

Environmental Assessment

Rangeland Grasshopper and Mormon Cricket  
Suppression Program

Wyoming  
EA Number: WY-12-01

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**Environmental Assessment**  
**Rangeland Grasshopper and Mormon Cricket Suppression Program**  
**Wyoming**

## **I. Need for Proposed Action**

### *A. Purpose and Need Statement*

An infestation of grasshoppers and/or Mormon crickets (hereafter referred to collectively as grasshoppers) may occur in Wyoming. The Animal and Plant Health Inspection Service (APHIS) Plant Protection and Quarantine (PPQ) and any cooperating agency, based on location of infestation may, upon request by land managers or State departments of agriculture, conduct treatments to suppress grasshopper infestations.

Populations of grasshoppers that trigger the need for a suppression program are normally considered on a case-by-case basis. Participation is based on potential damage, such as reduced forage, and benefits of treatments including reduction of pest outbreak populations and control of incipient pest populations. The goal of the proposed suppression program analyzed in this environmental assessment (EA) is to reduce grasshopper populations to acceptable levels in order to protect rangeland ecosystems and/or cropland adjacent to rangeland.

This EA analyzes potential environmental consequences of the proposed action and its alternatives. This EA applies to proposed suppression programs that would take place from March 15, 2012 to August 30, 2012 in Wyoming.

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.

### *B. Background Discussion*

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

APHIS conducts surveys for grasshopper populations on rangeland in the western United States, provides technical assistance on grasshopper management to land owners/managers, and cooperatively suppresses grasshoppers when direct intervention is requested by a Federal land management agency or a State agriculture department (on behalf of a State or local government, or a private group or individual) and deemed necessary. The need for rapid and effective suppression of grasshoppers when an outbreak occurs limits the options available to APHIS. The application of an insecticide within all or part of the outbreak

area is the response available to APHIS to rapidly suppress or reduce (but not eradicate) grasshopper populations and effectively protect rangeland.

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

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

APHIS will follow all state laws regarding pesticide application including Wyoming State Statutes §35-7-350 through §35-7-375 (<http://legisweb.state.wy.us/statutes/statutes.aspx>) and Chapter 28 Rules and Regulations, State of Wyoming, (<http://soswy.state.wy.us/AdminServices/RulesOverview.aspx>).

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

The MOU further states that the responsible FS official will request in writing the inclusion of appropriate lands in the APHIS suppression project when treatment on national forest land is necessary. According to the provisions of the MOU, APHIS can begin treatments after APHIS issues an appropriate decision document.

In February 2009, 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 and Mormon crickets on BLM lands (Document #09-8100-0870-MU, February 13, 2009). This MOU clarifies that APHIS will prepare and issue to the public site-specific environmental documents that evaluate potential impacts associated with proposed measures to suppress economically damaging grasshopper and Mormon cricket populations. The MOU also states that these documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from the BLM.

The MOU further states that the responsible BLM official will request in writing the inclusion of appropriate lands in the APHIS suppression project when treatment on BLM land is necessary. The BLM must also approve a Pesticide Use Proposal (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 BLM approves the Pesticide Use Proposal.

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

The MOU further states that the responsible BIA official will request in writing the inclusion of appropriate lands in the APHIS suppression project when treatment on BIA land is necessary. The request should include the dates and locations of all tribal ceremonies and cultural events, as well as “not to be treated” areas that will be in or near the proposed treatment block(s). According to the provisions of the MOU, APHIS can begin treatments after APHIS issues an appropriate decision document.

### *C. About This Process*

The EA process for grasshopper management is complicated by the fact that there is very little time between requests for treatment and the need for APHIS to take action with respect to those requests. Surveys help to determine general areas, among the scores of millions of acres that potentially could be affected, where grasshopper infestations may occur in the spring of the following year. There is considerable uncertainty, however, in the forecasts, so that framing specific proposals for analysis under NEPA is 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.

The 2002 EIS provides a solid analytical and regulatory foundation; however, it may not be enough to satisfy NEPA completely for actual treatment proposals, and the “conventional” EA process will seldom, if ever, meet the program’s timeframe of need. Thus, a two-stage NEPA process has been designed to accommodate such situations. For the first stage, this EA will analyze aspects of environmental quality that could be affected by grasshopper treatment in Wyoming. This EA and finding of no significant impact (FONSI) will be made available to the public for a 30-day comment period. If comments are received during the comment period, they will be addressed in stage 2 of the process. For stage 2, when the program receives a treatment request and determines that treatment is necessary, the specific site within Wyoming will be extensively examined to determine if environmental issues exist that were not covered in this EA. This stage is intended mainly to insure that significant impacts in the specific treatment area will not be experienced. A supplemental determination will be prepared to document this finding and would also address any comments received on this EA. Supplemental determinations prepared for specific treatment sites will be provided to all parties who comment on this EA.

## II. Alternatives

The alternatives presented in the 2002 EIS and considered for the proposed action in this EA are: (A) no action; (B) insecticide applications at conventional rates and complete area coverage; (C) reduced agent area treatments (RAATS); and (D) research. Each of these alternatives, their control methods, and their potential impacts were described and analyzed in detail in the 2002 EIS. Copies of the complete 2002 EIS document are available for review at USDA APHIS PPQ, 5353 Yellowstone Rd, Suite 208, Cheyenne WY. It is also available at the Rangeland Grasshopper and Mormon Cricket Program web site, [http://www.aphis.usda.gov/plant\\_health/ea/downloads/fgheis.pdf](http://www.aphis.usda.gov/plant_health/ea/downloads/fgheis.pdf).

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

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

### *A. No Action Alternative*

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

### *B. Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative*

Alternative B, insecticide applications at conventional rates and complete area coverage, is generally the approach that APHIS has used for many years. Under this alternative, carbaryl, diflubenzuron (Dimilin®), or malathion will be employed. Carbaryl and malathion are cholinesterase inhibitors. Diflubenzuron is an insect growth regulator.

Applications would cover all treatable sites within the infested area (total or blanket coverage) per label directions. The application rates under this alternative are as follows:

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

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

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

### *C. Reduced Agent Area Treatments (RAATs) Alternative*

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

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

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

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

#### *D. Research (applied using air and/or ground equipment)*

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

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

Research that may occur in Wyoming in 2012 may involve small un-replicated 10 acre and/or replicated 40 acre plots. Dimilin and the adjuvant EDT may be evaluated in replicated 40 acre blocks to reduce the amount of oil and water currently used in Dimilin treatments (10 and 20 oz of oil and water respectively). This study will require 800 acres including 160 acres as an untreated control. These treatments will be aerially applied. A study to evaluate *Beauveria bassiana* strain GHA (BbGHA) (currently registered for grasshoppers on rangeland but not used in programs) may be conducted on replicated plots. If conducted, BbGHA will be tank mixed with various sub-lethal doses of Dimilin or Spinosad and applied with BbGHA to replicated 40 acre plots in an effort to improve fungal activity. One to two sections of rangeland could be required for this study. The Entrust, an organically registered formulation of Spinosad may be applied to 10 acres for evaluation. An insect fungal pathogen, *Metarhizium anisopliae* DWR346, isolated from soil in Arizona and other US domestic isolates, may be applied to 10 acres for evaluation against grasshoppers. Finally, small cage studies involving several hundred cages, each cage of ca. one square foot, may be used to evaluate potential efficacy against rangeland grasshoppers with U.S. isolates of *Beauveria bassiana* and *Metarhizium anisopliae*. Additional, small cages may also be used to evaluate solid baits, including carbaryl and Coragen baits and other candidate carrier materials.

Evaluations of aerially applied insecticides currently registered on rangeland but not currently an option in APHIS sponsored programs may be evaluated in 40 acre plots (replicated 4 times) or in un-replicated 640 acre (section) plots. Coragen, a new candidate for use against grasshoppers may be evaluated in replicated 40 acre blocks to determine acceptable doses. It is currently registered for use on rangeland against many Lepidopteran species. In studies requiring 640 acre plots, additional plots may be used for RAATs (Reduced Agent Area Treatments, where alternating swaths are not directly treated) applications of the same insecticide.

Additionally, 10 acre plots may be ground or aerially applied with non-domestic isolates (from Australia and/or Africa) of the Orthopteran specific fungus *Metarhizium acridum*. Any application of these foreign pathogens will only occur with the approval of the USDA, APHIS Permit Unit under a specific approved permit that has been issued after a thorough

evaluation including a specific Environmental Assessment for the non-persistent, rapidly degrading, biologically based insecticide. Note: These trial studies are under way in Sidney, MT. USDA, ARS.

When new materials or formulations not registered, are investigated or applied on areas larger than 10 acres, Experimental Use Permits (EUP) are required and issued by the Environmental Protection Agency (EPA) to the company developing the product. The necessary experiments may then be carried out under the guidelines or the limitations outlined in the EUP.

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

### **III. Affected Environment**

#### *A. Description of Affected Environment*

This EA covers the State of Wyoming. Additionally, APHIS recognizes that concerns outside this area could necessitate protection buffers that extend into this area.

The size of this region is approximately 97,914 square miles (62,664,960 acres). The total relief is 10,690 feet and ranges from 3,114 feet to 13,804 feet at Gannett Peak. Grasshopper and Mormon cricket treatments occur primarily between 3,640 feet and 7,500 feet in this region. Pine forests dominate the higher elevation. No treatments are anticipated in these forested areas. Annual precipitation in the primary area of concern ranges from six inches to 22 inches. Precipitation is higher in the mountains. Temperatures can be extremely variable at any location. Summer temperatures in the 90's and low 100's are common in the lower elevations. Winter low temperatures are often well below 0 °F. The yearly mean temperatures for the region are 40°F to 48°F.

Croplands are concentrated along major rivers where irrigation is possible. Less than three percent of the region is cultivated. The major crops are: alfalfa, 690,000 acres; other hay, 580,000 acres; wheat, 155,000 acres; barley, 80,000 acres; corn, 90,000 acres; oats, 40,000 acres; sugar beets, 31,000 acres; and dry beans, 37,500 acres (acreage figures are from Wyoming Agriculture Statistics, 2009 Crop estimates). Damage to these croplands is expected when migrating bands of Mormon crickets and grasshoppers enter these fields.

Information on the species composition of grasshoppers is available from USDA APHIS PPQ in Cheyenne, WY through the Wyoming Grasshopper Information System. The species of major economic importance are *Ageneotettix deorum*, *Amphitornus coloradus*, *Anabrus simplex*, *Aulocara elliotti*, *Aulocara femoratum*, *Camnula pellucida*, *Cordillacris crenulata*, *Cordillacris occipitalis*, *Melanoplus bivittatus*, *M. differentialis*, *M. femurrubrum*, *M. infantilis*, *M. occidentalis*, *M. sanguinipes*, *Phlibostroma*

*quadrimaculatum*, *Phoetaliotes nebrascensis*, and *Trachyrhachys kiowa*. Approximately 96 other lesser important species were represented in surveys from this region. These 96 species may become economic pests if part of a high density species complex. Warm, dry weather is generally the most favorable for high populations, and severe loss of forage most often occurs in conjunction with drought.

The major population centers are in the towns of Cheyenne and Casper. Smaller towns are located throughout the region. The total population is approximately 563,626 (2010 census figure).

Major recreational areas in this region include various State parks and National Forest lands. The roads through the region are a major thoroughfare for tourist traffic to and from Yellowstone National Park.

Domestic bee yards are found throughout Wyoming. Approximately 146 apiarists operating 53,484 bee yards with a total of 123,000,448 bee hives are registered with the Wyoming Department of Agriculture for 2009. Alfalfa leafcutter bees are commonly used in some areas covered by this EA. Site specific locations can be found through apiary registrations at the Wyoming Department of Agriculture or checking with alfalfa seed producers in the case of leafcutter bees. (WDA, apiary registration database)

Many species of big game (antelope, mule deer, elk, and others) and smaller animals (rabbits, squirrels, muskrats, beavers, minks, weasels, badgers, coyotes and foxes) range within the varied habitats. Livestock ponds, streams and reservoirs within the proposed treatment area provide a nesting and breeding habitat for waterfowl. Many nongame birds migrate through or nest in the region. Golden eagles, peregrine falcons and other raptors nest within the region and game birds (ringed-necked pheasant, greater sage-grouse, wild turkey, Hungarian partridge, chukar and dove) are present. Recreational hunting is very important to the local economy.

## ***B. Other Considerations***

### **1. Human Health**

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

No treatment will occur over congested areas, recreation areas, or schools and if appropriate, a buffer zone will be enacted and enforced. Refer to the Operational Procedures and Recommended Mitigation Measures for further information.

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

Malathion and carbaryl are cholinesterase inhibitors. Cholinesterase (including acetylcholinesterase) are enzymes that function at the nerve synapse. The nerve synapse is the point where information in the form of electrical impulses is relayed or transmitted by chemical messengers (called transmitters) from one nerve cell to another. Cholinesterase then inactivates or destroys the transmitter chemical (like acetylcholine) after it completes its job, otherwise the transmitter would continue indefinitely and precise control of the enervated tissue (muscle or organ) would be lost. Refer to the 2009 guidelines (Appendix 1) for further information on mitigating exposure to cholinesterase inhibitors.

No human health effects are likely from exposure to Dimilin 2L (diflubenzuron) if it is used according to label instructions. A human exposure assessment was done in detail for diflubenzuron and can be found in APHIS's "Chemical Risk Assessment for Diflubenzuron Use in Grasshopper Cooperative Control Program".

## 2. Non-target Species

Sensitive non-target species within the area include plants, terrestrial vertebrates and invertebrates, bats, resident and migratory birds, biocontrol agents, pollinators, aquatic organisms, and Federal and State listed threatened and endangered species. APHIS will use an Integrated Pest Management (IPM) approach to ensure non-target effects are reduced. APHIS will also consult with local agency officials to determine appropriate protective measures. Appropriate protective measures will be considered within an IPM framework. These strategies may include but are not limited to chemical selection, reduced rates, reduced coverage areas, buffer zones, timing restrictions and environmental monitoring. If such a request occurs and the grasshopper or Mormon cricket management option selected poses a clear threat to any of these species, APHIS will confer with the land managers, the U.S. Fish & Wildlife Service and/or Wyoming Game & Fish personnel to agree on protective measures.

### a. Threatened and Endangered Species and Sensitive Species of Concern

The following are federally listed threatened and endangered species that reside in Wyoming.

#### FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES:

##### Animals:

black-footed ferret  
gray wolf

*Mustela nigripes*  
*Canis lupus*

Endangered / Experimental  
Experimental

Canada lynx	<i>Felis lynx</i>	Threatened
Grizzly bear	<i>Ursus arctos horribilis</i>	Threatened
Wyoming toad	<i>Bufo baxteri</i>	Endangered
Kendall warm springs dace	<i>Rhinichthys osculus thermalis</i>	Endangered
Preble's Meadow Jumping	<i>Zapus hudsonius preblei</i>	Threatened

Plants:

Colorado butterfly plant	<i>Gaura neomexicana coloradensis</i>	Threatened
Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	Threatened
desert yellowhead	<i>Yermo xanthocephalus</i>	Threatened
blowout penstemon	<i>Penstemon haydenii</i>	Endangered

A summary of species determinations and impact minimization measures can be found in Appendix 4. In the absence of a recent national biological opinion local section seven consultations are conducted yearly with Fish and Wildlife Service to mitigate impacts that grasshopper suppression programs may have on listed threatened and endangered species. These correspondences can be found in Appendix 2.

b. Greater Sage-Grouse (*Centrocercus urophasianus*)

The Wyoming Game and Fish Department (WGFD) and Bureau of Land Management (BLM) have indicated concern regarding the impacts of a grasshopper suppression program on greater sage-grouse, hereafter referred to as sage-grouse. Sage-grouse numbers have declined throughout Wyoming in the second half of the 20<sup>th</sup> century” according to “Wyoming greater sage-grouse Conservation Plan (WGS-GCP), 2003”. In order to break this trend WGF has adopted the WGS-GCP.

As part of the WGS-GCP, Local Sage-Grouse Working Groups (LWGs) were created to develop and facilitate implementation of local conservation plans for the benefit of sage-grouse, their habitats, and whenever feasible, other species that use sagebrush habitats. The plans will identify management practices and the financial and personnel means to accomplish these practices, within an explicit time frame, for the purpose of improving sage-grouse numbers and precluding the need for listing under the Endangered Species Act. These groups are made up of individuals from varying interest groups including federal land managers, conservation groups, mineral industry representatives, agriculture producers, and others.

As a result of the Governor's Executive orders 2008-2 and 2010-4, superseded by 2011-5 the Governor's sage grouse implementation team developed the sage grouse core area concept in order to protect critical habitat from further degradation. The BLM has adopted this core area strategy in their “Greater Sage-Grouse Habitat Management Policy dated December 29, 2009. The BLM has also issued Instruction Memorandum WY 2012-019 regarding Greater Sage-Grouse habitat management policy on Wyoming BLM administered public lands including the federal mineral estate.

In 2009 USDA APHIS PPQ met with the three LWGs most likely to be affected by grasshopper control suppression activities in 2010 to explain how USDA APHIS PPQ grasshopper suppression activities may affect sage-grouse populations. Concerns to sage-grouse include the toxicity effects of the chemicals in question, the effects to the food base of the greater sage-grouse, and the physical disturbance factors related to a grasshopper suppression program.

Sage-grouse as a species of concern is addressed in the 2002 EIS. While it is clear that diflubenzuron poses less direct toxicity to greater sage-grouse than both carbaryl and malathion, toxicities were analyzed in the risk assessment and concluded that alternative B and C would not directly affect greater sage-grouse for any of the proposed insecticides.

The effect of grasshopper suppression programs to the food base of the greater sage-grouse can be significant during the early brood rearing timing of the sage-grouse life cycle. Study results indicate that sage-grouse chicks require insects for survival until about three weeks of age. (Johnson, May 1987) For most of Wyoming this timing coincides with the earliest likely timing of grasshopper suppression programs. In order to limit the effects to the food base of the greater sage-grouse APHIS PPQ will utilize alternative C (RAATS) within greater sage-grouse core areas. By using the RAATS method, effects to non-target insects and grasshoppers will be reduced. The Governor's executive order 2011-5 specifically lists Grasshopper / Mormon cricket control following Reduced Agent-Area Treatments (RAATS) protocols as an exempt activity under attachment C.

In extreme cases grasshopper infestations may be so damaging that crucial sage-grouse habitat is compromised. These areas may not be apparent in time to use diflubenzuron and a faster knockdown may be required to protect the habitat. For these situations APHIS reserves the ability to use carbaryl and malathion in greater sage-grouse core areas. If treatments are late enough in the season that diflubenzuron is deemed ineffective then it is also most likely that sage-grouse chicks will be mature enough that they will have adjusted their diet to a mixture of forbs and sage brush versus insects only. Situations that require the use of carbaryl or malathion within sage-grouse core areas will be considered on a case by case situation only with input from the land manager, land owner and Wyoming Game and Fish.

#### c. Species of special concern to the Wyoming Game and Fish Department

The Wyoming Game and Fish lists Species of Greatest Conservation Need (SGCN). This list may be found in State Wildlife Action Plan, 2010, which can be found at <http://gf.state.wy.us/SWAP2010/Plan/index.asp> .

WGFD has specific concerns regarding greater nongame birds and bats with respect to grasshopper suppression programs.

#### i. Nongame birds

The following species appear on the SGCN list and the Wyoming Partners in Flight Priority Species list, and may be negatively affected by grasshopper control in areas where

they nest and forage: burrowing owl, short-eared owl, Brewer's sparrow, sage sparrow, McCown's longspur, loggerhead shrike, sage thrasher, vesper sparrow, lark sparrow, lark bunting, dickcissel, and bobolink. In particular, the following species consume large amounts of grasshoppers and/or Mormon Crickets; therefore the impact of grasshopper control on these species is likely to negatively affect both adult and young birds during the nesting season: McCown's longspur, loggerhead shrike, sage thrasher, and lark bunting. Grasshopper suppression activities are designed to leave behind some grasshopper populations in order to minimize impacts to species that use grasshoppers as a food base. At no time will APHIS strive to eradicate grasshopper populations.

#### ii. Bats

In previous years the Wyoming Game & Fish has raised concerns about possible impacts of this program on spotted bats. The spotted bat is a nocturnal feeder on flying insects primarily around desert water holes. The bat and its food source are protected by the buffers associated with water. Additional protective measures, such as the use of bait or RAATs, will be negotiated with the Wyoming Game & Fish if proposed pesticide applications directly conflict with sites having recent spotted bat activity.

#### d. Bald and Golden Eagle Protection Act (BGEPA)

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

As listed in the National Bald Eagle Management Guidelines (FWS, May 2007) the following mitigation measures will be followed when practical.

"Category G. Helicopters and fixed-wing aircraft. Except for authorized biologists trained in survey techniques, avoid operating aircraft within 1,000 feet of the nest during the breeding season, except where eagles have demonstrated tolerance for such activity. In addition, Category A (Agriculture) and Category D (Off Road Vehicle Use) both provide the same guidance for use of ATV's or trucks: No buffer is necessary around nest sites outside the breeding season. During the breeding

season, do not operate off-road vehicles within 330 feet of the nest. In open areas, where there is increased visibility and exposure to noise, this distance should be extended to 660 feet.”

Most bald eagles nest close to their food source, typically waterways, by policy and label restrictions APHIS will not conduct suppression activities within 500 ft. of water bodies providing some inherent protection for Bald Eagles.

e. Aquatic Species not previously listed

The malathion label warns of its toxicity to fish, shrimp, and crabs and prohibits its use over water. EPA lists carbaryl and malathion as pesticides that may affect endangered aquatic species (EPA, 1986).

The Dimilin label warns that diflubenzuron is toxic to aquatic invertebrate animals and that it cannot be applied directly to water or to areas where surface water is present.

Important game fish in the region include: Walleye, Sauger, Cutthroat, Brown, Rainbow, Brook and Lake trout.

Programmatic protection for federally listed endangered and threatened species of aquatic animals is covered in the 2002 EIS, Biological Assessments and the Biological Opinions. These procedures will ensure protection of sensitive aquatic species from any adverse effects caused by grasshopper control.

f. Bees

i. Domestic Bees

Beekeepers are given notice when definitive treatment areas are identified. Treatment block maps will be available for beekeeper review at the County offices of the Weed & Pest Districts. Beekeepers will be advised to move their bees at least two miles from the spray block boundaries. In all cases when using malathion or carbaryl where beekeepers fail to move or otherwise protect their bees, a two mile buffer zone will be observed around the bee yard. The above procedures will ensure that there will be no significant impact on domestic bee production.

ii. Alfalfa Leafcutter Bees

Alfalfa leafcutter bees are managed for pollination of alfalfa in the area. The areas with these bees are mostly centered at Basin, Burlington, Emblem, Powell, Byron, Lovell and Riverton. Notification is on a case-by-case basis. Beekeepers will be advised to move their bees at least four miles from the spray block boundaries. In all cases when using malathion or carbaryl where beekeepers fail to move or otherwise protect their bees, a four mile buffer zone will be observed around the bee yard. The above procedures will ensure that there will be no significant impact on alfalfa leafcutter bee activity.

#### g. Wildlife Habitat Reservations and Wilderness Areas

The Wyoming Game & Fish Department operates 35 Wildlife Habitat Management Units in Wyoming. These can be located on the web at <http://gf.state.wy.us/wildlife/access/gf/whma/index.asp>. If a request for treatment involves any of these lands APHIS will negotiate locally with the habitat biologist located at the nearest Game and Fish regional office for any protective measures necessary, additional to the operation procedures.

#### h. Bureau of Land Management Wilderness Study Areas

In Wyoming there are 42 Bureau of Land Management (BLM) administered Wilderness Study Areas (WSA), encompassing 577,504 acres. These WSA's are managed under BLM's Interim Management Policy (IMP).

The objective of the IMP is to continue resource uses within the WSA's in a manner that maintains the area's suitability for preservation as wilderness until Congress either designates these lands as wilderness or releases them for other purposes.

Handbook H-8550 -1 (Interim Management Policy for Lands under Wilderness Review) provides guidance regarding how BLM will manage the WSA's. H-8550-1 does provide for insect and disease control by chemical or biological means under certain conditions as discussed in Chapter 3, Section D Rangeland Management, 4 e.

Because of the special requirements found in H-8550-1, including NEPA related requirements, before conducting any Grasshopper and Mormon cricket project involving a WSA, the BLM Field Office administering the specific WSA will be consulted with and involved in the project.

#### i. Migratory Birds

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

#### j. Protective Mitigation Measures of Above Species

Protective mitigation measures that may be taken by APHIS in the grasshopper treatment areas covered by this EA may include, but is not limited to buffer zones and/or skip swaths. It is important to note that treatment goals are to reduce grasshopper populations to an economic threshold, not eradication. At no time will APHIS strive to reduce populations

below levels encountered in non-outbreak years. This will help insure grasshopper populations sufficient to provide food sources and biodiversity for species of concern.

If after specific program boundaries have been set and if it has been determined by Fish and Wildlife Services or the land manager that species of concern are within the specific area, mitigation measures as described in Appendix 4 or site specific documentation will be followed.

### 3. Socioeconomic Issues

#### Economic Considerations

The possible treatment areas are subject to reoccurring drought. A combination of drought and grasshopper damage causes economic stress to landowners and permittees.

The control of grasshoppers and Mormon crickets in this area would have beneficial economic impacts to local landowners (or permittees). The forage not utilized by grasshoppers will be available for livestock consumption, and harvesting. This will allow greater livestock grazing, decreased needs for supplemental feed, and increased monetary returns. The control of migrating bands of Mormon crickets is most important in protection of crops but if populations are extreme, damage to rangeland forage will occur.

### 4. Cultural Resources and Events

In previous years, BLM has expressed concerns regarding the effect of pesticide applications on Cation-ratio dating techniques of pictographs and petroglyphs. There is presently no information on this subject. Until such information is available USDA-APHIS will confer with BLM on a local level to protect known sites on BLM managed lands.

Where tribal lands are involved APHIS will confer locally with Tribal Officials on possible cultural impacts of proposed grasshopper/Mormon cricket treatment.

No other known historical or cultural resource area will be affected by any proposed control program.

### 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.

Consistent with EO No. 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations,” APHIS considered the potential for disproportionately high and adverse human health or environmental effects from the proposed treatment is minimal and is not expected to have disproportionate adverse effects to any minority or low income populations.

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

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

The human health risk assessment for the 2002 EIS analyzed the effects of exposure to children from the three insecticides. Based on review of the insecticides and their use in the grasshopper program, the risk assessment concluded that the likelihood of children being exposed to insecticides is very slight and that no disproportionate adverse effects to children are anticipated over the negligible effects to the general population. Treatments are primarily conducted on open rangelands where children would not be expected to be present during treatment, or enter should there be any restricted entry period after treatment.

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

Aerial Broadcast Applications of Liquid Insecticides

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

- No treatments will occur over congested urban areas. For all flights over congested areas, the contractor must submit a plan to the appropriate Federal Aviation Administration District Office and this office must approve of the plan; a letter of authorization signed by city or town authorities must accompany each plan. Whenever possible, plan aerial ferrying and turnaround routes to avoid flights over congested areas, bodies of water, and other sensitive areas that are not to be treated.

#### Aerial Application of Dry Insecticidal Bait

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

#### Ultra-Low-Volume Aerial Application of Liquid Insecticides

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

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

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

## IV. Environmental Consequences

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

### A. *Environmental Consequences of the Alternatives*

#### 1. No Action Alternative

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

Grasshoppers in unsuppressed outbreaks would consume agricultural and nonagricultural plants. The damage caused by grasshopper outbreaks could also pose a risk to rare, threatened, or endangered plants that often have a low number of individuals and limited distribution. Habitat loss for birds and other wildlife and rangeland susceptibility to invasion by nonnative plants are among the consequences that would likely occur should existing vegetation be removed by grasshoppers. Loss of plant cover due to grasshopper consumption will occur. Plant cover may protect the soil from the drying effects of the sun, and plant root systems hold the soil in place that may otherwise be eroded.

Another potential scenario, if APHIS does not participate in grasshopper suppression programs, is that some Federal land management agencies, State agriculture departments, local governments, or private groups or individuals may attempt to conduct widespread grasshopper programs. Without the technical assistance and program coordination that APHIS can provide to grasshopper programs, it is possible that a large amount of insecticides, including those APHIS considers too environmentally harsh, but labeled for rangeland use, could be applied, reapplied, and perhaps misapplied in an effort to suppress or even locally eradicate grasshopper populations. It is not possible to accurately predict the environmental consequences of the no action alternative because the type and amount of insecticides that could be used in this scenario are unknown.

## **2. Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative**

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

### **Carbaryl**

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

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

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

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

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

### **Diiflubenzuron**

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

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

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

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

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

Possible exposure to freshwater invertebrate populations would be minimized by strict adherence to label requirements.

### **Malathion**

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

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

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

Malathion is of slight acute oral toxicity to mammals. There is little possibility of toxicity induced mortality of upland birds, mammals, or reptiles, and no direct toxic effects have been observed in field studies. Malathion is not directly toxic to vertebrates at the

concentrations used for grasshopper suppression, but it may be possible that sublethal effects to nervous system functions caused by AChE inhibition may lead directly to decreased survival. AChE inhibition at 40 to 60 percent affects coordination, behavior, and foraging ability in vertebrates. Multi-year studies at several grasshopper treatment areas have shown AChE inhibition at levels of no more than 40 percent with most at less than 20 percent (McEwen *et al.*, 1996a). Field studies of birds within malathion treatment areas showed that, in general, the total number of birds and bird reproduction were not different from untreated areas (McEwen *et al.*, 1996a). Malathion does not bioaccumulate HSDB, 1990; Tsuda *et al.*, 1989).

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

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

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

### 3. Reduced Area Agent Treatments (RAATs) Alternative

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

#### Carbaryl

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

protective clothing. Routine safety precautions are expected to provide adequate protection of worker health at the lower application rates under RAATs.

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

Direct toxicity of carbaryl to birds, mammals, and reptiles is unlikely in swaths treated with carbaryl under a RAATs approach. Carbaryl bait also has minimal potential for direct effects on birds and mammals. Field studies indicated that bee populations did not decline after carbaryl bait treatments, and American kestrels were unaffected by bait applications made at a RAATs rate. Using alternating swaths will furthermore reduce adverse effects because organisms that are in untreated swaths will be mostly unexposed to carbaryl.

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

### **Diflubenzuron**

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

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

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

Possible exposure to freshwater invertebrate populations would be minimized by the strict adherence to label requirements.

## **Malathion**

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

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

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

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

### **4. Research Alternative**

For the Dimilin project the environmental consequences will be the same or less than described in the previous section (3. RAATS alternative) due to the lower rates of AI. The environmental consequences for the proposed biocontrol project are expected to be minimal due to the non-toxicity of the treatment application. Evaluations of the biological agent *Metarhizium anisopliae* var. *acridum* will be considered in a separate specific environmental assessment.

### ***B. Other Environmental Considerations***

#### **1. Cumulative Impacts**

Cumulative impact, as defined in the CEQ NEPA implementing regulations (40 CFR § 1508.7) “is the impact on the environment which results from the incremental impact of the action when added to the past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative

impacts can result from individually minor but collectively significant actions taking place over a period of time.

APHIS does not anticipate cumulative impacts and does not expect overlapping grasshopper treatments. There are a number of other chemicals that may be applied on rangeland in Wyoming. Herbicides do not have a known cumulative effect with Carbaryl, Diflufenzuron, or Malathion. If at the time of treatment other chemical treatment programs are discovered within the site specific area an addendum will be added explaining the synergistic effects that may occur.

## 2. Endangered Species Act

Under the Endangered Species Act of 1973, Section 7, federal agencies are required to consult with the U.S. Fish and Wildlife Service regarding the degree of impact to federally proposed and listed species and critical habitat from the program action and the necessary protective measures to avoid or minimize adverse effects. Informal consultation between APHIS and the FWS may be used to determine whether any adverse effects to species or habitat by the proposed action can be avoided or summarily minimized.

Currently, documents to initiate formal consultation between APHIS and FWS are underway, but the biological assessment will not be completed in time for the 2012 treatments. The last formal consultation resulted in the 1998 biological assessment prepared by APHIS and the 1995 biological opinion issued by FWS. This environmental assessment uses information from past formal consultations in determining protective measures.

Malathion and carbaryl have been included in consultation procedures in the past. The 1995 biological opinion has summarized the language from former assessments and opinions on the effects of both pesticides:

### **Carbaryl:**

In general, carbaryl demonstrates low to moderate mammalian toxicity, low toxicity to birds, and moderate toxicity to fish. It is very toxic to aquatic invertebrates and many terrestrial insects. Carbaryl remains effective on vegetation for approximately seven days and 28 days in anaerobic soils (U.S. Fish and Wildlife Service, 1995).

### **Malathion:**

Malathion is relatively low in toxicity to mammals and birds. It is moderately too highly toxic to fish and amphibians. Malathion is extremely toxic to aquatic invertebrates and highly toxic to most insects, including bees. Malathion is relatively non-persistent in soil, water, plants, and animals. Its half-life in alkaline soils is generally less than one day; in water, the half-life is generally less than two days. Malathion residues in plants persist up to five to seven days. Malathion does not bioaccumulate in animals; it is rapidly excreted after exposure ceases (U.S. Fish and Wildlife Service, 1995).

**Diflubenzuron:**

The chemical, diflubenzuron (dimilin), has been added to the treatment program, as described in the 2002 EIS. This chemical is new to the consultation process and will be locally consulted on at a site-specific level and included in the forthcoming biological assessment.

Further information on carbaryl, malathion, and diflubenzuron is included earlier in this EA and in the 2002 EIS.

Due to the incomplete formal consultation, local informal consultations have been completed. Correspondence regarding local consultations between APHIS and FWS are included in Appendix 3

### 3. Monitoring

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

The second area included in monitoring is safety. This includes ensuring the safety of the program personnel through medical monitoring conducted specifically to determine risks of a hazardous material. (See APHIS Safety and Health Manual (USDA, APHIS, 1998)

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

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## VI. Listing of Agencies and Persons Consulted

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## **Appendix 1: APHIS Rangeland Grasshopper and Mormon Cricket Suppression Program FY-2012 Operational Procedures**

The 2012 Operational Procedures are excerpted from the APHIS Rangeland Grasshopper and Mormon Cricket Suppression Program FY-2011 Treatment Guidelines Final Version 01/26/11. The entire document along with the Grasshopper Treatment Manual is available upon request.

### **2012 Operational Procedures**

#### ***GENERAL PROCEDURES FOR ALL AERIAL AND GROUND APPLICATIONS***

1. Follow all applicable federal, state, tribal and local laws and regulations in conducting grasshopper and Mormon cricket suppression treatments.
2. Conduct scoping programs to allow public participation in the decision making process. Record the What, Where, and When of these public scoping programs.
3. Notify federal, state and tribal land managers and private cooperators of grasshopper and Mormon cricket outbreaks on their lands. Describe estimated boundaries, severity of the infestation, and treatment options. Request the land manager to advise PPQ of any sensitive sites that may exist in the proposed treatment areas.
4. Obtain request(s), in writing, from land managers or landowners for suppression treatments to be undertaken on their land.
5. Notify residents within treatment areas, or their designated representatives, prior to proposed operations. Advise them of control method to be used, proposed method of application, and precautions to be taken.
6. Avoid residences and other premises whose occupants are opposed to insecticide treatments. In cases when state law requires treatment, but landowners or occupants are opposed to the treatments, PPQ will cooperate to the extent possible and as authorized by federal and state laws.
7. Instruct program personnel in the use of equipment, materials and procedures; supervise to ensure procedures are properly followed and safety is first.
8. All entry- and journeyman-level employees in a professional series, or employees identified by members of the PPQET (or their designee), who in the performance of official duties, directly supervise, use, or monitor the use of any pesticide whether classified for general or restricted use, must complete Pesticide Certification Training (PCT).

Temporary, part time, summer hires, letter of authorities (LA's), or other intermittent PPQ employees normally receive close supervision from a certified applicator. They are not required to complete PCT unless a member of the PPQET (or their designee) or local jurisdictions require such certification.

Each Suppression Program with an independent contractor will have a certified aerial/ground treatment manager on site. Each State will have at least one COR available to assist in GH/MC suppression programs.

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

Furthermore, provide the following buffers for water bodies:

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

10. Use one of the following disposal methods (in order of preference) for pesticide containers:

- a) Use full service contracts and require the contractor to properly store and dispose of pesticide containers.
- b) Require chemical companies, distributors, or suppliers to accept the triple-rinsed containers.
- c) Crush and/or puncture the empty triple-rinsed containers and dispose of the scrap metal. Report the destruction on Form AD-112 to Property Services, Field Servicing Office, Minneapolis, MN.
- d) Other suitable methods, as approved locally in concurrence with Safety, Health and Environmental Security (Lori Miller, 301-734-0626).

11. Conduct mixing, loading, and unloading in an approved area where an accidental spill would not contaminate a water body. In the event of an accidental spill, follow the procedures set forth in PPQ Guidelines for Managing Pesticide Spills (USDA APHIS, *Treatment Manual*) and the 2007 Aerial Application Manual.

12. All APHIS project personnel will have baseline cholinesterase tests before the first application of AChE inhibiting insecticides, such as organophosphates or carbamates (i.e., no testing required for dimilin usage), and on a routine basis as advised by Federal Occupational Health.

13. PPQ will assess and monitor rangeland programs for the efficacy of the treatment, to verify that a control program has properly been implemented and treatments fall within our guidelines.
14. Medical clearance and fit testing is Mandatory prior to any respirator use. Refer to the Grasshopper Treatment SharePoint site under Safety for additional details.

#### ***SPECIFIC PROCEDURES FOR AERIAL APPLICATIONS***

1. Pre-spray reconnaissance flights or ground orientation trips may be conducted to ensure that pilots are familiar with program area boundaries, buffers, and areas that are not to be treated.
2. Make the following available to relevant personnel in advance of any treatment: stock safety kits, pesticide spill kits, thermometers, flagging material, wind gauges, spray-deposit samplers, and daily aircraft records.
3. 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.
4. Do not apply while school buses are operating in the treatment area. Do not apply within 500 feet of schools or recreational facilities.

#### ***SPECIFIC PROCEDURES FOR GROUND APPLICATIONS***

1. All PPQ personnel performing treatments with all-terrain vehicles and/or ground application equipment will have the proper training and safety training to operate all-terrain vehicles and/or ground application equipment prior to actual treatment operation.
2. All PPQ personnel performing treatments with all-terrain vehicles will be required to wear prescribed safety equipment while performing treatment operation.
3. **Refer to the Grasshopper Treatment SharePoint site under Safety for further details on Safety equipment requirements. Also contact the WR Safety Officer for further details and/or questions.**

## Appendix 2: FWS/NMFS Correspondence



United States  
Department of  
Agriculture

Animal Plant Health  
Inspection Service

Plant Protection  
and Quarantine

Wyoming State Office  
5353 Yellowstone Road, Suite 208  
Cheyenne, WY 82009  
Phone: 307-432-7979  
FAX: 307-432-7970

Federal Relay Service (Voice/TTY/ASCII/Spanish)  
1-800-877-8339

March 13, 2012  
Mark Sattelberg  
Field Supervisor-Wyoming  
USDI, Fish and Wildlife Service  
5353 Yellowstone Rd Suite 308A  
Cheyenne WY, 82009

Dear Mark Sattelberg,

USDA APHIS PPQ Wyoming would like to enter into Section 7 consultation with the Wyoming USFWS Field Office regarding the proposed action to conduct suppression programs for grasshoppers and Mormon cricket outbreaks in Wyoming.

For T&E species that occur in Wyoming mitigation measures have been agreed upon in 2011 for all species except for the recently added Preble's meadow jumping mouse.

Grasshopper suppression activities in Wyoming are not likely to adversely affect the Preble's meadow jumping mouse. It is not likely that APHIS grasshopper suppression programs will occur in areas of the mouse's preferred habitat, riparian areas due to a programmatic buffer placed on either side of streams or water bodies. This 500 foot buffer is standard procedure for all USDA APHIS PPQ grasshopper aerial suppression programs. For those areas that may be treated using ground equipment the 50 foot buffer will be increased to 500 feet around waters and riparian areas that are Preble's meadow jumping mouse suitable habitat, within the range of the species.

Additional changes to the EA from 2011 include references to the Governor's executive order 2011-5, and BLM IM WY 2012-19 regarding protection of greater sage-grouse habitat.

In 2012 APHIS plans to publish both the EA and FONSI for a thirty day public comment period. After comments have been received and a program area has been determined a supplemental determination will be prepared in order to address any concerns brought by the public comment period or any areas that were not addressed in the EA.

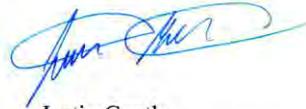


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The species of concern for the proposed areas and the respective impact minimization measures are outlined in the attached file (Appendix 4).

The 2012 hazard map showing areas of concern is attached as appendix 6 of the 2012 EA.

Sincerely,



Justin Gentle  
Domestic Program Coordinator  
USDA APHIS PPQ

References cited

Rangeland Grasshopper and Mormon Cricket Suppression Program, Final Impact Statement 2002,  
USDA-APHIS-PPQ.

cc: BLM, Cheyenne, Pest Management Specialist (Ken Henke)



## United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services  
5353 Yellowstone Road, Suite 308A  
Cheyenne, Wyoming 82009



In Reply Refer To:  
06E13000/WY1210160

APR 05 2012

Justin Gentle, Domestic Program Coordinator  
U.S. Department of Agriculture  
Animal and Plant Health Inspection Service  
5353 Yellowstone Road, Suite 208  
Cheyenne, Wyoming 82009

Dear Mr. Gentle:

This letter is in response to your letter dated March 13, 2012, and Environmental Assessment (EA) plus appendices received March 13, requesting initiation of section 7 consultation pursuant to section 7(a)(2) of the Endangered Species Act of 1973 (Act), as amended, 50 CFR 402.13 for potential effects to listed species from the Animal and Plant Health Inspection Service (APHIS) Rangeland Grasshopper and Mormon Cricket Suppression Program. Activities associated with this program are scheduled to occur from March 15 to August 30, 2012. It is our understanding that the preferred alternative is to use diflubenzuron, known by the tradename as Dimilin<sup>®</sup>, using the Reduced Agent Area Treatments (RAATs) method. Based on your commitment to implement the impact minimization measures identified in Appendix 4 of your EA, the U.S. Fish and Wildlife Service (Service) concurs that the Kendall warm springs dace (*Rhinichthys osculus thermalis*), the Wyoming toad (*Bufo baxteri*), and the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) are not likely to be adversely affected by the suppression program.

The Service concurs with your not likely to adversely affect determination for blowout penstemon (*Penstemon haydenii*) based on information from APHIS that no grasshopper or Mormon cricket control is anticipated to occur in habitat known to be occupied by this endangered plant (Carbon County). Furthermore, if grasshopper or Mormon cricket population control becomes necessary in a sand dune area not currently known to be occupied, then APHIS will employ measures such as buffer zones and will consult with the Service to determine other protective measures.

The Service concurs with your not likely to adversely affect determination for the desert yellowhead (*Yermo xanthocephalus*), Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*), and Ute ladies' -tresses (*Spiranthes diluvialis*) based on your commitment to employ the following protective measures should a treatment occur near occupied habitat: (1) no aerial application of malathion or carbaryl will occur within 3 miles of occupied habitat of the

plant for the protection of the pollinators, (2) only carbaryl bran bait or diflubenzuron combined with RAATs will be used within a 3-mile buffer, and (3) no application of carbaryl bran bait will be applied within a 0.25-mile buffer of occupied habitat of these plants.

According to your EA, suppression treatments are unlikely to occur in the Shirley Basin area where there is a non-essential experimental population of black-footed ferrets (*Mustela nigripes*). The Service concurs with your determination that treatment activities are not likely to jeopardize the continued existence of the Shirley Basin population because, by definition, any effects to a non-essential, experimental population will not likely jeopardize the continued existence of the species. The Service also concurs that treatment activities, outside the Shirley Basin, are not likely to adversely affect this species because there are no other populations of black-footed ferrets known to exist in Wyoming. Furthermore, if suppression efforts are to occur in non-block cleared areas, then APHIS has committed to consulting with the Service on the development of a site-specific grasshopper suppression plan to minimize potential impacts to black-footed ferrets.

APHIS has determined that the proposed action will have no effect to the Canada lynx (*Lynx canadensis*) and its designated critical habitat or the grizzly bear (*Ursus arctos horribilis*) as treatments are not expected to occur in the montane habitat these two species occupy. When APHIS makes a no-effect determination, concurrence from the Service is not required. We do appreciate, however, receiving the information that led up to the determination. The Service concurs with your determination that the proposed action is not likely to jeopardize the continued existence of the gray wolf (*Canis lupus*). Gray wolves in Wyoming are part of a non-essential experimental population. By definition, any effects to a non-essential experimental population will not jeopardize the continued existence of the species.

The Service has recently determined that the greater sage-grouse (*Centrocercus urophasianus*) warrants listing under the Act (75 FR 13910). At this time, the development of a listing proposal is precluded by other higher-priority listing actions giving the greater sage-grouse "candidate species" status. Candidate species are reviewed annually by the Service to determine if they continue to warrant listing or to reassess their listing priority. Ideally, sufficient threats can be removed to eliminate the need for listing in which case the greater sage-grouse would no longer be a candidate species. If threats are not addressed or the status of the species declines, a candidate species can move up in priority for a listing proposal. Regarding protection of the greater sage-grouse, the Service supports recommendations from the Wyoming Game and Fish Department in their letters to APHIS dated March 7, 2011, and April 4, 2012, offering comments on the APHIS Rangeland Grasshopper and Mormon Cricket Suppression Program.

To be consistent with previous consultations and EAs for Wyoming on grasshopper and Mormon cricket suppression, the Service agrees with APHIS's recommendation that a 500-foot buffer be maintained for aerial liquid insecticides, a 200-foot buffer for aerial bait, and a 50-foot buffer for ground bait of diflubenzuron, carbaryl, and malathion for all waters, including rivers, tributaries, streams, reservoirs, and wetlands where species of concern are not present.

This concludes informal consultation pursuant to the regulations implementing the Act. This project should be re-analyzed if new information reveals effects of the action that may affect listed or proposed species or designated or proposed critical habitat in a manner or to an extent not considered in this consultation; if the action is subsequently modified in a manner that causes an effect to a listed or proposed species or designated or proposed critical habitat that was not considered in this consultation; and/or, if a new species is listed or critical habitat is designated that may be affected by this project. Also, the Service requests that visual observation of threatened and endangered species during suppression activities be reported to our office as soon as possible.

We appreciate your efforts to ensure the conservation of endangered, threatened, and candidate species and migratory birds. If you have questions regarding this letter or your responsibilities under the Act, please contact Alex Schubert of my staff at the letterhead address or phone (307) 772-2374, extension 238.

Sincerely,

  
for R. Mark Sattelberg  
Field Supervisor  
Wyoming State Office

cc: BLM, Cheyenne, WY, Natural Resource Specialist (K. Henke)  
FWS, Denver, CO, Environmental Contaminants Coordinator (K. Johnson)  
WGFD, Cheyenne, WY, Statewide Habitat Coordinator (M. Flanderka)  
WGFD, Lander, WY, Non-Game Coordinator (B. Oakleaf)

## Appendix 3: FONSI

### **FINDING OF NO SIGNIFICANT IMPACT** Rangeland Grasshopper and Mormon Cricket Suppression Program Environmental Assessment in Wyoming EA Number WY-12-01

The U.S. Department of Agriculture, Animal and Plant Health Inspection Service (APHIS), has prepared an environmental assessment (EA) that analyzes alternatives for suppressing grasshopper and Mormon cricket outbreaks on rangeland in Wyoming. The EA, incorporated by reference in this document, is available from USDA APHIS PPQ, 5353 Yellowstone Rd. Suite 208, Cheyenne WY 82009.

- The EA includes an analysis of the potential impacts of 4 alternatives. They included (1) No Action, (2) Insecticide Applications at Conventional Rates and Complete Area Coverage, (3) Reduced Agent Area Treatments (RAATs), and (4) research methods. The preferred method will be (3) Reduced Agent Area Treatments. APHIS participation in this suppression program may be necessary to reduce grasshopper populations in order to preserve rangeland forage levels used for grazing, protect adjacent cropland from being infested with damaging grasshopper species, and to protect range conditions for long term range management. The goal of these suppression treatments is not to eradicate grasshopper species, but to mitigate outbreak populations back to normal levels without causing any significant adverse effects to human health or the environment.

APHIS has determined that the proposed suppression program, conducted in accordance with the Guidelines for Treatment of Rangeland Grasshoppers and Mormon Crickets (treatment guidelines), which contains the operational procedures, will not significantly impact the quality of the human environment.

The finding of no significant impacts was determined on the following:

1. Human health: The 2002 EIS contains detailed hazard, exposure, and risk analyses for the chemicals available to APHIS. Impacts to workers and the general public were analyzed for all possible routes of exposure (dermal, oral, inhalation) under a range of conditions designed to overestimate risk. No treatment will occur over congested areas, recreational areas, or schools and if appropriate, a buffer zone will be enacted and enforced. No treatment will occur directly over water bodies. Furthermore, the following buffers will also be adhered to: 500 foot buffer for aerial liquid insecticides; 200 foot buffer with aerial bait; and a 50 foot buffer for all ground applications. No impact to groundwater is anticipated. Workers will utilize necessary safety protection measures to mitigate the risk of exposure. All APHIS treatments will strictly adhere to label requirements and further protection measures as outlined in the Treatment Guidelines and Operational Procedures. No human health effects are likely.
2. Nontargets: Chemical label instructions and APHIS Treatment Guidelines and Operational Procedures will be strictly followed. This will mitigate any adverse effect on non targets. Bee keepers will be given notice of any potential treatments in areas that contain domestic or leaf cutter bees. In all cases when using malathion or carbaryl a two mile buffer for domestic bees and a four mile buffer for leaf cutter bees will be enforced either by the movement of bees or

with buffer zones. APHIS will conduct environmental monitoring in areas where buffers are implemented. No adverse effects are likely for nontargets.

3. Endangered and threatened species: Protection measures that resulted from the Section 7 Consultation process will be implemented and strictly followed. APHIS will confer with land managers, the U.S. Fish & Wildlife Service and/or Wyoming Game & Fish personnel once treatment areas are identified to determine if any threatened or endangered species occur and, if so, which mitigating measures are needed for the selected treatment option. Suppression treatments are not likely to adversely affect endangered or threatened species or their habitats.
4. Socioeconomic issues: Potential suppression efforts would likely have beneficial economic impacts to local landowners and permittees. The forage not utilized by grasshopper and Mormon crickets will allow for greater livestock grazing, decreased needs for supplemental feed and increased monetary returns.
5. Cultural resources and events: USDA-APHIS does not anticipate any impact on cultural resources or events. APHIS will confer with BLM on a local level to protect known pictograph and petroglyph sites. Where tribal lands are involved, APHIS will confer locally with Tribal Officials on possible cultural impacts of proposed suppression efforts.
6. Executive Orders (12898 low income and minorities), 13045 (children), and 13186 (migratory birds): No adverse effects are anticipated on low income and minority populations or children because possible suppression treatments will be conducted primarily on open rangeland where human activity is unlikely. APHIS routinely conducts programs in a manner that minimizes the impact to the environment, including any impact to migratory birds.

The time between the receipt of a request for treatment and the start of a suppression program is very short. In order to inform the public and give them time to submit comments on the proposed program, APHIS has made the EA available for comment from March 5<sup>th</sup> till April 12<sup>th</sup> 2012. At this time the comments have been received and have been addressed. Once a treatment request is received and it has been determined that a suppression program will take place, APHIS will prepare a supplemental determination if any site specific information shows that there may be additional affects on the quality of the human environment that have not already been addressed in the EA. The supplemental determination will be provided to all parties that commented on the EA.

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

Bruce A. Shambaugh

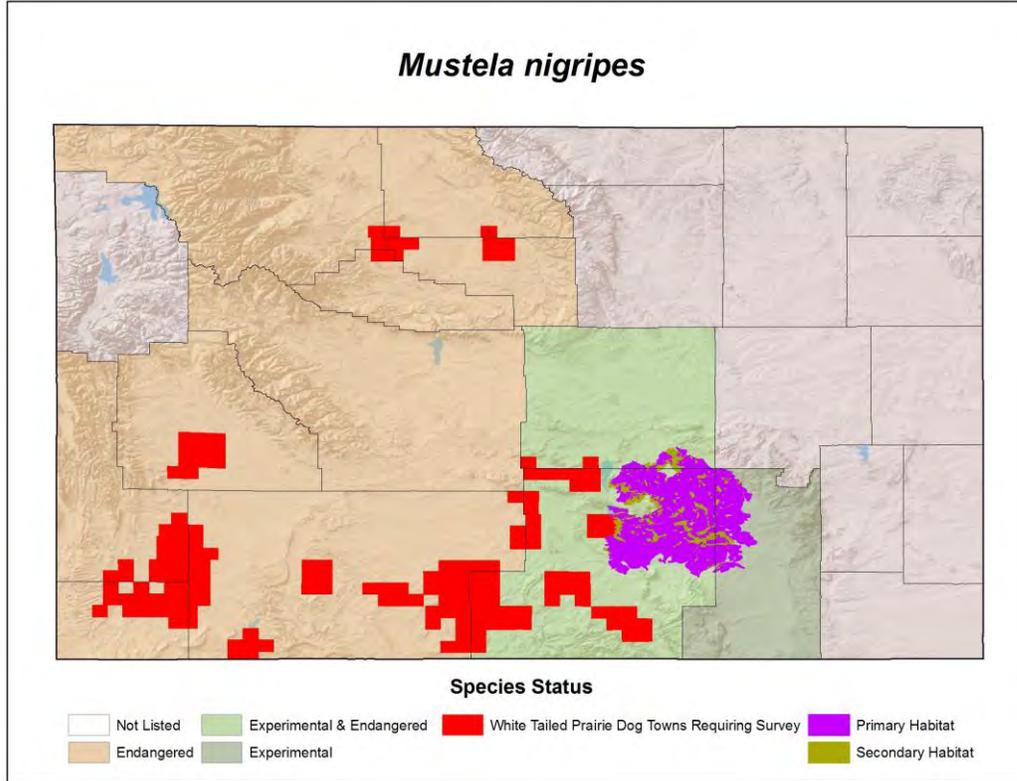
Bruce Shambaugh  
State Plant Health Director

4/16/12

Date

## Appendix 4: Summary of Species Determinations and Impact Minimization Measures

1. black-footed ferret; *Mustela nigripes*
  - a. Species Status Map



- b. FWS status: Endangered

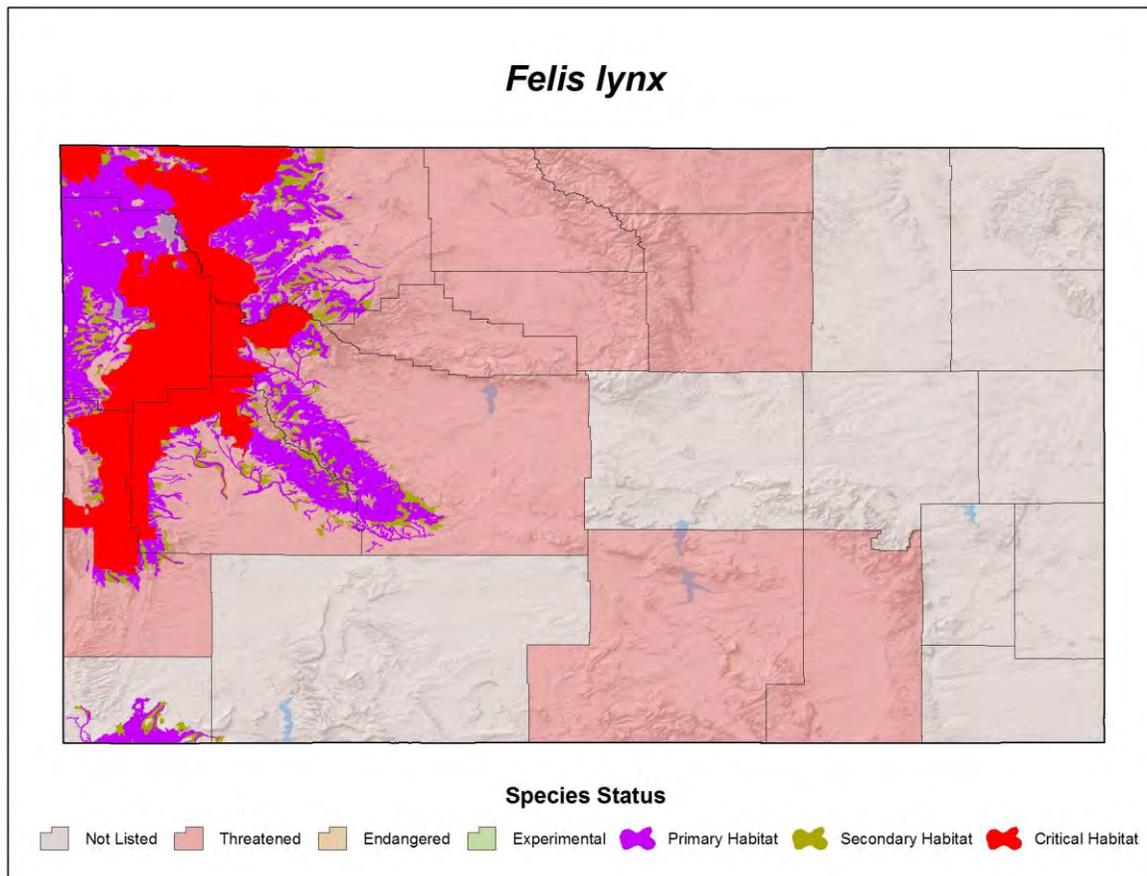
Grasshopper suppression activities in Wyoming are not likely to adversely affect black-footed ferrets. This determination is based on the fact that there are no known non-reintroduced black-footed ferret populations in Wyoming. If a suppression program is to occur in the non-cleared blocked areas indicated by the above map (dark red) then USDA APHIS will consult with Fish and Wildlife Service with a site specific plan. The use of insecticides may have a beneficial effect upon the black-footed ferret by controlling fleas and subsequently the spread of plague. Secondly the use of diflubenzuron at the reduced rate (preferred method) will minimize any impact to the species. Diflubenzuron is not toxic to mammals and the black-footed ferret is not dependent upon insects or aquatic invertebrates.

- c. FWS Status: Experimental (Shirley Basin population)

There is one non-essential experimental population of black-footed ferrets in Wyoming. Located in the Shirley Basin, ferrets were reintroduced in 1991.

Grasshopper suppression activities in Wyoming are not likely to jeopardize the continued existence of the species based on the fact, by definition; any effects to an experimental non-essential population of any species will not jeopardize the continued existence of the species. Secondly Grasshopper suppression activities are very unlikely to occur in the Shirley Basin recovery area.

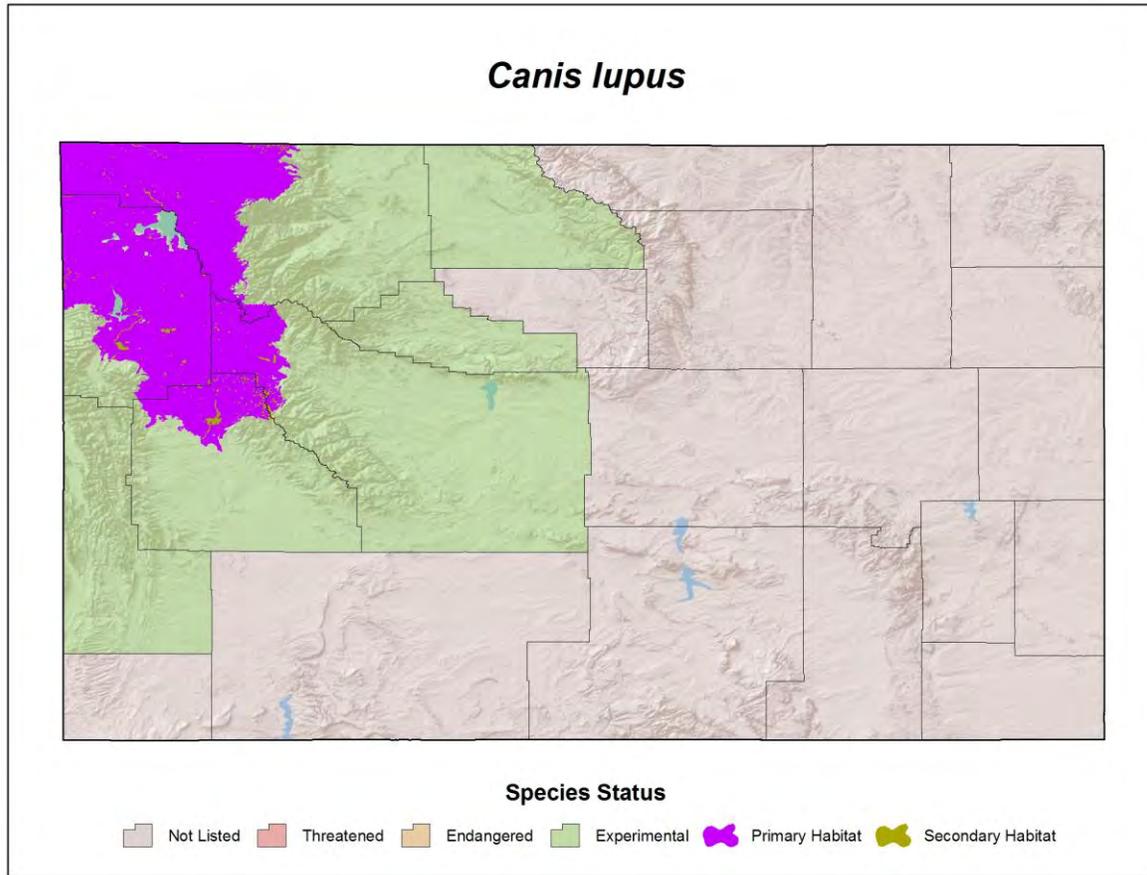
2. Canada Lynx; *Felis lynx*  
a. Species Status Map



b. FWS status: Threatened

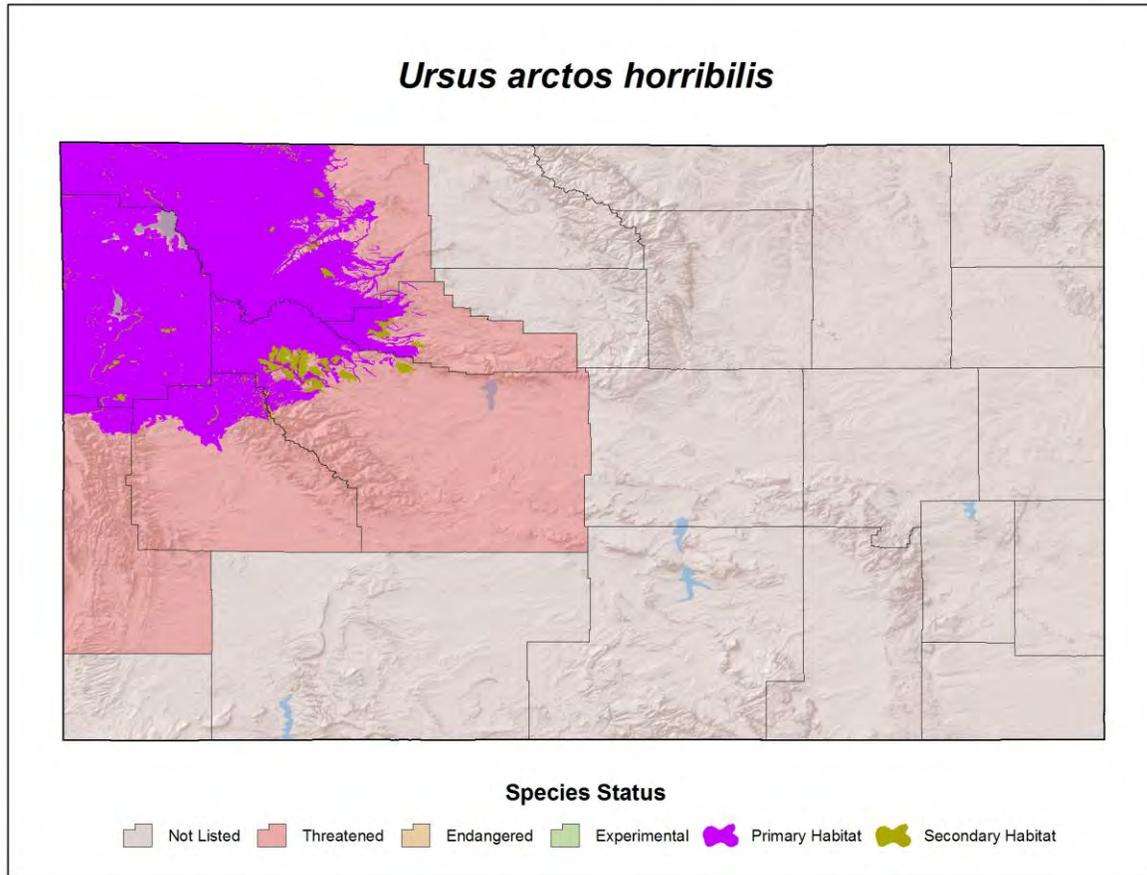
APHIS grasshopper suppression programs will have no effect on the Canada lynx or its designated critical habitat. It is not likely that APHIS grasshopper suppression programs will occur in areas of the lynx preferred habitat, boreal forests. If a suppression program does overlap with the critical habitat areas of the Canada lynx then a site specific consultation will be initiated with FWS.

3. grey wolf; *Canis lupus*  
a. Species Status Map



b. FWS status: Experimental  
Grasshopper suppression activities in Wyoming are not likely to jeopardize the continued existence of the species based on the fact, by definition; any effects to an experimental non-essential population of any species will not jeopardize the continued existence of the species.

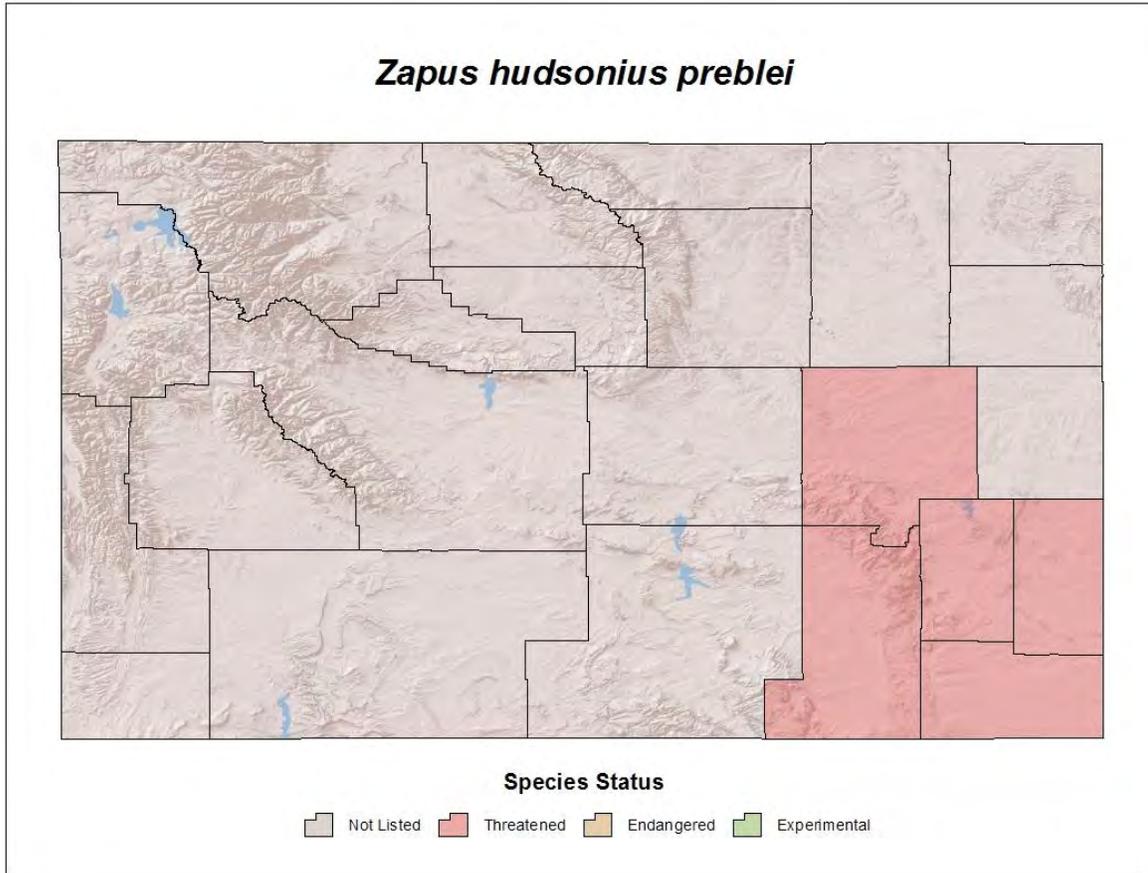
4. grizzly bear; *Ursus arctos horribilis*  
a. Species Status Map



b. FWS status: Threatened

APHIS grasshopper suppression programs will have no effect on the grizzly bear. It is not likely that APHIS grasshopper suppression programs will occur in areas of the bear's preferred habitat, montane forests. If a suppression program does overlap with the habitat areas of the grizzly bear then a site specific consultation will be initiated with FWS.

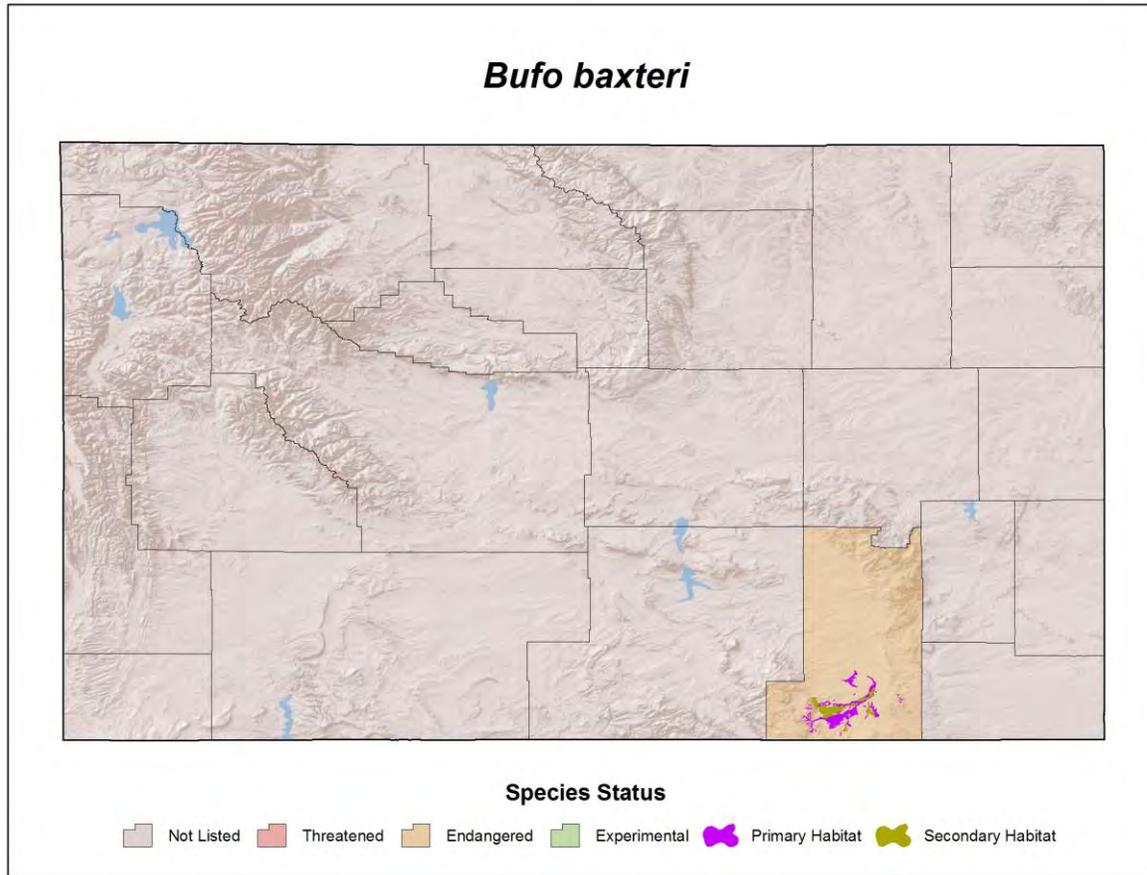
5. Preble's meadow jumping mouse; *Zapus hudsonius preblei*  
a. Species Status Map



b. FWS status: Threatened

Grasshopper suppression activities in Wyoming are not likely to adversely affect the Preble's meadow jumping mouse. It is not likely that APHIS grasshopper suppression programs will occur in areas of the mouse's preferred habitat, riparian areas due to a programmatic buffer placed on either side of streams or water bodies. This 500 foot buffer is standard procedure for all USDA APHIS PPQ grasshopper aerial suppression programs. For those areas that may be treated using ground equipment the 50 foot buffer will be increased to 500 feet around waters and riparian areas that are Preble's meadow jumping mouse suitable habitat, within the range of the species.

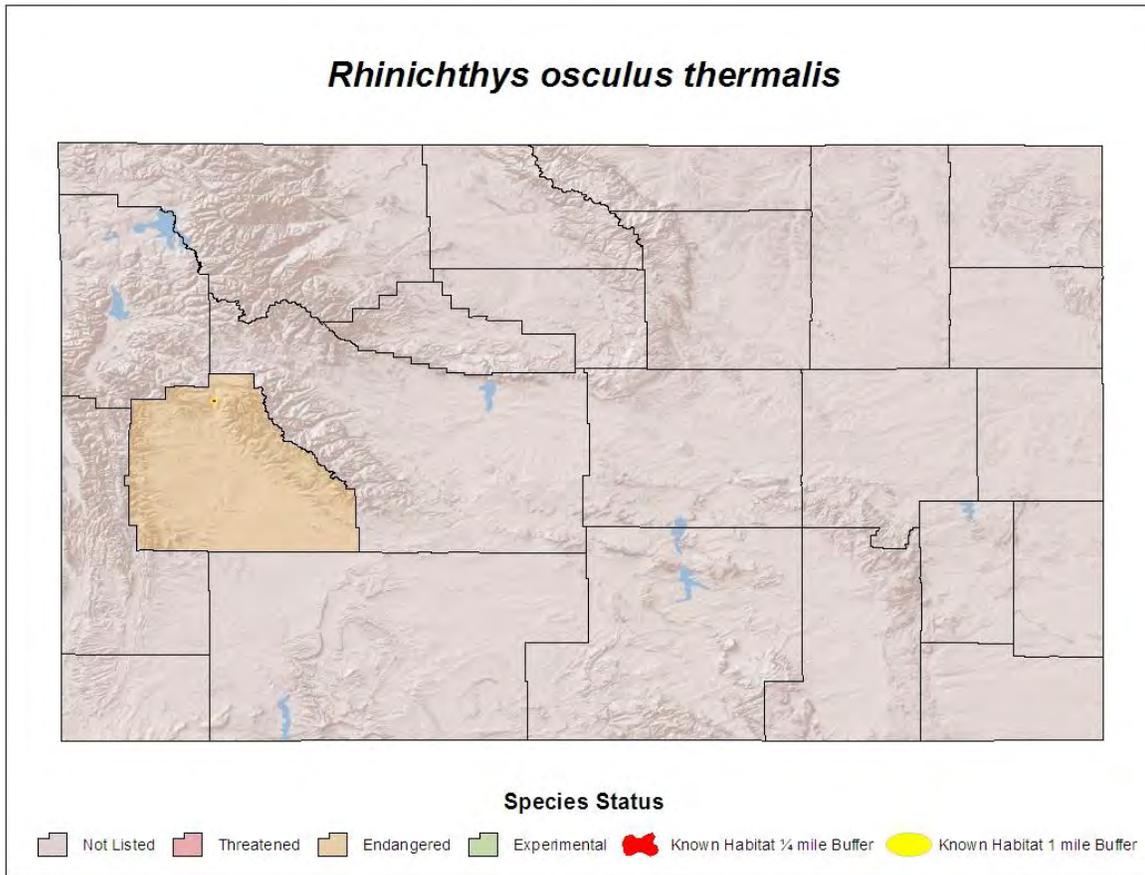
6. Wyoming toad; *Bufo baxteri*  
a. Species Status Map



b. FWS status: Endangered

Grasshopper suppression activities in Wyoming are not likely to adversely affect the Wyoming toad. It is not likely that APHIS grasshopper suppression activities will occur in the vicinity of Moretenson lake. If suppression activities are conducted in Albany county then the following impact minimization efforts will be put into place. A 0.25 mile buffer for aerial spray shall be maintained on each side of the Little Laramie river and no treatments will be applied within a 0.25 mile buffer of Mortenson NWR.

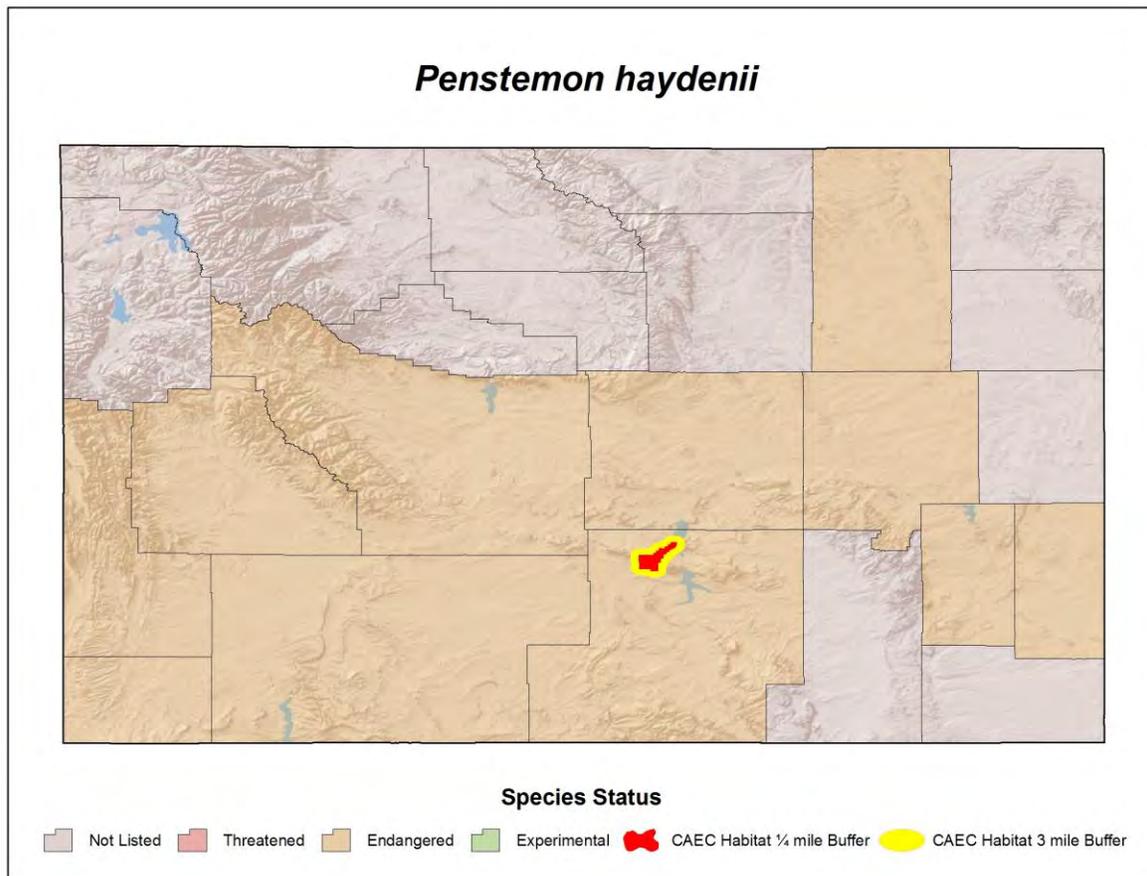
7. Kendall warm springs dace; *Rhinichthys osculus thermalis*  
a. Species Status Map



b. FWS status: Endangered

Grasshopper suppression activities in Wyoming are not likely to adversely affect the Kendall warm springs dace. It is not likely that APHIS grasshopper suppression activities will occur in the vicinity of Kendall warm springs. If suppression activities are conducted in Sublette county then the following impact minimization efforts will be utilized. A 0.25 mile buffer shall be maintained around the Kendall warm springs site for carbaryl, diflubenzuron, and ground applications of malathion. For aerial applications of malathion, a 1 mile buffer will be maintained.

8. blowout penstemon; *Penstemon haydenii*  
a. Species Status Map

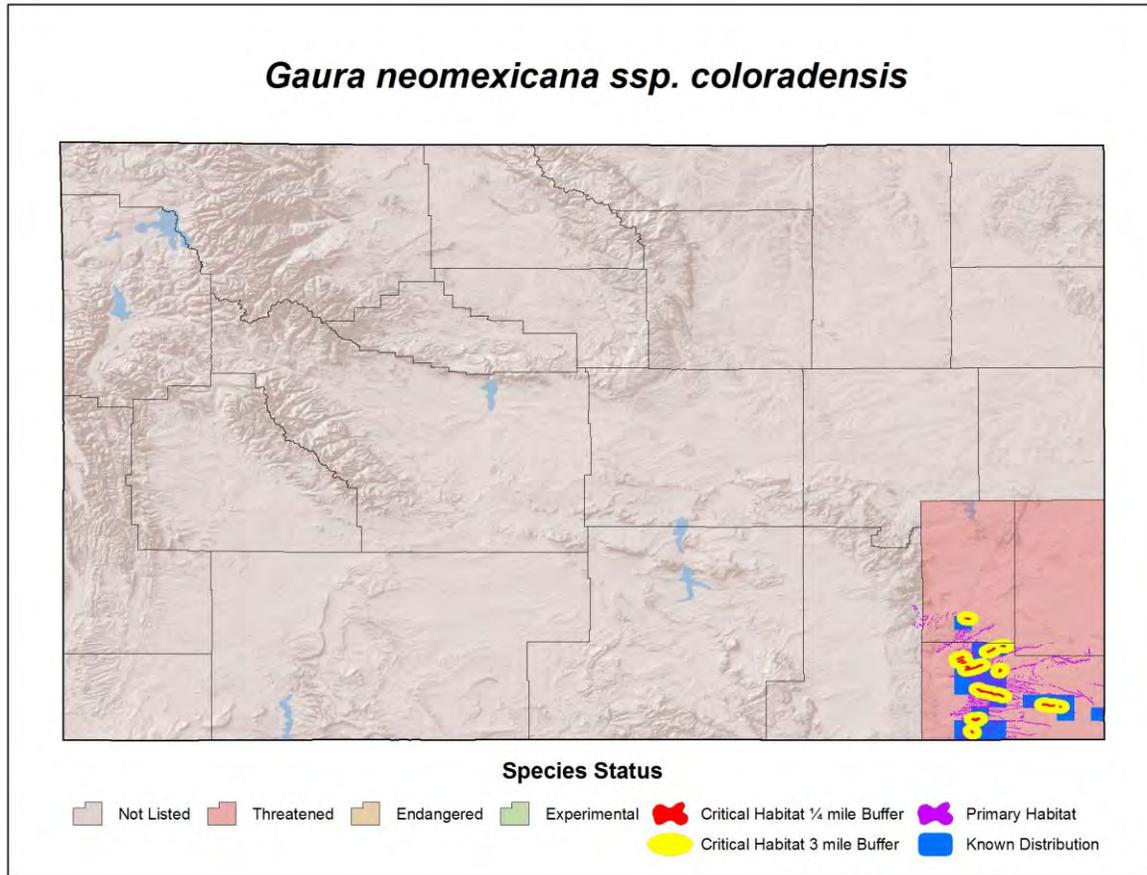


b. . FWS status: Endangered

Grasshopper suppression activities in Wyoming are not likely to adversely affect the blowout penstemon. APHIS does not anticipate any treatments in Carbon county, the only county in Wyoming where the species is known to occur. APHIS will take the following impact minimization measures for the protection of pollinators if a spray block occurs within the Critical Area of Environmental Concern (CAEC) as defined by BLM.

- 1) No aerial application of malathion or carbaryl within 3 miles of the CAEC habitat.
- 2) Only carbaryl bran bait or diflubenzuron combined with RAATS will be used within the 3 mile buffer, and
- 3) No application of carbaryl bran bait will be applied within a 0.25 mile buffer of CAEC habitat of the plant.
- 4) No buffer is required for diflubenzuron as it has no effect on adult insect pollinators.

9. Colorado butterfly plant; *Gaura neomexicana ssp. coloradensis*  
 a. Species Status Map



b. . FWS status: Threatened, Critical Habitat designated

Grasshopper suppression activities in Wyoming are not likely to adversely affect the Colorado butterfly plant or its designated critical habitat. APHIS will take the following impact minimization measures for the protection of pollinators if a spray block occurs within critical habitat or known occupied habitat.

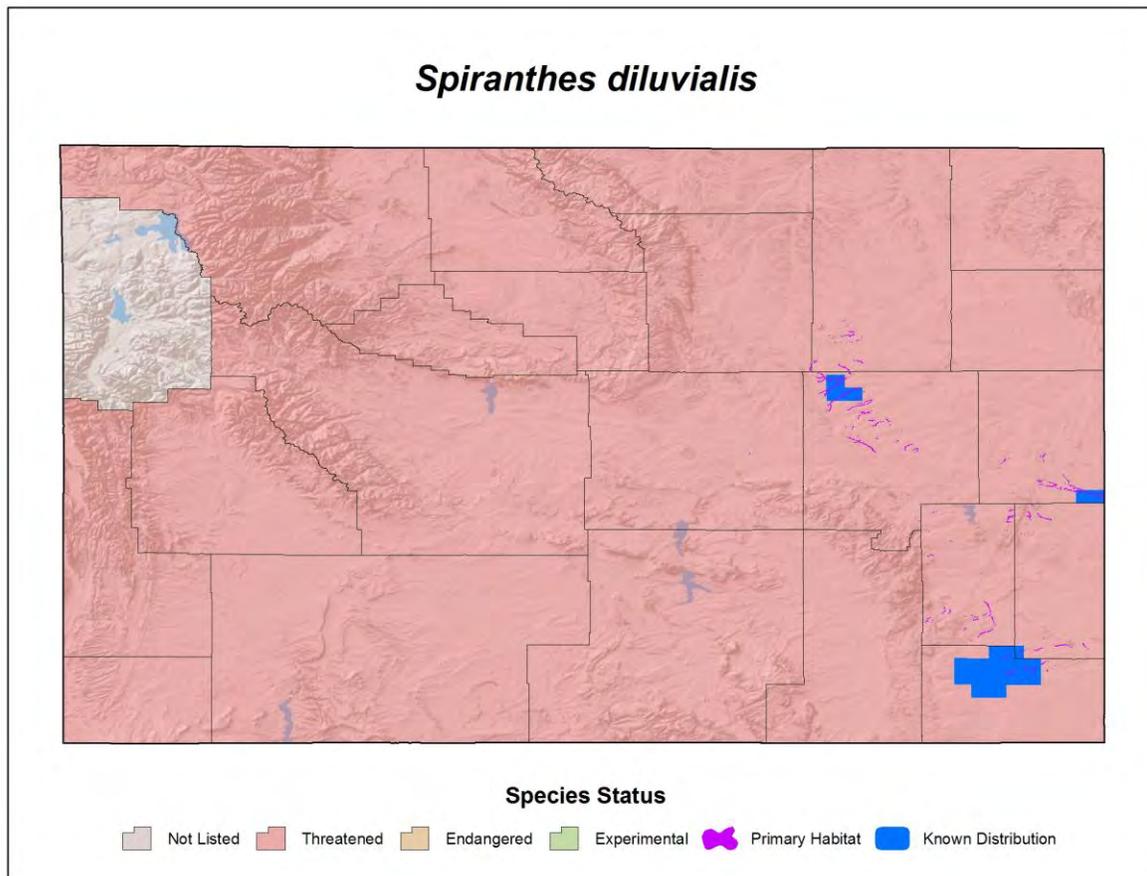
1) No aerial application of malathion or carbaryl within 3 miles of the critical habitat or known occupied habitat.

2) Only carbaryl bran bait or diflubenzuron combined with RAATS will be used within the 3 mile buffer, and

3) No application of carbaryl bran bait will be applied within a 0.25 mile buffer of critical habitat or known occupied habitat of the plant.

4) No buffer is required for diflubenzuron as it has no effect on adult insect pollinators.

10. Ute ladies'-tresses; *Spiranthes diluvialis*  
a. Species Status Map

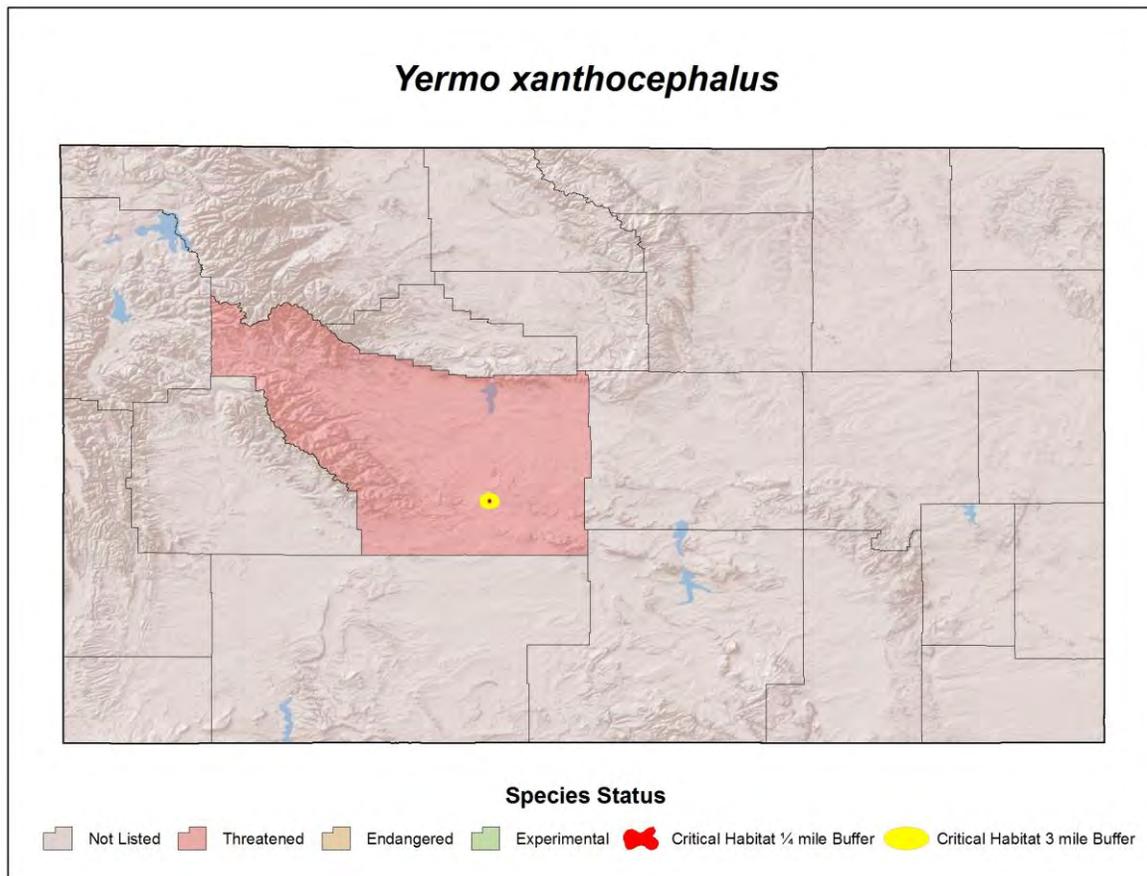


b. . FWS status: Threatened

Grasshopper suppression activities in Wyoming are not likely to adversely affect the Ute ladies'-tresses. APHIS will take the following impact minimization measures for the protection of pollinators if a spray block occurs within occupied habitat.

- 1) No aerial application of malathion or carbaryl within 3 miles of the occupied habitat.
- 2) Only carbaryl bran bait or diflubenzuron combined with RAATS will be used within the 3 mile buffer, and
- 3) No application of carbaryl bran bait will be applied within a 0.25 mile buffer of occupied habitat of the plant.
- 4) No buffer is required for diflubenzuron as it has no effect on adult insect pollinators.

11. desert yellowhead; *Yermo xanthocephalus*  
a. Species Status Map



b. . FWS status: Threatened, Critical Habitat designated

Grasshopper suppression activities in Wyoming are not likely to adversely affect the desert yellowhead or its designated critical habitat. APHIS will take the following impact minimization measures for the protection of pollinators if a spray block occurs within critical habitat.

1) No aerial application of malathion or carbaryl within 3 miles of occupied or critical habitat.

2) Only carbaryl bran bait or diflubenzuron combined with RAATS will be used within the 3 mile buffer, and

3) No application of carbaryl bran bait will be applied within a ¼ mile buffer of occupied or critical habitat of the plant.

4) No buffer is required for diflubenzuron as it has no effect on adult insect pollinators.

## Appendix 5: Comments received during the open comment period



### WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

Phone: (307) 777-4600 Fax: (307) 777-4699

Web site: <http://wgfd.wyo.gov>

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CHARLES PRICE

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March 4, 2012

WER 9810.00  
Animal and Plant Health Inspection Service  
Environmental Assessment  
Rangeland Grasshopper and Mormon Cricket  
Suppression Program  
Wyoming  
EA Number: WY-12-01

Justin Gentle  
Domestic Program Coordinator  
USDA APHIS PPQ  
5353 Yellowstone Road Suite 208  
Cheyenne, WY 82009

Dear Mr. Gentle:

The staff of the Wyoming Game and Fish Department (WGFD) has reviewed the environmental assessment (EA) for the Rangeland Grasshopper and Mormon Cricket Suppression Program. We offer the following comments for your consideration.

The EA appears to have addressed our past concerns about Carbaryl and Malathion with a statement about additional consultation with WGFD should they actually consider a site-specific use of either. We appreciate the consultation.

The EA includes a section on monitoring which states:

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

"The third area of monitoring is environmental monitoring. APHIS Directive 5640.1 commits APHIS to a policy of monitoring the effects of Federal programs on the environment. Environmental monitoring includes such activities as checking to make sure the insecticides are applied in accordance with the labels, and that sensitive sites and organisms are protected. The environmental monitoring recommended for grasshopper suppression programs involves monitoring sensitive sites such as bodies of water used for

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*"Conserving Wildlife - Serving People"*

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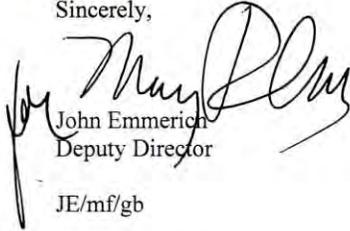
Mr. Justin Gentle  
April 4, 2012  
Page 2 – WER 9810.00

human consumption or recreation or which have wildlife value, habitats of endangered and threatened species, habitats of other sensitive wildlife species, edible crops, and any sites for which the public has expressed concern or where humans might congregate (e.g. schools, parks, hospitals)."

The EA has no mention of past reports or how access to them. If such reports actually exist from past years, there should be reference to them or a link provided. This is a recurring comment we have had when commenting on previous EAs.

Thank you for the opportunity to comment.

Sincerely,



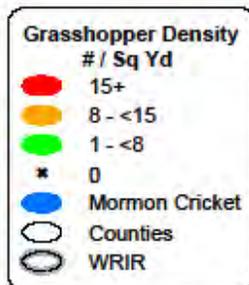
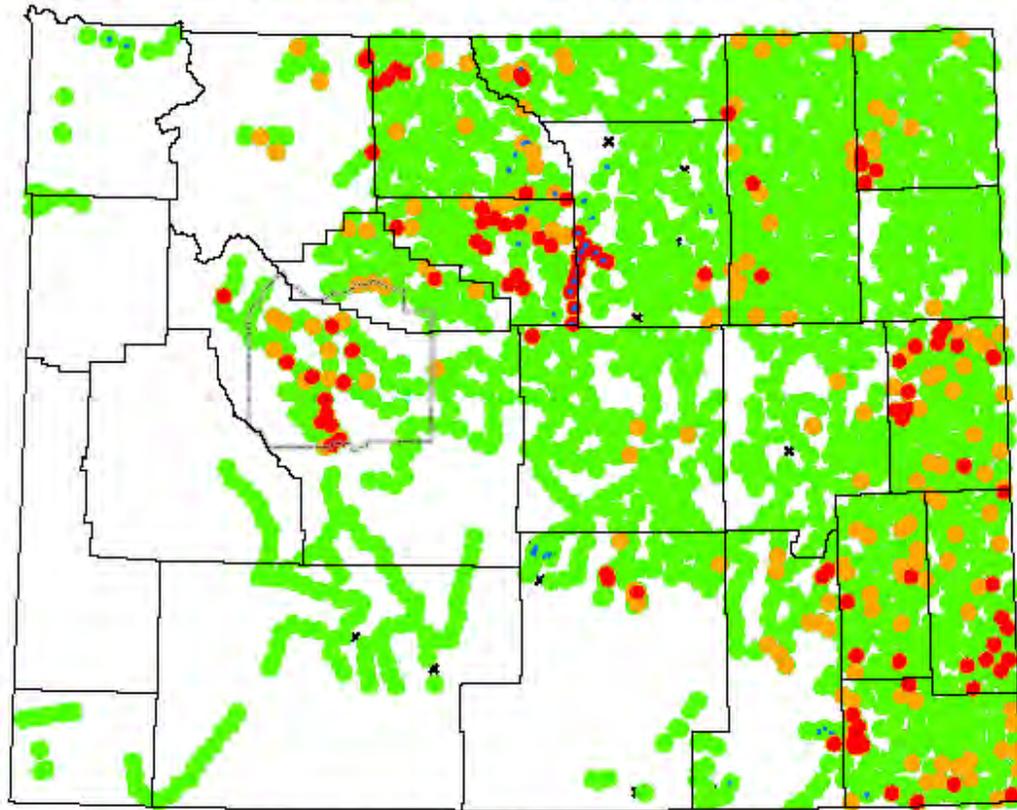
John Emmerich  
Deputy Director

JE/mf/gb

cc: USFWS

# Appendix 6: 2011 Adult Grasshopper Survey Map

## Wyoming Adult Grasshopper Survey, 2011



Buffer Radius  
 Green 3.25 miles  
 Orange 3.00 miles  
 Red 2.50 miles  
 Blue 0.75 miles

GH per Sq. Yd.	Acres			
	8 to <15	15+	8+	MC
Private	1,960,792	740,391	2,701,183	15,235
BLM	408,884	238,154	647,038	13,159
State Lands	189,827	74,672	264,499	3,827
USFS	123,291	43,538	166,829	6,719
Wind River Indian Reservation	148,984	62,484	211,468	
Bureau of Reclamation	14,368	8,751	23,119	
DOD	27,400	5,653	33,053	
USFS, Grasslands	1,916	278	2,194	
Bankhead Jones	1,131	0	1,131	
National Park Service	2,193	0	2,193	2,261
Fish and Wildlife	202	375	577	
<b>Total Acres Infested</b>	<b>2,878,988</b>	<b>1,174,296</b>	<b>4,053,284</b>	<b>41,201</b>

This information is to be used by Land Managers and W&P Personnel in order to project possible outbreaks in spring of 2012.

State wide 2,064 stops were surveyed between 7/18/2011 and 9/22/2011.

Survey stops were collected by APHIS employees using the (18 sq. foot)/2 method.

All data was collected as point data and displayed using a fixed buffer.

Map Created by  
 USDA APHIS PPQ WY  
 5353 Yellowstone Rd. Suite 208  
 Cheyenne WY 82009



