could help to reduce reliance on pesticide applications and allow abiotic and biotic factors to regulate grasshopper and Mormon cricket populations to the greatest extent possible. For example Onsager (2000) found that (compared to season-long grazing) rotational grazing resulted in significantly less adult *Melanoplus sanguinipes* grasshoppers and significantly less damage to forage. Under rotational grazing, the nymphs developed significantly slower and their stage-specific survival rates were significantly lower and less variable. Consequently, significantly fewer adults were produced significantly later in the season under rotational grazing. Seasonal presence of all grasshopper species combined averaged 3.3X higher under season-long grazing than under rotational grazing. Local outbreaks that generated 18 and 27 adult grasshoppers per square meter under season-long grazing in 1997 and 1998, respectively, did not occur under rotational grazing. The outbreaks consumed 91% and 168%, respectively, as much forage as had been allocated for livestock, as opposed to 10% and 23%, respectively, under rotational grazing.

In addition, some research suggests that grasshoppers could be managed without insecticides by carefully timing fire and grazing to manage vegetation and reduce habitat suitability for target species (Capinera and Sechrist 1982; Welch et al. 1991; Fielding and Brusven 1995; O'Neill et al. 2003; Branson et al. 2006). While more research is needed to develop species- and region-specific management treatments that use alternatives to pesticides (Vermeire et al. 2004), there is likely enough data to employ cultural techniques now.

As described above (see item 8 in this comment letter), birds may consume 50% of grasshoppers on site. Ensuring healthy bird populations is critical for long-term grasshopper management. Another argument for re-thinking the chemical-centric suppression program is that the costs of the program constrain APHIS' ability to respond to treatment requests. In addition, climate change poses a threat that may alter the frequency and locations of outbreaks.

*The comments comparing rotational grazing to season long grazing are valid concerns. APHIS supports such management practices. However, the rotational grazing practices in Nevada by the ranchers are not under the control of APHIS grasshopper program. Ranchers practice rotational grazing in Nevada, APHIS only responds to the large outbreaks associated with the rangeland forage damage. Grazing practices are not under the control of APHIS. The research the commenter referenced concerning fire management, biological control, and other nonchemical methods are not valid control practices presently. Fire Management of rangeland is not controlled by APHIS. This method would have to be implemented by the land management agencies.*

**20. Overall Transparency of the APHIS Grasshopper / Mormon Cricket Suppression Program Must Be Improved.**

We appreciate that public notice of this site-specific EA and its comment period was posted at the APHIS website. Grasshopper suppression efforts, especially those on federal lands, are of more than local concern. The action being proposed is a federal action, proposing to use federal taxpayer funds. The species of the United States, our natural heritage, do not observe ownership, county, tribal, or state boundaries. As such, APHIS should not claim that grasshopper suppression actions are only of local interest. All proposed grasshopper suppression actions and environmental documents should be noticed properly to stakeholders across the United States. The proper and accepted way of doing this is to publish notices and decisions in the Federal Register.

We understand that this program may have attracted little public attention in the past. This is not a valid reason for not using broad methods to invite public participation, such as notices of availability in the Federal Register. It t is past time for APHIS to be more transparent about its actions, particularly on public lands. To do so will build trust. As such, there is little to lose and much to gain.

*The commenter gave the same comment in the 2020 EA's. Please refer to APHIS' responses to comments 1, 2, 3, 51 and 54 of the 2020 EA's.*

21. **All comments from last year are equally applicable this year as the 2021 draft EAs suffer from the same or similar deficiencies as the 2020 ones, are incorporated by reference and are attached as Appendix A. Also, comments on these EAs by the Xerces Society for Invertebrate Conservation from both 2021 and 2020 are equally applicable, incorporated by reference and attached as Appendix Band C.**

*APHIS responded to comments provided by these parties last year in Appendix D of the 2020 EAs.*

22. **In addition to the content of these comprehensive comments, we have a few additional comments. The first relates to species listed under the Endangered Species Act ("ESA"). The various mitigation and avoidance measures for these species, particularly endemic fish and sensitive trout but all species in general, to do appear to be based on the actual biology of these species and appear somewhat arbitrary. We ask that you either provide an explanation for why these measures were adopted and how they will protect these specific species, or adopt measures that do take the biology and life cycles of these species in to account.**

*The commenter both praises the biology-based protection measures and describes them as arbitrary in the same sentence. APHIS also does not apply insecticides directly to water bodies such as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers. APHIS also follows all other label restrictions designed to protect aquatic habitats. Furthermore, APHIS uses 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*

*Increased buffers for ESA listed species are agreed upon through consultation with the land manager and USFWS. APHIS invites the commenter to read the grasshopper program EAs and EISs more thoroughly to find explanations why these measures have been adopted programmatically.*

23. **In addition, we repeat that you still have not established compliance with the ESA, as there are no modern completed consultations, and thus you have no coverage for incidental takings. APHIS needs to finish its programmatic ESA consultations before spraying and should not rely on vague statements.**

*Local Nevada APHIS and USFWS personnel completed a three-year concurrence in 2018 for the 2018, 2019, and 2020 seasons. On March 26, 2021 a follow up consultation was completed, and* *a letter of concurrence submitted by USFWS for the 2021, 2022, and 2023 treatment seasons is attached in the 2021 EA in appendix D.*

**24. In terms of your NEPA compliance, while many of these issues are covered in the other comments, we again note that you have not established an environmental baseline because there is no information about where sprayings might occur.**

*The commenter expressed a similar opinion concerning the 2020 EA's. Please refer to APHIS' response to comment 98 in the 2020 EA's.*

**25. There is also no information regarding the environmental impacts of spraying in or near places like Wilderness Study Areas, National Monuments, near waterways or communities, etc. At a very minimum, APHIS should disclose where spraying has occurred in the past and what impacts have resulted as a part of establishing a baseline. This would also allow for a proper cumulative effect analysis, which is missing here. The impact of spraying a site more than once require particular consideration.**

*A commenter gave a similar comment in the 2020 EA's. Please refer to APHIS' response to comment 50 of the 2020 EAs. Please see comment responses 14, 15, 16, 17, 18, 22, 24, 27, 35, and 38 of the 2021 EAs. Furthermore, no treatments will occur within 500 feet of any communities, schools, or other housing structures located in or around the treatment area as described in the EA under Section IV.B.3 Executive Order No. 13045, Protection of Children from Environmental Health Risks and Safety Risks. Additionally, APHIS only applies a single application per site within a treatment season.*

**26. Also, you have again not properly disclosed the environmental impacts of the proposed action. Human health, ESA, migratory bird, and non-target species impacts get only cursory consideration. Mitigation measures lack specificity and evidence of efficacy.**

*The environmental impacts of the proposed actions can be found in detail in the 2002 and 2019 EISs. The Human Health and Ecological Risk Assessments (HHERAs) can be found on the APHIS website. ESA, Migratory birds, and non-target species mitigations are outlined in appendix C of the 2021 EA. Any additional species of concern identified by the land manager would require the requesting land manager to provide APHIS with mitigation measures they want in place. APHIS would then implement the mitigation measures or determine a treatment is no longer biologically sound and discontinue the proposed treatment. In Nevada, APHIS has had no reports of adverse effects on ESA, Migratory birds, or species of conservation concern that would indicate lack of efficacy in its buffers. See APHIS' responses to comments 1, 5, 6, 8, 10, 11, 13, 14, 15, 22, 23, and 25 in the 2021 EAs.*

**27. The EAs lack adequate consideration of impacts to waterways, water quality standards, and aquatic organisms. Even if a NPDES permit is obtained for spraying that results in discharges to waterways, this does not absolve APHIS of its duties to disclose impacts to waterways and water quality under NEPA. APHIS does not**

**meet its obligations under NEPA by simply stating that it will comply with laws such as the Clean Water Act and the ESA, it needs to disclose impacts to waterways and species even if it will obtain authorizations under other laws.**

*APHIS complies with the Clean Water Act as administered by the Nevada Division of Environmental Protection. An NPDES permit is required if pollutants are discharged from a point source into waters of the United States. The Nevada Division of Environmental Protection, the issuing body of NPEDS permits in Nevada, concurs that an NPEDS permit is not required based on the scope of the program.*

*APHIS employs several mitigation measures intended to mitigate offsite transport of pesticides to sensitive habitats, including waterbodies. APHIS reduces the potential for drift and volatilization by not using ultra-low volume (ULV) sprays when the following conditions exist in the spray area:*

- *Wind velocity exceeds 10 miles per hour (unless state law requires lower windspeed)*
- *Rain is falling or is imminent*
- *Dew is present over large areas within the treatment block*
- *There is air turbulence that could affect the spray deposition*

*APHIS also does not apply insecticides directly to water bodies such as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers. APHIS also follows all other label restrictions designed to protect aquatic habitats. Furthermore, APHIS uses 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*

*APHIS agrees with the commenter that NPDES permits do not absolve Federal agencies from complying with NEPA.*

28. **Regarding your compliance with the Plant Protection Act, as discussed more fully in the Xerces comments, you have not established that the economic threshold for spraying has been met. APHIS must disclose its cost benefit analysis so the public can understand the threshold and when it has, or has not, been met.**

*Please refer to APHIS' response to comment 4 above.*

29. **We also note that we are concerned about APHIS's ability to comply with the complex labels for these pesticides given the variable conditions in the field, particularly in the Basin and Range zone where weather can come in seemingly out of nowhere, and especially when aerially spraying from much higher heights than are standard in agricultural operations.**

*APHIS wants to assure the commenter that their concern about APHIS' ability to comply with pesticide labels in unwarranted. APHIS field personnel and contractors are both literate and* *knowledgeable about pesticide applications. Furthermore, APHIS field personnel are very familiar with the variable weather patterns in Nevada and make prudent judgements after examining the most current meteorological data and forecasts.*

*Please refer to APHIS' responses comments 24 and 9 in the 2020 and 2021 EAs, respectively.*

30. **Finally APHIS needs to provide the public with explanation for how it coordinates with the Bureau of Land Management, Forest Service and other land managers to address sage grouse impacts, the various resource management plan requirements, wilderness limits, etc.**

*BLM, APHIS, NDA, NDOW, and USFWS operate under a Memorandum of Understanding when treating near sage grouse habitat. The outlined mitigation measures in the MOU are put into place to minimize the impacts to foraging leks which utilize grasshopper and Mormon crickets in their diets. A three-mile buffer around active and pending lek sites provides ample forage for sage grouse leks. Any sensitive or wilderness sites the land manager does not want treated will be outlined by the land manager and APHIS will adhere to their requests for treatments.*

31. **Spraying of chemical agents to "control" insect populations should never be considered for use on public lands due to the wider ecological harm that it causes to native species, pollinators, ecosystems, water resources and human health. When we interfere with the functioning of ecosystems to such an extent, the repercussions, both known and unknown, can be devastating. We do not know the long-term ecological consequences of the use of Diflubenzuron, Carbaryl and Malathion to the environment and native species. The Precautionary Principle should most definitely be applied.**

*APHIS understands the commenter is concerned about grasshopper treatments on rangeland. APHIS believes a more thorough examination of the EAs and EIS will reduce those concerns.*

32. **USDA has failed to consider a reasonable alternative that addresses the issue of lost ranching income without the need to spray hazardous insecticides on public lands. Why not discontinue your aerial spraying program and establish a fund that directly pays ranchers for any losses accrued as a result of insect outbreaks? This seems like a win-win-win. Good for the environment, good for the public and good for ranchers.**

*The commenter is incorrect. APHIS did consider a No Suppression Program Alternative in the EAs. APHIS encourages the commenter to read the EAs and EISs and other cited rangeland grasshopper literature (e.g. the IPM Handbook) more thoroughly to better understand why this alternative could be bad for the environment, public and ranchers.*

*The APHIS grasshopper suppression program draws its authority from the Plant Protection Act of 2000 (7 U.S.C § 7717). The statute authorizes APHIS to authority to exclude, eradicate, and control plant pests, including grasshoppers. Specifically, language in the PPA provides authority for APHIS to protect rangeland from "economic infestation" of grasshoppers. In its recent EIS* *updating the program (APHIS 2019), the Agency describes its determination of an economic infestation as follows:*

> *The "level of economic infestation" 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 a treatment.*

*The Plant Protection Act of 2000 does not give authority to APHIS to purchase replacement feed for ranchers, but rather only provides funding when available to suppress outbreak populations of grasshoppers to save forage.*

*The commenter may also read Comment 2 and APHIS' response above.*

33. **We are poisoning ourselves and the planet at a level that is unsustainable and untenable. Present and future generations of all species (humans included) are at great risk under our current land management regimes. The sixth mass extinction is well underway and it is attributed entirely to human activities (Shivanna2020~~1~~). Climate disruption, biodiversity loss and industrial/chemical pollution make up the trifecta of crises. Wide-spread aerial insecticide spraying is an unnecessary and reckless activity that exacerbates our perilous situation.**

*APHIS understands the commenter is concerned about a wide range of global climatological, biological and environmental issues including grasshopper treatments on rangeland. APHIS believes a more thorough examination of the EAs and EISs will reduce the concerns related to the APHIS grasshopper suppression program.*

34. **Less than 2% of our nation's beef supply is produced from public lands grazing (Fisher et al 2016) yet the ecological damages are immense and unsustainable (Testimony of Erik Molvar 2018). In addition to the direct impacts from livestock grazing on public lands, supporting government programs such as APHIS cause additional ecological harm in support of industry at great expense to the American taxpayer. State-sponsored ecocide in support of the livestock industry must come to an end.**

*The commenter seems to suggest the only benefits of grasshopper suppression is accrued by beef-livestock producers who utilize public lands to graze their cattle. APHIS encourages the commenter to read the EIS (Background, Section 3 Damage Caused by Grasshoppers) to better understand how grasshopper outbreaks can harm the environment. APHIS believes a more* *thorough examination of the EAs and EISs will reduce the commenters concerns to where they will recognize phrases like "State-sponsored ecocide" are unrealistic hyperbole.*

**35. USDA Must Establish an Adequate Baseline**

USDA has violated NEPA by failing to establish an adequate baseline. USDA does not know the trends and populations status of all endangered species, sensitive species (including greater sage-grouse) in the areas they wish to spray insecticides. In large part because the agency does not know where their project areas are until "outbreaks" occur. "The establishment of a 'baseline is not an independent legal requirement, but rather, a practical requirement in environmental analysis often employed to identify the environmental consequences of a proposed agency action.'" Or. Natural Desert Ass'nv. Jewell, 840 F.3d 562, 568 (9th Cir. 2016) (quoting Am. Rivers v. FERC, 201 F.3d 1186, 1195,n.15 (9th Cir. 1999)).

*APHIS has established and described baseline conditions as part of our environmental risk analysis. APHIS adequately summarized available data for current baseline conditions in the draft EA. This includes cultural resources as well as the potential for any overlap of federally listed species with the proposed areas of treatment. APHIS has complied with the Endangered Species Act and works closely with cooperating agencies to protect sensitive sites and species. These sensitive sites are not publicized by the land manger or Tribal nations. In the request for treatment letters and in site specific consultation with the landowners/managers, APHIS is made aware of and adheres to protective measures agreed upon. APHIS adheres to protective measures which have been agreed upon with USFWS and addressed in the letters of concurrence (Appendix D). APHIS also works with Federal and State land managing agencies to protect other sensitive resources managed on their lands.*

**36. The Proposed Alternative Constitutes a Major Federal Action That Would Significantly Affect the Human Environment for Which an EIS is Required**

NEPA serves two purposes: (1) "it ensures that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts," and (2) it "guarantees that the relevant information will be made available to the larger audience that may also play a role in both the decision making process and the implementation of that decision."Dep't of Transp.v. Pub. Citizen, 541 U.S. 752, 768 (2004) (quoting Robertson v. Methow Valley Citizens Council,490 U.S. 332, 349 (1989)). An EIS must be prepared for all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). An agency may avoid an EIS only if the action will have "no significant impact." 40 C.F.R. §§ 1508.9(a)(1),1508.13. The Council on Environmental Quality's (CEQ) regulations define "significance" in terms of "context" and "intensity." Id.§ 1508.27. Context "simply delimits the scope of the agency's action, including the interests affected." Nat'l Parks Conservation Assn v. Babbitt,241 F.3d 722, 731 (9th Cir. 2001).

The EA is programmatic in nature, and does not contain site-specific analysis of project areas. It is clear that site-specific analysis Is required prior to insecticide spraying. The paper NEPA's Site Specific Requirement states: Approval of specific projects, such as construction or management activities located in a defined geographic area. [§1508.18(b)(4) Major federal action] The significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. [§1508.27(a) Significantly]

*APHIS understands the commenter disagrees with the agency's NEPA documentation. The EAs are prepared for geographic areas within Nevada to allow for site-specific examination of potential environmental effects. The commenter appears to be unaware that APHIS has prepared programmatic EISs and Records of Decision for the grasshopper program to examine how the suppression of grasshoppers across 17 western states affects the quality of the human environment. The commenter is concerned about grasshopper treatments on rangeland. APHIS believes a more thorough examination of the EAs and EIS will reduce the commenter's concern that the agency's grasshopper suppression program in portions of Nevada will result in significant impacts.*

**37. The EA Fails to Address Economic Requirements in the Plant Protection Act**

2000 Plant Protection Act§7717 Control of Grasshopper and Mormon Crickets (b) (c) states: *In general, subject to the availability of funds pursuant to this section, on request of the administering agency or the agriculture department of an affected State, the Secretary, to protect rangeland, shall immediately treat Federal, State, or private lands that are infested with grasshoppers or Mormon crickets at levels of economic infestation, unless the Secretary determines that delaying treatment will not cause greater economic damage to adjacent owners of rangeland.*

The EA contains no economic data and the USDA is operating in the dark. What constitutes a level of "economic infestation'? How will the USDA know when to delay a treatment with economic information to guide their decision making?

*The commenter is asking for survey data to be submitted to the public. This data is accumulated during the nymphal survey season and is not available when compiling the EA's. APHIS utilizes and provides links to extensive resources for determining when a grasshopper outbreak is exceeding IPM thresholds including, "a level of economic infestation". The Purpose and Needs section of the EA and supporting documents adequately define the multiple factors that must be evaluated before APHIS decides a treatment is necessary. Establishing a treatment threshold based on the number of grasshoppers ignores a variety of factors that must be considered by program managers before treatments. Some examples include how voracious the individual species are that compose a grasshopper infestation and the hardiness of rangeland vegetation within a proposed treatment block. These factors are also discussed in the recently published final EIS and are incorporated by reference in the final EAs.*

*See previous responses for economic thresholds.*

**38. NPEDS Permits Are Required When Spraying Near Water Bodies**

Even if USDA is not spraying directly over waterbodies, wind can carry chemicals long distances polluting lakes, ponds and streams. A NPEDS permit is required when spray near water.

*APHIS believes the commenter is suggesting the agency is required to hold a National Pollution Discharge Elimination (NPDES) Permit. APHIS complies with the Clean Water Act as administered by the Nevada Division of Environmental Protection. An NPDES permit is required if pollutants are discharged from a point source into waters of the United States. The Nevada Division of Environmental Protection, the issuing body of NPEDS permits in Nevada, concurs that an NPEDS permit is not required based on the scope of the program.*

*APHIS employs several mitigation measures intended to mitigate offsite transport of pesticides to sensitive habitats, including waterbodies. APHIS reduces the potential for drift and volatilization by not using ultra-low volume (ULV) sprays when the following conditions exist in the spray area:*

- *Wind velocity exceeds 10 miles per hour (unless state law requires lower windspeed)*
- *Rain is falling or is imminent*
- *Dew is present over large areas within the treatment block*
- *There is air turbulence that could affect the spray deposition*

*APHIS also does not apply insecticides directly to water bodies such as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers. APHIS also follows all other label restrictions designed to protect aquatic habitats. Furthermore, APHIS uses 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*

### 39. The USDA Should Follow EPA Recommendations to Consider Effects to ESA Candidate Species

In the document title: “Response to Public Comments Received on Proposed Revised Method for National Level Endangered Species Risk Assessments for Biological Evaluations for Controversial Pesticides ”the Xerces Society asked the following in Comment 189: “FIFRA Endangered Species Task Force indicated that they do not agree with inclusion of species are not currently listed as endangered or threatened (i.e., candidate species). Xerces society indicated that proposed and candidate species should be included in BEs.”

**EPA response:** Because proposed and candidate species may be formally listed as endangered or threatened over the course of the 15-yearperiod of the action (registration review), EPA decided to include effects determinations for proposed and candidate species based on the recommendation from the Services.

The USDA has failed to consider the effects of their pesticide spraying to ESA candidate species like the monarch butterfly. What other candidate species are present in potential project areas?

Since site specific project areas are mostly unknown, the USDA cannot lawfully proceed because proper analyses cannot be conducted under NEPA.

*APHIS and the US EPA are different agencies and have different procedures for complying with the Endangered Species Act (ESA). The commenter points out the EPA registration of pesticides are actions that span 15 years before additional regulatory review. APHIS consults with the US FWS to ensure compliance with ESA on much shorter time frames, typically annually. APHIS often includes Biological Assessments and Concurrence Letters in our EAs (see Appendix D). These are documents used for interagency consultation between the Services and APHIS, as mandated by Section 7(a)(1) of the Endangered Species Act (ESA). There is no requirement under ESA or NEPA that requires consultation documents to be made available to the public for comment or review. The EA includes a section that discusses APHIS compliance with the ESA. The US FWS does not give concurrence for candidate species.*

**40. The EA Fails to Thoroughly Consider Impacts to Sage-Grouse**

The state Greater Sage-Grouse Approved Resource Management Plans (ARMPAs) were developed as a last ditch effort to recover sage-grouse to prevent the listing of the species under the Endangered Species Act (ESA) across the West despite a determination in 2015 by the U.S. Fish and Wildlife Service that they were indeed eligible for ESA listing. The EA appears to be dismissive of the imperiled status of the bird because they were not listed under the ESA. Due to the lack of information concerning site-specific project areas, USDA is flying blind when it comes to sage-grouse protections. The known deadly effects of Organophosphorus Insecticides to Sage-Grouse (Blus et al. 1989) have not been considered in depth and thoroughly discussed in this EA. Insecticides and pesticides should not be used anywhere near sage-grouse habitat.

Will sage-grouse population data be collected or researched for an area before determining if that area will be sprayed? Will ARMPA Sage Grouse Focal Areas or Priority Habitat Management Areas be off limits to spraying? Are there long term impacts to food sources? How will impacts to leks be avoided when flying in an airplane? What impacts do your insecticides of choice have on brood rearing birds?

*BLM, APHIS, NDA, NDOW, and USFWS operate under a Memorandum of Understanding when treating near sage grouse habitat. The outlined mitigation measures in the MOU are put into place to minimize the impacts to foraging leks which utilize grasshopper and Mormon crickets in their diets. A three-mile buffer around active and pending lek sites provides ample forage for sage grouse leks.*

**41. [Ranchers and producers in Lander, Pershing, and Humboldt counties] have now experienced two years of extremely heavy infestations of Mormon Crickets. They have been coming in to the irrigated and living areas by the many thousands, and staying virtually all summer. The forage that they consume is valuable, and their remarkable numbers make it nearly impossible to work and exist in their presence. We are in dire need of assistance from both APHIS and NDA to coordinate and assist with a**

**<u>suppression program that will enable us to take our land and our lives back. Thank you very much for your consideration of this sorely needed EA and program.</u>**

*APHIS is aware of sustained populations of Mormon crickets and grasshoppers in and around Lander, Pershing, and Humboldt counties. Thank you for sharing your experiences with problematic populations in the area. APHIS and NDA have joint plans to assist with economically damaging populations on federal lands to assist private landowners in cooperative efforts to suppress damaging populations in the area.*

42. **<u>Our residents and ranchers [within the Lander County Conservation District] have suffered economic and environmental damage due to extremely high populations of crickets and grasshoppers throughout the county for the past two years and beyond. Our Conservation District offers a cost share program for private landowners to help suppress infestations on private land, but without the ability to treat adjacent public land, we fight a losing battle, as swarms of these awful creatures continue to migrate from public to private lands. As a Conservation District, we are very much in favor of a cooperative approach to land management, and therefore encourage the adoption of a coordinated suppression program involving private individuals, APHIS and the NDA. Thank you very much for your consideration.</u>**

*APHIS appreciates the support provided by the Lander County Conservation District. APHIS agrees a cooperative approach through coordinated suppression programs between landowners, APHIS, and NDA is imperative for successful suppression of economically damaging pest populations.*