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Environmental Assessment Rangeland Grasshopper and Mormon Cricket Suppression Program

ADA, ADAMS BANNOCK, BEAR LAKE, BINGHAM, BLAINE, BOISE, BONNEVILLE, BUTTE, CAMAS, CANYON, CARIBOU, CASSIA, CLARK, CUSTER, ELMORE, FRANKLIN, FREMONT, GEM, GOODING, JEFFERSON, JEROME, LEMHI, LINCOLN, MADISON, MINIDOKA, ONEIDA, OWYHEE, PAYETTE, POWER, TETON, TWIN FALLS, VALLEY, WASHINGTON counties of , IDAHO

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Prepared by:

Animal and Plant Health Inspection Service
9118 Blackeagle Drive,
Boise, ID 83709

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Acronyms and Abbreviations

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

Final Site-Specific Environmental Assessment

Rangeland Grasshopper and Mormon Cricket Suppression Program
Idaho: ID-2024-26-1

I. Need for Proposed Action

A. Purpose and Need Statement

Mormon cricket and Grasshoppers populations often reach levels that cause measurable economic losses to agriculture producers in southern Idaho and the Animal and Plant Health Inspection Service (APHIS) is charged with protecting American agriculture from pests and diseases, the Plant Protection Act of 2000 provides APHIS the authority to carry out this task. The purpose of this action is to implement a cricket and grasshopper suppression program that reduces agricultural losses in Idaho, while minimizing effects to non-target species to the extent practicable. 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. Land managers request APHIS assistance to control grasshopper outbreaks because of the potential damage to rangeland resources. The benefits of treatments include the suppressing of over abundant grasshopper populations to lower adverse impacts to range plants and adjacent crops. Treatment would also decrease the economic impact to local agricultural operations and permit normal range plant utilization by wildlife and livestock. The goal of the proposed suppression program analyzed in this EA is to reduce grasshopper populations below economical infestation levels to protect the natural resources of rangeland ecosystems, the value of livestock and wildlife forage, 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 April 1, 2024 to August 31, 2026 in Ada, Adams, Bannock, Bear Lake, Bingham, Blaine, Bonneville, Butte, Camas, Canyon, Caribou, Cassia, Clark, Custer, Elmore, Franklin, Fremont, Gem, Gooding, Jefferson, Jerome, Lemhi, Lincoln, Madison, Minidoka, Oneida, Owyhee, Payette, Power, Teton, Twin Falls, Valley, and Washington counties of Idaho.

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 2024-2026 Control Program for Ada, Adams, Bannock, Bear Lake, Bingham, Blaine, Bonneville, Butte, Camas, Canyon, Caribou, Cassia, Clark, Custer, Elmore, Franklin, Fremont, Gem, Gooding, Jefferson, Jerome, Lemhi, Lincoln, Madison, Minidoka, Oneida, Owyhee, Payette, Power, Teton, Twin Falls, Valley, and Washington counties of Idaho.

Grasshopper Infestation on rural residence
(East Fork area, Custer County)

Cereal crop damage from grasshoppers
(Downey area, Bannock County)

BELOW: Crop damage (Sugar beets) from Mormon Crickets - initial infestation to complete defoliation
(Bruneau area, Owyhee County)

Photo credits: Brian Marschman, Paul VerHagen, Brad Newbry

BELOW:

Crop damage (Alfalfa) from Mormon Crickets
(Oreana area, Owyhee County)

Mormon Crickets invade Court House
(Murphy, Owyhee County)

Mormon crickets on US Hwy 95

Grasshoppers invading range

Photo Credits: Paul VerHagen, Brad Newbry, Derrick Woller

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

[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.

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 landowners and managers, and may cooperatively suppress grasshoppers when direct intervention is requested by a federal land management agency. 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) 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 (USDA APHIS, 2019).

In April 2014, APHIS, and the USDA Forest Service (FS) signed a Memorandum of Understanding (MOU) detailing cooperative efforts between the two groups on suppression of grasshoppers on national forest system lands (Document #14-8100-0573-MU, April 22, 2014). This MOU clarifies that APHIS will prepare and issue to the public, site-specific environmental documents that evaluate potential impacts associated with proposed measures to suppress economically damaging grasshopper populations. The MOU also states that these documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from the Forest Service.

The MOU further states that the responsible FS official will request, in writing, the inclusion of appropriate lands in the APHIS suppression project when treatment on national forest land is necessary. The FS must also approve a Pesticide Use Proposal (Form FS-2100-2) for APHIS to treat infestations. According to the provisions of the MOU, APHIS can begin treatments after APHIS issues an appropriate decision document and FS approves the Pesticide Use Proposal.

In January 2022, APHIS, and the Bureau of Land Management (BLM) signed a memorandum of understanding (MOU) detailing cooperative efforts between the two groups on suppression of grasshoppers on BLM system lands (Document #22-8100-0870-MU, January 11, 2022). This MOU clarifies that APHIS will prepare and issue to the public site-specific environmental documents that evaluate potential impacts associated with proposed measures to suppress economically damaging grasshopper populations. These documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from BLM.

The MOU further states that the responsible BLM official will request, in writing, the inclusion of appropriate lands in the APHIS suppression project when treatment on BLM lands.

In September 2016, APHIS and Bureau of Indian Affairs (BIA) signed a MOU detailing cooperative efforts between the two agencies on suppression of grasshoppers and Mormon crickets on BIA managed lands (APHIS PPQ MOU # 16-8100-0941-MU, September 16, 2016). This MOU clarifies that APHIS will prepare and issue to the public site-specific environmental documents that evaluate potential impacts associated with proposed measures to suppress damaging grasshopper and Mormon cricket populations. The MOU also states that these documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from the BIA.

The MOU further states that the responsible BIA official will request, in writing, the inclusion of appropriate lands in the APHIS suppression project when treatment on Tribal land is necessary. The BIA must also approve a pesticide use proposal for APHIS to treat infestations. According to the provisions of the MOU, APHIS can begin treatments after APHIS issues an appropriate document and BIA 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's authority under the Plant Protection Act is to treat Federal, State and private lands for grasshoppers and Mormon cricket populations. APHIS's 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.

Reduced agent area treatments (RAATs) are one of the methods 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.

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 Idaho, 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.

Scoping as defined by NEPA is an early and open process for determining the scope of issues to be addressed by the environmental risk analysis and for identifying the significant issues related to a proposed action (40 CFR 1501.7). 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 suppression program. The process can occur formally and informally through meetings, conversations, or written comments from individuals and groups.

The Idaho scoping document were posted in December 2023 to obtain public comments on the process intended. Comments obtained from this process was used to assist in providing information to be included in this Environmental Assessment, a summary of the comments received is located at Appendix G.

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. The program will prepare a Final EA and FONSI when the program determines that grasshopper suppression treatments are possible within a portion of the state and that all environmental issues were accounted for in the Draft EA. Once the FONSI has been finalized, copies of those documents will be sent to any parties that submitted comments on the Draft EA and to other appropriate stakeholders. To allow the program to respond to requests for treatments 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 Final EA.

II. Alternatives

To engage in comprehensive NEPA risk analysis APHIS must frame potential agency decisions into distinct action alternatives. 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 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's treatment guidelines and operational procedures, included as Appendix 1 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 Idaho and therefore the environmental baseline should describe a no treatment scenario.

Alternative A: No Suppression Program

Under Alternative A, the No Action alternative, APHIS would not conduct a program to suppress grasshopper infestations within Idaho. 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.

Alternative B: Insecticide Applications Using Reduced Agent Area Treatments with Adaptive Management Strategy

Under Alternative B, upon evaluation of the population density and environmental conditions, and at the request of land manager, APHIS might manage a grasshopper treatment program using techniques and tools discussed hereafter to suppress outbreaks. Grasshopper treatments would be limited to within one mile of agricultural cropland and Mormon cricket treatments would not. Aerial treatments, if approved, would be conducted using the reduced agent area treatments (RAATs) technique. The insecticides available for use by APHIS include the U.S. Environmental Protection Agency (USEPA) registered chemicals carbaryl or diflubenzuron. These chemicals have varied modes of action. Carbaryl works by inhibiting acetylcholinesterase (enzymes involved in nerve impulses). Diflubenzuron inhibits the formation of chitin by insects which causes weak exoskeletons. APHIS would make a single application per year 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 used by the program in most states, 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, because of treatment delays, then carbaryl bait, is the remaining control option. 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 treated and untreated swaths. Both options are most often incorporated simultaneously into RAATs. Either carbaryl bait or diflubenzuron would be considered under this alternative, typically at the following application rates (i.e., sprayed or spread directly from the aircraft):

- 10.0 pounds (0.20 lbs. a.i./ac treated) of 2 percent carbaryl bait per acre.

- 1.0 fluid ounce (0.016 lbs. a.i.) of diflubenzuron per acre.

The width of the area not directly treated (the untreated swath) under the RAATs method is not standardized. The proportion of land treated during RAATs 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 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 recommended skipped swath width is typically no more than 100 feet for carbaryl and diflubenzuron. However, many federal government-organized treatments of rangelands tend to use a 50% skipped swath width, meaning if a fixed-wing aircraft's swath width is, for example, 150 ft., then the skipped habitat area will also be 150 ft. 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.

<u>RAATS Treatment Diagram</u>

Contractor use of Trimble GPS Navigation equipment is used to navigate and capture shapefiles of the treatment areas. All sensitive sites are buffered out of the treatment area using digital 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.

The potential generalized environmental effects of the application of carbaryl or diflubenzuron, 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 EA.

Alternative C : Ground Application Adaptive Strategy Approach using Carbaryl Bait

Under Alternative C, upon evaluation of the population density and environmental conditions, and at the request of land manager, APHIS might manage a grasshopper treatment program using ATV/UTV mounted Carbaryl bait spreaders to suppress outbreaks of grasshoppers and/or Mormon crickets on accessible roads, trails, and borders using swath coverage application (no skip swaths). Grasshopper treatments would be limited to within one mile of agricultural cropland, but Mormon cricket treatments would not. Damage to rangeland forage and habitat may be severe if exceptionally severe grasshopper or Mormon cricket outbreaks occur and some damage to crops may be expected. This is the preferred method by the Bureau of Land Management (BLM). The application rates under this alternative are typically at the following:

- 10.0 pounds (0.20 lbs. a.i./ac treated) of 2 percent carbaryl bait.

Use of ArcGIS Quick Capture GPS Navigation equipment is used by APHIS applicators to capture maps of the treatment areas and exclude all preloaded sensitive sites that are buffered out of the treatment area using digital 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.

See Appendix E for a copy of the Historic Treatment maps captured using this technology.

III. Affected Environment

A. Description of Affected Environment

The proposed suppression program area included in the EA encompasses 2,550,537 estimated acres in the counties covered by this EA. Table 3 below gives a breakdown by county.

It is not generally possible to predict the precise locations where grasshopper/Mormon cricket outbreaks and migrations will occur in any given year. Because APHIS cannot be sure where migration and spread of the infestations will occur, it is necessary to include an expanded area in the EA. The proposed suppression program area specified in this EA includes virtually all areas in Southern Idaho that might host outbreaks requiring suppression.

The proposed grasshopper suppression area is limited to federal rangelands within one (1) mile of private agricultural lands. We estimate that there are 2,550,537 acres of federal rangeland in Southern Idaho that fit this criterion before subtraction of excluded areas such as ACECs (Areas of Critical Environmental Concern), Snake River Birds of Prey National Conservation Area, and buffered areas for sensitive species.

APHIS estimates that no more than 1 to 2% of this area would be included in treatment blocks and maximum area treated within a block would not exceed 75%.

Table 1. Individual county acreage figures:

COUNTY	ACRES	COUNTY	ACRES	COUNTY	ACRES
Ada	49177	Cassia	263132	Madison	10255
Adams	13212	Clark	141490	Minidoka	29318
Bannock	55486	Custer	88099	Oneida	84714

Bear Lake	31326	Elmore	211271	Owyhee	274286
Bingham	94708	Franklin	17986	Payette	7721
Blaine	121435	Fremont	44812	Power	53981
Boise	6654	Gem	15881	Teton	21714
Bonneville	69815	Gooding	66920	Twin Falls	158960
Butte	122158	Jefferson	78398	Valley	5464
Camas	21374	Jerome	82359	Washington	40282
Canyon	2887	Lemhi	24874		
Caribou	111406	Lincoln	128982		

Table 2. Historical acres treated in the last 10 years:

Year	Mormon Crickets	Grasshoppers
2023	645	320
2022	1,010	1,180
2021	0	15
2020	12,050	0
2019	46,636	0
2018	4,100	0
2017	385	0
2016	4,930	2,085
2015	0	75
2014	85	0

In the last ten years, most treatment projects were restricted to ground application. Aerial treatments were conducted in 2020, 2019, 2018, and 2016.

See Appendix E for a copy of the Historic Treatment map (2006-2023).

Map of the described areas is in Appendix B – Potential Grasshopper Treatment Areas for Idaho

The area lies within the Interior Columbia Basin. Landforms consist primarily of valleys bordered by north-south running mountain ranges. Numerous impoundments on the Snake River and its tributaries serve multipurpose use. Irrigation systems serve agricultural areas throughout the region. Except for the Snake River (and Bear River in southeast Idaho) and its major tributaries, most streams in the area are generally intermittent. There are some small streams which are perennial. Major tributaries of the Snake River that traverse proposed program areas include:

Table 3. Major tributaries of the Snake River that traverse proposed program areas:

	Southwest Idaho	South Central Idaho	Southeast Idaho
Major Tributaries	Boise, Weiser, Bruneau, Owyhee, and Payette Rivers	Big Wood and Little Wood Rivers; Rock, Salmon Falls, and Camas Creeks	Portneuf River and Rock Creek

Predominate Mountain Ranges	Owyhee, Boise, and West Mountains	Albion Mountains and South Hills on southern edge; Soldier, Smoky and Pioneer Mountains form northern edge.	Deep Creek Mountains; Portneuf, Wasatch, and Caribou Ranges

Events during the Pleistocene shaped much of Idaho's landscape. In the southern portions of Idaho, repeated overflows of historic Lake Bonneville into the Snake River modified the Snake River Valley. In addition to volcanic flows, sedimentary deposits, including glacial till, outwash and loess, and valley fill, terraces, and scour features are present over much of the area. Soils in the Snake River Plains developed from loess deposits, and this has enabled these areas to become highly productive agricultural areas. Intensive livestock production systems such as dairies, feedlots, and trout farms create demand for feed which is partially supplied locally by alfalfa, corn, and wheat fields. Potatoes, sugar beets, and grain are other primary crops produced within the area.

The most intense agricultural production sites are in the Treasure Valley and Lower Payette Valley in southwest Idaho, the Magic Valley and Camas Prairie in south central Idaho, the Snake River Plain, and in valleys and on foothills in southeast Idaho. Crops include row crops for food and feed, and very high value seed crops.

The plains and foothills are semi-arid sagebrush steppe. Average annual temperature is 40 to 55 °F. Total annual precipitation averages 5 to 20 inches with almost no rain falls during the summer months. Examples of probability of 0.50" of precipitation in a 24 hour period from April 15 to August 15 (Western Regional Climate center, http://www.wrcc.dri.edu) are:

Table 4. Probability of 0.50" Precipitation/24 Hr. April 15 to August 15

Gooding, Mountain Home, Richfield, Twin Falls	0 to 2%
Caldwell, Parma, Pocatello	0 to 3%
Hailey, Idaho Falls, Malad	0 to 4%
Cambridge	0 to 5%
Silver City	0 to 9%

The rangelands are primarily shrub steppe and are utilized for cattle and sheep grazing. They provide habitat for native and introduced game, and non-game animal species. They are in an accelerated state of ecological change due to invasion by exotic plant species, changes in fire patterns, and intervention by humans.

Grassland and shrub land are present across the general area. Forest lands are present at higher elevations. Grasshopper/Mormon cricket treatments would occur only in grass and shrub lands, not in forests. BLM manages rangelands within the Boise, Twin Falls, and Idaho Falls Districts. FS manages rangelands within Boise and Payette National Forests, Sawtooth, Caribou, Targhee, Cache National Forests, and the Curlew National Grasslands, where treatments might occur.

Elevation and topography within the overall area vary considerably from 2,000 to near 10,000 feet and from flat plains to steep mountain ranges. Treatments would occur on mountains, foothills, and flatlands usually near cropland and hayfields. Some treatments could occur on remote blocks of rangeland where critical forage, re-vegetation projects, or recreational resources are threatened by grasshoppers.

Towns or cities near the federally managed rangelands include American Falls, Arco, Boise, Burley, Dubois, Gooding, Hailey, Idaho Falls, Malad, Mountain Home, Pocatello, and Twin Falls. Special areas include Bear Lake, Camas, City of Rocks National Reserve, Craters of the Moon National Monument, Jarbidge-Bruneau Rivers Wilderness, Deer Flat National Wildlife Refuge, Duck Valley Indian Reservation, Fort Hall Indian Reservation, Gray's Lake, Hagerman Fossil Beds National Monument, Hagerman National Fish Hatchery, Minidoka National Wildlife Refuge, Oxford Slough National Wildlife Refuge, and the Snake River Birds of Prey National Conservation Area. Idaho National Laboratory occupies a very large tract of land in southeast Idaho and provides a large employment base.

Excluded Program Areas
Areas specifically excluded from treatment are:

- All Wilderness Areas

- Rangeland areas in the watersheds which drain into the Snake River downstream from Brownlee Dam will be excluded. APHIS has completed consultation with National Oceanic and Atmospheric Administration (NOAA) Fisheries regarding measures to protect endangered salmon and steelhead. However, APHIS would not include watersheds which are involved with those species. Historically, there has been less need for treatments in Northern Idaho and fewer situations where a crop protection program could be implemented. For these reasons APHIS has chosen to limit its suppression program to Southern Idaho.

- All Areas of Critical Environmental Concern unless otherwise noted below.

- Snake River Birds of Prey National Conservation Area south of Boise, including the Ted Trueblood Wildlife Area, north of Grandview in Elmore County.

- Treatment in Columbian Sharp-tailed Grouse ACEC, north of Weiser, would only be considered on a case-by-case basis. Ground treatment would be limited to existing roads and trails.

- Wilderness Study Areas (WSA) and Research Natural Areas (RNA) will be excluded from consideration for treatments except for those within the Owyhee Field Office of BLM which will be considered on a case-by-case basis.

- Other areas which are specifically identified in this EA in section V.B.5 because of their association with sensitive species or other sensitive sites will be excluded.

B. Site-Specific Considerations

1. Human Health

The suppression program would be conducted on federally managed rangelands that are not inhabited by humans. Human habitation may occur on the edges of the rangeland. Most habitation is comprised of farm or ranch houses, but some rangeland areas may have suburban developments nearby. Average population density in rural areas of Idaho is 6.8 persons per square mile (U.S. Census Bureau, 2022). Recreationists may use the rangelands for hiking, camping, bird watching, hunting, falconry, or other uses. Ranchers and sheepherders may work on the rangelands daily. Individuals with allergic or hypersensitive reactions to insecticides may live near or may utilize rangelands in the proposed suppression program area.

Some rural schools may be in areas near the rangeland which might be included in treatment blocks. Children may visit areas near treatment blocks or may even enter treatment blocks before or after treatments.

2. Nontarget Species

Non-target species within the suppression program area include terrestrial vertebrate and invertebrate animals, aquatic organisms, and terrestrial plants (both native and introduced).

Invertebrate organisms of special interest include bio-control agents and pollinators. Land managers and others have released and managed bio-control agents, including insects and pathogens, on many species of invasive plants within and near the suppression program area. These bio-control agents are important in decreasing the overall population, or the rate of reproduction, of some species of undesirable rangeland plants, especially exotic invasive weeds.

Pollinators, including insects and other organisms, occur within and near the suppression program area. Pollinators include managed exotic and native insect species such as honeybees, leafcutter bees, and alkali bees which are commercially valuable for agriculture. Other species of insects and other animals pollinate native and exotic plants and are necessary for the survival of some species.

Vertebrates include highly visible introduced and native mammalian species such as cattle, sheep, horses, mule deer, elk, pronghorn, coyotes, and wolves, as well as smaller animals like rabbits, mice, gophers, and bats. Birds comprise a large portion of the vertebrate species complex, and they also include exotic and native species. Some exotic game birds, like pheasant and partridge, have been deliberately introduced into the area, and other species such as starlings and pigeons have spread from other loci of introduction. Sage obligate bird species, typified by sage grouse, are present in much of the area. Various reptiles and amphibians are also present. Many of the herbivorous vertebrate species compete with grasshoppers/Mormon crickets for forage. Many of the vertebrate species utilize grasshoppers/Mormon crickets and other insects as a food source. There is special concern about the role of grasshoppers/Mormon crickets as a food source for sage grouse, sharp-tailed grouse, Yellow-billed Cuckoo, and other bird species.

The proposed suppression area contains a vast variety of terrestrial invertebrates, primarily insects and other arthropods. They include species which compete with grasshoppers/Mormon crickets, and some which prey on grasshoppers/Mormon crickets. In turn, grasshoppers/Mormon crickets may prey opportunistically on other invertebrates.

Aquatic organisms within the suppression area include plants and vertebrate and invertebrate animals. Some species of fish utilize grasshoppers/Mormon crickets as a significant food source during some parts of the year.

A diverse complement of terrestrial plants occurs within the proposed suppression area. Many such as rush skeletonweed, purple loosestrife, spotted and diffuse knapweed, cheatgrass and leafy spurge are invasive weeds. Others, such as crested wheatgrass have been planted for rehabilitation purposes. Native plants such as sagebrush, bitterbrush, and various grasses provide forage and shelter for animal species and help stabilize the soil against erosion.

Biological soil crusts, also known as cryptogrammic, micro biotic, cryptobiotic, and micro phytic crusts, occur within the proposed suppression area. Biological soil crusts are formed by living organisms and their by-products, creating a crust of soil particles bound together by organic materials. Crusts are predominantly composed of cyanobacteria (formerly blue-green algae), green and brown algae, mosses, and lichens. Liverworts, fungi, and bacteria can also be important components. Crusts contribute to several functions in the environment. Because they are concentrated in the top one to four millimeters of soil, they primarily affect processes that occur at the land surface or soil-air interface. These include soil stability and erosion, atmospheric N-fixation, nutrient contributions to plants, soil-plant-water relations, infiltration, seedling germination, and plant growth.

Federally listed threatened and endangered species that might occur in or near the proposed suppression area include:

Table 5. Ferally Listed T & E Species and county locale.

Banbury Springs Limpet	Gooding
Bliss Rapids Snail	Elmore, Gooding, Jerome, Twin Falls
Bruneau Hot Spring Snail	Owyhee
Bull Trout	Ada, Adams, Blaine, Boise, Butte, Custer, Elmore, Gem, Owyhee, Payette, Valley, Washington
Canada Lynx	Adams, Bear Lake, Blaine, Boise, Bonneville, Butte, Camas, Caribou, Clark, Custer, Elmore, Franklin, Fremont, Jefferson, Madison, Teton, Valley
Yellow-billed cuckoo	Ada, Bannock, Bingham, Blaine, Boise, Bonneville, Camas, Cassia, Clark, Custer, Elmore, Fremont, Jefferson, Lincoln, Lemhi, Madison, Minidoka, Owyhee, and Power
Grizzly Bear	Bonneville, Clark, Fremont, Teton

North American Wolverine	Adams, Bannock, Bear Lake, Bingham, Blaine, Boise, Bonneville, Butte, Camas, Caribou, Clark, Elmore, Franklin, Fremont, Gem, Jefferson, Lemhi, Madison, Teton, Valley and Washington
Northern Idaho Ground Squirrel	Adams, Valley, Washington
Slickspot Peppergrass	Ada, Canyon, Elmore, Gem, Owyhee, Payette
Snake River Physa Snail	Ada, Canyon, Cassia, Elmore, Jerome, Gooding, Minidoka, Owyhee, Twin Falls
Ute Ladies'-Tresses	Bingham, Bonneville, Fremont, Jefferson, Madison

Areas where critical habitat for bull trout is designated may be within or near the proposed suppression area including parts of Ada, Adams, Blaine, Boise, Butte, Camas, Custer, Elmore, Gem, Owyhee, Payette, Valley, and Washington Counties.

Discussion of these species is included in section: V.B.8.

Many other species are accorded special status by federal land managers or by the State of Idaho. Data about these species are available from the respective land managers or at https://fishandgame.idaho.gov/ifwis/portal/species.

3. Socioeconomic Issues

Local economies in the areas near most proposed suppression areas are driven primarily by agricultural production, processing, and marketing concerns. Major employers in southern Idaho include Super Value, Inc.; Chobani; Cliff Bar, Fred Meyer, Inc.; Glanbia; Hewlett-Packard Co.; Idaho Power Co.; J.R. Simplot Co.; Micron Technology, Inc.; St. Alphonsus Regional Medical Center; St. Luke's Regional Medical Center; and Wal-Mart. These businesses roughly divide into those which have headquarters, factories or service centers located in the Boise metropolitan area, and those which support agricultural and natural resource enterprises or provide retail trade in the rural areas.

Livestock enterprises include rangeland grazing by cattle and sheep, feedlots for beef, and concentrated dairy operations. Local processing which adds value to livestock production systems includes meat packing houses and cheese processing plants.

Farmers in areas near proposed suppression areas grow feed for the dairies and feedlots. This includes alfalfa and corn. They also grow potatoes, sugar beets, wheat, barley, sweet corn, beans, and a variety of other crops. Potato and sugar beet processing plants add value in several of the rural communities. In some areas near the proposed suppression area, growers produce seed of flowers and various forage, feed, and vegetable crops. The seed crops are often of exceptionally high value per acre compared to crops for consumption.

Acreage in organic production has increased in the area near proposed suppression areas in recent years. There were over 215,668 acres registered in organic production in Idaho in 2021 (Sparks, 2023). This includes feed for organic dairies and various other organic crops.

Beekeepers maintain hives to produce honey and other bee products on land which is included in or located near the proposed treatment area. Seed and fruit crops rely on pollination from bees which may live or forage on or near proposed suppression areas.
The public uses federally managed rangelands in the proposed suppression area for a variety of recreational purposes, including hiking, camping, viewing wildlife, hunting, falconry, shooting, plant collecting, rock collecting, and sightseeing. Members of the public traverse rangelands in or near the proposed suppression area on foot, horseback, all-terrain vehicles, bicycles, motorcycles, four-wheel drive vehicles, snowmobiles, aircraft, and balloons.

Artificial surfaces in or near the proposed suppression area include the walls and roofs of buildings, painted finishes on automobiles, trailers, recreational vehicles, and road signs.

Aesthetic values of the natural environment in the suppression area include the views, vistas, diversity of the biota, and the opportunity to commune with nature in isolated settings. Many stakeholders have expressed extremely strong opinions regarding the aesthetics of the natural environment.

4. Cultural Resources and Events

Cultural and historical sites include locations and artifacts associated with Native Americans, explorers, pioneers, religious groups, and developers. Native American petroglyphs have been discovered in several areas within the proposed suppression area. Artifacts from knapping occur within the proposed suppression area. Elements of the Oregon and California Trails transect portions of the proposed suppression area, and monuments have been erected in several places. Museums, displays, and structures associated with mining, logging, and irrigation development exist in areas near the proposed suppression area.

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.

Population makeup in Idaho (U.S. Census Bureau, 2022) is 80.7% Caucasian. Hispanic, including Latino of any race, is the next most numerous groups, comprising 13.5%. Other identifiable groups include Black or African American 1.0%, American Indian and Alaska Native 1.7%, Asian 1.7%, and Native Hawaiian and Other Pacific Islander 0.20%. Of the minority groups, Hispanic and Asian appear to be the groups with most involvement in agriculture. Hispanic workers are often engaged in production and processing of crops. Sheepherding is a profession which currently engages persons of Peruvian nationality or descent. Persons of Asian descent are frequently involved in crop production and processing.

Figures for Idaho put 10.7% of the individuals in the state below the poverty level in 2022. Median household income was estimated at $70,214 in 2018 (U.S. Census Bureau, 2022).

When planning a site-specific treatment action on public lands, APHIS considers the potential for any adverse human health or environmental impacts of its actions on all populations, including minority or low-income populations before a proposed action is implemented. In doing so, APHIS program managers work closely with the land manager, and identify these areas through public meetings or public posting of recreational and high traffic areas in the proposed area of treatment.

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).

Children under six (6) months of age may have greater susceptibility to Carbaryl than older individuals because they have immature livers and incompletely developed acetyl cholinesterase systems (2002 EIS B-28). It has been suggested that children might pick up and eat Carbaryl bait. Infants under three months of age have higher levels of methemoglobin than do older children and adults. Therefore, they may be at increased risk of methemoglobinemia if exposed to Diflubenzuron.

The low frequency, with which infants are present on rangelands, the low density of Carbaryl bait in the environment (approximately one pellet per two square feet), the difficulty of finding bait pellets on the ground, and the low application rate of Diflubenzuron make the likelihood of exposure and toxic consequences negligible.

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 the grasshopper 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, non-target wildlife, and its environmental fate in soil, air, and water. The assessments rely on data required by 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 is likewise tiered to that analysis. The HHERAs are heavily referenced in this 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 types and amounts 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 on western 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 grasshopper outbreaks in rangeland.

Vegetation damage during serious grasshopper outbreaks may be so severe that all grasses and forbs are destroyed causing impaired plant growth for several years. Rare plants may be consumed during critical times of their 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 other agricultural products.

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 or diflubenzuron, 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 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.

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's degradation in aerobic soil varies from rapid to slow with half-lives ranging from 4 to 253 days (USEPA, 2017a). Half-lives decrease with increasing pH from acidic to alkaline conditions. Under anaerobic soil conditions, carbaryl has a half-life of 72 days. 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).

Several 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); 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, 2012a). 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.

Most 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 pollinators to carbaryl treatments for grasshopper suppression. 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 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, to keep tolerances to acceptable levels, carbaryl spray applications on rangeland are limited to half a pound active ingredient per acre per year (USEPA, 2012a). 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 use of 2% carbaryl bait formulation 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 proposed use of carbaryl 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 liquid 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, 2012a) 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.

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). 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 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 greatly 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. The treatment history of Program since the introduction of diflubenzuron demonstrates it is the preferred insecticide.

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) 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, except 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 year, 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 were 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 bait or diflubenzuron 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."

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 season. 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 pesticides include insecticide resistance, synergistic chemical effects, chemical persistence, and bioaccumulation in the environment. The program use of reduced insecticide application rates is 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 that increases 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, most 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.

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." APHIS has evaluated the proposed grasshopper program and has determined there are not disproportionately high and adverse human health or environmental effects on minority populations or low-income populations.

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 grasshopper insecticide treatments are conducted in rural rangeland areas, where agriculture is a primary industry. The areas consist of widely scattered, single, rural dwellings in ranching communities with low population density. The program notifies residents within treatment areas, or their designated representatives, prior to proposed operations to reduce the potential for incidental exposure to residents including children. Treatments are conducted primarily 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. The program also implements mitigation measures beyond label requirements to ensure that no treatments occur within the required buffer zones from structures, such as a 500-foot treatment buffer zone from schools and recreational areas. Program insecticides are not applied while school buses are operating in the treatment area.

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 because 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 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 bait 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.
- Insecticides are not aerially applied in a 1,500 foot buffer zones for carbaryl bait or 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 and requested consultation with USFWS on March 9, 2015, for use of carbaryl and diflubenzuron, for grasshopper suppression in the 17-state program area. 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 requested concurrence from the USFWS on January 18, 2024 and is oncoming but the National letter of concurrence was signed on March 21, 2024.

1995 Biological Opinion and 1998 Biological Assessment will be used as a basis for these local consultations and are incorporated into this EA by reference. They are available for public inspection at 9118 West Blackeagle Drive, Boise, Idaho. For this EA, APHIS conducted informal consultation with USFWS, Snake River Basin Office, and arrived at determinations of protective measures which were needed, in addition to those derived from earlier Biological Opinions. APHIS conferred with NOAA Fisheries - Boise, Idaho Office and determined that consultation was not required if the proposed suppression area excluded watersheds of the Salmon River and the Snake River below Brownlee Dam.

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. However,

rangeland grasshopper suppression treatments occur during the late spring or early summer, after the nesting season when eagle young typically will have already fledged. The Program also recognizes disruptive activities in or near eagle foraging areas can interfere with bald eagle feeding, reducing chances of survival. Program operational procedures that prevent applications near water bodies will reduce the possibility of disturbing eagle foraging activities. USFWS has provided recommendations for avoiding disturbance at foraging areas and communal roost sites that are applicable to grasshopper management programs.

No toxic effects are anticipated on eagles as a direct consequence of insecticide treatments. Toxic effects on the principal 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.

Bull Trout, *Salvelinus confluentus* – Threatened.

Bull trout have been listed as threatened under the ESA. Within the area in Idaho included in the proposal, bull trout are distributed throughout the Payette, Weiser, and Boise River systems. Bull trout naturally exhibit a patchy distribution and will not likely occupy all areas of these basins at once. Proposed or designated bull trout critical habitat may also be distributed throughout these basins and includes some habitat that is not currently known to be occupied. A very general description of bull trout distribution would include the North, Middle, and South Fork Payette Rivers; Squaw Creek; the Weiser River Watershed; the Jarbidge and Bruneau Rivers; and the Main Boise and South Fork Boise Rivers, including Anderson Ranch, Arrowrock, and Lucky Peak Reservoirs.

In all areas occupied by bull trout (including designated critical habitat), APHIS would utilize a 500 foot buffer for Carbaryl bait and maintain a 0.5 mile buffer for all aerial sprays. If there are treatment needs within the buffer area, APHIS would consult with USFWS on a case-by-case basis to examine alternatives.

Banbury Springs Limpet, *Lanx sp*. – Endangered.
Bliss Rapids Snail, *Taylorconcha serpenticola* - Threatened.
Snake River Physa Snail, *Physa natricina* – Endangered.

The Banbury Springs Limpet is known to occur at three (3) sites in the Thousand Springs area near Hagerman, Idaho. It has only been found on cobble or boulder substrates in cool, clear, well-oxygenated water. All known populations have occurred in swift currents.

The Bliss Rapids Snail has primarily been found on cobble-boulder substrate in flowing reaches of the main stem Snake River and alcove springs. River populations have been found in spring-influenced habitat or near the edge of rapids. Most populations occur in the Hagerman Reach, the tailwaters of Bliss and Lower Salmon Falls dams, large alcove springs, and springs on the Fort Hall Indian Reservation upstream of American Falls Reservoir.

No photos available for these 3 species

The Snake River Physa Snail is a main-stem Snake River specie, which occurs along stretches of the Snake River near the proposed program area.

In areas along the Snake River between C.J. Strike Reservoir and American Falls Reservoir, APHIS would utilize 500 foot buffer for Carbaryl bait and maintain a 0.5 mile buffer for all aerial sprays. If there are treatment needs within the buffer area, APHIS would consult with USFWS on a case-by-case basis to examine alternatives.

Bruneau Hot Springsnail, *Pyrgulopsis bruneauensis* – Endangered

This freshwater snail occurs in a 5-mile reach of the Bruneau River and the lower one third of its tributary, Hot Creek, in Owyhee County, Idaho. The snail is native to geothermal springs and seeps, with temperatures ranging from 15.7 to 36.9 degrees Celsius. It is found in these habitats on the exposed surfaces of various substrates including rocks, sand, gravel, mud, and algal films.

Within the recovery area, as defined in the BHSS Recovery Plan, APHIS would utilize 500 foot buffer for Carbaryl bait and maintain a 0.5 mile buffer for all aerial sprays. If there are treatment needs within the buffer, APHIS will consult with USFWS on a case- by-case basis.

Canada Lynx, *Lynx canadensis* – Threatened.

On March 24, 2000, the U. S. Fish and Wildlife Service listed the Canada Lynx as a Threatened species under the ESA of 1973, as amended. This took effect on April 24, 2000. The proposed treatment areas may contain habitat conditions suitable for Canada Lynx foraging, movement, and dispersal activities. In Idaho, lynx is thought to primarily occur in the higher elevation cold forest habitats, which support spruce, subalpine fir, whitebark pine, and lodgepole pine. Shrub/steppe habitats, which occur adjacent to or are intermixed with cold forest habitats in Idaho, are thought to be used to a limited extent by lynx for foraging and dispersal activities.

APHIS Rangeland Grasshopper and Mormon Cricket Program activities are not likely to influence Canada Lynx because the pesticides used and the rates at which they are used for grasshopper suppression pose very little risk to the Canada Lynx and will not affect its prey base. Furthermore, Canada Lynx are unlikely to be found in the open rangeland areas where APHIS Rangeland Grasshopper Program activities occur.

Grizzly Bear, *Ursus arctos* –Threatened.

The grizzly bear has been federally listed as a Threatened species. Habitat for the bear in the project area is primarily in the Island Park area. The acreage is relatively small, but it could be important for a recovered population of bear. Any impact is highly unlikely because of proposed pesticides at the proposed rates of application.

Slickspot Peppergrass, *Lepidium papilliferum* –Threatened.

Lepidium papilliferum is an herbaceous plant that was first collected in 1892 near Nampa, Idaho. This Idaho endemic specie is found in Ada, Canyon, Gem, Elmore, Payette, and Owyhee Counties. *Lepidium papilliferum* is a tap rooted annual or biennial plant that reaches 4 to 12 inches and displays two life cycle types. The annual life form matures, reproduces by setting seed, and dies in one growing season. The biennial life form starts growth the first year but does not produce seed and die until the second year. Insect visitation appears essential for pollination, principally by bees and some beetle species.

This plant is associated with small slickspots interspersed within the sagebrush-steppe habitat. These slickspots are also called mini-playas or nitric sites and have high clay content. Most of the slickspots range in size from less than 10 square feet to 110 square feet within communities dominated by other plants.

Threats to the continued existence of this plant include wildfire, and changes to the frequency and intensity of wildfire due to the presence of nonnative annuals such as cheatgrass. Wildfire management and rehabilitation may also have an impact, as would grazing, off road vehicle use, and development. In order to protect pollinators of this plant, APHIS will maintain a three (3) mile no-treatment buffer from proposed critical habitat. Should treatment needs arise within that buffer, APHIS will consult with the USFWS to consider options.

Ute Ladies'-Tresses, *Spiranthes diluvialis* – Threatened.

Ute Ladies'-Tresses is listed as threatened under the ESA. This perennial orchid occurs in mesic or wet meadows and riparian/wetland habitats formed by springs, seeps, lakes, and streams from 1,500 to 7,000 feet in elevation. It is presently known from Colorado, Montana, Nebraska, Utah, Washington, Wyoming, and Eastern Idaho along the South Fork of the Snake River between Swan Valley and the confluence with the Henry's Fork. The South Fork populations were first discovered in 1996. A total of 24 occurrences of Ute Ladies'-Tresses are currently known from Idaho.

Surveys adjacent to the South Fork of the Snake River and other portions of the state have failed to discover additional Ute Ladies'-Tresses populations outside of the South Fork of the Snake River. The USFWS has considered the entire state of Idaho to be within the potential range of this species. Large and long-tongued bumblebees (*Bombus morrisoni* and *Bombus fervidus*) are the most important pollinators of Ute Ladies'-Tresses orchid. Along the South Fork Snake River and Henry's Fork River populations of Ute Ladies'-Tresses, APHIS would utilize a three (3) mile buffer for all aerial spray treatments.

Northern Idaho Ground Squirrel, *Spermophilus brunneus* – Threatened.

The Northern Idaho Ground Squirrel is smaller than most ground squirrels at about 8-9" long. Reddish-brown spots dot its coat, and the squirrel has a short, narrow tail, tan feet and ears, and a grey-brown throat. This rare squirrel needs large quantities of grass seed, stems, and other green leafy vegetation to store body energy for its eight-month hibernation from August through March. Adult males (two years old) emerge from their burrows first in early spring, usually March or early April, followed by the females and then their young.

In 1985, scientists estimated that over 5,000 ground squirrels inhabited west-central Idaho. The animals occurred in open meadows and shrub/grasslands among coniferous forests of older Ponderosa pines and Douglas fir. The major threat to the Northern Idaho Ground Squirrel is habitat loss due to conifer invasion and fire suppression. Other potential threats include agricultural land conversion, urban development, recreational activities, and naturally occurring events such as severe droughts lasting longer than three (3) years.

APHIS would utilize a .5 mile buffer for aerial sprays, and a 150 foot buffer for Carbaryl bait from known occupied habitat. However, if there are treatment needs, APHIS would consult with USFWS on a case-by-case basis to examine alternatives.

Yellow-billed Cuckoo, *Coccyzuz americanus* – Threatened.

The yellow-billed cuckoo has been listed as threatened under the ESA. In Idaho, the bird is considered as a rare visitor and local breeder that occurs in scattered drainages primarily in the southern portion of the state in riparian zones. They have been most frequently and consistently reported in willow/cottonwood forests in the Snake River Valley in southeastern Idaho.

In all areas occupied by Yellow-billed cuckoo near any water, APHIS would utilize a 500 foot buffer for Carbaryl bait. For aerial applications of Diflubenzuron, a 0.5 mile buffer would be maintained. If there are treatment needs within the buffer area, APHIS would consult with USFWS on a case-by-case basis to examine alternatives.

Candidate Species and Former Candidate Species

Whitebark Pine *Pinus albicaulis* - Candidate.

The Whitebark Pine is a slow growing long-lived tree that often lives for 500 and sometimes more than a thousand years. It lives at alpine tree line and subalpine elevations and is considered a keystone, or foundation, specie in Western North America. Above tree line it often grows in krummholz form with stunted and shrublike growth due to cold temperatures and high winds. Significant threats to this specie include the white pine blister rust, the mountain pine beetle (*Dendroctonus ponderosae*), fire and the environmental effects of climate change.

The APHIS rangeland grasshopper program activities are not likely to influence this species as treatments would not likely occur in the alpine environment occupied by the Whitebark Pine.

Columbia Spotted Frog, *Rana luteiventris* – Former Candidate.

The Columbia Spotted Frog is olive green to brown in color, with irregular black spots. They may have white, yellow or salmon coloration on the underside of the belly and legs. Tadpoles are black when small, changing to a dark then light brown as they increase in size. Spotted frogs are about one inch in body length at metamorphosis, can attain a length of four inches as adults, and can live more than ten years. They begin reproducing in their second or third year. Softball-sized egg masses are deposited in shallow, calm water in March and April, depending on weather and climate. Tadpoles hatch two to three weeks later, eventually moving from breeding sites to any connected wet areas and feeding on algae, plant material, and detritus. Tadpoles transform into small juvenile frogs between late July and November, at which time they forage on tiny insects before seeking shelter for winter hibernation.

Spotted frogs live in spring seeps, meadows, marshes, ponds, and streams, usually where there is abundant vegetation. They often migrate along riparian corridors between habitats used for spring breeding, summer foraging, and winter hibernation. Depending on climate and habitat conditions, spotted frogs may begin seeking overwinter sites as early as September. Springs, cutbanks, and willow roots provide quality habitat for hibernacula that are well-oxygenated and stable in temperature.

Prior to 1997, the Columbia Spotted Frog and the Oregon Spotted Frog were lumped into one species, *Rana pretiosa.* Additional genetic information indicated that they are two separate species. Columbia Spotted Frogs have been further divided into four populations, including the Great Basin population. The Great Basin population is found in Eastern Oregon, Southwestern Idaho, and Nevada. In Idaho, it occurs in the mid-elevations of the Owyhee uplands and in Southern Twin Falls County.

Threats to the Great Basin population of Columbia Spotted Frogs include grazing, spring development, road and trail construction, water diversion, fire in riparian corridors, pesticides, disease, and the introduction of non-native fish. Increasing habitat fragmentation due to activities that reduce riparian connectivity makes local populations vulnerable to extirpation.

APHIS would utilize a .5 mile buffer for aerial sprays, and a 500 foot buffer for Carbaryl bait from known occupied habitat. If there are treatment needs within the buffer area, APHIS would consult with USFWS on a case-by-case basis to examine alternatives.

Southern Idaho Ground Squirrel, *Spermophilus brunneus endemicus* – Former Candidate.

The Southern Idaho Ground Squirrel is about 8-9" long, with a short, narrow tail, tan feet and ears, and a grey-brown throat. This small-eared mammal differs from a similar subspecies, the Northern Idaho Ground Squirrel, in pelage coloration. The Southern (squirrels) have a noticeably paler coat than the Northern (squirrels), which is attributed to the lower-elevation, sagebrush/grassland habitat in which they live. The granitic sands and clays of the Weiser River Basin are thought to influence the Southern Idaho Ground Squirrel's lighter coloration, while the deeper reddish-colored Northern are found in higher-elevation areas with shallow reddish soils of basaltic origin. Research suggests that the squirrels prefer areas with a high percentage of native cover such as big sagebrush, bitterbrush and a variety of native forbs and grasses; however, some nonnative features may enhance their survival such as alfalfa fields, haystacks or fence lines.

These squirrels spend much of their time underground. Adults emerge from seasonal hibernation in late January or early February, depending on elevation and habitat conditions. As with other ground squirrels in the Northwest, the adults have a short active season above ground of 4 to 5 months. During this time, the animals feed on large quantities of grass seed, stems, and green leafy vegetation, which are required for storage of fat to survive long months of hibernation. When squirrels emerge from their burrows they begin breeding. Young are born about three weeks later and emerge from the nest burrow in about 50 days. The ground squirrels cease their above ground activity by late June or early July to return to their burrows for hibernation.

The Southern Idaho Ground Squirrel occurs within an 810-square mile area (Gem, Payette, and Washington Counties).

Threats to Southern Idaho Ground Squirrels include exotic grasses and weeds; habitat fragmentation; direct killing from shooting, trapping or poisoning; predation; competition with Columbian Ground Squirrels (*Spermophilus columbianus*); and inadequacy of existing regulatory mechanisms to protect the species or its habitat. Most of these threats occur throughout the range of the species. APHIS would consult with USFWS on a case by case basis.

Greater Sage Grouse *Centrocercus urophasianus* **–** Former Candidate.

Young grouse hatch in the spring at about the same time as grasshopper populations begin to mature. Insects are a critical source of protein for the young birds. Large grasshopper populations may be common in the critical habitat.

APHIS would exclude all identified habitat areas provided by land mangers shapefile and include a 1 mile border from this area. APHIS will also abide by the guidance contained in BLM Memorandum IM-2016-115 and ID-2018-014 regarding grasshopper and Mormon cricket treatments within sage grouse habitat.

Goose Creek Milkvetch, *Astragalus anserinus* – Former Candidate.

This plant species occurs in the upper Goose Creek drainage of Cassia County, Idaho, Box Elder County, Utah, and Elko County, Nevada. This plant was first collected in 1982 in Box Elder County, Utah and described in 1984. It is a low growing, matted, perennial forb in the pea or legume family (Fabaceae), with grey, hairy leaves, pink-purple flowers, and brownish-red curved seed pods. This plant typically flowers from late May to early June. Pollination is assumed to be accomplished via insects, but the specific pollinators are unknown.

APHIS would maintain a three (3) mile, no aerial insecticide treatments from known populations. If there are treatment needs within the buffer area, APHIS would consult with USFWS on a case-by-case basis to examine alternatives.

Species under Review by U.S. Fish and Wildlife Service or Petitioned for Listing as T&E

Bonneville Cutthroat Trout and Yellowstone Cutthroat Trout

Both the Bonneville Cutthroat Trout (top photo) and Yellowstone Cutthroat Trout (bottom photo) are currently petitioned for listing as threatened under the ESA. The Bonneville Cutthroat Trout is limited to the Bear River watershed. The Yellowstone Cutthroat Trout is believed to occupy several streams scattered across Eastern Idaho. Their current distribution is under investigation.

Mulford's Milkvetch, Woven-Spore Lichen, and Malheur Prince's Plume

These plants are currently under review by the USFWS for listing as federal candidate species. Mulford's Milkvetch, *Astragalus mulfordiae*, is endemic to Southwest Idaho and extreme Southeast Oregon, where it grows in deep sandy soils. It is typically associated with bitterbrush, needle-and-thread grass, and Indian ricegrass. In Idaho, Mulford's Milkvetch is known from Ada, Owyhee, Payette, and Washington Counties. While no information is available regarding its pollination biology, Mulford's Milkvetch is believed to be insect pollinated. Seed dispersal is most likely by gravity and wind. Although no data are readily available, it may be consumed by grasshoppers.

Woven-Spore Lichen, *Texosporium sancti-jacobi*, grows on humus in sagebrush-steppe habitats in Southwest Idaho, Central Oregon, and Southern Washington. Several localities are also known from Southern California. Woven-Spore Lichen has been found at fourteen (14) localities in Idaho, all within Ada and Elmore Counties. Most of the sites are adjacent to or are surrounded by private land. Nothing is known of its reproductive or dispersal mechanisms. Although no data are readily available, it may be consumed by grasshoppers.

The USFWS initiated a status review for Malheur Prince's Plume, *Stanleya confertiflora*, in 2000. This showy, three foot tall biennial plant species is known from six widely scattered localities in Gooding, Owyhee, and Washington Counties in southwest Idaho. It grows only on sparsely vegetated clay soils. Approximately fifteen populations of Malheur Prince's Plume are known from southeast Oregon in Harney and Malheur Counties. A variety of bees and beetles have been observed visiting the flowers, but no pollination studies have been conducted. Although no data are readily available, it may be consumed by grasshoppers.

North American Wolverine, *Gulo gulo luscus*- Threatened

The Wolverine is a proposed threatened species and listed in Idaho as a protected non-game species (Idaho Department of Fish and Game 2010, p. 4). Habitat for the wolverine is located primarily in the high altitude remote areas of mountainous areas. Any impact is highly unlikely as a result of proposed pesticides at the proposed rates of application. These areas would most likely never be considered for treatment under current criteria.

9. Fires and Human Health Hazards

Various compounds are released in smoke during wildland fires, including carbon monoxide, 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 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.

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.

APHIS consults with the land manager on all proposed treatments and inquires of any issues regarding impacts to cultural and historical resources in addition to all other items of concern. APHIS implements any recommendations and avoidances provided by the land manager.

Table Key

Special Species Status

C	Candidate Species for possible listing under the Endangered Species Act
E	Listed Endangered under the Endangered Species Act
P	Proposed for listing under the Endangered Species Act
T	Listed Threatened under the Endangered Species Act
X	Experimental, Non-essential Population
FC	Former Candidate

Determinations

NE	No Effect
NJ	Not Likely to Jeopardize the Population
NLAA	Not Likely to Adversely Affect

Table 6 – Threatened and Endangered Species with Proposed Protection Measures/Determinations

Yellow-Billed Cuckoo (T) NLAA Yellow Billed Cuckoo Proposed Critical Habitat (PCH)	APHIS would use a .5 mile buffer for all aerial sprays and a 500 foot buffer for Carbaryl bait. Areas identified as Proposed Critical Habitat will also be buffered 500 feet.
Bliss Rapids Snail (T) Snake River Physa Snail (E) Banbury Springs Lanx (E) NLAA Bruneau Hot Spring snail (E) NLAA Bull Trout (T) NLAA	Along the Snake River and associated springs and within the recovery area as defined in the final BHSS Recovery Plan, APHIS would utilize a .5 mile buffer for all aerial sprays and a 500 foot buffer for Carbaryl bait.
Grizzly Bear (T) (NLAA) North American Wolverine (T) (NLAA)	Any impact unlikely as a result of proposed pesticides at proposed rates of application. These areas would most likely never be considered for treatment under current criteria.
Canada Lynx (T) (NLAA)	APHIS Grasshopper and Mormon Cricket Program activities are not likely to influence Canada Lynx because the pesticides used and the rates at which they are used for Mormon cricket suppression pose very little risk to the Canada Lynx and will not affect its prey base. Canada Lynx is unlikely to be found in the open rangeland areas where APHIS Mormon Cricket Program activities occur.
Slickspot Peppergrass (T) NLAA Proposed Critical Habitat (PCH) Ute Ladies' Tresses (T) NLAA	APHIS would utilize a .5 mile buffer for all aerial sprays and a 150 foot buffer for Carbaryl bait.

Table 7 – Candidate and Former Candidate Species with Proposed Protection Measures/Determinations

Columbia Spotted Frog (FC) NLAA	APHIS will utilize a .5 mile buffer for aerial sprays, and a 500 foot buffer for Carbaryl bait from known occupied habitat.
Greater Sage Grouse (FC) NLAA Sharp Tailed Grouse	APHIS will abide by the protective measures in the June 24, 2016 BLM Instruction Memorandum No. 2016-115 and IB ID-2018-014. APHIS will also exclude and buffer any areas identified as occupied by maps provided by the land manager.
Whitebark Pine (C) NLAA	The Rangeland Grasshopper and Mormon Cricket Suppression Program is focused on rangelands and treatments unlikely to occur in the alpine habitat of the Whitebark pine.
Southern Idaho Ground Squirrel (FC) NLAA	APHIS would consult with USFWS before treating occupied Southern Idaho Ground Squirrel habitat.
Goose Creek Milkvetch (C) NLAA	APHIS would utilize a .5 mile buffer for all aerial sprays and a 500 foot buffer for Carbaryl bait.

Table 8 – State Sensitive Species with Proposed Protection Measures/Determinations

Idaho Dunes Tiger Beetle Bruneau Dunes Tiger Beetle Monarch Butterfly	APHIS would utilize a .5 mile buffer for all aerial sprays and a 500 foot buffer for Carbaryl bait to protect the Idaho Dunes Tiger Beetle and the Bruneau Dunes Tiger Beetle. Maintain same buffer for documented Monarch occurrence areas.
Raptor Shrimp (Branchineta raptor)	To protect Raptor Shrimp, APHIS would not treat within one mile of occupied Playa habitat.
Point headed Grasshopper	To protect the Point headed Grasshopper (Acrolophitus pulchellus), APHIS will consult with the BLM and FS to identify occupied habitat and will avoid pesticide applications in those areas.

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VI. Listing of Agencies and Persons Consulted

Frymire, Kimberly, Fish & Wildlife Biologist/Botanist, Hydro Branch, Snake River Basin Office, U.S. Fish and Wildlife Service, US Department of the Interior, 1387 S. Vinnell Way, Suite 368, Boise, ID 83709

Ellsworth, Ethan, State Office, Bureau of Land Management, Department of the Interior, 1387 S. Vinnell Way, Boise, ID 83709

Holly Crawford, Twin Falls District, Bureau of Land Management, Department of the Interior, 2878 Addison Ave. E, Twin Falls, ID 83301

James Warren, Environmental Protection Specialist/Environmental Toxicologist, USDA, 1200 Cherry Brook Drive, Suite 100, Little Rock, AR 72211

Kai Caraher, Biological Scientist, USDA APHIS-PPQ, 4700 River Road, Unit 150 Riverdale, MD 20737

Ryan Vasquez, National Operations Manager, Grasshopper and Mormon Cricket Suppression Program, USDA APHIS-PPQ, 1007 Ten Rod Road #1014, North Kingstown, RI 02852

Sam Kellendy, Grasshopper Program Coordinator, Idaho State Department of Agriculture, 2270 Old Penitentiary Rd, Boise, 83712 sam.kellendy@isda.idaho.gov

Lori Ann Burd, Center for Biological Diversity, PO Box 11374, Portland, OR 97211
LABurd@biologicaldiversity.org

Sharon Selvaggio, Xerces Society, 628 NE Broadway, Suite 200, Portland, OR 97232
sharon.selvaggio@xerces.org

Appendix A - APHIS Rangeland Grasshopper and Mormon Cricket Suppression Program
FY-2024 Treatment Guidelines
Version 02/01/2024

APHIS Rangeland Grasshopper & Mormon Cricket Suppression Program Treatment Guidelines

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

General Guidelines for Grasshopper / Mormon Cricket Treatments

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

2. Subject to the availability of funds, on request of the administering agency or the agriculture department of an affected State, APHIS, 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 APHIS determines that delaying treatment will not cause greater economic damage to adjacent owners of rangeland. In carrying out this section, APHIS shall work in conjunction with other Federal, State, Tribal, and private prevention, control, or suppression efforts to protect rangeland.

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

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

5. On APHIS run suppression programs, the Federal government will bear the cost of treatment up to 100 percent on Federal, Tribal, and Trust land.

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 parties may opt to reimburse APHIS for suppression treatments. Interagency agreements or reimbursement agreements must be completed prior to the start of treatments which will be charged thereto.

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

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

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

1. Follow all applicable Federal, State, Tribal 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 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 as solid bait
   b. Diflubenzuron 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).

   Provide the following buffers for water bodies:
   - 500-foot buffer with aerial liquid insecticide
   - 200-foot buffer with aerial bait

- 50-foot buffer with ground bait.

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

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

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

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

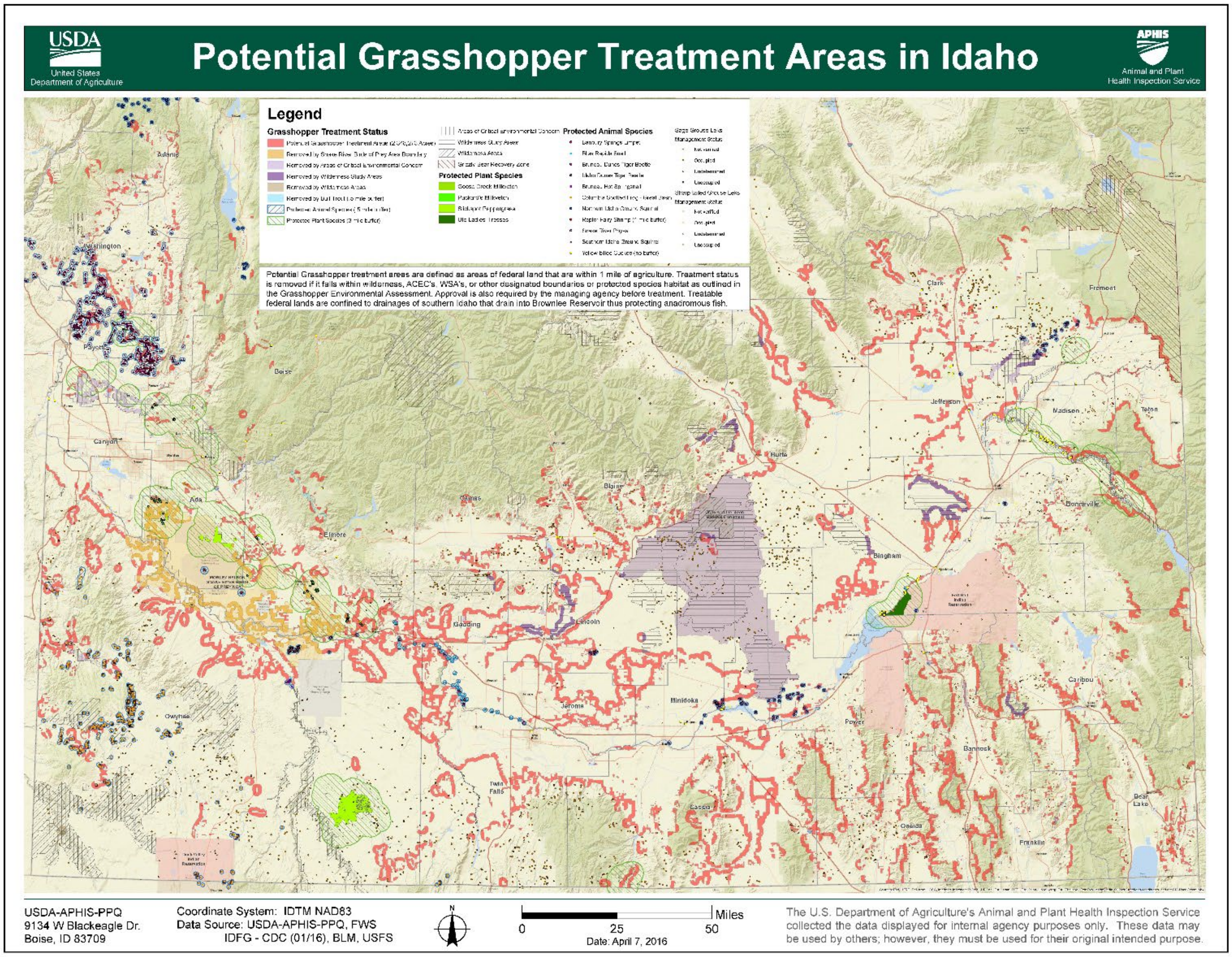
2. Minimize the potential for drift and volatilization by not using ULV sprays when the following conditions exist in the spray area:
   a. Wind velocity exceeds 10 miles per hour;
   b. Rain is falling or is imminent;
   c. Dew is present over large areas within the treatment block;
   d. There is air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

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

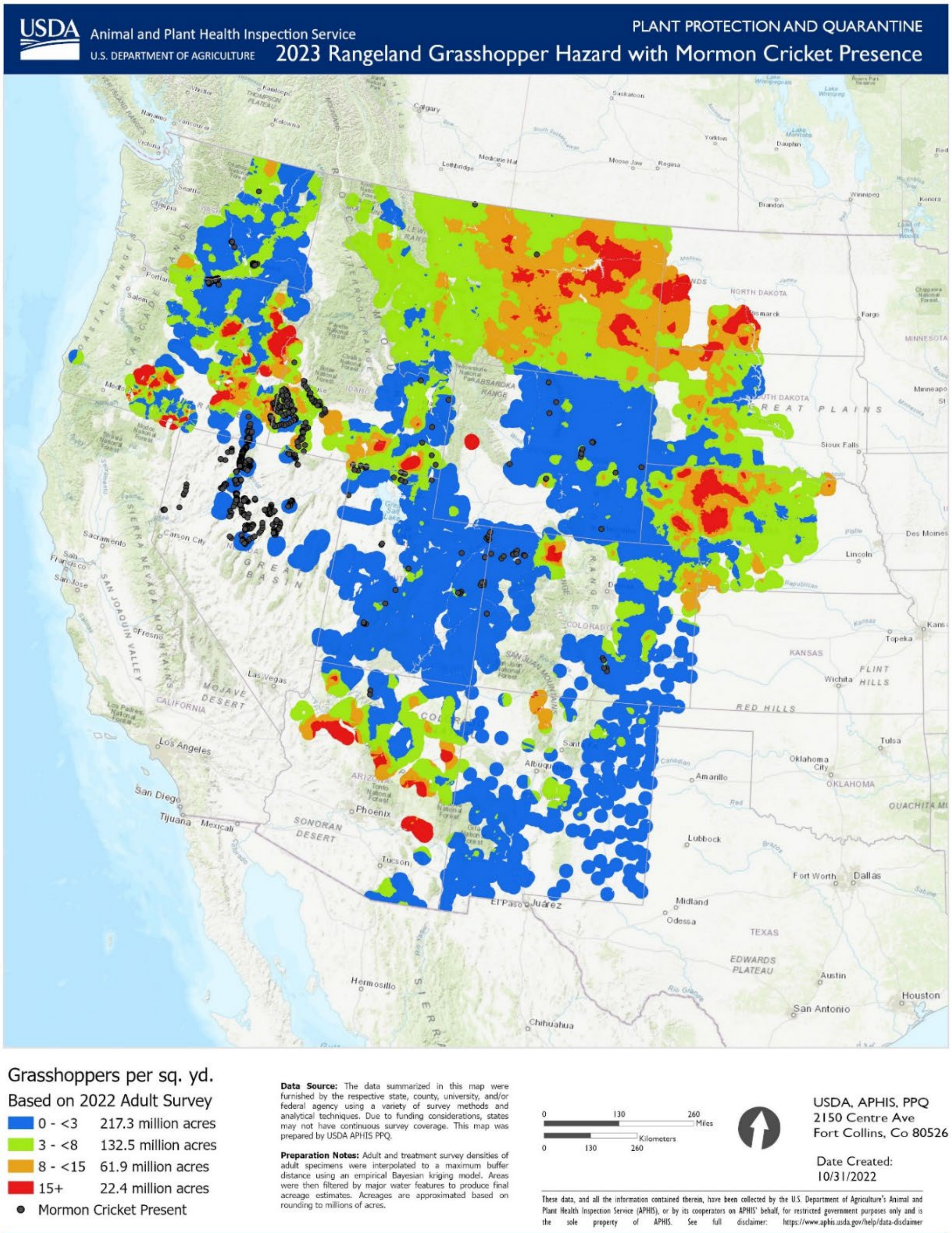
4. Application aircraft will fly at a median altitude of 1 to 1.5 times the aircraft's wingspan.

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

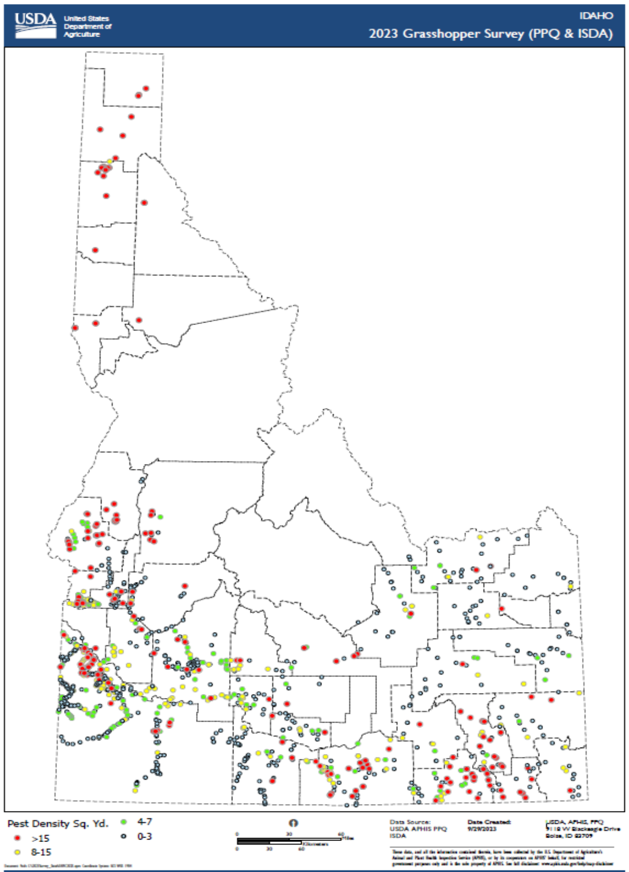
Appendix B: Map of the *Potential Grasshopper Treatment Areas*

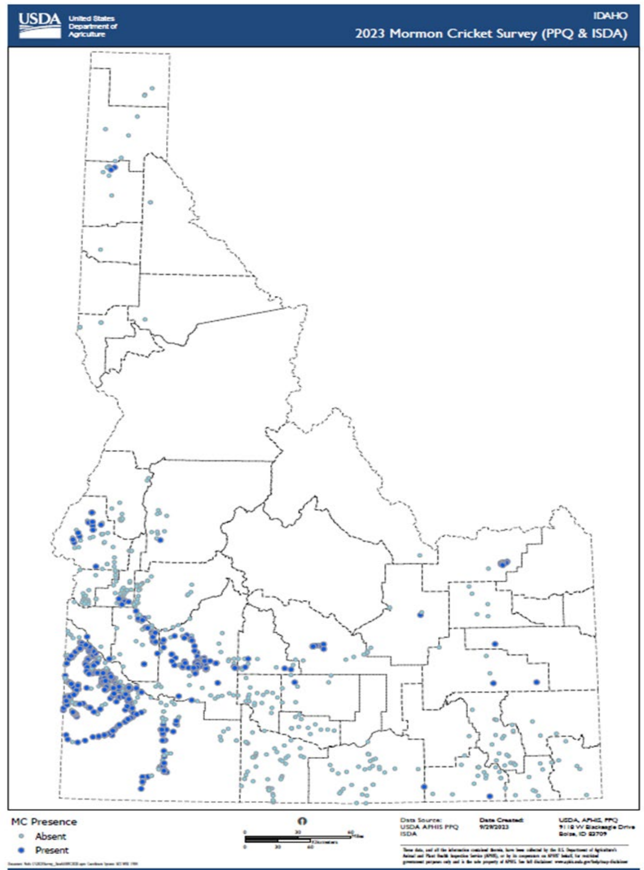


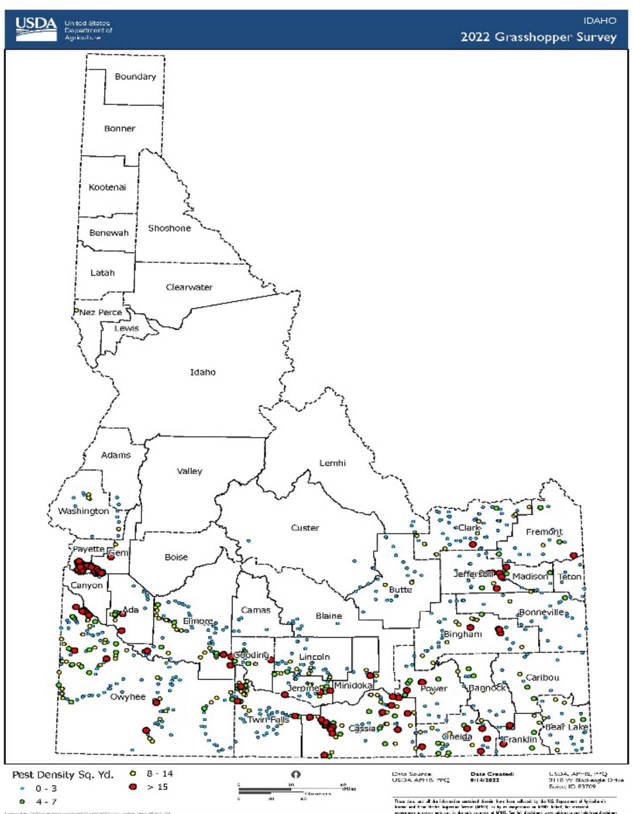
Appendix C: 2023 National Hazard Map

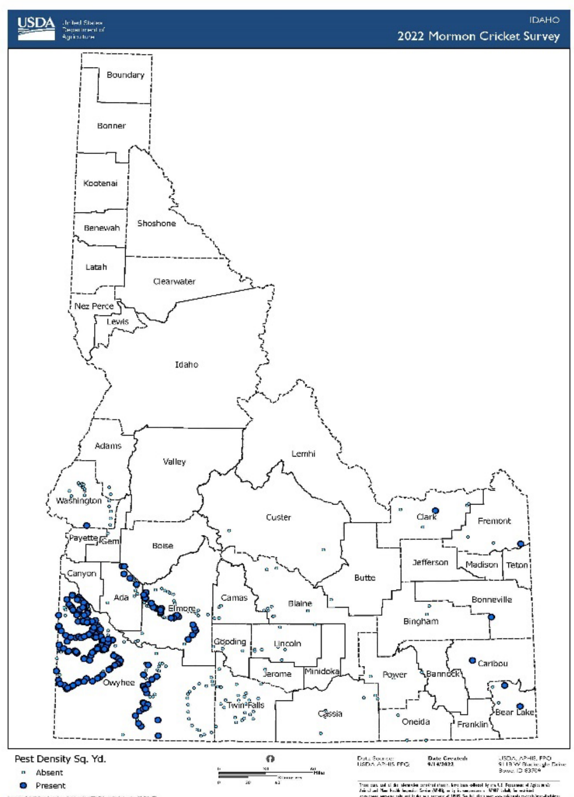


Appendix D: 2023 Survey Maps

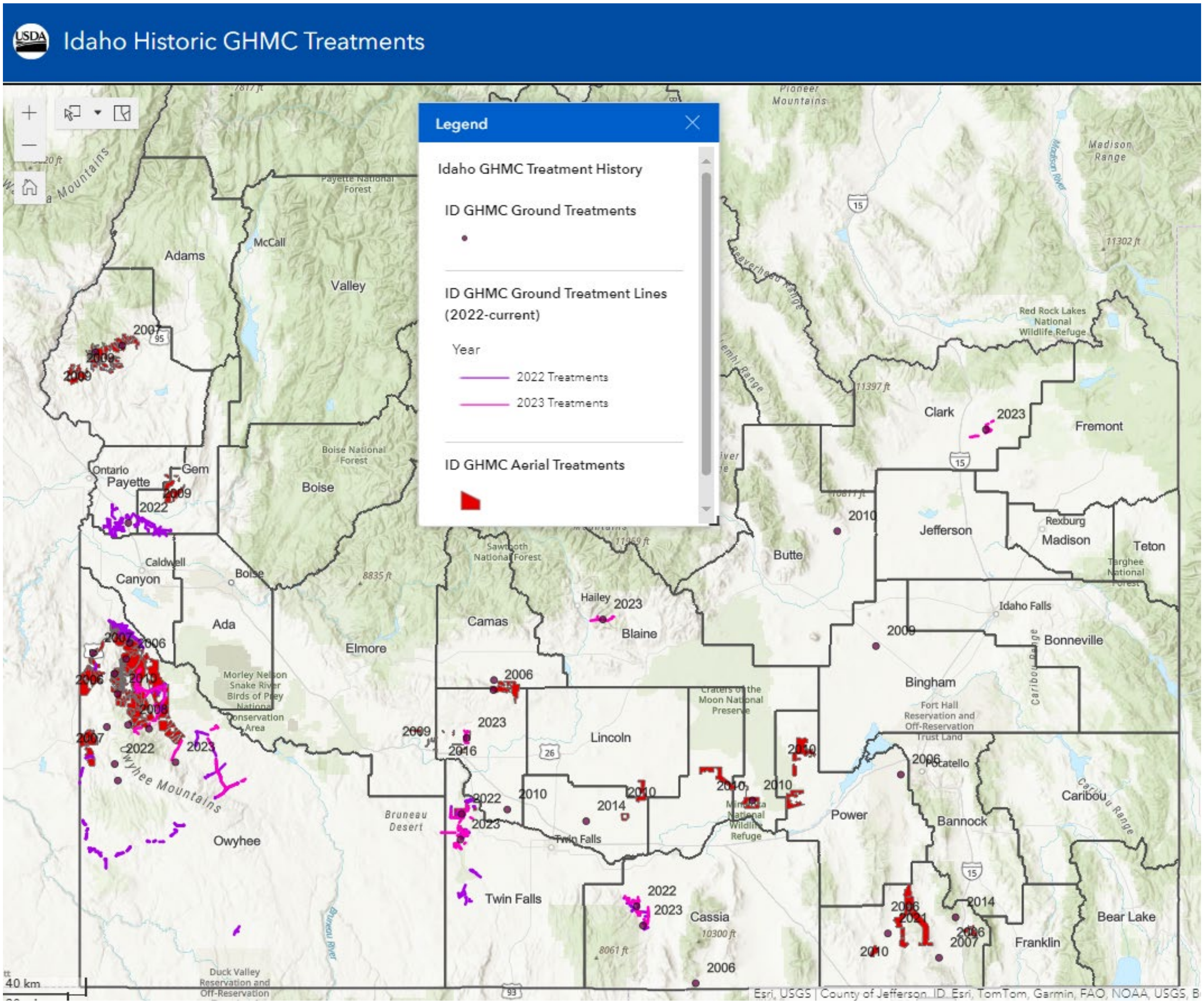








Appendix E: Historic Treatment Map 2006-2023



Appendix F: Program Forms

USDA APHIS PPQ Idaho Environmental Assessment Grasshopper/Mormon Cricket Suppression Form

FORM #1 **REQUEST FOR EVALUATION FOR SUPPRESSION OF GRASSHOPPERS OR MORMON CRICKETS IN IDAHO**

USDA APHIS PPQ, 9118 W. Blackeagle Dr, Boise, ID 83709 Boise Phone (208) 373-1600

Date of request: _______________ Grasshopper Complaint ______ Mormon Cricket Complaint _____

Name of individual(s) requesting control: ____

Principal Contact (if other than party requesting control): ____

Physical Address: _________________________________ City:_______________ State: ____

Home phone: _______________ Cell phone:________________ Email: __________________________

County where land is located: _____________ Estimated acreage: BLM:______ Forest Service: ______

Description of area where assistance is requested and the nature of problem:
(Are you aware of environmentally sensitive issues such as: water (streams, reservoirs, canals), bees, or endangered species critical habitat in the area where you are requesting assistance?)

____

____

____

FIELD EVALUATION OF COMPLAINT FOR GRASSHOPPERS OR MORMON CRICKETS

Will be completed by USDA Field Scout upon receipt of a request for evaluation from a land manager or complaintant.

Date Evaluated: ____________________, 20____

Person(s) Performing Evaluation: ____

Was complainant contacted during the visit? Yes___ No ____ (Phone: ______________________)

Density per sq. yard: _______ Predominant instar(s): _________ Species: ___________________

Approximate acres of rangeland infested: Federal: _________ State: _______ Private: _________

Narrative report including sensitive issues (bees, water, endangered species, organic farms, etc.):

____
____
____
____

Attach or sketch map (if possible) showing infested areas and sensitive sites.

Complaint number / DWP assigned (if applicable): _____________________

1

FORM 2. **USDA APHIS PPQ RECOMMENDATION PER IDAHO COMPLAINT # _______________**
FOR SUPPRESSION OF GRASSHOPPERS OR MORMON CRICKETS

To be completed by USDA APHIS PPQ Grasshopper Coordinator upon receipt of evaluation from Field Scout. Will be forwarded to Federal Land Manager specified in request for evaluation (and person who initiated request if other than land manager).

I have reviewed the evaluation of complaint #______________

Regarding an infestation on _______________________ in __________________ County, Idaho.

I recommend the following course of action:

____

____

____

____

____

____

____

____

____

____

____

____

____

Signature ____ Date: _____________________

FORM 3 - LAND MANAGER CONSISTENCY REVIEW OF IDAHO COMPLAINT # _________
FOR SUPPRESSION OF GRASSHOPPERS OR MORMON CRICKETS

To be completed by Land Manager after review of Recommendation from USDA APHIS PPQ.

The Environment Assessment, "Site Specific Environmental Assessment, Grasshopper and Mormon Cricket Suppression Program for Southern Idaho, EA Number: _______________" and associated Finding of No Significant Impact (FONSI) have been carefully reviewed. Request for Evaluation for Control, Evaluation of Request and Recommendation for Action #____________ have also been carefully reviewed. The recommendation is (Check one):

Consistent ☐ **Not Consistent** ☐

with control actions on rangeland specified by those documents. Any treatment will be implemented by APHIS in accordance with the operational procedures, design features, and mitigating measures described and adopted in the above-referenced documents.

In addition, the following measures are required, as well as those referenced above:

____
____
____

Due to the following extenuating circumstances, treatment should not occur:

____
____
____

Signature_______________________________________ Date: ____________________

____
Name, Title, and Organization of Responsible Official

Additional forms required by land management agency should be attached.

FORM 4 - TREATMENT(S) ON COMPLAINT / DWP # ________________
for suppression of Grasshoppers or Mormon Crickets

To be completed by USDA APHIS PPQ at the time of treatment

Date(s) treatment occurred: ______________________________________

Contractor or employee(s) who applied treatment: ______________________________________
____
____

Acres treated: ___________________________ Acres Protected: ___________________

Type and amount of pesticide applied:
Carbaryl 2% bait ______________ total lbs. Diflubenzuron ___________ total oz.

Comments:
____
____
____

POST TREATMENT MONITORING OF TREATMENTS

To be completed by USDA APHIS PPQ at the time of monitoring.

LOCATION OF POST-TREATMENT EVALUATION: ____________________________________

Date of evaluation: _____________________ Target pest density per sq. yd.: ___________

Predominant species: ________________ Predominant instar(s): _____________________

Other monitoring observations:
____
____

Person conducting post-treatment monitoring:____________________________________

Appendix G: FWS/NMFS Correspondence

Responses to Draft Environmental Assessment Public Comments Received

During the open comment period on the Draft Environmental Assessment for the Idaho, 2024-2026 Rangeland Grasshopper and Mormon Cricket Suppression Program (EA Number: ID-1-2024-26) APHIS received a letter from the Xerces Society for Invertebrate Conservation, the American Bird Conservancy, the Center for Biological Diversity, staff and members of the Western Watersheds Project and the Idaho Conservation League. In this letter the commenters urged APHIS' federal grasshopper and Mormon cricket suppression program to adopt sustainable solutions in Idaho that protect biodiversity, honor Tribal ties, avoid cherished landscapes, respect aquatic ecosystems, and acknowledge the public's right to early notification and involvement. The commenters have concerns regarding broad-scale aerial insecticide applications to public lands, ecosystems services of insects as food, decomposers and nutrient cycling, pollination, and water filtration.

1. Western voters overwhelmingly support conservation, as is evident from a recent survey of nearly 4,000 voters in eight western states.

The Colorado College State of the Rockies Project Conservation in the West Poll, an annual survey of voters from the states of Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming. The latest poll of nearly 4,000 voters from these states, finds that in 2024, support for conservation is very high. Excerpts from the 2024 poll include:

- 70% of Westerners support protecting sources of clean water, air quality and wildlife habitat while providing opportunities to visit and recreate on our national public lands.
- There is grave concern about loss of pollinators, such as bees and butterflies. Consistent with 2021, 89% of Western voters say the loss of pollinators is a serious problem.
- Declines in populations of fish and wildlife reached peak levels of concern among voters, with 86% of Westerners describing such population declines as a serious problem.
- 85% of Westerners emphatically support creating new national parks, national monuments, national wildlife refuges, and tribal-protected areas to protect historic sites or areas for outdoor recreation.

Recommendation: We ask that APHIS take into account the deep concern Western voters are expressing about the welfare of wildlife, pollinators, clean water, and the importance of public lands. Given this concern, we ask that APHIS immediately shift toward more sustainable ways of managing grasshopper populations, in concert with its land management partners. See more information on this elsewhere in our comment letter.

APHIS RESPONSE:
Thank you for your engagement in our program and informing APHIS of the Colorado College poll results. All proposals for APHIS involved treatments are justified by survey results and required by law (Plant Protection Act, Section 7717) and will only be implemented if necessary and request ed by the affected land managers. APHIS believes preventing grasshopper population outbreaks will conserve rangeland plants and will improve other environmental and ecological criteria. The Purpose and Needs sections of our NEPA documents clarifies these points for the conservation-oriented public.

2. There is not enough protection guaranteed for land under special designations. Treatments could occur within areas under specific special designations, including Wilderness Study Areas,

Areas of Critical Environmental Concern, National Wildlife Refuges, Important Bird Areas, National Monuments, parks, near Wild and Scenic Rivers, and numerous other special designations.

While we appreciate that the Idaho office has taken preliminary steps to exclude certain special designations from the proposed spray, the exclusions do not go far enough. Presumably the Idaho-APHIS office excluded areas like Wilderness areas, certain Wilderness Study areas and certain Areas of Critical Environmental Concern based on the recognition of the risk that that insecticides could pose to the values for which these areas were established.

Unfortunately, the EA contains no real analysis of the values of existing special designations within and adjacent to the area, and leaves vulnerable many important designations such as National Wildlife Refuges, National Monuments, Important Bird Areas, parks, near Wild and Scenic Rivers, and numerous other special designations.

Within Idaho, even unique, biodiverse, and high profile areas such as Craters of the Moon National Monument have received spray.

Elsewhere, recent history show several instances where Wilderness Study Areas have been included within spray boundaries, including one just last year in 2023. This spray was advertised to cover 187 square miles of Malheur County within Oregon and included a Wilderness Study Area. The EA that authorized this spray contained no analysis of the values of this or other Wilderness Study Areas.

Records provided by APHIS through a FOIA request even show that in 2017, approximately eight thousand acres of the Malheur National Wildlife Refuge was sprayed. The U.S. Fish and Wildlife Service describes Malheur NWR as "*disproportionately important as a stop along the Pacific Flyway, and as a resting, breeding, and nesting area for hundreds of thousands of migratory birds and other wildlife… Many of the species migrating through or breeding at Malheur are highlighted as priority species in national bird conservation plans."*

The EA also provide no protection for Areas of Critical Environmental Concern, National Monuments, Important Bird Areas or highly valued recreational areas. Special designation areas are highly valued by the public and are frequently associated with high biodiversity and some of the last refugia for declining species. For example, Oregon's 2024 EA states*: "The Oregon Bee Atlas project has documented approximately 750 species of bees native to Oregon, most of which occur in the more arid parts of the state, especially in wilderness areas and areas with diverse floral nectaries."*

Recommendation: APHIS must do a better job of assessing and protecting special designation areas. These special status areas have been designated for specific purposes, can be highly valuable for conservation, and generally discourage human intervention with the natural ecosystem. Grasshopper suppression should not be undertaken in such areas. APHIS must review its procedures and ensure that it is not in danger of violating any federal laws or policies pertaining to such special designations. Wide buffers should also be utilized to prevent drift into specially designated areas – a minimum of ¼ mile.

APHIS RESPONSE*:*

APHIS has worked with the local BLM office to determine what mitigation measures needed to be in place for the wilderness areas the commenter has named, including National Wildlife Refuges, National Monuments, Wild and Scenic Rivers, Areas of Critical Environmental Concern, and parks. APHIS does not agree that more extensive analysis is required to determine if grasshopper treatments near and even within these areas will have significant impacts. The commenters concern about the Malheur National Wildlife Refuge in Oregon is misplaced because this EA only considers treatments in Idaho.

3. Procedures are inadequate for protecting recreationists and others from spray over wildlands.

The EA states: *The public uses federally managed rangelands in the proposed suppression area for a variety of recreational purposes, including hiking, camping, viewing wildlife, hunting, falconry, shooting, plant collecting, rock collecting, and sightseeing" and claims later that recreational areas are posted before treatment."* However, there is no mention in the Treatment Guidelines (Appendix A) of these protections.

Recommendation: Recreationists and others out on public wildlands do not care to be put at risk from pesticide sprays overhead or persisting on land and water surfaces that they may contact. APHIS must identify areas that are commonly used for recreation, and standardize, include protections for recreationists in its Treatment guidelines and expand its public notification, for example by posting spray areas online, at trailheads, and at other physical and virtual locations where recreationists congregate.

APHIS RESPONSE*:*

APHIS will perform the necessary scouting of treatment areas for evidence of backcountry recreational users prior to treatments, The probability of backpackers using the same wilderness area during the specific day when treatments are applied, and APHIS, BLM, and the pesticide applicator being unaware of the presence of people in the treatment area is extremely low. Idaho only conducts ground treatments and can easily identify individuals and avoid them.

4. There is no mention of protecting seasonal watercourses from sprays even if rain may be in the forecast, and the EA includes misleading information about the potential for its chemicals to contaminate water. The EA includes no information about whether an NPDES permit has been obtained, and what provisions it includes if so.

Water is life in the arid West. A huge number of rangeland species depend on riparian and aquatic areas. Many streams are ephemeral or intermittent during the hot summer months, but quickly carry water when it is present. Yet these ephemeral, intermittent and seasonal watercourses, if dry, are given no protection under the APHIS program.

Summer rainfall may be uncommon in this region. Still, due to the importance of aquatic systems in this arid environment, buffers along such ephemeral and intermittent waterways should be considered, especially given the toxicity carbaryl and diflubenzuron pose to aquatic organisms. If summer rainfall were to occur, insecticide applied near or over dry watercourses could enter and contaminate water, putting both aquatic species and all the other wildlife (and people) that depend on water at risk. This contamination also harms humans, who rely on the rivers and streams for life, as well as for agriculture and livestock.

APHIS suggests that diflubenzuron is unlikely to contaminate water, given its low solubility and affinity for organic material. But the diflubenzuron Dimilin 2 label indicates that the chemical is subject to runoff for months after application, and could result in discharges to surface water.

Other pesticides with similar properties, such as pyrethroids, regularly make their way into aquatic systems (soil erosion is one key way) and these pesticides generally are found persisting in sediments, rather than the water column itself. Because so many aquatic invertebrates are benthic, and considering the fact that intermittent, ephemeral or seasonal streams enjoy no buffer protections, we have serious concerns about contamination of aquatic systems from the use of diflubenzuron, even with the buffers required for perennial streams.

APHIS makes no mention of how it will consider upstream and watershed effects to species that utilize streams or rivers. In addition, given the potential for drift (discussed more below) and the critical importance of aquatic areas in arid rangeland environments, the current buffers for aquatic habitats do not provide enough margin of safety.

APHIS also includes no information about whether an NPDES permit has been obtained, and what provisions it includes, if so. Under the Clean Water Act, discharges require permit coverage under the National Pollutant Discharge Elimination System. An NPDES permit may be required. Even if an NPDES isn't required for certain activities, APHIS still has a duty to comply with state water quality standards under the Clean Water Act. Further, an NPDES permit does not absolve the agency of its duty to disclose impacts to water quality under NEPA.

Diflubenzuron is toxic to mollusks and other aquatic invertebrates, raising concern about its potential impacts for important stream biota. Given its persistence, aquatic impacts from these chemicals could

occur weeks beyond the treatment period. It is also not clear if environmental monitoring is conducted in such a way as to pick up delayed transfer of APHIS chemicals to nearby waterways.

Recommendation: APHIS should include buffers not just around surface water present at the time of treatment but also around ephemeral, intermittent, and seasonal water bodies, and around stock ponds. APHIS must disclose whether its program has obtained an NPDES permit, or whether this requirement has been waived (and if so, why). APHIS must comply with state water quality standards and disclose impacts to water quality in the EA. APHIS should also disclose its environmental monitoring reports at its website and conduct environmental monitoring in such a way as to test for runoff effects weeks or months after treatment, in addition to drift at the time of treatment.

APHIS RESPONSE:

The APHIS program currently uses a 200-foot buffer (ground-based vehicle application) and a 500-foot buffer (aerial application) around water bodies. APHIS has also worked with the local BLM office to determine other water bodies, either seasonal or perennial, to buffer. APHIS has analyzed the potential for diflubenzuron contamination of water bodies caused by run off from treated areas. APHIS encourages the commenter to read our Environmental Impact Statement and the Human Health and Ecological Risk Assessment for Diflubenzuron where such chemical fate and transport scenarios have been evaluated and found unlikely to cause significant impacts.

Idaho is one of the few states where the U.S. Environmental Protection Agency (EPA) has not delegated regulation and enforcement of the Clean Water Act. The BLM Pesticide Use Permit (PUP) also addresses this topic.

5. The EA is silent on the status of APHIS consultation with Tribal Governments. Meaningful consultation must occur before any decisions are made, including publication of the FONSI and the Final EA.

Tribal Nations may have specific rights on ceded lands and/or collect food or medicines within areas that could be subject to spray. Spray areas may also contain sacred sites, areas revered and honored by sovereign Tribal Nations and used for cultural and religious practices since time immemorial.

Executive Order 13175 of November 6, 2000 (Consultation and Coordination with Indian Tribal Governments) charges all executive departments and agencies with engaging in regular, meaningful, and robust consultation with Tribal officials in the development of Federal policies that have Tribal implications. White House Memorandum of January 26, 2021 (Tribal Consultation and Strengthening Nation-to-Nation Relationships) reiterated executive support for this E.O. Sloan (in draft) and Blumm and Pennock (2022) have described key principles of consultation with Tribal Governments, which is summarized here.

Tribes, Pueblos and Indigenous Nations are sovereign Nations and exercise self-determination under their own laws, regulations, and customs. Under several executive orders, a Secretary of Interior directive, and the National Historic Preservation Act, federal agencies are obligated to consult with Tribal governments upon proposal of projects that may affect Tribal lands, physically, socially, and/or economically. The project does not need to be in immediate proximity to existing Reservations or Tribal lands; cultural and religious practices may be associated with other lands.

In addition to federal law and policy governing nation-to-nation consultation, APHIS should be consulting under the principle of the International Indigenous Peoples Doctrine of Free, Prior and Informed Consent (FPIC) before any decisions, or any pre-determined outcomes are made regarding any proposed project, ordinance, policy, agreement, or program that may or will affect Pueblos, Tribes or Indigenous Nations with a nexus to the land affected. FPIC is a specific right that pertains to Indigenous Peoples and is authored and recognized in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) Article 19. Please see Sloan, Meaningful Tribal Consultation, for more. The duty to obtain free prior and informed consent (FPIC) from indigenous peoples is recognized by the

International Labour Organization Convention (“ILO”) 169 and the U.N. Declaration on the Rights of Indigenous Peoples (“UNDRIP”), Articles 10, 11, 19, 28, 29, and 32

Recommendation: APHIS must take the time to engage in meaningful consultation with Tribal Nations with ties to the land proposed for spray while developing the Draft Environmental Assessment, and definitely before a Final EA and FONSI is issued.

APHIS RESPONSE:

APHIS encourages the commenters to read Chapter IV. Environmental Consequences, Section B.4. Tribal Consultation, of the Draft EA. APHIS sent out our draft EA to several tribes in the area (Duck Valley and Fort Hall reservations) and no responses were received.

6. The EA mentions nothing about the significance of Idaho to native pollinators, which as a group are already in worrisome condition and will be further put at risk by the proposed action. Some are facing significant declines. There are at least nine species of Idaho bees and about seven dozen species of Idaho butterflies already at risk. These species cannot afford additional harm.

Bees: The geographic area covered by this EA may be home to ~700 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, health 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 EA.

Pollinators, including bumble bee species that occur in Idaho and are within the range of historic and possibly future treatments, are facing significant declines (National Research Council 2007; Cameron et al. 2011).

Bumble bees as a group, and several bumble bee species endemic to western states are perhaps the best known examples of pollinators in serious decline. Bumble bees are known to be important pollinators on many rangeland plants, including listed plant species such as Ute Ladies' Tresses *(Spiranthes duvialis)*. Scientists recognize serious information gaps about the relative and interacting effects of stressors to bumble bee populations, especially the effects of pathogens, pesticides, climate change and habitat loss (see Graves et al. 2021).

Potential spray areas in Idaho are within the range of several bumble bee species that have experienced declines in abundance and range contractions*: Bombus suckleyi*; *Bombus occidentalis; Bombus morrisoni; Bombus bohemicus; and Bombus fervidus*. The first two (*B. suckleyi* and *B. occidentalis*) have been petitioned for listing under Endangered Species Act and both received positive 90-day findings from the U.S. Fish and Wildlife Service. The APHIS EA did not disclose this fact nor analyze it. *Bombus morrisoni* has also been petitioned for listing and a 90-day finding is due shortly.

The decline statistics and range contractions for these bumble bee species are captured in a valuable IUCN overview of North American bumble bee species (Hatfield et al. 2015). For *B. morrisoni*, its relative abundance is just 17.4% compared to historic values. *B. occidentalis* abundance relative to historic values is only 28.5%. *Bombus fervidus* has relative abundance of only 38% of historic levels, and appears to have been sighted a number of times within the area covered by the EA. See the Bumble Bee Atlas summary results.

In Britain and the Netherlands, where multiple bumble bee and other bee species have gone extinct, there is evidence of decline in the abundances of insect pollinated plants. The decline of native bees is a significant concern and must be taken into account when insecticide applications are under consideration by government or their delegates.

Despite this very real crisis in biodiversity, the EA does not consider the threats that treatments could pose to these dwindling bumble bees or other native bees that are dwindling but not yet on the Endangered Species List. See lists of at-risk bees found in Idaho in **Attachment 1.**

Specific risks to bees from the insecticide diflubenzuron are described elsewhere in this letter. But concerningly, researchers have outlined the many ways in which risk assessments may underestimate risk to native bees by relying exclusively on honey bee studies (see, for example Gradish et al. 2019). Native bees and honey bees have significant life history differences, including the following:

- Honey bee queens do not forage; native bee queens do.
- Honey bee larvae do not eat raw pollen; native bee larvae do.
- Honey bees nest above the ground in hives; native bees mostly nest in the ground.
- Foraging exposure is different; for example, foraging bumble bee adults may experience higher exposure to pesticides due to their ability to be active during weather conditions and at times that honey bees do not forage, and because bumble bee foragers visit more flowers per day.
- Honey bees have well-defined caste systems and very large sizes; most native bees have little or no social organization and nests are very small.

Butterflies: Many of Idaho's native butterflies are already considered at-risk. See lists of at-risk butterflies found in Idaho in **Attachment 2.** Some butterflies are already suffering steep population declines, and the use of insecticides over natural areas puts them at risk.

We discuss the case of monarch butterfly specifically later in this letter, but offer another example here. The west coast lady butterfly (*Vanessa annabella*) which was historically found in many locations in Southern Idaho, is in steep decline. This species was historically common across much of the western U.S, and was locally abundant in some places, but has become increasingly rare across much of its range, despite continued monitoring and an increase in interest and participation in tracking butterflies among community scientist over the last 20 years. Analyses conducted by Forister et al. 2022 demonstrate that *Vanessa annabella* has declined across its range, even in areas of its range with the highest habitat suitability. This same study recently ranked this species as one of the butterflies most at risk of extinction in the next 50 years, eclipsing other imperiled widespread species, such as the monarch butterfly (*Danaus plexippu*s). Additional analyses show that *V. annabella* is observed less frequently in 50% of its range in the recent time period, including areas of historically high habitat suitability.

Both *Vanessa annabella* and *Danaus plexippu*s are in serious decline and both are found in the region that could be impacted by this spraying.

Unfortunately, documented declines for pollinators are just echoes 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).

Even in the face of these concerns, the EA does not consider the threats that treatments could pose to at-risk butterflies. The EA further fails to 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 Idaho 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 EA. 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 EA makes 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 were described in our previous comment letters.

Recommendation: In the face of declining pollinator and insect populations and the existence of federal directives for agencies to support and conserve pollinators and their habitat, APHIS must not conduct business as usual. APHIS should identify the at-risk pollinator species potentially present in the geographic area of the EA (see Attachments 1 and 2) and map their ranges prior to approving any treatment requests. Prior to treatment, APHIS should ensure that it has identified specific, actionable measures it will take to protect the habitat of at-risk pollinator species from contamination that may occur as a result of exposure to treatment.

Some ways to enact protections for at-risk pollinators above and beyond those included in the EA include:

- Survey for butterfly host plants and avoid any applications to host plants.
- Time pesticide applications to avoid exposure to at risk species.
- Do not apply pesticides (especially insecticides) when pollinators (adult and immature) are present or expected to be present.
- Avoid aerial applications.
- Avoid using malathion and liquid carbaryl.
- Ensure use of any chemicals is fully justified and that these site-specific justifications are publicly available.
- Include larger buffers around all water sources, including intermittent and ephemeral streams, wetlands, and permanent streams and rivers, as well as threatened and endangered species habitat, honey bee hives, and any human-inhabited area. Buffers should be sufficient to reduce potential drift deposition to insignificant levels. For example, Tepedino (2000) recommends a three-mile buffer around rare plant populations, as many of these are pollinated by solitary bees that are susceptible to grasshopper control chemicals.

See McKnight et al. (2018) and Pelton et al. (2018) for more.

APHIS RESPONSE:

APHIS understands the commenter's concern the grasshopper suppression treatments may affect pollinators in the treatment areas. APHIS believes our risk analysis sufficiently describes the potential for toxicological effects to bumble bees. The agency's grasshopper suppression program in Idaho can select from two insecticides, carbaryl bait and diflubenzuron. The pollinator exposure scenarios for carbaryl bait suggested by the commenters are extremely unlikely. Diflubenzuron interferes with chitin synthesis, the formation of the insect's exoskeleton, and has no effect on adult foraging insects. Larval pollinators are unlikely to be exposed to the foliar applications at concentrations sufficient to cause toxicological effects because of the ultra low volume application rates. The potential for significant impacts to pollinator populations is further reduced by the small size of the treatment blocks compared to the vast areas of Idaho rangeland and the alternating of spray and no-spray swaths during treatments.

7. APHIS spray protocols are contrary to advisory statements on the diflubenzuron pesticide labels to protect bees. To protect bees and other wildlife, APHIS should cease any use of aerial sprays.

APHIS states 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."*

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." 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 minimize exposure to bees.

The mitigations that APHIS proposes, such as limiting application periods to within two hours of sunrise and sunset may not work for bumble bees. 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. **Moreover, none of the aircraft application records of APHIS applications that we obtained through FOIA showed such a timing restriction, showing that in practice, APHIS does not limit applications to within two hours of sunrise or sunset. Given the timing of application sprays in late spring/early summer, it is also impossible for APHIS to avoid plants in bloom.**

That leaves reduced rates and/or untreated swath widths as the **sole** measures that APHIS implements to reduce risk to pollinators. Yet these measures still result in residue levels that could cause risk to bees (see more detailed comments on risk to pollinators elsewhere in this letter).

Recommendation: We ask that APHIS cease from use of aerial sprays altogether, as these pose excessive risks to pollinators and other wildlife. APHIS must explain how its treatments are in compliance with the pesticide labels, and if necessary, incorporate additional mitigations to ensure that it is not in violation of federal pesticide laws.

APHIS RESPONSE:

The commenter has stated that pollinator populations are suffering significant declines, which APHIS does not dispute. However, the agency does not agree the proposed grasshopper treatments will significantly contribute to those declines.

APHIS understands the commenters are concerned that grasshopper program treatments could cause harmful effects on bees that are exposed to pesticides. While APHIS tries to minimize pesticide exposures to native pollinators, the agency does not claim it will eliminate all harm. The EA and supporting environmental risk analysis predicts those effects will not significantly impact bee populations for the following reasons. If treatments are necessary, the size of the treatment blocks would be miniscule (substantially less than 1%) compared to the amount of rangeland in Idaho.

APHIS believes the use of RAATs mitigates the risk of significant impacts to non-target insects and pollinator populations. 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 18 - 20 of the 2024 Draft EA. Additional descriptions of APHIS' analysis methods and discussion of the toxicology can be found in the 2019 EIS.

Idaho currently only conducts ground treatments at the direction of BLM and would only implement an aerial program under extreme infestation situations at the request of the land manager.

8. The EA understates the risks of the broad-spectrum insecticide diflubenzuron for exposed bees, lepidopterans, dung beetles, and other invertebrates. Diflubenzuron is toxic to pollinators and a broad range of invertebrates as demonstrated in lab studies, field studies and models. APHIS mischaracterizes or minimizes studies that have demonstrated risk, while overemphasizing studies that found little risk.

In its EA, APHIS states:

> *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.*

We dispute this conclusion and present data below that shows that important invertebrates of rangeland ecosystems are put at risk by the use of diflubenzuron.

a) *Diflubenzuron Risk to Bees*

Common practice in risk assessment includes use of models to understand potential environmental concentrations, and comparing these to known toxicity endpoints for species or taxa of interest. Another method is the use of field studies, with controls and/or pre and post treatment assessments to understand treatment effects.

APHIS did not utilize models of exposure in concert with toxicity endpoints to bolster its statement. Models do raise concern for bee mortality and for sublethal effects. As we described in our comments on the 2021 EAs, at either the higher or lower application rates allowed by APHIS, diflubenzuron deposition on flowers and pollen (in the absence of drift or wind) is estimated to range from 1.32 – 1.76 mg/kg (equivalent to 1320-1760 ppb). Adults will collect contaminated pollen and place it in nests for consumption by developing juveniles. Comparing these deposition rates with EPA-reported toxicity endpoints, we determined that diflubenzuron at these rates would pose an acute dietary risk quotient of
4.9 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.

We also utilized diflubenzuron deposition values using the point zero and point 500 feet analyses presented in the APHIS drift analysis included in its 2010 BA to NMFS. Even at 500 feet from the spray, we estimate acute dietary larval RQ as 2.4 and chronic dietary RQ larval RQ as 16.6.

An acute risk quotient (RQ) of 1.0 (or higher) indicates that the estimated environmental concentration is sufficient to kill 50% of exposed bees. The Level of Concern (LOC) is an interpretation of the RQ. Normally the LOC is established at RQ=1.0. However, for acute risk to bees, because of bees' great ecological and agricultural importance, combined with concern about the risks posed to them by pesticides, EPA sets the LOC value at RQ=0.4. Using the deposition estimates above, larval acute RQs range from 2.8 – 4.9 (7-12X the EPA LOC threshold) within sprayed swaths, depending on drift. Outside of sprayed swaths, even 500 foot distant from a spray, the diflubenzuron RQ estimate is 2.4, which is 6X the EPA Level of Concern.

Chronic risk to bees is evaluated with an LOC at RQ=1.0 (USEPA 2014). As indicated in our comment letter from 2021, even at 500 feet from the application site, using APHIS predictions for deposition, chronic RQ is estimated at 16.6. At the release site, assuming drift, the chronic RQ is estimated to be 19.1, assuming no drift it would be 34 at the full rate. Diflubenzuron RQs are thus 17-34X the EPA Level of Concern.

Risk quotients this many times the LOC values indicate a potential for mortality and chronic harm to exposed bee larvae.

Managed bees may also be at risk; data shows 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. APHIS appears to acknowledge the risk to managed bees in the 2024 EA by including notification to all State-registered beekeepers before a treatment, and offering buffers. However, APHIS then provides a contradictory and misleading statement that diflubenzuron is expected to have "minimal risk" to pollinators---the vast majority of which are not managed and cannot be protected by buffers.

The EA effects analysis is incomplete because APHIS left out or misrepresented important studies examining impacts to native bumble bees. For example, APHIS left out any mention of the results found in Graham et al. (2008), the largest field study of diflubenzuron ever conducted in Western rangelands. Graham et al. (2008) found that treated areas resulted in significantly lower abundance of non-ant Hymenoptera (this group includes bees) at two of the three treated sites compared to untreated areas (not higher as APHIS stated in the EA).

APHIS misrepresents an important study of diflubenzuron on bumble bees (Mommaerts et al. 2006). The Mommaerts study found drone production to be cut in half at concentrations **below those that would be expected to result from APHIS program rates—not at higher use rates as APHIS states.** This is an egregious misstatement and should be corrected in the Final EA.

The effects analysis is incomplete with respect to its analysis of the program effects to pollinators because additional studies that examined diflubenzuron impacts to bees are left out of the EA. For example, APHIS does not mention Camp et al. (2022) or Litsey et al. (2021).

Camp et al. (2022) found that *Bombus terrestris* microcolonies fed with diflubenzuron inhibited drone production. Using a similar methodology to Mommaerts, the Camp study found reproductive effects at a lower rate than Mommaerts. Pollen consumption and drone production were both significantly affected by exposure to 100 ppb and 1000 ppb diflubenzuron, which are within the range or below the concentrations expected with APHIS sprays. Drone production was inhibited by diflubenzuron in a concentration-dependent manner; the authors calculated a 42 day IC50 (inhibitory concentration) for drone production at 28.6 ppb.

Litsey et al. (2021) examined the impact to honey bee workers that had been exposed as larvae to chronic sublethal doses of insect growth disruptors. Bees developmentally exposed to diflubenzuron had lower adult survival relative to controls.

Considering that bumble bees (and other native bees) have inherently low fecundity, recovery may be slow in and near suppression areas. As a result, we have concerns that population level impacts could occur to already declining native bees, resulting in potential impact to other species, such as flowering plants.

b) Diflubenzuron Risk to Other invertebrates:

As discussed above, APHIS omitted mention of the results found in Graham et al. (2008), the largest field study of diflubenzuron ever conducted in Western rangelands. In this study, Lepidoptera (butterflies and moths) also showed lower abundances in sprayed zones. Other groups that also perform pollination or contain important natural enemies were affected as well. See the following figure.

Overall, Graham et al. (2008) concluded that Coleoptera, Diptera, Hemiptera, non-ant Hymenoptera, Lepidoptera, Orthoptera, and Scorpiones may be more susceptible to diflubenzuron. Differences between sprayed and unsprayed zones were greater when sampled a year after diflubenzuron application, suggesting that the effect may lag behind application. Non-ant Hymenoptera (a group which includes predatory and parasitic wasps) were significantly lower in treated zones at two out of three treated sites. Ants showed differences at the genus level in their responses to diflubenzuron treatment.
Some genera (for example, *Forelius*) had higher numbers in sprayed zones, while the abundance of other genera (for example, *Tapinoma*) was lower in sprayed zones. *Formica* and *Tapinoma* tended to have lower numbers in treated zones, while *Forelius* and perhaps *Pheidole* tended to increase in treated zones.

Many of the effects noted in Graham were observed 1-year post treatment, a lag effect which is not unexpected since diflubenzuron acts to impede arthropod development, rather than killing adults directly.

Nearly all of the other field studies of diflubenzuron impacts on non-targets cited by APHIS that were conducted in Western rangelands were of very small scale (40 acres or less) or were barrier treatments (not a method currently much used in APHIS rangeland grasshopper suppression). Small acreage studies are of little use in gauging treatment impacts especially to more mobile invertebrates since small tested acres can be easily recolonized from the edges.

Dung beetles, an important group of insects that recycle nutrients, are affected by diflubenzuron. Fincher (1991) found that two dung-burying beetle species exhibited reduced larval emergence seven weeks after diflubenzuron treatment. Domingues and Mendes (2009) found that dung beetle adults exposed to diflubenzuron in manure produced significantly fewer offspring.

Effects to butterflies: Lepidoptera are an important taxa in rangelands, serving as food for birds and pollinating flowering plants. Adults consume plant nectar while larvae eat leaf tissue. Lepidopteran larvae are not relatively protected in nests while developing (like bees are) but are fully exposed to the elements, including pesticide sprays.

APHIS fails to adequately consider the effects that diflubenzuron has on larval butterflies, i.e. caterpillars.

Several studies of diflubenzuron on pest species are identified in Eisler (1992). Eisler identified the following concerning results from published studies:

- In studies on Gypsy moth, all larvae died when exposed at 100 ug/kg food (100 ppb)
- Cabbage moth (*M. brassicae*), 90% larvae died when exposed to 2200 ppb in spray (3rd instar)
- Large white butterfly (*P. brassicae*), 50% of larvae died at 390 ppb.

The results from the gypsy moth and large white butterfly studies were conducted with exposures expected from applications under this grasshopper suppression program, while the cabbage moth study utilized a rate slightly higher than what would be expected from a full rate application with no drift.

Foerster (1992) tested diflubenzuron in the field at 10 g/ha (the equivalent of 0.009 lb a.i./acre—less than APHIS rates), finding that velvetbean caterpillars on treated sites were only 15% as abundant after 10 days as on untreated sites. In a study of diflubenzuron applied aerially to control spongy moth in forests, Martinat et al. (1988) found significant reductions in forest canopy macrolepidoptera on red oak and red maple weeks after diflubenzuron was applied aerially at 70.7 g/ha. Testing half this rate, Butler et al. (1997) also found the abundance of forest canopy macrolepidoptera significantly reduced for two years past the treatment year, after diflubenzuron was applied by air at 35 g/ha (0.03 lb ai/ac). While this rate is above that utilized by APHIS, researchers collected arthropod samples from the low-mid canopy where deposition may have been less, and the persistence of the effect is notable.

The results from Foerster (1992) and Butler et al. (1997) were not identified in the EA when APHIS discussed risk to pollinators, but they lend additional urgency to the need for APHIS to seriously reconsider the effects of diflubenzuron on pollinators and other rangeland invertebrates.

Recommendation: Faced with significant and concerning pollinator declines, APHIS must better account for the risk to native bees and butterflies from these treatments. APHIS should present 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—especially where Species of Greatest Conservation Need are located— and improve its monitoring capability to try to understand what non-target effects actually occur as a result of the different treatments. APHIS must examine the effects of its treatments to a broad range of beneficial rangeland invertebrates (including dung and other beetles) and find more sustainable ways to manage grasshopper/Mormon cricket outbreaks that do not put these beneficial organisms at risk.

APHIS RESPONSE:

Information on the possible effects of diflubenzuron on bees and pollinators is provided in the EA, which is also 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 LC50 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 LC50 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 appreciates the commenter sharing the Impact of Diflubenzuron on Bombus impatiens (Hymenoptera: Apidae) Microcolony Development (Camp et.al. 2020) and applauds the researchers for trying to develop validated methods for assessing toxicity in bumble bees. APHIS disagrees with the commenters' assertion that the tested solutions of diflubenzuron in the supplied syrup and pollen are within the range of the pesticide applied during grasshopper suppression treatments. Diflubenzuron is applied once per year to foliar vegetation and only a miniscule proportion would be to flowers with nectar and pollen. In this experiment the bumble bees were fed syrup and pollen with fresh doses of diflubenzuron three times per week. The same difficulty of applying this study's findings to real field exposures, as is also the case with Mommaerts et.al., 2006, is described below.

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 in the Mommaerts study and 42 days in the Camp study is not expected to occur in the APHIS grasshopper and Mormon cricket suppression program. In field application diflubenzuron exposures would decline 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 season further reducing the risk to pollinators when compared to the current number of applications that can be made in a year to rangeland.

APHIS understands the commenter's concern that using diflubenzuron to control rangeland grasshoppers could affect populations of non-target insects. The U.S. Geological Survey study cited (Graham et al. 2008) did not find direct effects of diflubenzuron on arthropod communities. The researchers concluded, "At the order level, no consistent patterns of difference in proportional representation between treated and untreated sites at any of the three study areas indicate that treatment with diflubenzuron affects nontarget arthropods." The researchers collected data at three rangeland field sites. At one of these study areas, Grouse Creek, they were able to conduct pre-treatment and post-treatment surveys. The other two study areas had been treated the prior year, and so only post-treatment data was collected. At Grouse Creek no significant differences in pre- and post-treatment arthropod numbers occurred within the sprayed zone. Total arthropods did not differ in the sprayed zone. Only Orthoptera showed a decrease from pre- to post-treatment numbers in the sprayed zone, indicating that diflubenzuron did accomplish the management goal of decreasing Orthoptera numbers in the sprayed zone. APHIS appreciates the commenter sharing this study that further affirms the use of diflubenzuron to selectively control grasshoppers and Mormon crickets.
The commenter may have noted the researcher's post-treatment comparisons of unsprayed and sprayed zones showed that spiders and non-ant Hymenoptera were significantly more abundant in the unsprayed zone following application of diflubenzuron. However, there were statistically significant differences in average abundance for the Hemiptera, non-ant Hymenoptera, and Orthoptera in the untreated and treated zones before the treatments.
APHIS wishes to clarify that while the researchers found the average numbers of Lepidoptera, Scorpions, and total arthropods differed markedly in the sprayed and unsprayed zones, but not to the point of statistical significance. The commenter expressed concern that Lepidoptera were more abundant in the unsprayed zone, but the researchers attributed this post-treatment difference to inherent differences in the Lepidoptera communities of the two zones. Based on the findings of this research, APHIS does not believe rangeland grasshopper treatments using diflubenzuron will have significant impacts on the environment.

9. Carbaryl bait risks to bees and other wildlife are not adequately discussed. Carbaryl is also considered a likely human carcinogen by the EPA.

The EA includes updated information from EPA (2017) noting that some evaluations have found half- lives as long as 253 days. This suggests that carbaryl may be far more persistent than previously thought.

Bees: According to EPA (2017b), carbaryl is considered highly toxic by contact means to the honey bee, with an acute adult contact LD50 of 1.1 ug/bee. The APHIS 2019 EA describes the oral LC50 value as 0.1 ug/bee.[1] Larval bee toxicity was not available from the APHIS 2019 EIS.

Carbaryl baits are thought to pose less exposure to bees as the large size of the flakes means most particles would not be collected deliberately. Still, the potential for the bait to dissolve in nectar or for small particles to be picked up incidentally and mixed with pollen exists. Peach et al. (1994) found significant mortality to larval alfalfa leafcutter bees fed with pollen-nectar provisions (30% at 2 mg carbaryl; 18% at 1 mg carbaryl; control had 11% mortality). While the authors concluded that real world exposures would likely be less, they did caution that progeny produced on the day of spraying would be at risk. APHIS did not capture this conclusion in its analysis. Furthermore it is unknown how bait that may fall into ground nests affect bees.

Carbaryl baits pose risks to other insects that play important ecological roles, such as beetles (Coleoptera). Beetles are important for a variety of ecological roles - food for mammals and birds, as dung burial and recycling, and predation on other insects.

Quinn et al. (1991) examined the effects of large scale aerial treatments of carbaryl bait on carabid ground beetles (many of these are predaceous, others eat weed seeds). Baits resulted in large effects on ground beetles, with the most abundant species (*Pasimachus elongatus*, a predator species) declining by 75% in baited areas, while remaining unchanged in untreated areas. The second most abundant species (*Discoderus parallelus,* unknown food habits*)* also declined by 81% in the treated areas, while increasing in the untreated areas.

In a second study examining effects on darkling beetles (Quinn et al. 1990), the authors found that darkling beetles declined 59%. Effects disappeared by the 2nd year. The authors attributed the lack of a carryover effect in the second year to the timing of the control treatments, (they surmised that the beetles had reproduced prior to treatments), and to in-migration into the treated areas).

George et al. (1992) also found carbaryl baits affecting Coleoptera, with biomass diminished both in the short term and a year after application, compared to control areas.

Recommendation: APHIS must recognize the ecological impacts of applications of carbaryl, including applications put on as bait, which remains in widespread use in Idaho. To more effectively target non-mobile species such as Mormon crickets, APHIS should avoid block treatments and focus on barrier treatments. In addition, APHIS should limit its treatments to only areas near cropland, and work with landowners on proven methods to protect their crops as outlined in many extension documents.

APHIS RESPONSE:

APHIS published in 2019 the Final Human Health and Ecological Risk Assessment for Carbaryl in Rangeland Grasshopper and Mormon Cricket Suppression Applications. The assessment analyzes risk of carbaryl in this program. The EPA published a review November 2022, for the label of carbaryl and the response to public comments regarding the use of carbaryl.

The EPA's response to comments regarding the use of carbaryl in APHIS grasshopper program are as follows. "The Agency's Biological and Economic Analysis Division (BEAD) has reviewed technical literature relevant to the USDA APHIS programs aimed at managing grasshoppers, crickets, as well as Forest Service and Park Service management programs aimed at wood-boring *beetles in western US regions. The review concluded that for these uses carbaryl provides important pest control benefits and is one of a very limited set of effective control tactics available. For more information on the consideration of benefits, please see Assessment of Carbaryl (PC Code 056801) Usage, Benefits, and Risk Mitigation Impacts in Non-Crop Use Sites available in EPA's public docket (EPA-HQ-OPP-2010-0230). The Agency also discusses the resistance management role of carbaryl in its memorandum on agricultural uses; for that, please see Assessment of Carbaryl's (Chemical Code 056801) Benefits and Impacts of Potential Mitigation Measures in Agricultural Use Sites also available in EPA's public docket (EPA-HQ-OPP-2010-0230)."*

10. Within the EA, APHIS leaves much ambiguity about how the Reduced Agent and Area Treatments (RAATs) will actually be implemented, compromising the necessary site-specific analysis necessary for the EA.

The problem, both from a NEPA and from an IPM perspective, is that RAATs in the EA is virtually indistinguishable from a conventional application because the EA neither **commits to** a lower dose nor a **minimum untreated swath width**. Indeed, in this EA in Alternative 2 (the RAATs Alternative), the rate shown for diflubenzuron application 1.0 oz/acre is actually the **conventional** rate under APHIS' EIS (APHIS 2019, see page 25). Furthermore the 1.0 oz/acre rate shown is equivalent to 0.016 lb/ai-acre, not 0.012 lb ai/acre as the Idaho EA states.

Therefore, there is no assurance that RAATS will in fact result in the conservation biocontrol outcome that APHIS touts. Moreover, the conservation biocontrol outcome was insufficiently studied in the original Lockwood and Schell study, and results from other studies (for example Graham et al. 2008) throw into doubt whether RAATS in practice actually achieves the conservation biocontrol benefits promised.

Recommendation: APHIS should correct the error in its rate equivalent and more rigorously implement and study the RAATs method. A minimum swath width should be specified, not a maximum, and outcomes under this method should be studied. Also see next comment.

APHIS RESPONSE:

As stated in the EA, Idaho treatments are with <u>ground equipment only</u>, drift associated with aircraft treatments is beyond the scope of the Idaho EA and will not be addressed. The ground treatments conducted typically do not implement the skip-swath method as they are border treatments on land adjacent to crop land or on a single trail or road. The commentor is correct in the statement on 1.0 ounce diflubenzuron equals 0.016 lbs. of a.i. per acre. The change was made in the Final EA.

11. The EA relies too heavily on broad assertions that untreated swaths under the RAATS method will mitigate risk. Untreated swaths are presented as mitigation for pollinators and refugia for beneficial insects, but expected drift from ULV treatments into untreated swaths is not analyzed, while studies that examine effects from similar environmental concentrations are mischaracterized.

While the EA and the EIS suggest that the use of untreated swaths will mitigate impacts to natural enemies, bees, and other wildlife, the width of the skipped swaths is uncertain, as there is no minimum width specified. Instead, the EA states that for ground applications, the skipped swath width is typically 20-45 feet, and aerial skipped swath widths can also vary depending on the kind of aircraft used. No minimum width is presented at all.

APHIS relies on studies that used substantially wider skipped swath widths (Lockwood et al. 2000) to attempt to substantiate its claim that RAATS treatments results in "a markedly higher abundance of non-target organisms following application." But compared to what the EA is proposing under APHIS standard operating guidelines, these studies were more protective:

- In Lockwood et al. 2000, skipped swath widths measured 30.5 and 60 meters or approximately 100-200 feet in the study**.** Obviously, these swath widths are much greater than those that will be utilized under any ground applications proposed in Idaho.
- APHIS also leaves out a key findings of the Lockwood et al. 2000 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.

Lockwood et al. 2000 also leaves important data gaps including:

- 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 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 cites 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. While we have commented on it repeatedly, APHIS has done nothing to fix this over the years.

The reality is that neither the EA nor the 2019 EIS present estimated environmental concentrations (EECs) in the untreated swaths that would result from drift, and simply included statements that untreated swaths would reduce risk to nontargets. Indeed the original paper examining the concept of RAATS for the grasshopper suppression program (Lockwood and Schell 1997) identified drift into untreated swaths from aerial applications as an additional mechanism that could enhance efficacy.

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.

A drift incident in Nevada due to an APHIS diflubenzuron spray in 2019 was recorded, and the state investigation detected diflubenzuron on homeowner plants **more than 1,000 feet** from the spray area perimeter. Due to the documented drift at this distance, the state official who completed the investigation recommended increasing the no spray buffer around any sensitive site to ¼ mile.

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 and on sensitive adjacent lands. Ground-based ULV applications were studied in the field by Schleier et al. (2012), on sites with little vegetative structure and a flat topography, similar to many sites that could be treated by APHIS. The authors observed that an average of only 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 that only 1 to 30% of the insecticide sprayed deposits on the ground within 100 m (328 ft) of the spray source.

According to drift experts, the most important variables affecting drift are droplet size, wind speed, and release height (Teske et al. 2003). The Dimilin 2L label does not require a minimum droplet size 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 (VMD of 137.5). For example, for ULV applications used in adult mosquito control operations, VMD measures between 8 and 30 μm and 90% of the droplet spectrum should be smaller than 50 μm (Schleier et al. 2012). EPA estimates VMD for ULV applications as 90 μm (USEPA 2018).

APHIS Program treatment guidelines (included as an appendix in the EA) 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 will “provide additional benefits” or significantly increase the survival of pollinators or other beneficials within the treated blocks. It is essential that APHIS conduct a rigorous assessment of drift into untreated swaths and compare that to toxicity endpoints for representative species.

Recommendation: APHIS should rethink its blithe statements that its current implementation of RAATs will mitigate risk to sensitive insects, plants and other wildlife – it is overstating the evidence. APHIS should work with independent researchers to rigorously measure and analyze drift from its applications. Based on such research, APHIS should commit to minimum untreated swath widths wide enough to meaningfully minimize exposure to bees and other beneficials. APHIS must use science-based methodologies to assess actual risk from the proposed treatments and institute untreated swaths that would ensure meaningful protections for bees and other beneficials. APHIS should disclose its quantitative analysis and the EECs it expects--by distance-- into untreated swaths for each application method it proposes. APHIS must also specify in its operational procedures the use of nozzles that will result in droplet spectra that accord with its analysis.

APHIS RESPONSE:

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.

12. Freshwater mussels are at risk across the country and need particular attention.
The Dimilin label indicates that the product is toxic to mollusks.

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.

Recommendation: As discussed elsewhere in these comments, diflubenzuron presents a risk of runoff to aquatic systems months after application. APHIS must disclose impacts to at-risk mussels where they are present. In addition, APHIS should use larger buffers to protect freshwater mussels, such as those designated for listed salmonids in other states. In addition, APHIS should include monitoring for the presence and health of mussels in streams that traverse or are adjacent to treatment areas as part of its monitoring strategy.

APHIS RESPONSE:
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. Diflubenzuron has not been used in Idaho since 2019, and we do not anticipate using it as BLM has not authorized the use of this product in our program.

13. The EA fails to state that nearly all species of fungi examined contain chitin. Absent from the EA is any discussion of how diflubenzuron could affect fungi within the affected landscape and the cascading effects on rangeland ecosystems.

Chitin is the second most abundant natural polymer after cellulose (Jimenez-Gomez and Cecilia 2020). In addition to being part of arthropod exoskeletons, chitin is found in nematodes and fungi, in fact, nearly all fungi contain chitin as part of their cell walls (Abo-Alsoud and El-Kady 2019). Fungi are vital components of rangeland ecosystem, with a "profound influence" on ecosystem resilience and invasion resistance in rangelands, according to a recent paper by Hovland et al. (2019). Fungi contribute to plant community structure by facilitating nutrient cycling and uptake, contributing to soil structural stability, and mediating plant competition (Hovland et al. 2019).

Diflubenzuron inhibits fungal growth and development (Ramos et al. 2013; Zhou et al 2017). In the EA, APHIS neglected any mention of the potential for diflubenzuron applications to affect fungi and by extension, plant communities.

***APHIS RESPONSE*:**

APHIS anticipates that any impacts to fungi in rangeland that are treated with diflubenzuron will be reduced by the use of RAATS and the small areas of treatment relative to the total area of rangeland that would be left untreated. Fungi that are sensitive to diflubenzuron impacts would recolonize these areas after treatment and degradation of the insecticide. Aerobic and anaerobic soil half-lives for diflubenzuron are typically short reducing the time that fungi would be exposed to soil concentrations that could result in potential effects. The sensitivity of fungi to diflubenzuron is variable with impacts to some fungi but not to other species in toxicity studies. This was noted in the Ramos et al. 2017 paper referenced in the comment and the 2004 diflubenzuron risk assessment prepared by the U.S. Forest Service that summarized toxicity study results testing various fungal species. Diflubenzuron is also registered by the EPA Office of Pesticide Programs as a pre- and post-emergent insecticide for use on edible fungi.

14. The EA fails to meaningfully analyze the risk to grassland birds, many of which are declining.

Lack of attention to vulnerable birds: The EA does not discuss the dozens of species on the state Species of Greatest Conservation Need (SGCN) list for birds (or other taxa) in Idaho, even though many of these species could occur in the area identified for potential treatment. Some, such as grasshopper sparrow sagebrush sparrow, and various gulls are important predators on grasshoppers (Wiens and Rotenberry 1979; Petersen and Best 1986; Forbush 1907), and addressing their contributions and conservation needs would have shed important light on grasshopper suppression activities.

A recent study estimated a net loss of nearly 3 billion birds since 1970, or 29% of 1970 abundance in North America (Rosenberg et al. 2019). It is critical to recognize that grassland birds—an important group of species that extends well beyond the iconic sage-grouse—have suffered the largest decline

(53%) among habitat-based groups since 1970, while populations of six species of grassland birds (Baird's sparrow, Cassin's sparrow, Chestnut-collared longspur, lark bunting, Sprague's pipit, and McCown's longspur) have declined by 65-94%. This is never disclosed in the EA nor considered in the cumulative effects analysis.

Habitat loss is a huge driver of declines, yet pesticides still play a role (Hill et al. 2014), especially if their prey is affected. Birds are themselves 'free' insect control as described above hence negative effects for birds could actually increase insect pests. The use of broad-spectrum insecticides and other pesticides has been repeatedly found to impact bird populations via declining insect populations, including a study which "demonstrated that the use of fertilizers and pesticides had reduced the abundance of insects, with consequences for the abundance of insectivorous bird species…" (Møller et al., 2021).

Bird use of grasshoppers as prey: As a group, terrestrial birds rely heavily on grasshoppers and other insects for food. McAtee (1953) examined 40,000 bird stomachs and reported that >200 species prey on grasshoppers. Within western rangeland, scientists have recorded dozens of birds that prey on grasshoppers and Mormon crickets (Knowlton and Harmston 1943; La Rivers 1941). Other biologists have quantified the percent grasshopper or cricket matter within breeding bird's diets, finding high levels for a wide number of passerines (Wiens and Rotenberry 1979; Adams et al. 1994; Boyd 1976; Baldwin 1972).

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 Greater sage-grouse, Swainson's hawk, long-billed curlew, sage thrasher, grasshopper sparrow, Sprague's pipit, Baird's sparrow, chestnut-collared longspur, and others.

The importance of bird predation on grasshoppers and Mormon crickets is exemplified by the Mormon settler historical accounts, leading ultimately to Mormons honoring gulls in Temple Square. According to historical records, gulls helped save crops of the settlers from outbreaks of Mormon crickets and grasshoppers in the early years of their settlement within the Great Basin.

A variety of studies have also documented that bird predation does reduce grasshopper densities, from 26-80 percent (Bock et al. 1992; Fowler et al. 1991; Joern 1986; Branson 2005; McEwen et al. 1996).

Lack of substantiation of RAATs as a sufficient method to reduce risk to birds: Despite the strong linkage between grasshoppers and the health of rangeland bird communities, APHIS claims that use of RAATS (again not strictly defined in Alternative B therefore very squishy in its possible implementation) would leave an adequate prey base for these birds. However, in a contradictory statement, the EA simultaneously states that RAATS only reduces grasshopper mortality slightly compared to conventional application.

Based on the drift information we have seen and presented elsewhere in this comment letter, and the likelihood of at least short-term effects to the prey base that is documented in a variety of studies, we question the conclusion that even RAATs treatments within the habitat of declining bird species would not be likely to have a significant impact. Some of APHIS' 2023 EAs in other states acknowledged that the use of diflubenzuron will reduce immature insects up to 98%. This is a damning indictment of the actual harm of this chemical.

Risks of diflubenzuron and carbaryl bait to bird prey: Though direct effects on birds from these chemicals are listed as not likely by APHIS in the EA, the indirect effects on vertebrates are not wholly accounted for.

Wiens and Rotenberry (1979) studied the prey composition of passerine birds of North American grassland and shrubland ecosystems, finding that, on average, passerine nestlings of these ecosystems consume biomass comprised of grasshoppers/crickets (29% of dietary biomass), beetles (24% of dietary biomass) and butterfly/moth caterpillars (23% of dietary biomass). They noted that *"The importance of Lepidoptera (butterflies and moths), Orthoptera (grasshoppers and Mormon crickets), and Coleoptera (beetles) to passerine nestling diets is consistent across a range of North American grassland and shrubland ecosystems."*

APHIS dismisses the idea of impacts to birds by proposing that birds will prey-switch, but what do birds switch to when their three main insect food group are affected by the insecticides used by APHIS? Based on toxicology studies, negative effects to these important insect groups are anticipated under the APHIS programs as described elsewhere in this comment letter, even when RAATs is employed.

Impacts to the avian prey base can result in more serious impacts, such as increased energy expended to find food, reduced brood size, or inability for birds to use the area. Adams (1994) found that vesper sparrows with nests on plots treated with carbaryl bait foraged significantly further from the nest.

Johnson (1987) found that insect reduction as a result of rangeland grasshopper control reduced brood size in a wild sage-grouse population. Meadowlark populations on grasshopper-treated plots consistently decreased at 10 and 21 days post-treatment (George et al. 1995).

Sample et al. (1986) examined the effects of diflubenzuron exposure to nine species of forest songbirds finding that birds were affected indirectly through reduced availability of Lepidoptera larvae. Birds possessed differing capabilities to compensate for these diflubenzuron-induced food reductions. Most birds adjusted by switching prey, while others consumed less food.

Recommendation*:* APHIS must address the potential for indirect impacts to rangeland birds, factoring in the noted declines documented for grassland birds, looking closely at how the scale of treatments may impact populations, and considering the cumulative impact of insecticide exposure to prey in combination with existing stressors already impacting these imperiled birds.

APHIS RESPONSE*:*

APHIS agrees that habitat loss has caused declines in grassland bird populations, and notes that program treatments help rangeland uses remain economically viable options for land managers and livestock producers. As was noted by the literature cited by the commenter (Hill et.al., 2014) habitat loss rather than acute insecticide exposure was many times better at predicting those declines.

The commenter assumes that there are widespread treatments in Idaho. However, this is not the case; treatments only occur in relatively small, isolated areas adjacent to cropland or small band areas near roads and trails. Birds are highly motive predators and will search for prey beyond the boundaries of a treatment area. The use of carbaryl bait to control grasshoppers, which is the most likely alternative to be selected by the program will have minimal impacts on lepidopteran prey of these grassland birds.

Sage grouse areas are excluded by buffers provided by land manager and these areas are avoided. In areas where large sage is present, due to the thick nature of the stands all such habitat has always been excluded from treatment areas, because it is impossible to treat using ground equipment.

15. APHIS must utilize cultural, physical, and biological methods—not just chemical methods—when conducting pest management, as required by federal law. In addition, the Plant Protection Act requires APHIS to engage in prevention of grasshopper and Mormon cricket outbreaks, not just suppression.

In its most recent Environmental Impact Statement (EIS), APHIS acknowledges that "the best grasshopper management strategies are preventative in nature and are long-term efforts that are designed to head off, rather than combat, outbreaks." Nonetheless, APHIS failed to articulate such long- term strategies and instead focused solely on the use of insecticides in its EIS, as well as in the Idaho 2024-26 EA. To meet the sustainability challenges we face, APHIS should work with public land managers to maintain landscapes less favorable for grasshopper outbreaks. Aspects of this are discussed in more detail below.

***APHIS RESPONSE**:*
APHIS disagrees with the commenters' interpretation of the Plant Protection Act of 2000 and other statutes encouraging agencies to utilize integrated pest management. APHIS is not violating federal law by treating grasshopper outbreaks with insecticide. In addition to chemical suppression methods, APHIS also provides technical assistance to land managers, neighboring private landowners, and the public on a variety of options including cultural and mechanical methods to suppress infestations. In many situations, APHIS may recommend treatment option A, no treatment as listed in the EA.

16. APHIS fails to acknowledge the important role of natural enemies in natural regulation of grasshopper and Mormon cricket populations, fails to evaluate the effect of its insecticides on natural enemies, and never analyzes the possibility that its suppression effort may actually worsen future outbreaks of grasshoppers. As a result APHIS overlooks important preventative vegetation management measures that could be very important in accomplishing its goals.

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. For example, Capinera and MacVean (1987) suggest that Mormon crickets are preyed upon by approximately 50 species of birds, rodents, and reptiles. See discussion on bird predation of Orthopterans elsewhere in this comment letter.

Parker and Wakeland (1957) examined 238,000 soil samples across 16 study areas in 7 states, finding that an average of **18% of grasshopper egg pods were destroyed annually by the larvae of invertebrate predators**, including bee flies (Bombyliidae), and ground beetles (Carabidae), and blister beetles (Meloidae).

Respected researchers Lockwood, Kemp, and Onsager wrote*: "Although the degree of natural control exerted by parasites and predators of grasshoppers is not well documented, available evidence indicates that substantial regulation of grasshoppers by beneficial insects may exist."* (Lockwood et al. 1988).

While it may be difficult to consider and manage for all these natural enemies, plant species composition and structure is important.

According to the Rangeland Management section of the Grasshopper IPM handbook (Cunningham and Sampson 1996-2000) 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.

Within Section VI.1 of the Grasshopper IPM handbook, Onsager noted: "*chemical control is but one of several available management options and is not universally the most economical tactic.*"

Chemical suppression of grasshoppers runs the very real risk of disrupting important natural regulation processes, potentially setting the stage for worsened outbreaks in the future. For example, elimination of "non-pest" grasshoppers generated this concern from ARS scientist David Branson and collaborating researchers:

> *The overwhelming majority of grasshoppers killed in control programs are not causing the problem and may be beneficial."* (Branson et al. 2006)

Branson et al. (2006) also noted that the Grasshopper IPM Project (Cunningham and Sampson 1996-2000) concluded with an urgent need to develop management solutions that focus on outbreak prevention rather than suppression and urges a greater focus on management of rangeland vegetation rather than primarily managing grasshopper densities.

The possibility that chemical grasshopper control can worsen future outbreaks was 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. Researchers warned about the potential for treatments to worsen outbreaks in the Grasshopper Integrated Pest Management 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."*

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 treated areas. Of these, grasshopper populations in 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 claims that its treatments have insignificant effects on non-Orthopteran insects, including the natural enemies of grasshoppers and Mormon crickets. But APHIS often stretches science to the point beyond credulity. 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 scavenger 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.

In contrast the field study of large scale applications by Graham et al (2008) found significant effects to important natural enemies of grasshoppers, including Diptera, and non-ant Hymenoptera. These groups contain important predators and parasitoids of grasshoppers and other organisms. These are the very organisms that help regulate grasshopper populations.

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 instars*[2] *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 and 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 malathion (and possibly carbaryl), it could have quite a different effect than the two chemicals examined by Quinn et al. 1991. Therefore, this study cannot be relied upon to assume that recovery would be similar to recovery under a carbaryl or malathion treatment.

Recommendation: In its EA, APHIS must address the role of natural enemies, their ability to regulate grasshopper populations, and the risk to these natural enemies posed by chemical treatments. APHIS must not stretch the science beyond where it is credible. APHIS should work with its research arm and research partners to conduct meaningful research exploring natural enemies, competition, and other natural processes that hold the potential of regulating grasshopper populations without the use of chemicals.

APHIS RESPONSE:

The commenter states that "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." APHIS agrees with the assertion. In fact, that "competition with other grasshoppers" is caused by the destruction of their food sources by over-foraging due to overpopulation of the grasshoppers themselves. Today rangeland is managed for conservation to benefit wildlife, sensitive species and livestock. APHIS consults with range managers to determine if grasshopper/Mormon cricket suppression is necessary to preserve range plant continuity. Overabundant orthopteran populations can be reduced without the danger of losing the range forage which is necessary to feed other species. This is the reason that Congress mandated that APHIS help range managers and landowners suppress "competing" grasshoppers in order to preserve range plant resources.

The commentor suggests that no efforts have been made in identifying natural enemies or allowing them to be an alternative means of control. Research is conducted on an ongoing process by various groups on alternative suppression and biological controls. However, certain grasshopper species and Mormon crickets have the propensity to increase in large populations in continued years, particularly with minimal suppression efforts being employed on a small, restricted area. These large populations have resulted in infestation levels well beyond the ability for natural predation to reduce below an economic threshold.

Another assertion states 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)."

The science does not support the substance of this comment, including a thorough reading of the ARS cited source. For other citations it is not clear how applicable they are, such as how they would apply to the specific application methods being proposed. When grasshoppers are in outbreak conditions, they are generally only limited by disease and climatic conditions, not predators or parasitoids which become quickly satiated, as it well established in literature, including the ARS developed IPM handbook.*

The quote taken from the ARS publication, which APHIS frequently provides to cooperators for IPM reference, is given out of context and does not apply to the proposed work in the way that is implied, for the following reasons:

- *There is a strong distinction between low-productivity land which: Can be damaged by low densities of grasshoppers; but is generally controlled by trophic means (pests, predators and disease); and may want to be treated by land manager but is often not advisable for various reasons (including the specific long-term effects cited), and is usually discouraged by APHIS.*
- *Mid-productivity, a hybrid of the two extremes. APHIS does not typically control grasshopper infestations on mid-productivity rangeland, unless they are part of a larger strategy.*
- *Finally, high productivity sites where in essence, grasshoppers are never controlled by trophic webs, except for them not having enough food to eat, or weather conditions making them very vulnerable. The generally available amount of food makes control by trophic means not scalable even under poor*

conditions. These are the situation that warrant control in New Mexico, where high productivity meets grasshopper population booms and natural enemies do not respond in scale, regardless of land management decisions or treatment history.

We agree that protecting beneficial species is an important part of crop and rangeland management, and that treatment of low-productivity sites where grasshoppers can be limited by natural enemies may do more long-term harm than good. It should be noted the selective insecticides and use of the RAATs method by the APHIS grasshopper program limits population level effects on beneficial non-target species. However, we also agree with the further points in the ARS publication which state that in other situations, especially where ample food is available for grasshoppers, that natural enemies play an insignificant role in providing any level of control under most climatic condition.

17. APHIS must strengthen its collection and presentation of environmental monitoring data.

The EA states: "*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.*"

Yet, if 2021's Environmental Monitoring Report is any indication, APHIS has a long way to go to achieve the goal of assuring that any environmentally sensitive sites are protected. The report on the 2021 spray program reveals that APHIS collected only 2 water samples, even though treatments that year were applied over a footprint of more than a million acres. It is unclear from the report whether cards were placed vertically, horizontally, or at an angle, of what material they were made, whether the distances shown were from the edge of the treatment block or not, whether samples were collected downwind and downstream or at a different orientation to the flow of air and water, etc.

Given the 2019 investigation in Nevada on a drift incident and the official's verification that drift had occurred more than 1,000 feet, it is very important that APHIS strengthen its procedures.

Recommendations: APHIS must strengthen its procedures, place drift cards beyond 1,000 feet, explain its methods more clearly, provide maps of monitoring points relative to spray blocks, describe the orientation of each card and the wind speeds range during each spray event where monitoring was conducted, and provide a statistically defensible number of monitoring samples. In addition, these reports should be made available to the public without having to resort to a FOIA. Environmental monitoring protocols could be strengthened by allowing public review of a draft report.

APHIS RESPONSE:

The Environmental Monitoring Reports prepared by the PPQ Environmental Compliance Unit are not rigorous scientific studies with control, duplicate and blank samples collected to prove or disprove hypothesis. APHIS considers the careful examination of the treatment blocks and identification of sensitive sites to be one of our primary monitoring objectives. When program managers determine collection of chemical residue samples can or should be collected, the available program personnel are assigned these tasks. Often the field technicians are seasonal or temporary hired employees with only brief training on sample placement, documentation and preservation procedures. The publishing of draft versions of the monitoring reports would cause confusion about the nature and extent of the *monitoring effort among the engaged stakeholders as this commenter's written expectations have made clear.*

Laboratory grade dye cards are placed near sensitive sites, typically at the far extent of the 500-foot water buffer. The orientation of the dye cards should be toward the treatment block, but they are not rigid and bend in the wind. APHIS has improved the sample documentation by providing timely trainings but agrees more information from field personnel engaged in the monitoring would be beneficial to the report analysis. Program managers must make difficult personnel resource allocation decision to ensure the safety of program operations and collection of chemical residue samples are not always the best use of field personnel. Again, the careful examination of the rangeland near and within treatment blocks for sensitive sites by field personnel in most cases sufficiently satisfies our environmental monitoring objectives.

18. For APHIS and its cooperative land management agencies, fully understanding system factors that may be contributing to grasshopper or Mormon cricket outbreaks, and building resilience into the system should be the key goal.

In Idaho, ecological disturbance, especially shrub loss and conversion to annual grasslands, is associated with increased densities of pest grasshoppers, as noted by Fielding and Brusven (1993):

> *"Grasshopper assemblages on sites dominated by annual vegetation were characterized by relatively high densities, low species diversity, and high proportions of species with broad diet breadths. Introduced perennial grass seedings were characterized by a high proportion of grass- feeding grasshopper species and high species diversity. Sagebrush–grass sites were characterized by lower grasshopper density and high species diversity. These results, obtained under generally low grasshopper densities, suggest that rehabilitation of annual grasslands with perennial grasses and shrubs, and protection of endemic plant communities, can contribute to more diverse grasshopper communities with lower proportions of pest species."*

Moreover, on page 29 of the Oregon 2024 Grasshopper suppression EA, APHIS states: *"Nonnative plants, including invasive weeds such as annual grasses (e.g. cheat grass, venenata), annual forbs (e.g. diffuse knapweed, Scotch thistle, yellow starthistle), perennial forbs (e.g. Canada thistle, Russian thistle, leafy spurge, white top), and woody plants (e.g. Russian olive, tamarisk) are common in areas prone to grasshopper outbreaks and may help to support these populations."*

Such root causes—vegetation community alteration and disturbance—should be analyzed and addressed. But the Idaho EA makes no mention of what is most sorely needed: cooperation and planning with land managers to take appropriate steps in vegetation management to prevent the types of grasshopper and cricket outbreaks that are now dealt with by chemical controls.

To fully embrace its mission, APHIS and its land management partners must go beyond **noting** such associations (between invasives, disturbed and annual grasslands, and grasshopper outbreaks) and take the next step. This would include actively working to support land management methods that can counteract habitat conditions conducive to outbreaks, including countering invasives and supporting ecological restoration of perennial, native vegetation communities. 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.

As mentioned above, according to the Rangeland Management section of the Grasshopper IPM handbook (Cunningham and Sampson 1996-2000) 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 sanguinipe*s 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. While we don't endorse any particular grazing strategy, this is an issue APHIS should have carefully considered. APHIS should also consider whether reducing the number of AUMs authorized, or eliminating grazing entirely, would be a reasonable alternative to repeated applications of toxic chemicals to large swaths of land.

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, 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.

Recommendation: The operating guidelines state "*landowners requesting treatment are encouraged to have implemented IPM prior to undergoing treatment.*" This does not go far enough. APHIS must elevate the expectation of preventative approaches in its cooperative agreements with other land management agencies. APHIS can collaborate with agencies (such as the Natural Resource Conservation Service (NRCS), the Farm Service Agency (FSA), and State Extension program) to facilitate discussion and disseminate information to ranchers about preventative measures that can be taken on private land and alternatives to pesticide use. On public lands, APHIS and its collaborating agencies should investigate and implement opportunities to incentivize healthy range management practices.

APHIS and its partners should be approaching the problem by keeping a focus on the potential to reduce grasshopper carrying capacity by making the rangeland environment less hospitable for the pests.

APHIS must not take a limited view of its role and responsibilities, and should utilize any available mechanism to require land management agencies to diminish the severity, frequency and duration of grasshopper outbreaks by utilizing cultural management actions. For example, Memoranda of Understanding (MOUs) should be examined and updated to ensure that land management agencies are accountable in utilizing cultural techniques to diminish the carrying capacity of pest species.

Longer-term strategic thinking should include:

- Prevent conditions that allow grasshopper and Mormon cricket populations to reach outbreak conditions by employing diverse management techniques (e.g., biological, physical, and cultural).
- Implement frequent and intense monitoring to identify populations that can be controlled with small ground-based pesticide application equipment.
- If pesticides are used, select active ingredients and application methods to minimize risks to nontarget organisms.
- Monitor sites before and after application of any insecticide to determine the efficacy of the pest management technique as well as if there is an impact on water quality or non-target species.

APHIS RESPONSE:

APHIS is not specifically tasked with these land management responsibilities, however the ARS IPM website—cited by the commentor above—is shared frequently with public and private land managers, and the general understanding of the most practical IPM science available is included whenever possible in outreach efforts. As stated previously however, APHIS does not agree that there are always viable alternatives to selective pesticide use during grasshopper outbreaks, rather the alternative to non-action is often simply a continued and prolonged duration of damaging grasshopper populations, which are potentially limiting to the health and flora species abundance of the ecosystems in general.

The comments comparing rotational grazing to season long grazing are valid concerns. APHIS supports such management practices. However, the rotational grazing practices in Idaho by the ranchers are not under the control of APHIS grasshopper program and APHIS only responds to the large outbreaks associated with the rangeland forage damage when requested by landowners in written form. The research the commenter referenced concerning biological control and other nonchemical methods are not valid APHIS management practices presently since more data is needed. Fire management of rangeland is not controlled by APHIS and would have to be implemented by landowners or land management agencies.

APHIS is not expert in land-management practices – the respective land managers are. APHIS does make integrated pest management (IPM) recommendations, with respect to practices that help impede grasshopper and Mormon cricket outbreaks. But APHIS is mandated by the Plant Protection Act of 2000 to help land managers treat damaging populations of orthopterans when IPM or cultural practices are not sufficient.

APHIS, for the above reasons, encourages range managers to "prevent conditions that allow grasshopper and Mormon cricket populations to reach outbreak conditions by employing diverse management techniques (e.g., biological, physical, and cultural)." APHIS "Implement(s) frequent and *intense monitoring," through its seasonal statewide surveys, "to identify populations that can be controlled with small ground-based pesticide application equipment."*

In Idaho, APHIS only conducts treatments on federally managed lands. Our treatment efforts are restricted to ground treatments only and under the direct involvement and guidance of the land manager. APHIS conducts pre and post treatment surveys to monitor efficacy of efforts. Unfortunately, APHIS has been restricted to small scale treatments in select areas, as a result of these limited suppression efforts, populations of certain species have significantly increased in recent years.

19. APHIS Should Have Included a Scoping Report within the Draft EA.

We were excited that the Idaho APHIS office opened a scoping period in December 2023 prior to releasing a Draft EA. However, we were puzzled and disappointed that the Draft EA included no summary of the scoping comments Idaho-APHIS received. Including a scoping summary to identify the key issues raised is an important and standard part of NEPA, especially since publicly identified issues and concerns should influence both Alternatives design and impact analysis.

Recommendation: We ask that APHIS include a scoping summary at its website and within the Final EA.

APHIS RESPONSE:

APHIS received 126 comments during the scoping process via email on the development of our draft EA. The majority of these comments (115) were from public citizens in opposition to the use of chemical treatments on public land. The large majority of these comments were a "cut and pasted" response that was an identical letter received from the Xerxes Society. Seven responses were in favor of chemical suppression efforts with a few restrictions.

20. Overall Transparency and Public Engagement Efforts of the APHIS Grasshopper / Mormon Cricket Suppression Program Must Be Improved.

In 2023, a proposed New Mexico spray attracted broad public controversy. A key issue for the public that doomed last year's spray was the fact that APHIS had chosen not to be transparent about its actions, even on public lands.

The spray was cancelled at the last minute because the Bureau of Land Management withdrew, citing insufficient advance public involvement and faulty environmental documentation.

The mess could have been avoided had APHIS simply been more transparent and forthcoming with the public about its plans.

Grasshopper suppression efforts, especially those on public 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 avoid claims 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.

Recommendation: It is not too late to invite the broader public into the process. We recommend a broadly advertised public meeting that includes leaders of conservation and recreation groups before the 2024 EA is finalized. We also recommend that, in the future, notice of open public comment periods for all site-specific EAs for grasshopper suppression be posted in the Federal Register, and documents made available for review at regulations.gov and at the APHIS grasshopper website. All the signatories to this letter request notice on environmental review of future applications for pesticide spraying in Idaho. In addition, we make the following recommendations to increase transparency and invite public participation:

- Actual proposed treatment areas should be mapped and shared with the public when each state APHIS office submits its treatment budget request. Special status lands and sensitive designations should be disclosed on these maps.
- Later refinements to locations should be mapped and shared with the public prior to treatments.
- Nymphal survey results should be provided as soon as available and prior to treatments, in map and table form (counts by species at each survey point, not total counts by survey point).
- Economic threshold analysis needs to be conducted and disclosed especially for treatments on public lands.
- Consultation documents, including APHIS' transmittal to the Services describing the listed species, APHIS determinations, and APHIS rationale for those determinations, should be shared with the public in the draft EA, along with the concurrence letter if it has been transmitted to APHIS.
- Results of environmental monitoring associated with treatments (i.e. drift cards, water samples) should be disclosed.

APHIS RESPONSE:

APHIS is very proactive in involving the public in the process. Idaho published a scoping document in December 2023 requesting input as well as sent out numerous emails to interested stakeholders regarding our EA and other program information. We received input from the public, environmental groups, County Commissioners, Idaho Congressional offices, and land managers in relation to a variety of suggestions and requests. APHIS publishes the EA, NEPA documents and consultation concurrences on the USDA website. All program forms, survey and treatment data are shared with land managers in print and in ongoing meetings.

APHIS is obligated to protect the privacy of agricultural producers (ranchers) and landowners. APHIS cannot publish actual treatment locations, site specific grasshopper survey data, and economic threshold analysis. The Agricultural Improvement Act of 2018 includes Section. 1247. Data On Conservation Practices. This section specifies that defines the term 'privacy and confidentiality requirements' means all laws applicable to the Department and the agencies of the Department that protect data provided to or collected by the agencies of the Department from being disclosed to the public in any manner except as authorized by those laws. The Food Conservation and Energy Act of 2008 specifies "the Secretary, any officer or employee of the Department of Agriculture, or any contractor or cooperator of the Department, shall not disclose - (A) information provided by an agricultural producer or owner of agricultural land concerning the agricultural operation, farming or conservation practices, or the land itself, in order to participate in programs of the Department; or (B) geospatial information otherwise maintained by the Secretary about agricultural land or operations for which information described in subparagraph (A) is provided."

21. **The EA includes only chemical control alternatives to respond to high grasshopper or Mormon cricket density events. APHIS fails to analyze other reasonable alternatives that could address any harm experienced by rangeland producers, such as buying substitute forage for affected leaseholders.**

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 outcomes, so it is important that the EA 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 EA contains 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 carefully and 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 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.

Recommendation: APHIS should include a reasonable alternative to chemical suppression, such as buying alternate forage for affected landowners, including through cooperative agreements with other agencies, if necessary, since the PPA doesn't address this specifically. Given the many other values of, and ecosystem services provided by, public lands, it only makes sense to consider such an alternative. Another reasonable alternative is not treating public lands. In addition, APHIS should separate the conventional from the RAATs method into two different alternatives, and analyze them accordingly.

APHIS RESPONSE:

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. APHIS informs cooperators about options of suppression, purchasing forage, or no action during public meeting presentations.*

22. The EA explains away APHIS' failure to adequately involve, inform, and notify the public about plans to apply insecticides to public lands with an absurd explanation that its options are limited. Moreover, the EA also does not adequately analyze impacts to the affected environment.

APHIS states in the EA:

> *"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."*

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 explained in the EA, APHIS only conducts treatments after receiving requests, which also help guide nymphal survey efforts. 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. Finally, to approve an application, APHIS must make a determination that the project meets an economic threshold determination, and complies with the Endangered Species Act and other federal laws. Therefore, any spray is the result of long planning process. As such, there is no valid reason for APHIS not to share maps of higher probability treatment areas by the Final EA or as soon as such information is available, and certainly it is not asking too much to post that information publicly upon preparation of a contract solicitation or final spray decision.

We appreciate that the APHIS office in Oregon publishes survey data and reports week by week which also assists the general public in understanding which areas are being assessed, what grasshopper/ Mormon cricket pressure may be, and where treatments are being considered. We suggest that Idaho's APHIS office do the same.

The Draft EA indicates that treatments will be limited to federal public lands in Southern Idaho. As such, APHIS could and should have done a more thorough job in analyzing the effect to sensitive areas or species locations within the specified counties.

The EA also does not address why and whether grasshopper numbers are rising or falling relative to historic patterns. While we appreciate the inclusion of a map in the Draft EA showing treatment locations, it would be more meaningful to describe this information over a longer time period such as 20-30 years, relative to the particular environmental conditions of areas, including fluctuations that occur from year to year.

Unfortunately, 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 species-specific 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 ascertain impacts to critical ecological and social resources, APHIS should provide the treatment request areas with the EA, even if actual treatments end up less than these.

Recommendation: In our comment letters on previous years' EAs, Xerces has repeatedly requested to receive a copy of maps and acreages of all final treatment areas. However, APHIS has neither provided those (except, in some cases for some states under formal FOIA requests) nor provided a reasonable explanation about why these taxpayer funded applications are necessary to keep secret.

We represent organizations that work to represent organisms without a voice—that could be impacted by the proposed actions either directly or indirectly. As such, we consider ourselves "stakeholders" and hereby request to be included among those whom APHIS informs of its proposed treatment areas once those are determined. We also ask to be informed if the season ends and there have been no treatments conducted by APHIS or outsourced. It is time to end the secrecy around the extent and location and timing of these treatments.

We urge APHIS to delay the publication of a decision until all treatment areas have been delineated and are identified to the public, using maps and providing acreage. Site-specific information related to the resources and values of these locations should then be included. This would provide the public with a much better understanding of the justification for the treatment, the actual number of acres to be treated and their location, the method to be used, and the scale of potential effects to local resources. This specific information should be posted at the APHIS website as soon as it is available, sent to interested parties, and made available for public comment.

If APHIS chooses to finalize its EA and publish a decision and FONSI earlier, it should at least provide its best estimate of where treatments will occur based on requests, nymphal survey information and historical treatment data, and describe the affected environment and anticipated environmental consequences in those areas with greater detail.

In future years, we urge APHIS to delay release of the EA until after treatment requests are received and all treatment areas have been delineated and identified to the public.

APHIS RESPONSE:

APHIS regularly engages with the public about areas experiencing outbreak grasshopper and Mormon cricket populations. Previous year adult surveys can be used to predict areas of high populations, but one year's survey data does not always directly correlate to current populations. Many variable factors may significantly impact developing nymphal populations. Furthermore, grasshopper populations are mobile and can migrate into areas that were not forecasted to have outbreak populations.

The analyses of the EAs cover most areas in the state that have the criteria outlined above. However, it is impossible to know exactly where these treatments will occur in advance. APHIS uses the EAs to capture the variability in these rural locations and can then work with local governments and federal *partners to rapidly respond to the public needs for treatments. APHIS only treats where land managers request suppression efforts and and exclude any areas where land managers request an exclusion. Public is notified of treatments to the best of our ability via meetings with local governments and direct notice to those in the immediate treatment areas.*

APHIS is obligated to protect the privacy of agricultural producers (ranchers) and landowners. APHIS cannot publish actual treatment locations, site specific grasshopper survey data, and economic threshold analysis. The Agricultural Improvement Act of 2018 includes Section. 1247. Data On Conservation Practices. This section specifies that defines the term 'privacy and confidentiality requirements' means all laws applicable to the Department and the agencies of the Department that protect data provided to or collected by the agencies of the Department from being disclosed to the public in any manner except as authorized by those laws. The Food Conservation and Energy Act of 2008 specifies "the Secretary, any officer or employee of the Department of Agriculture, or any contractor or cooperator of the Department, shall not disclose - (A) information provided by an agricultural producer or owner of agricultural land concerning the agricultural operation, farming or conservation practices, or the land itself, in order to participate in programs of the Department; or (B) geospatial information otherwise maintained by the Secretary about agricultural land or operations for which information described in subparagraph (A) is provided."

23. The cumulative effects analysis is insufficient.

There is insufficient analysis of cumulative impacts in the EA.

In the EA, APHIS states that cumulative effects associated with the Preferred Alternative *"are not expected to be significant"* basing its reasoning on the assertion that the probability of an outbreak occurring in the same area as a previous outbreak is unlikely. Yet there are contradictions to this statement even within this EA, as a look at the map in Appendix E shows. On this map, overlapping and adjacent treatment areas in different years are evident, especially in Owyhee and Adams counties.

The EA also does not discuss in any meaningful way the potential negative cumulative effects contributed by treatments on nearby private, county, or state lands within southern Idaho over these years. These are important to consider in a cumulative effects analysis since species don't care who applies the insecticide. Indeed, the state of Idaho provides for free insecticide to suppress grasshopper and cricket populations on private lands.

APHIS also places emphasis on the fact that its policy dictates that only one treatment a year is conducted, but does not address nearby private, county 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.

Certain locations across the West do appear to experience repeat outbreaks. Schell and Lockwood (1997) examined decades-long patterns of outbreaks in Wyoming and were also able to map higher-probability outbreak areas.

APHIS mentions applications by other partners in only one context – highlighting that many products could be used on private lands and stating that the impact of these private lands uses could be worse if the APHIS program did not exist. While, due to the reasons outlined above, this is not the only concern stemming from applications outside the APHIS program, the argument also does not consider another alternative – what the impacts might be if chemical control were not the *primary* solution considered by APHIS.

APHIS also does not give serious consideration to the potential impact of its grasshopper insecticides co- occurring with other pesticides in the environment. Pesticide use is widespread. For example, there is no discussion of how herbicide treatments (common on federal land) combined with insecticide treatments on federal land, or treatments conducted *nearby*—pesticides applied to crops by farmers, for instance— might interact with APHIS's treatments. Either additive and/or synergistic effects could occur if non- targets are simultaneously exposed to insecticides, fungicides and/or herbicides (Cedergreen 2014). And the exposure does not have to happen on the same land—many insects and other wildlife move and forage over a range of thousands of feet to miles. Mixtures of pesticides on plants, in water, in air, in soil and the bodies of insects are the norm, not the exception, and should be considered and analyzed particularly with respect to focal non-target wildlife (Mullin et al. 2010; Cedergreen 2014).

In addition, impacts to migratory species from cumulative exposures (such as honey bees which are in large part transported to California during the almond bloom) are not addressed.

Recommendation: To have an adequate understanding of cumulative impacts, APHIS must more thoroughly disclose where spraying has occurred in the past, and what impacts have resulted, as part of the current condition assessment. APHIS must also analyze cumulative impacts considering declining species, as these species will be more vulnerable to negative effects resulting from the treatments.
APHIS must consider cumulative exposure to any migratory species, especially those that merit more intensive consideration due to their legal protections, ecological importance or economic importance. APHIS must also take into account grasshopper management that is led by other agencies or private partners, and the combined effects of these on resources of concern.

APHIS RESPONSE:

The EA currently contains a historical treatment map although the information contained in this map is only of APHIS efforts. In Idaho, treatments frequently occur that are not monitored by APHIS as other agencies as well as public individuals conduct treatments. APHIS does not have authority to make decisions for other agencies or have access to their data. The insecticides used by the program do not persist in the environment and the use of RAATs methods allows beneficial insects to recolonize treated areas while suppressing the more mobile herbivorous grasshoppers. The commenter's concerns about cumulative effects are unfounded and certainly do not raise to the level of significant impacts.

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. Harmful effects to nontarget species that migrate from areas treated for grasshopper outbreaks by APHIS to and from areas treated with insecticides and herbicides by third parties are not expected to cause significant impacts to those animal populations.*

24. Use of "Emergency" Explanation to Avoid More Site-Specific Assessment of Impacts is Indefensible and Groundless

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

> *The emergency response aspect is why site-specific treatment details cannot be known, analyzed, and published in advance.*

The emergency explanation is indefensible when this program is given an annual budget and when grasshopper outbreak dynamics are reasonably well known. The Grasshopper IPM Project and subsequent studies did much to advance knowledge about grasshopper cycles and areas more prone to outbreak. Also, see Cigliano et al. (1995) which identified areas most prone to outbreak in Montana, and Schell and Lockwood (1997), which did the same in Wyoming.

Even though it disclosed a map of recent treatments within Idaho, APHIS did not bother to take a closer look at impacts to these areas' values and ecological, scientific, or recreational resources, which are considerable.

While APHIS may reasonably assert the need to respond quickly, that does not excuse ignoring existing information or refusing to provide environmental disclosures as required by NEPA.

Recommendation: APHIS must use the best information available to more thoroughly examine and disclose potential impacts in the areas most likely to be subject to treatments.

APHIS RESPONSE:

As noted earlier, APHIS regularly engages with the public about areas experiencing outbreak grasshopper and Mormon cricket populations. Previous year adult surveys can be used to predict areas of high populations, but one year's survey data does not always directly correlate to current populations. High variability of abiotic factors at a local level can significantly impact developing nymphal populations. Furthermore, grasshopper populations are mobile and can migrate into areas that were not forecasted to have outbreak populations.

Beginning with public meetings, APHIS is open and transparent with the public about what our surveys found last year, where we expect outbreaks to be possible this year, and any areas that could be impacted by grasshoppers or Mormon crickets.

The analyses of the EAs cover most areas in the state that have the criteria outlined above. However, it is impossible to know exactly where these treatments will occur in advance. The need for rapid response is akin to an emergency for rural communities who are significantly impacted by the economic damage caused by these pests. APHIS uses the EAs to capture the variability in these rural locations and can *then work with the land manager to rapidly respond to the public needs for treatments. Areas that meet the criteria, express a need and desire for treatments, and collaborate with APHIS have the potential to receive rapid response emergency treatments of the area when funds are available. APHIS only treats where land managers request suppression efforts and and exclude any areas where land managers request an exclusion.*

25. Statements on the effects of grasshopper damage are improperly supported.

In the EA, APHIS asserts that under some outbreaks, vegetation damage is so severe that all grasses and forbs are destroyed, impairing plant growth for several years, but provides no evidence to support this assertion. Furthermore, APHIS claims that grasshopper feeding results in soil drying which results in erosion, disruption of nutrient cycling, water infiltration, seed germination and other ecological processes. This assertion that grasshopper outbreaks lead to erosion, soil damage, and disruptions of rangeland ecosystems is based on a single study examining the effects of an outbreak of an introduced grasshopper in Hawaii in a non-rangeland ecosystem (Latchininsky et al. 2011). There are no data demonstrating similar extreme effects of grasshopper outbreaks in western rangelands, which have evolved with periodic grasshopper outbreaks. It is not appropriate to use the example from Hawaii in this context as justification for chemical treatments.

Recommendation: APHIS must substantiate its statements using science that is appropriate for the sites that will be treated under these EA, and avoid any impression of bias.

APHIS RESPONSE:

APHIS acknowledges that Hawaii is the location of one study. Potential soil disruption is one of many reasons suppression may be considered.

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

APHIS liberally employs relative language to create an impression of low risk. For example, in numerous locations in the environmental consequences section of the EA, APHIS described risk as "reduced." Reduced compared to what, exactly? The inexactness and lack of specificity of such statements make the EA of little utility for a person trying to determine the actual predicted impacts of insecticide spray on large blocks of Western rangelands and do not provide an accurate scientific assessment.

Recommendation: APHIS must be more clear, specific, and careful about how it describes risk. The use of relative terms such as "reduced" should be avoided unless APHIS is very clear about the factors and results being compared.

APHIS RESPONSE:

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. Other uses of the word "reduced" do quantify it's use.

27. It is not at all clear that treatments are always economically justified, as they should be under the Plant Protection Act.

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 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.

Perhaps because state offices have so little guidance regarding how an economic infestation is determined, we see contradictions in official statements about the frequency and distribution of "economic" damage.

The courts have held that "when an agency chooses to quantify the socioeconomic benefits of a proposed action, it would be arbitrary and capricious for the agency to undervalue the socioeconomic costs of that plan by failing to include a balanced quantification of those costs." *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1175, 1196–97 (D. Colo. 2014); *Motor Veh. Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983); *see also WildEarth Guardians v. Bernhardt*, CV 17-80-BLG-SPW, 2021 U.S. Dist. LEXIS 20792, *30 (D. Mont. Feb. 3, 2021).

It is unclear if the economic analysis that the PPA appears to require from APHIS is intended to include a quantitative assessment of ecological costs. The ecological costs of treatment are not quantified in the EA but as we have pointed out, are numerous, and there is no evidence that they are not significant

APHIS claims that treatments can reduce the likelihood of future outbreaks but this claim is not supported by evidence. Treatments are unreliable at thwarting outbreaks in subsequent years (Blickenstaff et al. 1974; Smith et al. 2006; Cigliano et al. 1995). At best, insecticide treatments may stem damage to forage and crops in the current year.

The EA did not include APHIS' protocol for delineation surveys to identify treatment areas. We are aware that APHIS encourages landowners to "sign up" for treatments in advance of nymphal surveys. Without inclusion of about how APHIS selects nymphal survey points, how it determines which nymphal survey points are above threshold, and how APHIS extrapolates between survey points when delineating treatment blocks, we do not have an adequate understanding of the actual distribution of grasshopper and Mormon cricket outbreaks, and whether treatments are always justifiable.

To conclude, we have concern that unjustified treatment may be occurring, with repercussions for sensitive ecological systems.

Recommendation: APHIS should consider explicit regulations that identify the economic factors to be considered in determining an economic infestation exists, and provide opportunities for the public to review the evidence for such economic infestations prior to any treatments.

APHIS RESPONSE:

This comment questions the worth of grasshopper suppression on rangeland and it is difficult to parse out which of the demands it places on APHIS are possibly grounded in actual law. The commenter makes a primarily fiscal argument against social or political decisions APHIS is not empowered to *make. NEPA requires environmental risk analysis, and it is not clear that APHIS has to demonstrate economic analysis in an Environmental Assessment. This political argument and could certainly proceed in other venues, however in the interest of explaining the purpose and need for grasshopper suppression APHIS will provide the following clarification.*

Treatment requests are received before the survey season begins, but they are very dynamic and can change week-to-week. Arbitrarily publishing requested treatment locations in the draft EA would not accurately reflect future treatment actions. Treatment locations on public land cannot be described accurately in the EA because the exact location is only known after nymphal surveys are conducted. Grasshopper nymphal stages generally develop every 5-12 days depending on environmental temperature. If draft EAs are published after nymphal surveys dictate treatment locations the grasshopper life stage would advance to the point that treatments with diflubenzuron could no longer take place.
The potential treatment area is described in the EA, unless the commentor would prefer knowing exact details of an area that would need treatment over the demand of the public to have economically and ecologically effective treatment (e.g. spraying broad spectrum pesticides in July in an area the public has had time to review in detail). This is not how modern Integrated Pest Management (IPM) science best management practices work, and would not be in anyone's best interest, certainly not the publics.

28. APHIS has not demonstrated that treatments in Idaho will meet the "economic infestation level." No site-specific data or procedures are presented in the EA to satisfy APHIS' own description of how it determines that the "economic infestation level" is exceeded. While it may be premature to do so at this date since grasshoppers and Mormon crickets are not yet hatched out, the EA offers no procedures to assure that such economic justification will be done and available for review prior to any treatments.

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.*

APHIS identifies many parameters to be considered in its case-by-case economic determination. However, it's not clear how these are captured and used in practice to inform treatment decisions. In the 2024-26 EA, APHIS should at least set forth its procedures for capturing and using the information necessary to make a treatment decision. But no analysis or procedures are provided, so it is unclear how APHIS, in practice, determines that suppression programs are or will be warranted economically.

It seems that APHIS considers the economics by only one measure – the value of livestock forage. Even this value, fairly easily obtained, is not presented in the EA or assessed in context. While APHIS mentions variables that might result in an economic damage scenario, APHIS does not discuss these variables further, nor is site-specific data presented for any of these factors, nor are procedures shown that APHIS intends to abide by to determine when an economic threshold is exceeded. Instead the reader is left to simply assume that all treatments obviously meet the economic threshold. This is a problem overall, and especially in the case of treatments for Mormon crickets. There is evidence that Mormon cricket rarely pose a significant risk to livestock forage plants (MacVean 1991).

This lack of assessment of the variables that APHIS says it uses is compounded by the problem that on the measure that APHIS does actually use – grasshopper or Mormon cricket densities, this measure is misused. APHIS collects data on mostly nymphal populations in the spring to determine where treatments will occur. But it appears that **nymphal densities are incorrectly being compared to density thresholds developed for adult densities** years ago (8 per square yard). Adult densities and nymphal densities should not be conflated. In fact grasshopper scientists have noted that the appropriate nymphal density may be many times the adult density before reaching threshold. In fact, under "average conditions" Torrell and Huddleston (1987) estimated the density of 4th-instar grasshopper nymphs would need to exceed 23/square yard before reaching an economic threshold.

Recommendation: Available data suggest that APHIS does not have adequate support to demonstrate that it treats only after lands reach an "economic infestation" according to its own definition, at least on federal lands. In addition, there appears to be insufficient support to demonstrate that APHIS will meet an economic threshold before treating. APHIS should develop written procedures for analyzing an economic threshold. It should move away from a simplistic binary determination that is outdated. It should develop appropriate nymphal densities "thresholds" for use rather than adult densities – and these should be used in context with the other variables that APHIS has outlined as important.

APHIS RESPONSE:

The EA noted that Idaho uses the population density of 8 per square yard and 3 per square yard of Mormon crickets. However, many other factors contribute to determination for economic threshold for any particular treatment, they may include; type and value of crop protecting, treatment equipment access near cropland and alternative application methods, and public response and concern.

29. Treatments on public lands are not economically justifiable when compared to grazing fees.

A general IPM principle is that pesticide treatments should only occur if it is judged that the cost of the treatment is less than the additional revenues expected to be received for the product.

On public lands, from a taxpayer point of view, it makes sense that—since 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 treatment costs per acre can be obtained from previous treatments. 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.

Information from a summary of treatments conducted across Western states in 2017, 2018, and 2019 shows treatment costs for treated acres ranging from $4.43-$35.00 (2107); $9.34-$45.44 (2018), and $2.70-$35.60 (2019). While the Oregon legislature was considering an emergency appropriation to reimburse private landowners for grasshopper/Mormon cricket treatments, an analyst's report indicated that costs of treatment were estimated at $7-$10/acre (Oregon Legislature 2021). 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.

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, shows that in many parts of Southern Idaho, it takes from 15-30 acres of rangeland to support one animal unit-month (AUM). Currently, on federal BLM and Forest Service lands, the US taxpayer receives $1.35 per AUM. Utilizing the mean of the carrying capacity range (22 acres per AUM), and calculating the value of the forage per acre as paid to the American taxpayer, the US taxpayer currently receives an estimated $0.06 per acre for the forage value on BLM or USFS federal rangelands. Livestock permittees on federal lands are also provided with USDA-FSA Livestock Disaster Forage Program funds if there are natural events that impact their herds.[3] These funds reduce the economic impact of infestations for permittees and this should have been considered in the EA. Additionally, federal agency actions providing additional economic support for this already heavily subsidized industry at taxpayer expense must be carefully considered, analyzed, and disclosed to the public.

Given that the direct costs of grasshopper treatments to the taxpayer appear to range from $2.70 up to $45.44/acre, it is clear that the economic threshold is nowhere near being met, at least on federal lands. The program makes no economic sense from the point of view of the taxpayer. Within the project area the EA should have identified which allotments in the project area were vacant, which would further reduce the economic benefit of treating these lands.

Recommendation: On federal lands, costs of protecting the forage should be compared to the revenues received for the program. In addition, if insecticide applications are proposed to suppress grasshoppers, APHIS should also explore other options as an Alternative in the EA, such as buying substitute forage.

We are aware that public lands are sometimes treated as a way to protect adjoining private lands. This is troubling; public lands should not be subjected to large-scale treatments to protect private interests.

APHIS RESPONSE:

This is a similar comment made earlier. See response to comment #27 above.

The assumptions made in the analysis provided by the commenter are an overestimate incured 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, the cost of treating noxious weeds *often introduced by hay, etc. The replacement feed costs in Idaho greatly out way any treatment costs accrued by the agency.*

30. The USFWS has completed its programmatic consultation on the USDA-APHIS suppression program. However, buffers designed to achieve a "Not Likely to Adversely Affect" determination are based on faulty assumptions that do not reflect information in the APHIS Final 2019 EIS, nor the 2019 Record of Decision (ROD) for the Final EIS. As a result, the buffers concurred to by FWS are smaller than actually needed.

No Biological Assessment is included within the Idaho Draft EA for 2024-26, however, we appreciate that the Draft EA did include some reasoning and a description of the buffers to protect listed and certain candidate species.

Since the Draft EA was released, the USFWS and APHIS have completed national programmatic consultation on the program. From our reading of the new national consultation, it appears that **FWS concurred with the BA based on assumptions that do not correspond with the preferred alternative selected in the Final EIS (APHIS 2019). In the following paragraphs we explain why these assumptions ignored important information in the Final EIS and its Record of Decision.**

a) **The consultation assumed that the rates of application are not greater than the RAATs rate specified in the EIS.** However, Alternative 3 (*Insecticide Applications at Conventional Rates or Reduced Agent Area Treatments (RAATs) with Adaptive Management Strategy*) was APHIS' preferred alternative and the one selected under the Record of Decision for the Final EIS in October 2019. In fact, in the ROD, it is stated: "*USDA-APHIS chose the adaptive management (alternative 3) approach for addressing grasshopper outbreaks in the 17 Western states. This approach involves the application of insecticides at USDA-APHIS conventional rates or RAATs* [emphasis added] *to suppress grasshopper outbreaks…. USDA-APHIS chose the adaptive management approach (alternative 3) because it is a suppression program that provides several treatment options that afford flexibility and site specific adaptations in managing grasshoppers in affected areas."* (ROD, page 3, emphasis added)

b) **The consultation assumed that skipped swaths will measure 150 feet. But this assumption does not correspond with information in the FEIS.** Page 34 of the FEIS states: *"There is no standardized percentage of area that is left untreated…. 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."* This is also evident when looking at the USDA-APHIS Aerial Application Manual, which lays out how aircraft size influences swath width. Idaho's Draft 2024-26 EA also acknowledges the same point, writing: *"For aerial applications, the recommended skipped swath width is typically no more than 100 feet for carbaryl and diflubenzuron. However, many federal government-organized treatments of rangelands tend to use a 50% skipped swath width, meaning if a fixed-wing aircraft's swath width is, for example, 150 ft., then the skipped habitat area will also be 150 ft."*

Hence, under its current national (and state) programs, APHIS permits flexibility in applications. Reduced rates under the RAATs methodology **may occur but are not required** under the selected EIS alternative; local managers may specify up to the full conventional rate, and may even eliminate skipped swaths, according to their discretion.

The newly completed consultation effort is flawed because it does not start from the actual application scenarios that are permitted under the ROD. Instead, it proceeds from the speculative assumption that APHIS managers will always choose the least amount of pesticide and the most amount of skipped swatch available.

As such, we fear that the program may result in unintended take of listed species and we urge the Idaho-APHIS office to adopt more protective buffers.

In addition, the consultation is unclear as to whether the buffers are intended for known occurrences or for suitable habitat. Protecting known occurrences with buffers may not be sufficient. Instituting adequate buffers around "suitable" habitat, not simply "occupied" habitat is more protective, and warranted for listed species within the range of a spray, especially those that are more widespread, not well-surveyed, or particularly rare.

As mentioned elsewhere in this letter, drift of insecticide has been measured for at least 1,000 feet. Knowing this, buffers of less than 1,000 feet from known occupied habitat will likely expose listed species.

Recommendations: Given the flaws in the consultation outlined above and the documentation of drift for at least 1,000 feet, the Final EA for Idaho's 2024-26 program should protect the habitat of all listed species from applications of liquid insecticide with a buffer measuring no less than one-quarter mile. For listed plants, the larger buffers of three miles as described in the Draft EA makes sense to protect their necessary pollinators. Furthermore, instituting adequate buffers around "suitable" habitat, not simply "occupied" habitat, is important for protecting rare and vulnerable species. APHIS should also consider upstream and watershed effects for aquatic species, and institute protections to guard against flushes of pesticide into their habitats. APHIS should also ensure that it has done due diligence in being aware of listed species or their habitat present on private land by asking specifically about this when gathering treatment requests.

APHIS RESPONSE:

The programmatic BA at the national level was completed and the letter of concurrence was signed March 21, 2024. The commenter is mistaken about the pesticide application rates used in the risk analysis and the untreated swath widths. The BA describes an "APHIS Full Rate" which has been called the "conventional" application rate in this EA and other program NEPA documents. For example, that rate is 0.016 pounds diflubenzuron active ingredient per acre sprayed (i.e., no skip swaths). The BA uses instead the more realistic and yet conservative "APHIS Maximum RAATS Rate" in which 0.012 pounds diflubenzuron active ingredient per acre are sprayed (i.e., no skip swaths).

APHIS maximum RAATs rates assume 100% coverage at a reduced application rate compared to the full rate while the average RAATs rates reflect those where a reduced rate and coverage have been used in actual treatments. - Revised Biological Assessment for the APHIS Rangeland Grasshopper and Mormon Cricket Suppression Program, January 2024.

For example, the diflubenzuron analysis is based on total coverage of an area, <u>without skip swaths</u> at 0.012 pounds diflubenzuron active ingredient per acre. Therefore, the commenters' concerns about the variable width of skip swaths where no pesticide is sprayed are unfounded. In addition, the BA does describe the variable widths of those swaths during treatments, "There is no standardized percentage of area that is left untreated." Although again, the risk analysis in the BA does not include or model a treatment with no-spray swaths.

The commentor refers to the buffers initiated by USFWS in their concurrence. We agree these buffers are different, however, in Idaho we have agreed to follow the land manager buffer recommendation which are much larger and restrictive than suggested by the USFWS.

31. APHIS should enact firm, protective policies to protect sage-grouse chicks from negative effects of program insecticides.

Greater Sage-grouse has seen its range cut in half and its population decreased 93 percent from historic numbers. Invertebrate food is essential for chick development and survival; 100% of chicks deprived of insects between days 4-10 died (Johnson and Boyce 1990).

Numerous observational and crop studies by early ornithologists noted feeding by Greater sage-grouse on Mormon crickets, including eggs (Wakeland 1959). Peterson (1969) identified Coleoptera, Orthoptera, Hymenoptera (primarily ants), and a variety of unidentified and immature insects as the most frequent components of sage grouse chick diets in Montana based on crop analysis. Within the Northern Great Basin, Gregg and Crawford (2009) identified Lepidoptera as important components associated w/ chick survival. In southeast Idaho, a study of the food items ingested by 44 Greater sage- grouse chicks found grasshoppers, ants and beetles were important constituents (Klebenow and Gray 1968).

Unfortunately, most of these insect orders could be at risk if chick rearing areas are not fully protected under the plan. Studies of diflubenzuron in the field show impacts to a wide array of insects used by sage grouse chicks for food, including grasshoppers, Coleoptera (beetles), Hymenoptera (bees, wasps, saw flies, ants), true bugs, and Lepidoptera. As described above, studies of carbaryl bait suggest it has significant impacts to beetles.

Although an agreement is in place to prevent ESA listing, FWS provides conservation recommendations to prevent populations from being further threatened. In the 2021 concurrence letter provided by USFWS for the Oregon EA, FWS provided the following information and recommendations:

> *Insect reduction as a result of rangeland grasshopper control has been found to reduce brood sizes in a wild sage-grouse population (Johnson 1987). In order to reduce the reliance on insecticides for control of rangeland grasshoppers, Johnson (1987) recommends the use of "Integrated Pest Management" (IPM) for control of rangeland grasshoppers. IPM uses naturally occurring pest controls such as weather, disease, predators, parasites, physical and chemical control, as well as habitat modification to keep grasshoppers from surpassing intolerable levels (Johnson 1987). In addition, sage-grouse brood areas should be located if not already known, and protected from insecticide spraying (Johnson 1987). Grasshopper control should also be delayed in brood-rearing areas to allow for maximal chick development before spraying reduces their insect forage (Johnson 1987). The Service recommends APHIS use these guidelines to avoid*

pesticide spraying of nesting and brood-rearing areas for sage-grouse in order to prevent further declines from current sage-grouse population levels.

While APHIS's 2024 Idaho EA makes little indication of how it will use IPM to help prevent rangeland grasshoppers (see our comments above on the issues with RAATs), protecting sage-grouse brood areas from insecticide applications is the right choice.

We appreciate that within the Draft EA, APHIS commits to no suppression activities within areas that BLM identifies as critical to protect within brood-rearing and nesting areas. However, it is unclear if these currently protect all known leks. Most chick rearing happens within a certain distance of leks, and due to chick dependence on insect food, these are the areas that are especially important to protect. We request that no spraying occur in the general habitats which is where important leks also occur.

***Recommendation**:* APHIS should implement strong protections for sage-grouse in keeping with BLM, state and regional conservation strategies. APHIS should implement firm no-treatment buffers around leks. We also request that no spraying occur in the general habitats. There is too much risk from the use of diflubenzuron and from carbaryl bait (outlined elsewhere in this comment letter) to allow its use within chick-rearing areas.

APHIS RESPONSE:

In Idaho, APHIS follows the avoidance restrictions put in place for Sage grouse in accordance with BLM. The EA states "APHIS will abide by the protective measures in the June 24, 2016 BLM Instruction Memorandum No. 2016-115 and IB ID-2018-014. APHIS will also exclude and buffer any areas identified as occupied by maps provided by the land manager". No treatments for grasshoppers are being conducted in areas identified by the land manager where Sage Grouse are located.

32. The monarch butterfly is now a candidate species under the Endangered Species Act, but the preferred alternative is vague about protection for their host plant, milkweed, from pesticide exposure.

The EA appears to recognize that protecting caterpillars on milkweed is an important conservation strategy, but does not clearly outline exactly how milkweed will be surveyed and protected in areas where sprays could occur. Habitat suitability modeling for monarch butterfly in the counties covered by this EA shows there are large concentrations of potentially highly suitable monarch habitat in Idaho within the area potentially subject to grasshopper suppression (Dilts et al. 2018).

The species is possibly under greater threat than previously thought; new information shows that at monarch overwintering sites in Mexico, Eastern populations of the monarch dropped by 59% to a new low, while western monarchs are also continuing to decline. This information must be taken into account and more protective measures taken. Lepidopteran species are often quite sensitive to diflubenzuron, as documented elsewhere in this comment letter, therefore, impacts to this highly diminished species from diflubenzuron should be specifically analyzed.

Currently the EA provides for a half-mile buffer from aerial sprays and a 500 foot buffer from ground bait applications to protect "documented Monarch occurrence areas." Given the potential for drift from aerial applications, robust buffers should also be put into place from any known **milkweed sites or areas suitable for milkweed to grow**, even if monarchs have not been documented from such sites.

Recommendation: We urge you to rethink and strengthen conservation measures for monarch butterfly. We recommend that APHIS survey for milkweed in all treatment areas, and implement larger buffers that would sufficiently protect milkweed from drift, even if only using ground applications. Any use of liquid insecticides warrants buffers from milkweed stands or areas where these may potentially occur. In order to limit harm to monarch, a species in steep decline, we recommend a similar buffer as that used for listed plants: three-mile buffers from known or potential milkweed stands for aerial applications and a 1-mile buffer from known or potential milkweed stands for ground applications to provide a reasonable margin of conservation protection. Even these measures would not be able to protect migrating monarch who are nectaring outside of milkweed stands.

If APHIS is unable to survey for milkweed, known and modeled habitat maps are available from at least three sources: Waterbury et al. 2019; Dilts et al. 2019; Western Monarch Milkweed Mapper.

APHIS RESPONSE:

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 USFWS 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.

Although not required, APHIS has agreed to include utilize a 500-foot buffer for Carbaryl bait near any identified and mapped locations of milkweed. APHIS currently uses a digital mapping application (Quick Capture) for ground applications and all sensitive species identified by the land manager is included for areas of avoidance, as a result no treatments have been made where Monarch hosts are identified.

33. Recent national consultation efforts (including a Biological Opinion) for carbaryl effects to listed species show the potential for widespread harm and even jeopardy.

The EA does not mention a recent nationwide consultation effort on carbaryl's effect to listed species. In March 2023, National Marine Fisheries Service (NMFS) released its Biological Opinion on carbaryl, finding grave harms from the chemical including determinations of jeopardy to 37 species. This is an extraordinary indictment of the chemical and finding of harm.

EPA released a final BE for carbaryl to cover non-anadromous species in March 2021 (EPA 2021). This BE made determinations of Likely to Adversely Affect (LAA) for 1,640 species and 736 species' critical habitats. The BE includes a documentation of a variety of effects to birds, mammals, insects, bees, fish, aquatic inverts, and plants. While the consultation has yet to be fully completed, these determinations are an indicator of widespread impact from use of this chemical. Mitigation under APHIS' program should be designed to eliminate, not just avoid, harmful effects from this very toxic chemical.

Species in Idaho that are likely to be adversely affected by use of carbaryl, as determined in the BE, are nowhere mentioned in the APHIS EA, and it is unclear if the recently completed FWS consultation considers the EPA 2021 BE.

Recommendation: Given the many ESA-listed and unlisted fish within the potential spray area, APHIS must examine the Biological Opinion authored by National Marine Fisheries Service, and rethink its applications of carbaryl bait. Larger buffers around waterways and streamcourses would be the most obvious immediate measure to take. For other ESA-listed species, APHIS should examine the EPA BE cited above, and implement appropriate measures to protect these species from harm that could be caused from carbaryl applications.

APHIS RESPONSE:

The Endangered Species Act section 7 pesticide consultation process between the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (the Services, collectively) and the EPA specifically concerns FIFRA pesticide registration and reregistration in the United States, including all registered uses of a pesticide. The state-level and programmitic Biological Assessments for APHIS invasive species programs are separate from any consultations conducted in association with pesticide registration and reregistration process. The Agricultural Improvement Act of 2018 (Farm Bill) created a partnership between USDA, EPA, the Services, and the Council on Environmental Quality to improve the consultation process for pesticide registration and reregistration. USDA is committed to working to ensure consultations are conducted in a timely, transparent manner and based on the best available science. The Revised Method for National Level Listed Species Biological Evaluations of Conventional Pesticides provides a directionally improved path to ensuring that pesticides can continue to be used safely for agricultural production with minimal impacts to threatened and endangered species.

APHIS provided information about use of carbaryl to EPA for the FIFRA consultation for carbaryl. The Grasshopper Program use of carbaryl has in the past comprised substantially less than 1% of the percent crop treated (PCT) for rangeland use of carbaryl. This is the case for the reasonably foreseeable future. For rangeland, in the EPA BE, the Grasshopper Program's very low usage was rounded up to <1% PCT, which gives an overestimate of rangeland acres treated and thus endangered species risk. APHIS use of carbaryl is even smaller compared to all uses of carbaryl nationwide. Further, the Grasshopper Program consults directly with the Services to ensure program activities do not adversely affect protected species or their critical habitat.

In Idaho, APHIS only uses carbaryl bait for a treatment option at the reduced rate of 0.20 pounds of active ingredient per acre. Because of our buffer efforts near water, diligence, and the small amount of rate of application, APHIS feels that the use of carbaryl bait is not likely to adversely affect fish or other sensitive species.

34. Potential for Sprays to Impact Lands Where Organic or Transitioning Production Occurs

The general treatment guidelines for 2024 state: *"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."*

We are concerned about the potential for drift and runoff to certified organic or transitioning lands. Certified organic farmers who receive drift, even if unintentional, would risk losing certification for three years. The USDA Risk Management Agency does not include pesticide drift or contamination as an insurable event for transitioning or organic growers, meaning that unintentional pesticide exposure resulting from label-approved use is not insurable. That would mean these producers would also lose any income from those acres, and they would then have to manage affected lands completely separately from other unaffected acres.

Organic producers place a large emphasis on improving biodiversity on their lands, per the National Organic Standard. Many organic farmers approach this by establishing or conserving permanent pollinator and native habitat – an effort that can take years.

The general guidelines, crafted for the program as a whole, and included in each state's EA, leave a number of questions about notification and avoidance of impacts to organic or transitioning producers, including:

- It is unclear if each state maintains a complete registry of organic and transitioning producers, and if that registry is spatially referenced. Many producers farm land in disparate locations. There are a number of certifying organizations across the west, not just the states. It is unclear if these different organizations share information, and if APHIS would be accessing a complete list in any locality.
- It is unclear what the notification process to organic and transitioning producers is. A public meeting is likely to not be sufficient. Given the short time frames between final treatment decisions and the fact that treatments usually occur in the early, critical part of the growing season, it also seems likely that some organic producers could completely miss a notification.
- APHIS appears to make the establishment of buffers optional. Given the issues we've outlined with notification, optional buffers are not sufficient protection.

Landowners requesting treatments may not, and should not be expected to, know the exact agricultural processes and philosophies of all landowners in the vicinity.

Recommendation: APHIS should explain its notification process in the EA. We are concerned that some organic, and especially transitioning, parcels could be missed if APHIS does not cast a wide net to identify all locations where organic or transitioning farms exist. The identification and notification process should include multiple sources beyond any state list, even if redundant, to ensure that any organic or transitioning producer is accounted for in the spatial footprint of the spray. APHIS should not

just notify but also confirm notification for each organic and transitioning producer, to ensure that its communication has reached its recipient. Given the large drift potential and its previous protocol for native managed bees, APHIS should not leave buffers open-ended but should institute a minimum 4-mile buffer around each identified organic or transitioning parcel. Organic trade associations and sites such as driftwatch.org and other spatial locators should be used to the full extent of their availability.

APHIS RESPONSE:

A noted earlier, APHIS only conducts ground applications on public lands. Any treatment that would be adjacent to a registered Organic producer are at the discretion of the land manager and cooperation of the Organic producer. We have conducted ground treatments in past years at the encouragement of the adjoining Organic producer utilizing the buffers as noted in our EA to protect their crops and reduce economic damage. PPQ currently consults with the Idaho State Organic Program in our efforts to identify any producer to communicate our treatments and buffer restrictions implemented.