U.S. Department of the Interior
Bureau of Land Management
Royal Gorge Field Office
3028 E. Main Street
Canon City, CO 81212

ENVIRONMENTAL ASSESSMENT

NUMBER: DOI-BLM-CO-2010-0075 EA

PROJECT NAME: Programmatic Vegetation Treatment Environmental Assessment (EA)

PLANNING UNIT: All planning units in the Royal Gorge Field Office (RGFO)

LEGAL DESCRIPTION: All public lands in the RGFO

APPLICANT: BLM

ISSUES AND CONCERNS:

Non-target vegetation valuable to wildlife and fish habitats could be adversely affected due to runoff and drift when using herbicides to control invasive plants if used improperly. Some of these species could be listed as sensitive by the BLM, or as threatened or endangered under the Endangered Species Act.

Vegetation treatments in Wilderness Study Areas are complicated due to restrictions on the use of motorized equipment.

INTRODUCTION/BACKGROUND:

The Bureau of Land Management (BLM) Royal Gorge Field Office (RGFO) is located in Colorado and manages approximately 680,000 acres of BLM lands east of the Continental Divide to the Kansas border and from the Wyoming border south to the New Mexico border, excluding the San Luis Valley and North Park. The vegetation types managed by the RGFO are very diverse, and range from shortgrass prairie on the eastern plains to alpine tundra in the Mosquito Range.

Management and control of vegetation for resource and habitat enhancement on lands managed by the RGFO is accomplished using a variety of treatment methods, including, but not limited to: use of herbicides, manual (use of hands or hand held tools), mechanical (use of large equipment), and biological controls such as insects, pathogens, fish, and domestic grazing animals. Integrated Pest Management (IPM) refers to the use of a combination of more than one vegetation treatment method. The RGFO uses an IPM approach to treating invasive plants.

In an IPM program, each management option is considered, recognizing that no one management option is a stand-alone option and that each has its own strengths and weaknesses. Utilizing the strengths of each allows for a more effective and environmentally sound program. When the BLM plans vegetation control projects, all control methods should be available for use, allowing the BLM to select the one method, or combination of methods, that optimizes vegetation control with respect to environmental concerns, effectiveness, and cost of control.

Invasive plants are plants that are not part of (if exotic), or are a minor component of (if native), the original plant community or communities that have the potential to become a dominant or co-dominant species on the site if their future establishment and growth are not actively controlled by management interventions, or are classified as exotic or noxious plants under state or federal law Many of the lands in RGFO that do not meet Public Land Health Standards do not meet because they lack plant species diversity. This is often due to the encroachment of invasive exotic species, such as Salt Cedar, Russian Olive, Leafy Spurge, Russian, Diffuse and Spotted Knapweed, etc, and, in some cases, invasive native species, such as Pinyon Pine, Juniper, Gambel Oak, Sagebrush, etc. Invasive species often out compete, and ultimately displace, other vegetation in that community, and create a monoculture which lacks a properly diverse population of plant species. However, species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants.

Noxious or exotic plants are terms for plants designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or non-native, new, or not common to the U.S.

The RGFO currently treats invasive plants using IPM following procedures in the 1998 programmatic *Environmental Assessment for Management of Noxious Weeds* (CO-057-98-081 EA), which is based on the 1991 *Final Environmental Impact Statement Vegetation Treatment on BLM Lands in Thirteen Western States.* The 1991 EIS authorized the use of 20 herbicide active ingredients on BLM lands.

In 2007, the BLM completed the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS), which can be accessed on the BLM's website at: www.blm.gov. The 2007 PEIS analyzed five program alternatives of vegetation management practices. These alternatives were: A) allow the BLM to continue its current use of 20 herbicide active ingredients in 14 western states (including Colorado), as authorized by earlier Environmental Impact Statements (EIS) Record of Decisions (No Action Alternative); B) allow for the use of 14 herbicide active ingredients currently used by the BLM and four new herbicide active ingredients (Preferred Alternative); C) prohibit the use of herbicides; D) prohibit the aerial application of herbicides; or E) prohibit the use of sulfonylurea and other acetolactate synthase-inhibiting herbicide active ingredients. This EA tiers to the analysis contained in the PEIS.

The Preferred Alternative of the 2007 PEIS, Expand Herbicide Use and Allow for Use of New Herbicides in 17 Western States, was approved and the Record of Decision (ROD) signed on September 29, 2007. The 2007 PEIS analyzed the potential direct, indirect, and cumulative

impacts associated with the BLM's use of herbicides on the environment. The BLM determined that the risks associated with the use of herbicides under this alternative will be minor, and the benefits of herbicide use will be greater than with the other alternatives. The decision approved the use of four new herbicide active ingredients and 14 existing active ingredients. Due to lack of use by the BLM in recent years, four previously approved active ingredients were not considered in the preferred alternative and were not approved for use on BLM land.

In 2007 BLM completed the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report* (PER), which can be accessed on the BLM's website at: www.blm.gov. The PER describes the BLM vegetation treatment programs, policies, and treatment methods and evaluates the effects of non-herbicide vegetation treatments. Some of the information in this EA regarding mechanical, manual, and biological control methods is taken from and incorporated by reference to the PER.

BLMs PURPOSE AND NEED:

The purpose of the proposed action is to provide the BLM with the methods required to treat vegetation using IPM on BLM lands in the RGFO and to describe the conditions and limitations that apply to their use. Ultimately, the purpose is to improve ecosystem health by controlling invasive plants and manipulating vegetation to benefit fish and wildlife habitat, improve riparian and wetlands areas, and improve water quality in priority watersheds.

The need for the action is treating invasive plants in accordance with *Federal Land Policy and Management Act of 1976*. This act directs the BLM to manage public lands "in a manner that will protect the quality of scientific, scenic, historic, ecological, environmental, air and atmospheric, water resources, and archeological value." *Executive Order 13112, Invasive Species,* directs federal agencies to prevent the introduction of invasive species and provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause. In order to treat invasive plants using the most effective methods and herbicides available to BLM, the proposed action is to adopt the preferred alternative of the PEIS (approved on September 29, 2007).

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES:

Proposed Action: Treat invasive plants using IPM incorporating best management practices from PEIS and PER

Under the proposed action, the RGFO would continue an IPM approach to treat invasive plants on all RGFO lands as needed, utilizing 18 herbicide active ingredients analyzed and approved for use on BLM land in the 2007 PEIS. This approach is proposed because herbicides are necessary to effectively control many invasive plants. The proposed action is very similar to the invasive plant management currently practiced by the RGFO but is updated to be consistent with the approved herbicides in the PEIS. The new herbicides allowed by the PEIS are more effective at controlling invasive plants and are safer to use than some previously used herbicides.

Herbicide active ingredients (AI) that were previously approved for use and will continue to be used by the RGFO under the proposed action are: 2,4-D; bromacil; chlorsulfuron; clopyralid; dicamba; diuron; glyphosate; hexazinone; imazapyr; metsulfuron methyl; picloram; sulfometuron methyl; tebuthiuron; and triclopyr. An analysis of risks to humans and non-target plants and animals was conducted before these herbicides were approved for use on BLM lands by earlier records of decisions.

Under the proposed action, the RGFO may use four additional active ingredients: imazapic; diquat; diflufenzopyr (in formulation with dicamba); and fluridone. In addition, the BLM would be able to use diflufenzopyr as a stand-alone active ingredient if it becomes registered for herbicidal use. Currently, diflufenzopyr is only labeled for use in formulation with the active ingredient dicamba.

These active ingredients and formulations could only be applied for uses, and at application rates, specified on the label directions. Some of the herbicides are selective (designed to kill only certain types of plants) and some of the herbicides are non-selective (designed to kill all plants). The RGFO would also use new active ingredients that are developed in the future if: 1) they are registered by the USEPA for use on one or more land types (e.g., rangeland, aquatic, etc.) managed by the BLM; 2) the BLM determines that the benefits of use on public lands outweigh the risks to human health and the environment; and 3) they meet evaluation criteria to ensure that the decision to use the active ingredient is supported by scientific evaluation and NEPA documentation.

All pesticide or insect applications on BLM lands require the submission of a *Pesticide Use Proposal (PUP) or Biological Use Proposal (BUP)*. These proposals require information on the target pests, chemicals or insects to be used, rates of application, locations of applications, and identification of any issues of concern. These proposals must be approved by the Field Office Coordinator, Certified Pesticide Applicator, RGFO Field Manager, Colorado State Office PUP Coordinator, and the Colorado Deputy State Director of Natural Resources. For herbicides, only those formulations on the BLM approved list may be used. Insects must be approved for use by U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service **(**APHIS**)** for use as a biological control agent before they are released onto BLM land.

Due to their infrequent use on BLM lands, the following active ingredients were eliminated by the PEIS and are no longer approved for use on BLM land. These include: 2,4-DP; asulam; atrazine; fosamine; mefluidide; and simazine.

The method of herbicide application primarily would be spot herbicide spraying, which would selectively direct an herbicide stream directly on the plants to be treated using backpack, handheld, animal mounted and vehicle mounted handgun sprayers. Other application methods that would be used where appropriate include aerial spraying from helicopter or fixed wing aircraft, stem injection, and broadcast herbicide spraying (using vehicle mounted booms or nozzles).

When necessary, and when ground conditions are suitable to minimize disturbance, ground vehicles (such as UTV’s) with sprayers would be used off of existing roads to gain access to

target vegetation. Any evident tracks caused by the treatment would be raked out or otherwise disguised to discourage public use in the future. If necessary signs would be installed to indicate that the tracks were not a designated route.

When necessary, treatment areas will be seeded to promote re-vegetation of disturbed sites with desirable species.

Treatments would occur within Wilderness Study Areas using methods similar to those outlined in the proposed action including spot treatment of herbicide using backpack, handheld and animal mounted sprayers. For small infestations that are readily accessible, access would be on foot or by animal (horse or other pack animal) and would not use motorized equipment. However, in instances where there is a need to treat heavy infestations, it may be necessary to use motorized ground vehicles to access the site and motorized hand tools (such as chainsaws and motorized sprayers) to aid in treatment. This would be approved on a case by case basis following the guidelines established in BLM Manuals 8550-1 "Interim Management Policy and Guidelines for Lands Under Wilderness Review." Where applicable, follow up treatments of dense and remote infestations would be done by foot and using non-mechanized equipment.

Treatment methods are explained in detail in the Appendix A. The timing for herbicide treatments would be dependent on the species, as well as any label restrictions, which vary by herbicide.

The application method chosen depends upon the treatment objectives (removal or reduction); the accessibility; the topography, infestation size, and land use of the treatment area; the characteristics of the target species and the desired vegetation; the location of sensitive areas and potential environmental impacts in the immediate vicinity; the anticipated costs; equipment limitations; and the meteorological and vegetative conditions of the treatment area at the time of treatment.

Application of herbicides to control aquatic species would be done in accordance with the label of the aquatically approved herbicide, and in accordance with BLM's Standard Operating Procedures.

All herbicide application on BLM land will be performed by or under the direct supervision of a BLM certified pesticide applicator, or a professionally licensed contractor. All co-operators will be required to follow BLM Standard Operating Procedures (Appendix B) including the application of only BLM approved herbicides under a current PUP.

The proposed action would allow the RGFO to continue to use other treatment methods in conjunction with herbicides to treat vegetation using IPM. These other methods include manual, mechanical and biological treatment.

Mechanical treatment involves the use of vehicles such as wheeled tractors, crawler-type tractors, or specially designed vehicles with attached implements designed to cut, uproot, or chop existing vegetation. Mechanical methods that may be used by the BLM include chaining, root plowing, tilling and drill seeding, mowing, roller chopping and cutting, blading, grubbing, and mulching. These methods would be used only on large infestations of invasive plants and would

not be performed within Wilderness Study Areas. Large scale projects involving the manipulation of native vegetation would be analyzed by additional NEPA documentation.

Manual treatment involves the use of hands, hand tools and hand-operated power tools to cut, clear or prune herbaceous and woody species. Treatments include cutting undesired plants above the ground level; pulling, grubbing, or digging out root systems of undesired plants to prevent sprouting and regrowth; cutting at ground level or removing competing plants around desired species; or placing mulch around desired vegetation to limit competitive growth.

Biological control involves the intentional use of domestic animals, insects, nematodes, mites, or pathogens (agents such as bacteria or fungus that can cause diseases in plants) that weaken or destroy vegetation. Biological control is used to reduce the targeted weed population to an acceptable level by stressing target plants and reducing competition with the desired plant species.

No Action- Continue Present Herbicide Use

The RGFO's weed management plan currently follows the 1998 Environmental Assessment for Management of Noxious Weeds. The 1998 EA is based on *the 1991 EIS, Vegetation Treatment on BLM Lands in Thirteen Western States*. Under this alternative, the RGFO would be allowed to use 14 of the 20 herbicide active ingredients approved by previous BLM RODs as part of an IPM approach to treat invasive plants (6 of the original 20 active ingredients are no longer used by BLM). The RGFO would not use the four new herbicide active ingredients approved in the *2007 PEIS* ROD.

PLAN CONFORMANCE REVIEW:

Name of Plan: Royal Gorge Resource Management Plan

Date Approved: 05/13/96

Decision Number: 1-1 – 10-1, C-28, C-29, C-62, C-65 - C-68

Decision Language:

1-1 – 10-1 Vegetation management will be as follows:
-vegetation will be managed to accomplish other BLM initiatives i.e., Riparian, Wildlife, etc;
-improved forage conditions will be distributed through cooperative efforts i.e., HPP;
-Desired Plant Condition objectives will be developed for all Integrated Activity Plans (IAPs);
-vegetation monitoring will be accomplished on an interdisciplinary basis.
C-28: Identify site-specific resource objectives, including specific desired plant community, in IAPs. In most cases, this will result in a reasonable achievement of a diverse community of grasses, shrubs and trees.
C-29: Monitor the overall trend, condition and forage production of vegetation. These factors are expected to improve.
C-62: Inventory and monitor, as necessary, threatened and endangered and sensitive species and plant communities to provide information for proper management.
C-65: Avoid actions that further jeopardize listed and sensitive species and enhance these species when possible as directed by the Endangered Species Act.

C-66: Determine desired plant community in vegetation manipulation areas to enhance habitat for the species.
C-67: Complete full compliance in all cases with Sec. 7 of the endangered Species Act before invoking specific actions resulting from RMP decisions. This requires mandatory consultation and coordination with the U.S. Fish & Wildlife Service and clearance of lands inhabited by these species.
C-68: Do inventory, analysis, and monitoring for special status plants/plant communities species.

The proposed action is in conformance with the LUP, even though it is not specifically provided for, because it is clearly consistent with the following LUP decisions (objectives, terms, and conditions).

Name of Plan: *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (*PEIS*)*

Date Approved: September 29, 2007

Standards for Public Land Health: In January 1997, Colorado BLM approved the Standards for Public Land Health. These standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. Because a standard exists for these five categories, a finding must be made for each of them in an environmental analysis. These findings are located in specific elements listed below.

AFFECTED ENVIRONMENT / ENVIRONMENTAL EFFECTS / MITIGATION MEASURES:

PHYSICAL RESOURCES

AIR QUALITY

Affected Environment:
The areas under consideration are for the most part rural, undeveloped public lands. Some parcels have some levels of public use for recreational purposes. Air quality throughout the planning area is, generally, good to excellent.

Environmental Effects

Proposed Action
Direct and Indirect Impacts: The proposed action may degrade air quality during the application phase. The impacts during the application phase will be limited in duration and area.

Cumulative Impacts: None foreseen
Mitigation/Residual Effects: Use standard practices and methods during the application operations to minimize drift.

No Action Alternative
Direct and Indirect Impacts: Similar to the Proposed action.
Cumulative Impacts: None foreseen
Mitigation/Residual Effects: Similar to the Proposed action.

GEOLOGIC AND MINERAL RESOURCES

Affected Environment: There are geologic and mineral resources present throughout the area that would be affected by this proposed action. However, this project will not have a direct adverse impact to the resource.

Environmental Effects

Proposed Action
Direct and Indirect Impacts: None
Cumulative Impacts: None
Mitigation/Residual Effects: None

No Action Alternative
Direct and Indirect Impacts: None
Cumulative Impacts: None
Mitigation/Residual Effects: None

SOILS (includes a finding on Standard 1)

Affected Environment: Soils within the Royal Gorge Field Office vary from high alpine cold soils to warmer grassland type soils. The majority of the land managed by the office consists of foothills type soils. In addition, a large number of the invasive plants that need management are located in riparian/wetland environments that have wet soils and higher groundwater tables.

Environmental Effects
As stated in the PEIS, herbicide applications inevitably result in contact with soils, either intentionally for systematic treatments, or unintentionally as spills, overspray, spray drift, or windblown dust. In addition to direct application, transmission to soil may occur when an herbicide is transported through the plant from sprayed aboveground portions to roots, where it may be released into soil. Also, some herbicides remain active in plant tissue and can be released into the soil during plant decay and result in residual herbicide activity.
Along with herbicide treatments, both alternatives include manual and mechanical treatment methods. Manual treatment methods are generally low impact and have very little impact on soils. Mechanical treatments involve larger equipment and can result in moderate impacts to

soils if Best Management Practices are not followed. These impacts are usually caused by working while soils are wet and can result in soil compaction and loss of top soil productivity.

Proposed Action
Direct and Indirect Impacts: It is assumed that all Best Management Practices and Standard Operating Procedures would be followed. These procedures are designed to reduce the potential for unintended impacts to soils. The impacts to soils related to herbicide application can be both positive and negative. Generally, invasive plants can increase the potential for wind and water erosion by altering fire frequency or producing chemicals that directly affect soil quality and organisms. These negative effects include increased sediment deposition and erosion, and alterations in soil nutrient cycling. Thereby, the control of invasive plants can have a positive impact to soils. The use of herbicides can also have a negative effect in that herbicides can persist in soils resulting in negative impacts to soil organisms including inhibited fungi and microbial growth and activity. Based on the PEIS analysis, while the use of herbicides can have some minor negative effects on soils, overall there would be a greater likelihood of reducing the number of acres covered by invasive plants and restoring ecosystem function, to the benefit of soil resources.

Mechanical treatments would have varying degrees of impacts to soils. The types of equipment proposed have the ability to generate a large amount of ground disturbance and can compact the soil. Soil compaction is a function of soil texture, soil moisture, the compactive force, and the number of passes made by heavy equipment. If a soil is compacted, pore spaces are reduced, and the bulk density of soil increases. Indirect effects include lower infiltration rates, increased runoff, increased erosion and sediment potential, and reduced soil productivity for the duration of compaction. With mitigation, these impacts are typically minor and the treatments are generally beneficial to soil resources in the long term as invasive plants are controlled.

Cumulative Impacts: At the watershed scale, most of the weed treatments in the field office are done as spot treatments and few large scale projects are accomplished each year. Overall, chemical usage in the area is low given the rural, undeveloped character of the landscape. The addition of the use of the four new herbicides by BLM would have negligible effect on soils.
Mitigation/Residual Effects: For mechanical treatments, heavy equipment use would cease if 1 inch or more of liquid precipitation occurs over a 5-day period, or if 0.25 inch or more of liquid precipitation occurs during one day. Off-road travel and drilling activities would only resume when soils have frozen or dried below the plastic limit sufficiently to avoid creating ruts deeper than 2 inches, excessive vehicle tracking and compaction, or when approval is obtained from the BLM.

No Action Alternative
Direct and Indirect Impacts: The impacts associated with the No Action Alternative would be similar to the Proposed Action. The only difference would be the ability to use four new herbicides that were not previously available. It is assumed that the same number of acres would be treated yearly, just with different chemicals.

Cumulative Impacts: Cumulative impacts would be the same as the Proposed Action.
Mitigation/Residual Effects: Mitigation would be the same as the Proposed Action.

Finding on the Public Land Health Standard for Upland Soils: Most soils within the field office are currently meeting Public Land Health Standards. The ability to better control invasive plants could lead to better soil conditions and result in more acreage within the field office meeting standards.

WATER QUALITY, SURFACE AND GROUND (includes a finding on Standard 5)

Affected Environment: Water quality, both surface and ground, throughout the field office is generally considered to be good. The exception to this is in areas that have been impacted by historic mining in the Leadville and Cripple Creek areas. In addition, many of the streams on the eastern plains have selenium issues. Although not identified on the Colorado 303(d) list, sediment is a big concern throughout the area. In many areas, the increased density of some vegetation types, such as piñon/juniper, has caused a decrease in herbaceous ground cover and resulted in an increase in sediment production from the uplands.

Environmental Effects

As analyzed in the PEIS, vegetation treatments can have both positive and negative effects on water resources and quality. These affects include altering water flows, surface and groundwater quantity and quality, and rates of groundwater recharge. Studies have shown some groundwater supplies to be contaminated with herbicides and other contaminants. Generally, shallow groundwater aquifers are at greater risk for contamination than deeper sources. For this assessment, it is assumed that all Standard Operating Procedures (SOP) would be followed. In addition, in the near future, a National Pollutant Discharge Elimination System (NPDES) permit may be required for the application of pesticides into waters of the US, or onto plants growing in waters of the US. The details of these permits are still being worked on, but at this time the EPA expects the permits to take effect October 31, 2011.

In addition to the herbicide treatments, mechanical treatments are also being proposed. The mechanical treatments would have varying degrees of impact on the water quality in the area, mainly in the form of increased sediment. All of the treatment methods proposed would result in some form of ground disturbance varying from very little for hand work to relatively high amounts for a feller-buncher/skidder work on steeper slopes. Anytime there is ground disturbance, surface runoff is potentially increased, raising the erosion risk.

Proposed Action

Direct and Indirect Impacts: The Proposed Action is essentially a continuation of the existing weed program within the field office, but adds the ability to use four new chemicals. Treatments would be focused on watersheds that provide opportunities for watershed improvement and protection. In addition, the office would strive to increase the number of properly functioning wetland/riparian areas and uplands to benefit water quality. The negative effects of vegetation treatments to water quality would be minimized through the use of SOP's and BMP's and would have a minor impact overall.

Cumulative Impacts: At the watershed scale, most of the weed treatments in the field office are done as spot treatments and few large scale projects are accomplished each year. Overall, chemical usage in the area is low given the rural, undeveloped character of the landscape. The addition of the use of the four new herbicides by BLM would have negligible effect on water quality.

Mitigation/Residual Effects: Mitigation covered in the soils section would also mitigate water quality impacts.

No Action Alternative
Direct and Indirect Impacts: The No Action Alternative would continue the weed management program that is currently in place within the field office. This is essentially the same as the Proposed Action from a water quality standpoint, except four new chemicals could be used. It is assumed that the same number of acres would be treated under either alternative, just with different chemicals; therefore the impacts to water quality would essentially be the same.

Cumulative Impacts: At the watershed scale, most of the weed treatments in the field office are done as spot treatments and few large scale projects are accomplished each year. Overall, chemical usage in the area is low given the rural, undeveloped character of the landscape. The addition of the use of the four new herbicides by BLM would have negligible effect on water quality.

Mitigation/Residual Effects: Mitigation covered in the soils section would also mitigate water quality impacts.

Finding on the Public Land Health Standard for Water Quality: Currently, most of the water within the field office is meeting standards; however there are sections that are not. The implementation of either alternative would not cause any waters to change with respect to the current finding.

BIOLOGICAL RESOURCES

INVASIVE PLANTS*

Affected Environment: The RGFO office manages approximately 680,000 acres of BLM lands east of the Continental Divide to the Kansas border and from the Wyoming border south to the New Mexico border, excluding the San Luis Valley. Vegetation types managed by the RGFO are diverse, and range from shortgrass prairie on the eastern plains to alpine tundra in the Mosquito Range. The invasive plants are equally diverse. They include but are not limited to: Russian olive, tamarisk, russian, diffuse and spotted knapweed, canada, scotch, bull, musk and plumeless thistle, common and cutleaf teasel, houndstongue, hoary cress, downy brome, black henbane, jointed goatgrass; yellow and dalmation toadflax, leafy and myrtle spurge, oxeye daisy, and elongated mustard (found near the Fremont/Chaffee county line across multiple jurisdictions, including BLM), which is an A list species in Colorado (must be eradicated under state law), and the only known infestation in Colorado.

Environmental Effects

Proposed Action
Direct and Indirect Impacts: Under the Proposed Action, the RGFO would be able to use four new herbicide active ingredients to treat invasive plants. Biological controls and other IPM methods will be used when they are feasible and reasonably effective. The proposed action will help the RGFO improve ecosystem health by managing invasive plants to benefit fish and wildlife habitat, improve riparian and wetlands areas, and improve water quality in priority watersheds.

Cumulative Impacts: Vectors (livestock, vehicles, recreationists, water, wind, wildlife) and disturbances (roads, natural gas development, grazing, fuel treatments, water developments, recreation developments, etc.) will continue to be present on BLM lands managed by the RGFO. These factors have contributed in the past and present to the establishment of invasive plant populations. Project-specific mitigations, incorporated into all new projects help to reduce the risk of new infestations and the spread of weeds associated with new disturbance. Many projects, including mineral development, have measures included for post project invasive plant control, as well as weed prevention measures, (e.g. equipment cleaning, weed free hay/mulch, revegetation, etc). Adjacent to the BLM lands, on Forest Service, State, and private lands, invasive plant control efforts are underway. There is a slight risk of damage to native plants from unforeseen environmental conditions. Severe thunderstorms or windstorms, for example, could move some herbicides away from target species. Because of the protection of non-target species by the direct application method; following the herbicide label requirements; the relatively short degradation time of the herbicides; and the small amount of herbicide being used; no long term adverse effects are expected from the Proposed Action.

Mitigation/Residual Effects: Site specific analysis would be done on major projects prior to implementation. This analysis would include specific mitigation requirements such as those in the Standard Operating Procedures found in Appendix B.

No Action Alternative
Direct and Indirect Impacts: The RGFO's weed management plan would continue to follow the 1998 Environmental Assessment for Management of Noxious Weeds. The 1998 EA is based on *the 1991 EIS, Vegetation Treatment on BLM Lands in Thirteen Western States*. Under this alternative, the RGFO would use 14 of the 20 herbicide active ingredients approved by previous BLM RODs as part of an IPM approach to treat invasive plants. The RGFO would not use the four new herbicide active ingredients approved in the *2007 PEIS* ROD. The No Action Alternative would not allow the RGFO to use the best available science to manage invasive plants.

Cumulative Impacts: Under the No Action Alternative, invasive plant infestations would continue to be treated in a similar manner as they are currently. Current methods of managing invasive plants would not be as effective as those available under the proposed action. This would result in an increased potential for invasive plant populations to establish and or grow in

size on lands managed by the BLM. An increase in invasive plants on BLM lands would lead to increases on other federal, state, and private lands.

Mitigation/Residual Effects: Site specific analysis would be done on major projects prior to implementation. This analysis would include specific mitigation requirements such as those in the Standard Operating Procedures found in Appendix B.

*Invasive plants are plants that are not part of (if exotic), or are a minor component of (if native), the original plant community or communities that have the potential to become a dominant or co-dominant species on the site if their future establishment and growth are not actively controlled by management interventions, or are classified as exotic or noxious plants under state or federal law. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants.

THREATENED, ENDANGERED, AND SENSITIVE SPECIES (includes a finding on Std. 4)

Affected Environment: See attached Section 7 Biological Assessment and the BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (Appendix D) for complete description of affected environment.

Environmental Effects: See attached Section 7 Biological Assessment and the BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (Appendix D) for complete description of environmental effects.

Proposed Action
Direct and Indirect Impacts: See attached Section 7 Biological Assessment and the BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (Appendix D) for complete description of direct and indirect impacts.

Cumulative Impacts: See attached Section 7 Biological Assessment and the BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (Appendix D) for complete description of cumulative impacts

Mitigation/Residual Effects: See attached Section 7 Biological Assessment and the BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (Appendix D) for complete description of mitigation/residual effects.

No Action Alternative

Direct and Indirect Impacts: Impacts are described in the "Noxious Weed Management Biological Evaluation" (1998) conducted jointly by the USFS and BLM for the 1998 Programmatic Noxious Weed EA. The Biological Evaluation determined that no alternatives would adversely affect threatened or endangered species or lead to the listing of any Forest Service or BLM sensitive species as threatened or endangered. Mitigation is required for some species to avoid detrimental effects, such as, seasonal restrictions near active peregrine falcon nest sites.

Cumulative Impacts: Cumulative impacts are described in the "Noxious Weed Management Biological Evaluation" (1998) conducted jointly by the USFS and BLM for the 1998 Programmatic Noxious Weed EA.

Mitigation/Residual Effects: These are described in the "Noxious Weed Management Biological Evaluation" (1998) conducted jointly by the USFS and BLM for the 1998 Programmatic Noxious Weed EA.

Finding on the Public Land Health Standard for Threatened & Endangered species: Implementing the Proposed Action will not affect the Land Health Standard for Threatened & Endangered species.

VEGETATION (includes a finding on Standard 3)

Affected Environment: The RGFO office manages approximately 680,000 acres of BLM lands east of the Continental Divide to the Kansas border and from the Wyoming border south to the New Mexico border, excluding the San Luis Valley and North Park. The vegetation types managed by the RGFO are diverse, and range from shortgrass prairie on the eastern plains to alpine tundra in the Mosquito Range. The precipitation, elevation, and temperature extremes, combined with soil and geology variability, create a variety of vegetation habitat types. The eastern areas of the RGFO are within the vast North American prairies, where mixed-grass communities dominate. The variety of vegetation habitat types due to the factors listed above, are most evident in the Foot hills area. High elevation areas support plants adapted to very low temperatures, an extremely short growing season, and high snow accumulation. BLM lands managed by the RGFO are within 7 Major Land Resource Areas (MLRA), (USDA Natural Resources Conservation Service, NRCS, MLRA Explorer website). A list of the 7 MLRAs and a general description of their plant community can be found in Appendix C.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Under the Proposed Action, management of invasive plants will reduce competition against desirable native vegetation. Minor negative impacts to desirable (non-target) species will occur due to their presence amongst or near the target population. Despite the potential for negative effects from various treatment methods, the effects of not treating invasive plants far outweigh the potential adverse effects of these treatments on native plants and plant communities. Without treatment, invasive plant infestations would increase and spread, displacing native plants. The Proposed Action will increase species diversity of native vegetation to a greater degree than the No Action Alternative.

Cumulative Impacts: Management of invasive plants has a positive impact on ecosystem health throughout eastern Colorado and beyond. Vectors (livestock, vehicles, recreationists, water, wind, wildlife) and disturbances (roads, natural gas development, grazing, fuel treatments, water developments, recreation developments, etc.) will continue to be present on BLM lands managed

by the RGFO. These factors have contributed in the past and present to the establishment of invasive plant populations. Project-specific mitigations, incorporated into all new projects help to reduce the risk of new infestations and the spread of weeds associated with new disturbance. Many projects, including mineral development, have measures included for post project invasive plant control, as well as weed prevention measures, (e.g. equipment cleaning, weed free hay/mulch, revegetation, etc). Adjacent to the BLM lands, on Forest Service, State, and private lands, invasive plant control efforts are underway for state listed noxious weeds. There is a slight risk of damage to native plants from unforeseen environmental conditions. Severe thunderstorms or windstorms, for example, could move some herbicides away from their intended target species. Because of the protection of non-target species by the direct application method; following the herbicide label requirements; the relatively short degradation time of the herbicides; and the small amount of herbicide being used; no long term adverse effects are expected from the Proposed Action.

Mitigation/Residual Effects: Site specific analysis would be done on major projects prior to implementation. This analysis would include specific mitigation requirements such as those in the Standard Operating Procedures found in Appendix B.

No Action Alternative
Direct and Indirect Impacts: Impacts would be similar to those of Proposed Action.
Cumulative Impacts: Impacts would be similar to those of Proposed Action.
Mitigation/Residual Effects: Site specific NEPA would be done on major projects prior to implementation.

Finding on the Public Land Health Standard for Plant and Animal Communities:
The project area was assessed for Standards for Public Land Health. Results vary from one parcel to another but for the most part the parcels are meeting public land health standards. The proposed Action will help improve or maintain public land health standards.

WETLANDS & RIPARIAN ZONES (includes a finding on Standard 2)

Affected Environment: As stated; in 2007 the BLM at the national level completed the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (EIS).* In that document, a precise definition of wetland and riparian characteristics is given along with affected environment discussion. Additionally, detailed environmental consequences of either treating, or not treating weeds and associated impacts of the uses of herbicides is given. If and when used, vegetation treatments must follow very important Standard Operation Procedures (SOP's table 2-8 of that document) to ensure proper application. That document is located on the BLM's website www.blm.gov. Generally, the analysis for RGFO Proposed Action here tiers to this EIS document for guidance. Within RGFO, wetland and riparian resources fit that analyzed and described in the EIS.

More regional, RGFO area wide wetland resources make up between one and three present of the landscape with greater proportions in some higher elevations and less at RGFO lower or arid regions. RGFO has diverse wetlands and stream habitats from alpine wet meadows that form

headwater streams to small streams merging to form larger creeks eventually growing in size to create the resources along the Arkansas River. Wetland / riparian resources can be contained in a range of settings from wide valleys of fertile soils and high productivity to waters flowing across essentially all rock in canyon settings. RGFO has numerous creek systems were water alternately springs, then recedes allowing some site-specific unique wetland areas. Additionally, RGFO has public lands with seeps, developed springs, manmade impoundments, stock ponds, seasonal wetlands like playas, and within temporary pools in rocky areas. Likely RGFO's most unique wetlands are ground-water supported fens with some inhabiting imperiled plants and plant associations.

The RGFO has a fractured land pattern and the high amount of public land edge introduces substantial private land management pressures and influence, including uncontrolled weed situations. Known problematic invasive plant introductions are common within riparian areas and total area under infestation has expanded. Other invasions are equally as likely to have expanded in unknown locations along the creeks, rivers, and wetlands under the jurisdiction of this office, but where landlocked or with difficult access are less known. RGFO has worked to improve conditions of riparian resources where historical use activities affected stream function. Good condition riparian resources are best suited to withstand weed encroachment, and overall work to improve functionality of riparian resources has had positive results for RGFO resources. There are however many areas in early stages of improvement or still in poor condition and these are most susceptible to and weed invasions.

Certain undesirable species can expand even within healthy wetland areas. Regionally specific to RGFO rather than the National Weed EIS, riparian and wetland areas here generally follow a continuum of slowly changing plant communities more influenced by elevation. Colorado plant communities are well described by the Colorado Natural Heritage Program and published information serves as a basis for understanding the integrity of a specific area. RGFO public land streams are interrupted by private land riparian areas between public land parcels where the communities present today are influenced by both historic and current management activities within the alternating ownerships.

Generally, herbaceous communities of sedges occupy the high elevation wet meadows. These meadows transition to high elevation mixed willow complexes along the riparian area of the streams while declining sedge dominated wetlands condense to narrower margins along streams. Decreasing elevation further transitions plants to communities of mixed tree species of cottonwood, alter, birch, aspen in some combination, often mixed with diverse willow species. Community composition depends upon stream geomorphology, runoff characteristics, aspect, distance to free water, etc. Lower elevation willow species begin to replace colder adapted species moving down in elevation. Evergreen species can become a large component of riparian communities and mix with an understory of diverse rushes and transition upland grasses where overall plant diversity often increases. Stream margin plants such as cattail, bulrush and numerous sedges become prevalent in slower moving or still water.

Further elevation declines combined with common major riparian disrupters such as altered flow, channelization, roadway encroachment, intensive agriculture and other human settlement disturbance introduces less predictability of community structure and non-native species occupy

larger percentages of most given locations. Low elevation riparian environments throughout eastern Colorado have introduced elms, hardwoods and other landscape industry escaped trees that invade. Primary RGFO targeted introduced trees would be salt cedar, Russian olive and elm trees, however individual outbreaks of other tree species do occur. Mid and higher elevation environments more typically see introduced forbs, thistles, and nap-weeds, but the range of plants possible is more extensive. Many areas, at a variety of elevations, have introduced agricultural hay grasses mixed into the native community. A matrix of undesirable plants mixing into specific native communities can be extensive and treatments can be complicated by plant expansion risk, optimum control methods, and controls based on timing/ optimal season of control, but the ability to manage invasive plants, where warranted, is essential to sustain favored native species. Each proposed treatment however will need to be evaluated for site specific plant and biological issues and interaction.

Environmental Effects

Proposed Action
Direct and Indirect Impacts: The EIS addresses the effects of herbicides and other plant control strategies in detail with specific discussion by treatment type and chemical. Affects within RGFO would be similar in all respects for wetland resources as that described in the EIS. Vegetation treatments have the objective of reducing or eliminating a target plant density or several target plants in an area. In low-density infestations, treatments can be effective with no long-term affects if SOP's and mitigation measures (EIS Table 2.8 and Appendix C,D) are followed. An issue for RGFO control of invasive plants within wetland areas could centers upon plant succession, post-treatment. Large monocultures of invasive plants may require post treatment efforts to reestablish native vegetation if bare ground results from the treatment. Outbreaks of invasive plants within the RGFO have generally been individual plants or small patches, such that the treatment of individual plants or small clusters still allows for colonization of desired native plants. Benefit-risk trade off discussion of treatments is discussed in the EIS and in the background of this document and is relative for RGFO riparian and wetland resources. Specific treatment operations, e.g. using mechanical tracked equipment, while treating weed infestation in RGFO can lead to non-direct but related resource concerns such as establishing trails, but these types of affects can be controllable. Likewise, burning, chemical drift away from targeted plants can have direct effects on non-target riparian, but the scale of the impact would be anticipated to be small. Realistically, following standard operation procedures would mostly eliminate substantial negative impacts in all, except for unforeseen circumstances such as an escaped controlled burn, or chemical spill.

It is beneficial for BLM to work controlling weeds, and to do so in cooperation in certain weed priority areas where outside groups are also working together on outbreaks. The Proposed Action is therefore recommended for the long-term protection of riparian and wetland resources over the other alternatives.

Cumulative Impacts: The EIS addresses the effects of herbicides and other plant control strategies in detail with specific discussion by treatment type and evaluates cumulative affects at the national scale. Cumulative impact summary for RGFO is similar in all respects for wetland resources. RGFO could not reliably know the quantity of adjacent landowners treatment

chemicals, but BLM treatments would be cumulative to those because of RGFO's fractured public-private land pattern. On a landscape scale however, RGFO potential treatments, though incrementally cumulative to perhaps larger-scale agriculture herbicide application, are individually generally minor in size. Treatments in riparian areas will generally be conducted by a small crew, and of limited acreage. SOP's focus treatment to targeted plants and given the patch nature of typical outbreaks, the treatments size in riparian areas cumulative to total weed treatment is minor.

Mitigation/Residual Effects: SOP's as discussed in the EIS and in this document are sufficient to protect RGFO wetland and riparian areas and are tiered to here for recommended mitigation (Appendix D). Additional precaution is necessary if weeds are treated in any South Park fen habitat, and Mosquito Pass wetland, whereby BLM sensitive plant species need to located and avoided. Otherwise, treatment as described are believed to be beneficial to maintain the advantages that come with a enhancing or sustaining a native plant community. Standard Operating procedures are listed in Appendix D.

No Action Alternative
Direct and Indirect Impacts: This action is similar to the Proposed Action in that weeds will continue to be treated, however selection of this alternative does not "modernize" RGFO with latest chemical advantages or seek to standardize RGFO with guidance at the national level.

Cumulative Impacts: Similar to the Proposed action.

Mitigation/Residual Effects: Same as the Proposed Action.

Finding on the Public Land Health Standard for Riparian Systems: Field office wide, wetland and riparian resources are in different categories relative to meeting land health standards. Treating weed outbreaks is only partially a factor in managing lands to meet functional condition. Treating weeds by itself generally will not move a non-functional resource to meeting the land health standard, and there are few instances whereby weeds by themselves are the only reason for land being in a poor land health category. Overall, treatment of nuisance vegetation however is beneficial to sustaining land resources in a condition to meet or move towards meeting BLM Land Health Standard.

WILDLIFE, AQUATIC (includes a finding on Standard 3)

Affected Environment: As stated earlier; in 2007, the BLM at the national level completed the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (EIS).* In that document aquatic habitat and aquatic wildlife are discussed. The western US described in that EIS is further broke down to nine hydrologic units for affected environment discussion and affects analysis. RGFO manages lands in the Arkansas basin primarily, but also the Upper Missouri by location of tributary South Platte streams. The 2007 EIS evaluates trade-off benefits of treating vegetation, or not and the environmental consequences with specific aquatic impacts of the herbicides evaluated. Generally vegetation treatments are thought of in an upland setting, however the 2007

EIS analyzed both treatment, or not, of invasive plants or target communities in upland settings, but also of aquatic plant nuisance species as well as those in adjacent riparian or wetlands. If and when used, both aquatic and upland vegetation treatments must follow very important Standard Operation Procedures (SOP's table 2-8 of that document) to ensure proper application. That document is located on the BLM's website www.blm.gov. Generally, the analysis for the RGFO Proposed Action here tiers to the 2007 EIS document.

Within the RGFO fish, aquatic wildlife and associated wetland habitats fit that analyzed and described in the EIS. The RGFO area-wide aquatic habitat resources make up between one and three percent of the landscape with greater proportions in some higher elevations, and less at RGFO lower or arid regions. RGFO has diverse aquatic habitat adjacent to wetlands and streams from alpine wet meadows that form headwater streams to small streams merging to form larger creeks eventually growing in size to create the resources along the Arkansas River. These habitats support a diverse aquatic community as a whole because the range-wide coverage of the RGFO public lands from higher elevations out into Colorado's eastern plains. Aquatic habitat and wildlife can be contained in a range of settings from wide valleys of fertile soils and high productivity to waters flowing across essentially all rock in canyon settings. RGFO has numerous creek systems where water alternately springs, then recedes allowing some site-specific unique isolated aquatic habitat areas. Additionally, RGFO has aquatic habitat at seeps, developed springs, manmade impoundments, within stock ponds, seasonal wetlands like playas, and within temporary pools in rocky areas.

Weed treatment along wetland and riparian areas has been a common management practice for the RGFO, however specific treatment within aquatic habitat has not. The national EIS however analyzed both types of treatments and RGFO tiers to this EIS for affected analysis and environmental consequences as the relevance matches the lands under jurisdiction here. The RGFO does have a fractured land pattern and the high amount of public land edge introduces substantial private land management pressures and influence, including uncontrolled weed situations. Problematic invasive plant introductions are common within riparian areas and total area has expanded. Other invasions are likely to have expanded in unknown locations along the creeks, rivers and wetlands under the jurisdiction of this office, but given that some parcels are landlocked or have difficult access parcels, less is known.

On most RGFO public lands, any treatment which could affect fish by means of a spill, escaped uncontrolled burn, or with a minor impact from a mechanical treatment creating soil eroding conditions would likely impact brown trout or brook trout populations. However, various ponded resources under RGFO management have other fish species. Most water bodies are not well inventoried by the BLM, however good information is generally available from the Colorado Parks and Wildlife as to species present. Treatment areas adjacent to waterways with either these known fish, mixed warm-water fisheries, or with populations of other aquatic wildlife would be evaluated on an individual basis to evaluate risk to any population.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: The EIS addresses the effects of herbicides and other plant control strategies in detail with specific discussion by treatment type and chemical including those targeted at true aquatic plants. Affects within RGFO would be similar in all respects for resources as that described in the EIS. Vegetation treatments have the objective of reducing or eliminating a target plant density or several target plants in an area. In low-density infestations, treatments can be effective with essentially no long-term affects if SOP's and mitigation measures (EIS Table 2.8 and Appendix C,D) are followed to eliminate chemical drift.

The primary issues for RGFO weed control adjacent to aquatic habitats centers upon plant succession, post-treatment to recover functional riparian areas or unplanned chemical entry into aquatic environments. Large monocultures of invasive plants may require post treatment efforts to reestablish native vegetation if bare ground results from the treatment and causes erosion into aquatic habitats. Coordination of large weed treatments may be necessary to effectively convert large weed stands back to native vegetation communities. Benefit-risk trade off discussion of treatments is discussed in the EIS and in the background of this document and is relevant for RGFO riparian, wetland resources and associated aquatic habitats. Specific treatment operations, e.g. using mechanical tracked equipment, while treating weed infestation in RGFO can lead to non-direct but related resource concerns such as establishing trails, but these types of affects should be controllable.

Likewise, burning, chemical drift away from targeted plants can have indirect effects on non-target riparian, but the scale of the impact would be anticipated to be small. Realistically, following standard operation procedures would mostly eliminate substantial negative impacts in all situations, except for unforeseen circumstances such as an escaped controlled burn, or chemical spill. There could be a direct impact to species such as brown trout, brook trout, tiger salamanders, various toad species, chorus frogs, snakes inhabiting aquatic environments, and aquatic macroinvertbrates if treatment protocol is not followed. Future analysis of any site specific treatment proposed would disclose the relevant biological community present, risk to that community, and overall sensitivity of that population. Additional protection stipulations or complete avoidance should be applied to any proposed treatment if SOP or mitigation measures are not sufficient to eliminate risk. Likewise if a population is deemed too sensitive to BLM or other wildlife management agencies to jeopardize hand treatments options only should be invoked.

Cumulative Impacts: The EIS addresses the effects of herbicides and other plant control strategies in detail with specific discussion by treatment type and evaluates cumulative affects at the national scale. Cumulative impact summary for RGFO is similar in all respects for aquatic resource protection to that of the EIS. RGFO could not reliably know the quantity of adjacent landowners treatment chemicals or chemical entry into aquatic ecosystems, but BLM treatments would be cumulative to those treatments on adjacent fractured land with mixed ownership. On a landscape scale however, RGFO potential treatments, though incrementally cumulative to perhaps larger-scale agriculture herbicide application, are individually generally minor in size and usually only adjacent to aquatic habitats. Treatments in riparian areas adjacent to aquatic habitat will generally be done by a small crew and targeted at individual plants rather than broadcast spray as typical with agriculture. SOP's focus treatment to targeted plants and given

the patch nature of typical outbreaks, the treatments size in riparian areas cumulative to total weed treatment is minor.

Mitigation/Residual Effects: SOP's as discussed in the EIS and in this document are sufficient to protect RGFO aquatic habitats and are tiered to here for recommended mitigation. Otherwise, weed treatments as described are believed to be beneficial to maintain the advantages that come with a enhancing or sustaining a native plant community which supports robust aquatic habitat and aquatic wildlife communities. Standard Operating procedures are listed in Appendix D.

No Action Alternative
Direct and Indirect Impacts: This action is similar to the Proposed Action in that weeds will continue to be treated, however selection of this alternative does not "modernize" RGFO with latest chemical advantages or seek to standardize RGFO with guidance at the national level.

Cumulative Impacts: Similar to the Proposed action.

Mitigation/Residual Effects: Same as the Proposed Action.

Finding on the Public Land Health Standard for Plant and Animal Communities: Aquatic species or aquatic communities on public lands within the RGFO are not known to be limited due strictly to a weed situation anywhere. Communities have been greatly impacted by biological species introductions, land uses, water development, among other reasons, but there is no specific, large scale weed infestations on public land known to have reduced species viability, without other factors being suspect as primary decline drivers first.

WILDLIFE, TERRESTRIAL (includes a finding on Standard 3)

Affected Environment: The mixed coniferous and ponderosa pine forests are typically very dry and warm, with less than 25 in of precipitation annually. Ponderosa pines are the largest conifers in Colorado and Gambel oak is a common component of the understory, typically in a shrubby form. Other common understory shrubs include mountain mahogany and wax currant. The forests on public land are generally closed canopy systems due to a lack of disturbance. A closed canopy obstructs the amount of sunlight reaching the forest floor, inhibiting the amount of understory growth, decreasing diversity in habitat for terrestrial wildlife. Game species expected to inhabit this habitat type include elk, mule deer, black bear, and wild turkey.

The piñon-juniper/shrub mix habitat type is the most prevalent in the resource area. While the number of terrestrial species that occupy this habitat is great, the analysis focuses on mega-fauna that have the potential to be impacted the greatest by the proposed action.

The eastern plains of Colorado and portions of South Park, Colorado contain flat to gently rolling topography, with occasional canyons and bluffs. The dominant habitat in this physiographic area is shortgrass prairie. Shortgrass is dominated by two low-growing warm-season grasses, blue grama and buffalo grass; western wheatgrass is also present, along with taller vegetation including widespread prickly-pear cactus and yucca, and cholla in the south. Sandsage prairie is

found where sandy soils occur, and is dominated by sand sagebrush and the grasses sand bluestem and prairie sand-reed. Mixed grass (needle-and-thread, side-oats grama) and tallgrass (big bluestem, little bluestem, switchgrass) communities occur locally.

In the shortgrass prairie, lowland riparian habitats occur along the few stream and river courses. Riparian vegetation is dominated by plains cottonwood, willow shrubs, and introduced species such as Russian-olive and Chinese elm. Trees were uncommon features of the shortgrass prairie before European settlement; development of woody vegetation has been facilitated in historical times by alteration of natural river flow regimes, a result of irrigation drawdown and reservoir construction for flood control.

Elk populations are typically meeting or exceeding population objectives set by Colorado Parks and Wildlife. Elk are both grazer and browsers, although they show a strong preference for grasses when available. Elk are inhabitants of a variety of seasonal and transitional ranges, occupying nearly all habitat types available at some point throughout the year. Currently, habitat factors are not limiting the elk population. In Colorado, elk numbers are primarily managed through hunting which is the primary cause of mortality.

Mule deer populations for this area are currently below Colorado Parks and Wildlife objectives. Being a successional species, deer rely on pre-climax habitat conditions. As the trend since the early 1900s has been towards more stability and approaching climax vegetative conditions, the ability of the habitat to support deer has declined. The primary causes of this trend in habitat conditions are thought to result from the elimination of wildfire from the forests, the encroachment of forest cover in formerly open grassland and shrubland habitats, and the improved soil and range management that has resulted in more stable grasslands. All these factors are to the detriment of the forb and shrub components, which are important parts of the deer diet.

The Merriam's turkey is a fairly common resident in foothills and mesas of southern Colorado. The Merriam's turkey is common in the assessment area in suitable habitat. Merriam's are found primarily in ponderosa pine forests with an understory of Gambel's oak. Tall pines are used during all seasons for roosting. In the assessment area it is often found in foothill shrublands (mountain mahogany) and piñon-juniper woodlands.

Black bear, mountain lion, bobcat and other meso-carnivores among others likely inhabit the project area sporadically. Home ranges of these species can be very large resulting in a small probability of occupancy at any one time.

<u>Environmental Effects</u>:

Proposed Action

Direct and Indirect Impacts: There are no terrestrial wildlife species (i.e. mammals or reptiles) that are known to use weed species as cover or forage to a substantial extent and it is generally assumed that intact native ecosystems provide the best habitat. The proposed action includes manual removal, biological control, and chemical control as weed treatment methods.

Manual Removal: Manual removal of weed species is not anticipated to result in notable disturbance to terrestrial wildlife. Larger, more mobile species would likely leave the area during treatment activities, however most treatments are not conducted at energetically critical times of the year and temporary displacements are viewed as a desirable trade-off in preventing further seed dissemination and continued expansion of weed-dominated sites.

Chemical Control: Chemical weed control can otherwise influence terrestrial wildlife due to exposure to hazardous chemicals (e.g. direct exposure or ingestion of contaminated food items) or alteration of habitat conditions (e.g. non-selective herbicides killing desirable plant species).

Exposure to Chemicals: Most of the herbicides approved for use by the BLM pose either no risk or low risk to terrestrial wildlife (Tables 1 and 2). There is a moderate risk to small mammals due to direct spray of triclopyr, glyphosate, or hexazinone at the maximum application rates or 2,4-D at any application rate. Consumption of contaminated food items also generally poses no or low risk. Consumption of vegetation that has been contaminated by diquat or diuron at maximum application rates poses a moderate risk to small mammalian herbivores. The standard operating procedures for the RGFO's weed management program is to use the least amount of chemical necessary. Unless absolutely critical, maximum application rates would not be used and terrestrial wildlife would likely only be at low risks to negative effects from herbicide applications. The exception would be the use of 2,4-D, for which there are moderate risks associated with any application rate (for direct spray). Other wildlife species are much more sensitive to 2,4-D and its use is to be restricted across the RGFO (see Migratory Bird Section and Threatened, Endangered, and Sensitive Animal Species Section). Thus, terrestrial wildlife are much less likely to be exposed to 2,4-D.

Alteration of Habitat Conditions: The RGFO uses chemical control for both weed treatments and bare ground treatments. Spot spray treatments or broadcast application of selective herbicides would have negligible influence on habitat for terrestrial wildlife since it would target only weed species. Removal of these isolated or small populations of weeds would be beneficial in the long term as it would prevent the area from becoming a dense stand of noxious or invasive species. Large infestations in areas with minimal desirable species may be treated with a broadcast application (ground or aerial) of a non-selective herbicide followed by seeding. It is expected that these areas provide limited benefit since they are often almost a monoculture of weeds (e.g. large areas of cheatgrass, leafy spurge, or yellow toadflax). Tebuthiuron (e.g. Spike 20P) is an herbicide for woody vegetation (i.e. trees and shrubs) that can be used (according to the label) to treat big sagebrush, juniper, and pinyon pine. These species are highly valuable habitat components for a variety of species. Treatments specifically targeting juniper, pinyon pine, or any other native shrub or tree should not be considered weed treatments, per se, and should be analyzed in a separate NEPA document. To prevent accidental harm to native woody vegetation over an unacceptably large area, tebuthiuron should not be aerially broadcast.

Bare ground treatments would be confined to fenced industrial facility yards and the immediate vicinity of oil and gas production and transportation equipment that has been maintained in a heavily disturbed and non-vegetated state and provide no practical cover or forage component for terrestrial wildlife. Short duration and localized herbicide application activities would have

no further influence on occupation of nearby habitats than periodic well and pipeline inspection and maintenance activities.

Cumulative Impacts: Refer to the BLM's Vegetation Treatments Using Herbicides Final Programmatic EIS addressing impacts to wildlife resources (pp 4-96 to pp 4-118) for landscape level description. Other activities on the project area do occur that could affect non-target plant and animal species and water quality associated with this issue. Those activities are generally multiple use activities common to the Bureau of Land Management system lands, such as livestock grazing, recreation, timber harvesting, minerals activities, and travel management. However, it is important to note that there are long term benefits to all resources with implementation of a noxious weed control program. Control of noxious weeds and the establishment of native vegetation is expected to decrease negative cumulative effects of non-target species and in some cases would be considered a mitigation action.

Mitigation/Residual Effects: Measures to reduce risks to terrestrial wildlife species and their habitats have been integrated into the proposed action.

No Action Alternative

Direct and Indirect Impacts: The RGFO's weed management plan currently follows the 1998 Environmental Assessment for Management of Noxious Weeds. The 1998 EA is based on *the 1991 EIS, Vegetation Treatment on BLM Lands in Thirteen Western States*. Under this alternative, the RGFO would continue to use 20 herbicide active ingredients approved by previous BLM RODs as part of an IPM approach to treat invasive plants. The RGFO would not use the four new herbicide active ingredients approved in the *2007 PEIS* ROD.

Wildlife impacts (positive and negative) would be similar to those that have occurred in the past 10 years. Negative impacts to wildlife could be lower than under the other herbicide-use alternatives, based on the relative number of acres treated. Impacts would include loss of non-target vegetation used by wildlife, and effects to wildlife health from exposure to herbicides. Aerial applications have the greatest potential to affect wildlife because they typically cover the largest treatment areas. The use of glyphosate is of concern in areas with amphibians.

Long-term positive impacts on wildlife communities (i.e., improvements in habitat and ecosystem function) would be less under this alternative than under the other alternatives. Invasive plant populations would likely continue to expand at the current rate or greater, increasing damage to native plant communities and wildlife habitat and inhibiting ecosystem functions associated with those communities.

Cumulative Impacts: See the RGFO's 1998 Environmental Assessment for Management of Noxious Weeds.

Mitigation/Residual Effects: See the RGFO's 1998 Environmental Assessment for Management of Noxious Weeds.

Finding on the Public Land Health Standard for Plant and Animal Communities: Implementing the Proposed Action will not affect the Land Health Standard for terrestrial wildlife species.

Table 1. Risk Categories Used to Describe BLM-evaluated Herbicide Effects on Non Special Status Wildlife According to Exposure Scenario

Application Scenario	BROM[1]		CHLOR		DICAMBA		DIFLU		DIQUAT		DIURON		FLUR		IMAZ		OVER		SULFM		TEBU	
	Typ[2]	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max
Direct Spray of Terrestrial Wildlife																						
Small mammal – 100% absorption	0[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pollinating insect – 100% absorption	L	L	0	0	0	L	0	0	L	L	L	M	0	0	0	0	0	0	0	0	0	0
Small mammal – 1st order dermal absorption	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indirect Contact with Foliage After Direct Spray																						
Small mammal – 100% absorption	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pollinating insect – 100% absorption	0	0	0	0	0	0	0	0	0	0	0	L	0	0	0	0	0	0	0	0	0	L
Small mammal – 1st order dermal absorption	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ingestion of Food Items Contaminated by Direct Spray																						
Small mammalian herbivore – acute	0	L	0	0	0	0	0	0	0	L	0	L	0	0	0	0	0	0	0	0	0	0
Small mammalian herbivore – chronic	0	L	0	0	0	L	0	0	L	M	L	M	0	0	0	0	0	0	0	0	0	L
Large mammalian herbivore – acute	0	L	0	0	0	L	0	0	0	M	0	L	0	0	0	0	0	0	0	0	0	L
Large mammalian herbivore – chronic	L	M	0	0	0	L	0	0	L	M	M	H	0	0	0	0	L	M	0	0	0	L
Small avian insectivore – acute	0	0	0	0	L	M	0	0	0	M	0	L	0	0	0	0	0	0	0	0	0	L
Small avian insectivore – chronic	0	0	0	0	0	0	0	0	0	M	0	L	0	0	0	0	0	0	0	0	0	0
Large avian herbivore – acute	0	0	0	0	0	0	0	0	0	L	0	L	0	0	0	0	0	0	0	0	0	0
Large avian herbivore – chronic	0	L	0	0	0	0	0	0	L	H	0	M	0	0	0	0	0	0	0	0	0	0
Large mammalian carnivore – acute	0	L	0	0	0	0	0	0	0	L	0	0	0	0	0	0	0	0	0	0	0	0
Large mammalian carnivore – chronic	0	0	0	0	L	L	0	0	0	0	L	L	0	0	0	0	0	0	0	0	0	0

[1] BROM = Bromacil; CHLOR = Chlorsulfuron; DIFLU = Diflufenzopyr; FLUR = Fluridone; IMAZ = Imazapic; OVER = Overdrive®; SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron.

[2] Typ = Typical application rate; and Max = Maximum application rate.

[3] Risk categories: 0 = No risk (majority of RQs < most conservative LOC for non-special status species); L = Low risk (majority of RQs 1-10x most conservative LOC for non-special status species); M =Moderate risk (majority of RQs 10-100x most conservative LOC for non-special status species); and H = High risk (majority of RQs >100 most conservative LOC for non-special status species). The risk category is based on the risk level of the majority of risk quotients observed in any of the scenarios for a given exposure group and receptor type. The reader should consult the risk tables in Chapter 4 of the BLM's Vegetation Treatments Using Herbicides Final Programmatic EIS to determine the specific scenarios that result in the displayed level of risk for a given receptor group.

Table 2. Risk Categories[1] Used to Describe Forest Service-evaluated Herbicide Effects on Wildlife According to Exposure Scenario

	2,4-D		Clopyralid		Glyphosate[2]		Hexazinone		Imazapyr		Metsulfuron		Picloram		Triclopyr[2]	
	Typ[3]	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max
Acute/Accidental Exposures																
Direct spray, small mammal, 1st order absorption	L[4]	L	0	0	0	0	0	L	0	0	0	0	0	0	L	M
Direct spray, small animal, 100% absorption	M	M	L	L	L	M	L	M	0	L	0	L	L	L	L	M
Direct spray, bee, 100% absorption	M	M	0	L	L	M	L	M	0	L	0	0	0	L	L	M
Consumption of contaminated fruit, small mammal	L	L	0	0	0	L	0	L	0	0	0	0	0	0	0	0
Consumption of contaminated grass, large mammal	M	M	L	L	L	M	L	M	0	L	0	L	L	M	L	M
Consumption of contaminated grass, large bird	M	H	0	L	L	L	L	M	0	L	0	0	0	0	L	M
Consumption of contaminated water, small mammal, spill	L	L	0	0	0	L	0	L	0	0	0	0	0	0	0	L
Consumption of contaminated water, small mammal, stream	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Consumption of contaminated insects, small mammal	M	H	L	L	L	M	0	0	0	L	0	L	L	M	L	M
Consumption of contaminated insects, small bird	H	H	0	L	L	M	M	M	L	L	0	0	0	0	L	M
Consumption of contaminated small mammal, predatory mammal	L	L	0	0	0	0	0	0	0	0	0	0	0	0	0	L
Consumption of contaminated small mammal, predatory bird	L	L	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Consumption of contaminated fish, predatory bird, spill	H	H	0	0	0	0	L	M	0	0	0	0	0	0	0	0
Chronic Exposures																
Consumption of contaminated vegetation, small mammal, onsite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Consumption of contaminated vegetation, small mammal, offsite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Consumption of contaminated vegetation, large mammal, onsite	M	M	0	L	0	L	L	M	0	0	0	0	0	0	L	M
Consumption of contaminated vegetation, large mammal, off -site	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	L
Consumption of contaminated vegetation, large bird, on-site	M	M	0	L	0	L	L	M	0	0	0	0	0	L	L	M
Consumption of contaminated vegetation, large bird, off-site	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Consumption of contaminated water, small mammal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Consumption of contaminated fish, predatory bird	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] Risk categories are based on upper estimates of hazard quotients and the BLM LOCs of 0.1 for acute scenarios and 1.0 for chronic scenarios. The reader should consult the text of this section of the individual Forest Service risk assessments to evaluate risks at central estimates of hazard quotients.

[2] Risk categories are the same for both evaluated formulations.

[3] Typ = Typical application rate; and Max = maximum application rate.

[4] Risk categories: 0 = No risk (HQ < LOC); L = Low risk (HQ = 1 to 10 x LOC); M = Moderate risk (HQ = 10 to 100 x LOC); and H = High risk (HQ > 100 LOC).

MIGRATORY BIRDS

Affected Environment: Ponderosa pine forests are very dry and warm, with less than 25 in of precipitation annually. Ponderosa pines are the largest conifers in Colorado and Gambel oak is a common component of the understory, typically in a shrubby form. Other common understory shrubs include mountain mahogany and wax currant. Tree species sometimes found mixed with ponderosa pine are junipers, pinyon pine, aspen, white fir, and Douglas-fir. Birds typical of the ponderosa pine forest type include Merriam's turkey, Williamson's sapsucker, pygmy nuthatch, western bluebird, band-tailed pigeon, Grace's warbler, flammulated owl, red-breasted nuthatch, violet-green swallow, western tanager, and chipping sparrow. Ponderosa pine forests support a rich avifauna, in part a reflection of the prevalence of Gambel's oak in many ponderosa stands. Oak adds structure and prey--insect densities are higher in oak than in nearby conifers.
Birds typical of the ponderosa pine forest type include wild turkey, pygmy nuthatch, western bluebird, and chipping sparrow. More bird species are found in ponderosa pine forests than any other coniferous forest habitat in this region. This abundant bird life reflects in part the prevalence of Gambel oak in many ponderosa stands. Oak adds structure, acorns, and prey--insect densities are higher in oak than in nearby conifers. Five species are identified as high priority in ponderosa pine habitats: band-tailed pigeon, flammulated owl, Mexican spotted owl, Lewis's woodpecker, and Grace's warbler.

Piñon-juniper habitat supports the largest nesting bird species list of any upland vegetation type in the West, and this habitat type is the most prevalent in the resource area. The richness of the piñon-juniper vegetation type is important due to its middle elevation. Survey tallies in piñon-juniper are similar in species diversity to the best riparian. Several species are found in the piñon-juniper habitat and include: black-chinned hummingbird, gray flycatcher, Cassin's kingbird, gray vireo, piñon jay, juniper titmouse, black-throated gray warbler, Scott's oriole, ash-throated flycatcher, Bewick's wren, mountain chickadee, white-breasted nuthatch, and chipping sparrow.

The eastern plains of Colorado and portions of South Park, Colorado contain flat to gently rolling topography, with occasional canyons and bluffs. The dominant habitat in this physiographic area is shortgrass prairie. Shortgrass is dominated by two low-growing warm-season grasses, blue grama and buffalo grass; western wheatgrass is also present, along with taller vegetation including widespread prickly-pear cactus and yucca, and cholla in the south. Sandsage prairie is found where sandy soils occur, and is dominated by sand sagebrush and the grasses sand bluestem and prairie sand-reed. Mixed grass (needle-and-thread, side-oats grama) and tallgrass (big bluestem, little bluestem, switchgrass) communities occur locally.

In the shortgrass prairie, lowland riparian habitats occur along the few stream and river courses. Riparian vegetation is dominated by plains cottonwood, willow shrubs, and introduced species such as Russian-olive and Chinese elm. Trees were uncommon features of the shortgrass prairie before European settlement; development of woody vegetation has been facilitated in historical times by alteration of natural river flow regimes, a result of irrigation drawdown and reservoir construction for flood control.

The following birds are listed on the US Fish and Wildlife Service Birds of Conservation Concern (BCC) – 2008 List for BCR 16-Southern Rockies/Colorado Plateau and BCR 18-Shortgrass Prairie. These species have been identified as species that may be found in the project area, have declining populations and should be protected from habitat alterations.

The golden eagle is a bird of grasslands, shrublands, piñon-juniper woodlands, and ponderosa pine forests, but may occur in most other habitats occasionally, especially in winter. Nests are placed on cliffs and sometimes in trees in rugged areas, and breeding birds range widely over surrounding habitats.

Northern harriers reside throughout Colorado, with highest densities on the eastern plains, mountain parks, and western valleys. These hawks feed on small mammals, birds, reptiles, and amphibians. They hunt by flying low over wetlands, grasslands, shrublands, and croplands.

Peregrine falcons in Colorado breed on cliffs and rock outcrops from 4,500-9000 ft in elevation. They most commonly choose cliffs located within piñon-juniper and ponderosa pine zones. These falcons feed on smaller birds almost exclusively, with White-throated swifts and rock doves being among their favored prey.

Prairie falcons nest in scattered locations throughout the state where they inhabit the grassland and cliff/rock habitat types. These falcons breed on cliffs and rock outcrops, and their diet during the breeding season is a mix of passerines and small mammals.

Flammulated owls prefer old-growth or mature ponderosa pine, apparently due to the presence of large broken-top and lightning-damaged snags and trees for nesting cavities, large cavities excavated by Northern Flickers and other woodpeckers, open structure of trees and under story for foraging, and high prey availability. They will utilize other habitats with similar structure, such as open mixed-conifer and aspen forests. Key habitat features seem to be the presence of large trees and snags, scattered clusters of shrubs or saplings, clearings, and a high abundance of nocturnal arthropod prey.

Piñon jays range the semiarid lands of the West. The Colorado Breeding Bird Atlas map shows them south of a diagonal line drawn from the northwest corner to the southeast corner of the state. Piñon jays are piñon and juniper obligates in Colorado and nest commonly at the lower elevations of piñon-juniper woodlands, often where junipers dominate. A few nest in ponderosa pine. They prefer extensive stands far from high human activity.

Black-throated gray warblers are fairly common summer residents in piñon-juniper woodlands across the southwestern half of Colorado. Some surveys show these warblers to be the most frequently encountered birds in the piñon-juniper woodland. Black-throated gray warblers, in Colorado, are piñon-juniper obligates, preferring tall, dense piñon-juniper woodlands.

Virginia's warblers in Colorado nest between 5,000-9,000 feet in elevation. They breed most abundantly in the western quarter of the state, along the eastern slope foothills, and in the upper Arkansas River drainage. Virginia's warblers nest in dense shrublands and on scrub-adorned slopes of mesas, foothills, open ravines, and mountain valleys in semiarid country. They use

scrubby brush, piñon-juniper woodland with a well-developed shrubby understory, ravines covered with scrub oak and dense shrublands--especially gambel oak. They also breed in open ponderosa pine savannahs that have a dense understory of tall shrubs.

Williamson's sapsuckers breed in forested regions and in Colorado populations are concentrated along the eastern edge of the Rockies. Williamson's sapsuckers nest primarily in ponderosa pine and in aspen components of mixed-conifer. They often place nest cavities in aspen trees, and often choose nest trees in aspen stands adjacent to open ponderosa pine or mixed-conifer forest.

The Gray vireo nests in western Colorado and on the eastern slope of Las Animas County. Gray Vireos are pinyon-juniper woodland obligates. Gray Vireos usually inhabit stands dominated by juniper or thin stands of pure juniper. They construct nests of dry grasses, plant fibers, stems, and hair, often camouflaging them with sagebrush leaves.

Grace's warblers breed from southwestern Colorado and southern Utah, south through central Arizona, western New Mexico, and into north-central Mexico. Grace's warblers inhabit open ponderosa pine forests with pines 16 ft tall, especially with a shrubby understory, usually Gamble's oak.

Environmental Effects: Refer to the BLM's Vegetation Treatments Using Herbicides Final Programmatic EIS addressing impacts to migratory birds (pp 4-96 to pp 4-118).

Proposed Action

Direct and Indirect Impacts: While some birds will utilize invasive species as nesting habitat (e.g. willow flycatchers nesting in tamarisk), it is generally assumed that intact native ecosystems provide the best habitat for birds. Migratory birds can be negatively impacted by the proliferation of weed species through lowered food availability (e.g. changes in insect communities and abundance), removal of appropriate nest sites (e.g. tamarisk replacing cottonwood trees), or large-scale habitat conversion (e.g. cheatgrass altering fire return intervals in sagebrush communities). The proposed action includes manual removal, biological control, and chemical control as weed treatment methods.

Manual Removal: Migratory birds may be impacted by manual removal activities if nests are destroyed during removal (e.g. cutting down tamarisk or Russian olive trees) or if the level of human activity associated with manual removal of weeds results in nest abandonment. Manual removal of weeds is labor intensive. If weeds are either dispersed or easy to remove, then personnel should be able to cover large areas of habitat during the breeding season (i.e. April through mid-August). However, any disturbance around nests would be of short duration and brief periods of disturbance are not expected to adversely influence an individual nesting effort.

Manual removal of weeds is most likely to negatively influence breeding success in areas of dense weeds that are difficult to remove since personnel would spend a large amount of time in a small area. However, such localized control activities are viewed as a desirable trade-off in preventing further seed dissemination and continued expansion of weed-dominated sites. Unlike most songbirds, raptor nests tend to be conspicuous and the RGFO maintains a database of active

nest locations. In the event raptor nest activity is discovered within treatment areas, restrictions on activities around the nest site would be applied until nest functions are complete.

Prescribed grazing may also be used a biological control method. However, a site-specific Environmental Assessment will be conducted for prescribed grazing treatments.

Chemical Control: In terms of disturbance to nest sites due to human activity, the impacts of chemical control methods are similar to those of manual control methods with more disturbance time in any given area associated with manual application of chemicals (e.g. wiping chemicals on individual plants) or spot-spray treatments in dense weed infestations. Chemical weed control can otherwise influence migratory birds due to exposure to hazardous chemicals (e.g. direct exposure or ingestion of contaminated food items) or alteration of habitat conditions (e.g. nonselective herbicides killing desirable plant species).

Exposure to Chemicals: Most of the herbicides approved for use by the BLM pose either no risk or low risk to migratory birds due to loss of invertebrate prey or consumption of contaminated food items (Tables 1 and 2). It is assumed that birds would move out of the area during herbicide application and the only individuals that may receive direct exposure to herbicides during broadcast applications would be young that have not yet fledged. Indirect impacts to insectivores due to loss of prey species are not anticipated. Most herbicides pose little to no risk to insects. Moderate risks to insects are associated with use of diuron, glyphosate, hexazinone, and triclopyr at the maximum application rates and with the use of 2,4-D at any application rate. Likewise, consumption of contaminated food items generally pose little to no risk to birds. Moderate risks are associated with consumption of insects that have been contaminated by dicamba, diquat, glyphosate, and triclopyr at the maximum application rate or hexazinone at any application rate. Moderate risks are also associated with consumption of vegetation that has been contaminated by 2,4-D at typical application rates or by diuron, hexazinone, or triclopyr at maximum application rates. The greatest risk to migratory birds from chemical exposure comes from consumption of vegetation that has been contaminated by diquat or 2,4-D at maximum application rates or from consumption of insects contaminated by 2,4-D (at any application rate). Consumption of contaminated fish (at any application rate of 2,4-D) also poses a high risk to piscivorous birds (e.g. belted kingfisher, *Ceryle alcyon*). One of the standard operating procedures for the RGFO is to "apply the least amount of herbicide needed to achieve the desired result" (See SOP Appendix). Consumption of contaminated vegetation due to application of typical rates of diquat poses only a low risk to migratory birds and thus use of diquat is not anticipated to result in substantial negative impacts to migratory bird populations.

However, the use of 2,4-D does cause concern. The majority of the "birds of conservation concern" in the RGFO (with the exception of the raptors and Cassin's finch) consume insects as a staple of their diet or feed their young primarily insects (Ehrlich et al. 1988). Since 2,4-D at any application rate poses a high risk to avian insectivores across a wide variety of habitat types, it is recommended that its use be restricted within the RGFO to the greatest extent practicable. Other herbicides that are not as toxic to migratory birds could be used to treat most of the weeds (except for leafy spurge and toadflax) that can be treated using 2,4-D. Site specific proposals shall be evaluated based on the application method (i.e. spot spray or broadcast), condition of the treatment area in respect to foraging and nesting habitat, and whether or not there are other

effective treatment methods for the target weed. It should not be used as a matter of convenience or habit when there are other treatment methods available and site specific proposals should document the reason why the use of 2,4-D is critical to achieving objectives.

Alteration of Habitat Conditions: Chemical control can be applied as a spot treatment or as broadcast application of either selective or non-selective herbicides. Typically, chemicals would be used to achieve weed removal with the goal of restoring native plant communities (hereafter referred to as "weed treatments"). However, chemicals are also used to kill all existing vegetation and promote bare ground around production facilities (hereafter referred to as "bare ground treatments").

Spot spray treatments or broadcast application of selective herbicides would have negligible influence on habitat for migratory birds since it would target only weed species. Removal of these isolated or small populations of weeds would be beneficial in the long term as it would prevent the area from becoming a dense stand of noxious or invasive species. Large infestations in areas with minimal desirable species may be treated with a broadcast application (ground or aerial) of a non-selective herbicide followed by seeding. It is expected that these areas provide limited benefit to migratory birds since they are often almost a monoculture of weeds.

Some migratory birds nest in tamarisk and Russian olives. If possible, delaying treatment of these weeds until after the nesting period (i.e. after mid-August) would prevent destruction of nests. If treatments are effective, then there may be a reduction in potential nesting habitat in the interim period after weeds are removed and native vegetation reestablishes. However, treatments would not be on such a scale to influence local populations of migratory birds and would be beneficial in the long-term as native plant communities are restored to the area. Tebuthiuron (e.g. Spike 20P) is an herbicide for woody vegetation (i.e. trees and shrubs) that can be used (according to the label) to treat big sagebrush, juniper, and pinyon pine. These species are highly valuable in terms of nesting and foraging habitat for migratory birds, including several species listed as "birds of conservation concern". Treatments specifically targeting juniper, pinyon pine, or any other native shrub or tree should not be considered weed treatments, per se, and should be analyzed in a separate NEPA document. To prevent accidental harm to native woody vegetation over an unacceptably large area, tebuthiuron should not be aerially broadcast.

Bare ground treatments typically use chemicals such Round Up (glyphosate), Krovar (bromacil and diuron), Sahara (diuron and imazapyr) and Karmex DF (diuron) to achieve long-term results. The proposed treatments would be confined to fenced industrial facility yards, rec sites (developed parking areas, developed picnic areas, boat ramps, etc.) and the immediate vicinity of oil and gas production and transportation equipment that has been maintained in a heavily disturbed and non-vegetated state and provide no practical cover or forage component for migratory bird use. Short duration and localized herbicide application activities during early to mid-summer would have no further influence on nearby nesting habitats than periodic well and pipeline inspection and maintenance activities. These episodes would have no reasonable probability of adversely affecting local reproductive efforts or recruitment.

Cumulative Impacts: Refer to the Vegetation Treatments Using Herbicides Final Programmatic EIS (pp 4-216 to 4-222). Other activities on the project area do occur that could

affect non-target plant and animal species and water quality associated with this issue. Those activities are generally multiple use activities common to the Bureau of Land Management system lands, such as livestock grazing, recreation, timber harvesting, minerals activities, and travel management. However, it is important to note that there are long term benefits to all resources with implementation of a noxious weed control program. Control of noxious weeds and the establishment of native vegetation is expected to decrease negative cumulative effects of non-target species and in some cases would be considered a mitigation action.

Mitigation/Residual Effects: Measures to reduce risks to migratory bird species and their habitats have been integrated into the proposed action. Also, refer to the Vegetation Treatments Using Herbicides Final Programmatic EIS including SOPs (pp 4-118).

To be in compliance with the Migratory Bird Treaty Act (MBTA) and the Memorandum of Understanding between BLM and USFWS required by Executive Order 13186, BLM must avoid actions, where possible, that result in a "take" of migratory birds. Pursuant to BLM Instruction Memorandum 2008-050, to reduce impacts to Birds of Conservation Concern (BCC), no habitat disturbance (removal of vegetation such as timber, brush, or grass) is allowed during the periods of May 15 - July 15, during the breeding and brood rearing season for most Colorado migratory birds. Therefore, mechanical weed treatments will not be allowed from May 15 – July 15.

An exception to this timing limitation will be granted if nesting surveys conducted no more than one week prior to vegetation-disturbing activities indicate no nesting within 30 meters (100 feet) of the area to be disturbed. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 a.m. under favorable conditions. If vegetation was cleared prior to May 15, this provision does not apply to ongoing construction or completion activities that are initiated prior to May 15 and continue into the 60-day period.

Avoid suitable mountain plover nesting habitat from April 15 – July 15. An exception may be granted if pre-treatment surveys by a qualified biologist indicate the absence of mountain plover in suitable nesting habitat.

Avoid occupied peregrine falcon nest sites from March 15-July 31 (includes the area in view of the nest site, up to one-half mile distant).

Avoid occupied northern goshawk nest areas from May 1-September 1.

Avoid ferruginous hawk nest areas from March 1 – July 1.

An exception may be granted to any mitigation pending review of treatment areas for available nesting habitat, historic nest sites, and/or active nesting by a qualified biologist. A visual survey for raptor nests will be within a quarter mile of the project site if nesting habitat is present. If a nest is found, the stated timing limitations will be implemented. Another exception to timing limitations may be granted if an additional survey indicates the nest was occupied but subsequently failed due to natural causes or the nest was occupied but the nestlings have fledged and dispersed from the nest.

No Action Alternative

Direct and Indirect Impacts: The RGFO's weed management plan currently follows the 1998 Environmental Assessment for Management of Noxious Weeds. The 1998 EA is based on *the 1991 EIS, Vegetation Treatment on BLM Lands in Thirteen Western States*. Under this alternative, the RGFO would continue to use 20 herbicide active ingredients approved by previous BLM RODs as part of an IPM approach to treat invasive plants. The RGFO would not use the four new herbicide active ingredients approved in the *2007 PEIS* ROD.

Wildlife impacts (positive and negative) would be similar to those that have occurred in the past 10 years. Negative impacts to wildlife could be lower than under the other herbicide-use alternatives, based on the relative number of acres treated. Impacts would include loss of non-target vegetation used by wildlife, and effects to wildlife health from exposure to herbicides. Aerial applications have the greatest potential to affect wildlife because they typically cover the largest treatment areas. The use of glyphosate is of concern in areas with amphibians.

Long-term positive impacts on wildlife communities (i.e., improvements in habitat and ecosystem function) would be much less under this alternative than under the other alternatives. Invasive plant populations would likely continue to expand at the current rate or greater, increasing damage to native plant communities and wildlife habitat and inhibiting ecosystem functions associated with those communities.

Cumulative Impacts: See the RGFO's 1998 Environmental Assessment for Management of Noxious Weeds.

Mitigation/Residual Effects: See the RGFO's 1998 Environmental Assessment for Management of Noxious Weeds.

CULTURAL RESOURCES

Affected Environment: Cultural resources on BLM land administered by the RGFO include a diverse array of prehistoric and historic archaeological sites that make up a unique cultural landscape. Prehistoric site types include open lithic sites, open camp sites, open and sheltered architectural sites, and rock art. Historic site types include homesteads, town sites, mining and milling complexes, prospecting and mining adits and shafts, and historic roads and trails.

Site density is generally high on BLM-administered land, which includes a foothills ecotone known for its diversity of plant and animal species desirable in ancient and historic subsistence regimes. Within the analysis area, there are a high number of sites eligible for the National Register of Historic Places (NRHP).

Environmental Effects:

Invasive plants may have long-term negative impacts on cultural resource sites by displacing native vegetation and increasing the potential for soil erosion, potentially leading to the loss of these resources. The removal of invasive vegetation could contribute to the restoration and

maintenance of historic and ethnographic cultural landscapes (USDI National Park Service 2003).

The effect of herbicide treatments on cultural resources depends on the method of herbicide application and the herbicide type used. Some chemicals can cause soil acidity to increase, which would result in deterioration of artifacts; even some types of stone from which artifacts are made. The application of chemical treatments can also result in impacts such as altering or obscuring the surfaces of standing wall masonry structures, pictograph or petroglyph panels, and organic materials. While chemicals may affect the surface of exposed artifacts, they can generally be removed without damage if treated soon after exposure. Organic substances used as inactive ingredients in herbicide formulations, such as diesel fuel or kerosene, may contaminate the surface soil and seep into the subsurface portions of a site. These organic substances could interfere with the radiocarbon dating of a site. Herbicides could also harm traditional use plants, or threaten the health of the people gathering, handling, or ingesting recently treated plants, fish, or wildlife that are contaminated with herbicides.

Mechanical and manual treatments have the potential to create ground disturbance resulting in vegetation removal, compaction and chiseling that could undermine the cultural contexts of prehistoric and historic sites. Heavy equipment and ATVs used off roads and trails can have the greatest impacts. Ground disturbance can also result in the unintended effect of the loss of vegetation cover and soil erosion that can result in the erosion of buried cultural deposits. Biological treatments utilizing livestock grazing can also have negative impacts on cultural resources that can include trampling, compaction, obliteration, or displacement of artifacts or features.

Proposed Action

Direct and Indirect Impacts: The treatments proposed have potential for direct and indirect effects to cultural resources. However, until specific areas are identified for treatment, impacts to historic properties cannot be definitively assessed.

Recommended Mitigation Measures: Because no cultural resources inventories have been completed, and historic properties have not yet been found, it is not possible to identify specific mitigation measures. However, BLM has developed the following process for evaluation of impacts:

1. BLM will conduct literature reviews for all proposed weed treatment requests in order to identify historic properties that might be affected. If a literature review suggests that historic properties are likely to be found in an area of potential effect, an intensive inventory will be conducted, unless BLM determines that the proposed treatment will not affect cultural resources.
2. If previously-recorded historic properties are located in the area of potential effect, BLM will analyze the impact of the undertaking on the historic properties, including a field visit if necessary.

3. If the literature review indicates that historic properties ***might*** be found in the area of potential effect, BLM may choose to conduct an intensive inventory or to simply monitor the treatment work.
4. If historic properties in the area of potential effect cannot be avoided, BLM will prepare a plan to mitigate the effects of the weed treatment. SHPO concurrence with BLM's mitigation plan will be required before the weed treatment commences. The range of possible mitigation activities possible is quite large, but a non-exhaustive list includes avoidance (always the first choice), testing, excavation (salvage, partial, or total) and data recovery in the form of archival recording (for standing structures and other historic-era phenomena).

Cumulative Impacts: As with mitigation, cumulative effects on historic properties cannot be specifically identified until cultural resources inventories are completed and historic properties have been identified.

TRIBAL AND NATIVE AMERICAN RELIGIOUS CONCERNS

Affected Environment: BLM's cultural resources program requires ongoing consultation with Native American tribal governments for the maintenance, preservation, and promotion of native cultural heritage and resources, including plant and animal subsistence resources and the use of vegetation for religious and ceremonial purposes. There are no known traditional plant collecting areas within or adjacent to the area of potential effect. However, ethnographic sources indicate that traditional plants used by the Native American populations in Colorado include, but are not limited to, goosefoot, chokecherry, prickly pear cactus, cholla cactus, sage, and piñon pine. Such plants are present in the area of potential effect, and so were most likely exploited by Native American populations in the past.

Environmental Effects: BLM consulted with 17 tribes regarding the proposed weed treatment program, including the Apache Tribe of Oklahoma, Cheyenne and Arapaho Tribes of Oklahoma, Cheyenne River Lakota Tribe, Comanche Tribe of Oklahoma, Crow Creek Sioux, Jicarilla Apache Nation, Kiowa Tribe of Oklahoma, Northern Arapaho Tribe, Northern Cheyenne Tribe, Oglala Sioux Tribe, Pawnee Nation of Oklahoma, Rosebud Sioux Tribe, Eastern Shoshone Tribe, Southern Ute Tribe, Standing Rock Sioux Tribe, Ute Tribe, and the Ute Mountain Ute Tribe. BLM sent a letter and map packet to all tribes that might be directly affected by vegetation treatment activities, and requested information on how the proposed activities might impact Native American interests, including the use of vegetation and wildlife for subsistence, religious, and ceremonial purposes. No tribe indicated any concerns.

Proposed Action

Direct and Indirect Impacts: None.
Cumulative Impacts: Similar to the Proposed action.
Mitigation/Residual Effects: None.

No Action

Direct and Indirect Impacts: Same as Proposed Action.
Cumulative Impacts: Same as Proposed Action.
Mitigation/Residual Effects: Same as Proposed Action.

PALEONTOLOGICAL RESOURCES

Affected Environment:
The RGFO contains paleontologic resources ranging in age from quaternary mammals to the now 3rd oldest fossils ever found. The BLM manages paleontological resources by the authorities granted in FLPMA (P.L. 94-579) and NEPA (P.L. 91-190) and the Paleontologic Resources Preservation Act that was passed by congress in March 2009. It is unlawful to collect or damage protected paleontologic resources without a Paleontological Resources Use Permit (43 CFR 3165.1-5).

Environmental Effects

Proposed Action: With regard to paleontological resources, the effect of herbicide treatments on fossil material would vary with respect to: 1) fossil type; 2) minerals; 3) degree of fossilization; and 4) whether the fossil is exposed or buried. Although it may be possible for chemicals found in herbicides to impact unique fossil material, herbicide treatments are more likely to affect researchers, students, or other field personnel conducting paleontological research than the paleontological resources. More likely, damage to fossil materials, if present, would result from the use of wheeled equipment to apply herbicides. The potential for impacts to fossils would depend on the attributes of the fossil material, whether the fossil is buried or exposed, and the method of herbicide application. Methods involving the use of vehicles driving cross-country would potentially crush fossil material exposed on the surface.

Direct and Indirect Impacts: Potential impacts to fossil localities would be both direct and indirect. Direct impacts to or destruction of fossils could occur from unmitigated activities related to the proposed action, conducted on formations with high potential for important scientific fossil resources. Indirect impacts would involve damage or loss of fossil resources due to the unauthorized collection of scientifically important fossils by workers or the public due to increased access to fossil localities in the Project Area.

Cumulative Impacts: Adverse impacts to important fossil resources would be long-term and significant since fossils removed or destroyed would be lost to science. Adverse significant impacts to paleontological resources can be reduced to a negligible level through mitigation of ground disturbing activities. It is possible that the proposed project would have the beneficial impact that ground disturbance activities might result in the discovery of important fossil resources.

Mitigation/Residual Effects: Once site specific information is available, all surface disturbing activity must be analyzed to ensure that protected paleontologic resources are not damaged. If surface disturbing activity is proposed in areas where protected paleontologic resources are present, an on the ground survey may be necessary before proceeding with treatment (see BLM IM 2008-009).

No Action Alternative

Direct and Indirect Impacts: Same as proposed action
Cumulative Impacts: Same as proposed action
Mitigation/Residual Effects: Same as proposed action

VISUAL RESOURCES

Affected Environment: Visual Resource Management (VRM) classes along with the corresponding VRM Objectives were established in the Royal Gorge Field Office in 1996 with the approval of the Royal Gorge Resource Area Resource Management Plan (RMP). Visual Resource Management objectives corresponding to the various management classes provide standards for analyzing and evaluating proposed projects. Projects are evaluated using the Contract Rating System to determine if it meets VRM objectives established by the RMP. More details regarding visual resource management can be found in the Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement.

Environmental Effects

Proposed Action
Direct and Indirect Impacts: Impacts to visual resources would be similar to impacts identified in the Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement (Visual Resources pp 4-152) and Standard Operating Procedures (SOPs) found in this document would be followed.

Cumulative Impacts: None.
Mitigation/Residual Effects: None

No Action Alternative

Direct and Indirect Impacts: Impacts would be similar to that of the Proposed Action. Short term impacts might be slightly less since fewer herbicides would be available for use.

Cumulative Impacts: None
Mitigation/Residual Effects: None

ENVIRONMENTAL JUSTICE

Affected Environment: The proposed action will generally affect areas that are rural in nature. There are no anticipated disproportionately high, adverse human health or environmental effects on minority or low-income populations. This condition or status, will be reanalyzed with each project specific application.

WASTES, HAZARDOUS OR SOLID

Affected Environment: The analysis of the chemical selection, application methods and characteristics and fate and transport of the chemicals have been evaluated in the PEIS. In addition, comprehensive risk assessments were also completed in the PEIS to understand the exposure pathways and potential for impacts to humans and the environment. Therefore, the recommendations for management and handling in the PEIS will be carried through to a Field Office Level.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: The safety aspects of this project with respect to field application have been covered in other portions of this document. The chemicals are planned for storage at the Royal Gorge Field Office and will be managed, stored and handled in accordance with all applicable Colorado RCRA regulations, as well as other applicable regulations.

Cumulative Impacts: This is summarized in the Vegetation Treatments Using Herbicides Final Programmatic EIS on pages 4-238 - 4-242.

Mitigation/Residual Effects: The RGFO Spill Contingency Plan will be updated to include protocol for responding to a spill of any chemical being proposed with this action, for both the storage location and while applying product in the field. In addition, the Vegetation Treatments Using Herbicides Final Programmatic EIS addresses impacts to human health and safety (which includes management, storage and handling of chemicals) in the SOPs on pp 4-175, which will be implemented within RGFO.

No Action Alternative

Direct and Indirect Impacts: Similar to the Proposed action.

Cumulative Impacts: Similar to the Proposed action.

Mitigation/Residual Effects: Similar to the Proposed action.

LAND RESOURCES

RECREATION

Affected Environment: The Vegetation Treatments Using Herbicides Final Programmatic EIS addresses impacts to recreation resources including SOPs (pp 3-58 & pp 4-158). Please refer to this document.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Refer to the Vegetation Treatments Using Herbicides Final Programmatic EIS addresses impacts to recreation resources including SOPs (pp 4-158).

Cumulative Impacts: Refer to the Vegetation Treatments Using Herbicides Final Programmatic EIS addresses impacts to recreation resources including SOPs (pp 4-158).

Mitigation/Residual Effects: Refer to the Vegetation Treatments Using Herbicides Final Programmatic EIS addresses impacts to recreation resources including SOPs (pp 4-158).

No Action Alternative

Direct and Indirect Impacts: Similar to the Proposed action.
Cumulative Impacts: Similar to the Proposed action.
Mitigation/Residual Effects: Similar to the Proposed action.

FARMLANDS, PRIME AND UNIQUE

Affected Environment: Very few acres of BLM lands administered by the RGFO are considered Prime and or Unique Farmlands. For those BLM lands that are considered Prime and or Unique Farmlands, even fewer are likely to require management of invasive plants.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: The proposed action will allow more effective management of invasive plants found on BLM lands that are considered Prime and or Unique Farmlands, and reduce their spread to adjoining federal, state, and private lands.
Cumulative Impacts: None
Mitigation/Residual Effects: None

No Action Alternative

Direct and Indirect Impacts: The No Action Alternative would be less effective than the Proposed Action in the management of invasive plants found on BLM lands that are considered Prime and or Unique Farmlands.
Cumulative Impacts: None
Mitigation/Residual Effects: None

RANGE MANAGEMENT

Affected Environment: The RGFO office manages approximately 680,000 acres of BLM lands east of the Continental Divide to the Kansas border and from the Wyoming border south to the New Mexico border, excluding the San Luis Valley. Authorized grazing occurs on 570,000 acres. The RGFO administers 316 grazing permits/leases on 381 allotments for 38,481 Animal Unit Months. The vegetation types managed by the RGFO are diverse, and range from shortgrass prairie on the eastern plains to alpine tundra in the Mosquito Range.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Vegetation treatment activities are designed to promote compliance with the state and regional rangeland health standards. Specific impacts include livestock forage improvement, wildlife habitat improvement, suppression of plants that are toxic to wildlife and livestock, removal of plants that compete with more desirable vegetation, improvement of watershed conditions on rangelands, and restoration of native plant communities. Common plants that are toxic to wildlife and livestock include, but are not limited to: Poison Hemlock, Larkspur, and Locoweed.

The 2007 PEIS states that four new active ingredients were selected for use by the BLM based on: 1) input from BLM field offices on types of vegetation needing control; 2) studies indicating that these active ingredients would be more effective in controlling noxious weeds and other unwanted vegetation targeted for control than active ingredients currently used by the BLM; 3) USEPA approval for use on rangelands, forestlands, and/or aquatic environments; 4) responses from herbicide manufacturers to a request from the BLM in October 2001 for a list of herbicides not currently approved for use on public lands that may be appropriate to control vegetation; 5) the ability of the herbicide formulations to be applied on a variety of plant species needing control; 6) the level of risk of the herbicidal formulations to human health and the environment; and 7) the funds available to the BLM to conduct human health and ecological risk assessments of the proposed herbicides.

Cumulative Impacts: Reduction or eradication of invasive plants on BLM lands will reduce their spread to the rest of the state of Colorado and neighboring states.

Mitigation/Residual Effects: See Appendix D for Best Management Practices.

No Action Alternative

Direct and Indirect Impacts: Invasive plants on public land managed by the RGFO would continue to be treated in a manner consistent with the 1998 programmatic *Environmental Assessment for Management of Noxious Weeds*, which is based on the 1991 *Final Environmental Impact Statement Vegetation Treatment on BLM Lands in Thirteen Western States.* Basing RGFO vegetation treatment activities on a twenty year old analysis will not allow the use of the best available science. Some future treatment options would be potentially less effective than those available under the proposed action.

Cumulative Impacts: Spread of undesirable species to non BLM lands in the state of Colorado and neighboring states could potentially by greater under the No Action Alternative than the Proposed Action. Spread of undesirable species from non-BLM lands to BLM managed lands could also be more difficult to control.

Mitigation/Residual Effects: See Appendix D for Best Management Practices.

LANDS AND REALTY

Affected Environment:

The BLM manages rights-of-ways, easements, R&PP Leases, and other realty actions throughout the project area. There are specific requirements and mitigations that are associated with each action that often includes a reclamation/mitigation plan for any disturbed sites. These realty actions include access roads, telecom or tower site pads, telephone or electric lines, gas lines, road right-of ways and easements, and other similar sites. Noxious weeds management is often an integral part of site reclamation and maintenance to prevent spread of weeds and maintain native vegetation characteristics where practical and feasible. Allowing BLM and partners to use herbicides and other forms of weeds treatments to control the spread of noxious weeds is an important tool for successful realty actions.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Direct impacts to realty include using additional chemical herbicides to prevent spread of noxious weeds on developed or leased sites which will likely improve the effectiveness of the weed treatments. Indirect impacts include a more effective ability to control the spread of noxious weeds from private, state and federal lands that has the potential to decrease mitigation and reclamation costs in the permitted and leased areas.

No Action Alternative

Direct and Indirect Impacts: There are no direct or indirect impacts from this project.

Cumulative Impacts: Spread of noxious weeds is controlled by the State, the Counties, and the federal entities and also by individual private landowners. Permit holders are generally required to control noxious weeds on their permitted or leased lands, easements, or Rights-of-ways. Noxious weeds can be spread by vehicles, maintenance equipment, wind, and livestock and pockets of weeds can impact areas outside of the origination zone. Spread of noxious weeds can occur across a landscape within a short time period and can impact multiple land owners and users. The mitigation/reclamation and maintenance plans associated with realty actions can help to add to the control of weeds across the landscape and aid in preventing spread from federal lands to other lands.

Not treating the current noxious weeds will allow their continued spread and effect land values, additionally, individual right of way holders will be increasingly affected by weed infestation. Spot treatments are less effective, and allow the increasing speed of spread by not controlling large outbreaks of weeds.

Mitigation/Residual Effects:

1) The holder shall be responsible for weed control on disturbed areas within the limits of the right-of-way. The holder is responsible for consultation with the authorized officer and/or local authorities for acceptable weed control methods (within limits imposed in the grant stipulations).
2) The holder shall mulch disturbed areas designated by the authorized officer. The type of mulch shall meet one of the following requirements:
    (a) Straw used for mulching shall be from oats, wheat, rye, or other approved grain crops, and free from noxious weeds (must be certified weed free) or other

objectionable material as determined by the authorized officer. Straw mulch shall be suitable for placing with mulch blower equipment.

(b) Hay shall be of approved herbaceous mowings, free from noxious weed or other objectionable material as determined by the authorized officer. Hay shall be suitable for placing with mulch blower equipment.

(c) Wood cellulose fiber shall be natural or cooked wood cellulose fiber, shall disperse readily in water, and shall be nontoxic. The homogeneous slurry or mixture shall be capable of application with power spray equipment. A colored dye that is noninjurious to plant growth may be used when specified. Wood cellulose fiber shall be packaged in new, labeled containers.

3) The holder shall revegetate all disturbed areas using a seed mixture specified by the authorized officer. Seeding shall not be initiated prior to October 1 of the year of completion of the construction activities and shall be completed prior to the following growing season. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)/acre. There shall be no primary or secondary noxious weed seed in the seed mixture (it must be certified weed free). Seed shall be certified seed; exceptions to this requirement must be approved in writing by the authorized officer. The seed mixture container shall be tagged in accordance with State law(s) and the tag(s) submitted for inspection by the authorized officer. Seeding shall be repeated if a satisfactory stand is not obtained as determined by the authorized officer upon evaluation after the second growing season.

References:

Beck, K. G., Associate Professor of Weed Science, Colorado State University, Ft. Collins, Colorado. How Do Weeds Affect Us All? Leafy Spurge Symposium, Bozeman, Montana; July 26-29, 1994

Weiser Charles, Economic Effects on Invasive Weeds on Land Values
(from an Agricultural Banker's Standpoint) Exotic Pests of Eastern Forests, Conference Proceedings - April 8-10, 1997, Nashville, TN, Edited by: Kerry O. Britton, USDA Forest Service & TN Exotic Pest Plant Council

CADASTRAL SURVEY

Affected Environment:

There is potential for destruction of PLSS Public (Land Survey System) corner monuments with mechanical treatments. Consultation with Cadastral survey should be made on a project by project basis and evaluated based upon Colorado IM 2011-015(I): Protection and Preservation of Public Land Survey System Monuments for Vegetation Treatment Projects.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Direct impacts of mechanical treatments would be the destruction of existing PLSS monumentation. Indirect impacts are the loss of the ability

to locate boundaries of public lands as well as affecting private boundaries and rights associated with private lands.

Cumulative Impacts: Restoration of destroyed PLSS monuments is expensive and unless the position has been previously preserved can never be reestablished in its exact undisturbed original location.

Mitigation/Residual Effects: Mitigation for those areas being treated mechanically would be to evaluate corner conditions and identify and flag PLSS corners within the treatment area.

No Action Alternative

Direct and Indirect Impacts: Similar to the Proposed action.
Cumulative Impacts: Similar to the Proposed action.
Mitigation/Residual Effects: Similar to the Proposed action.

WILDERNESS, AREAS OF CRITICAL ENVIRONMENTAL CONCERN, WILD AND SCENIC RIVERS

Affected Environment: Within the project area there are several Wilderness Study Areas (WSA) and Areas of Critical Environmental Concern (ACEC)

Wilderness Study Areas	**Areas of Critical Environmental Concern**
Upper Grape Creek	Mosquito Pass
Lower Grape Creek	Browns Canyon
Browns Canyon	Droney Gulch
McIntyre Hills	Arkansas Canyonlands
Beaver Creek	Garden Park
High Mesa Grasslands Instant Study Area	Phantom Canyon
	Grape Creek
	Beaver Creek

Executive Order 3310 dated December 22, 2010 directs the BLM to maintain wilderness resource inventories and to protect wilderness characteristics through land use planning. Since the planning area is extremely large and the Executive Order is relatively recent, wilderness resource inventories are not updated for the entire planning area so it cannot be determined if additional lands with wilderness characteristics are present.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: The BLM Vegetation Treatments Using Herbicides Final Programmatic EIS addresses impacts to Wilderness and Special Areas and also identifies several SOPs that would be used for treatments within these types of areas. BLM Manual 8550-1

"Interim Management Policy and Guidelines for Lands Under Wilderness Review" allows for the treatment of invasive plants to maintain the natural ecological balances as long as it meets the non-impairment criteria. Treatments within WSAs requiring the use of motorized vehicles would be planned for and approved on a case by case basis and evaluated to ensure that the non-impairment criteria would be met. Treatment proposals not meeting the non-impairment criteria would be modified to be brought into compliance.

All treatments within WSAs would be required to meet the non-impairment criteria and would maintain the area's suitability for preservation as wilderness. During treatments there would be temporary increases in workers in the area possibly affecting opportunities for solitude. This impact would be extremely isolated and of a short duration. Indirectly, the treatment of invasive plants within WSAs would help maintain the natural ecological balances of the area improving the overall vegetation conditions and wildlife habitat of the WSA.

The BLM, Royal Gorge Field Office is currently in the process of updating its inventory of lands for wilderness characteristics following the guidance found in "Manual 6301-Wilderness Characteristics Inventory". The proposed action would not impair wilderness characteristics that may be present. Additionally, manual "6303 Consideration of Lands with Wilderness Characteristics for Project-Level Decisions in Area Not Analyzed in Accordance with BLM Manual 6302" specifically allows for proposed actions whose intent is intended to control expansion of invasive plants.

The 1996 Royal Gorge Resource Area Resource Management Plan directs the BLM to protect and enhance special values of ACECs. These "special values" range from paleontological resources in Garden Park to the scenic values of Phantom Canyon. There would be minimal negative impacts to ACECs. This impact would mostly be associated with motorized travel off of existing or designated roads for hard to reach treatments. This would be done only when necessary and when ground conditions allow minimizing disturbance. Further, any evident tracks following treatment would be raked out, disguised, or signed if necessary to discourage motorized use by the public in the future. Some impacts to visual resources could occur but at minimal levels and for a short duration. Natural ecological balances within ACECs would be improved through the treatment of invasive plants contributing to the enhancement of their "special values".

Cumulative Impacts: Refer to the BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (pp 4-155).

Mitigation/Residual Effects: Refer to the BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (pp 4-155).

No Action Alternative

Direct and Indirect Impacts: Impacts would be similar to that of the Proposed Action. Fewer herbicides would be available for use so there could possibly be fewer treatments reducing the need for cross country travel. The positive impacts to the natural ecological balance of these areas would most likely be less since fewer herbicide options would be available for use. Also see the BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (pp 4-155).

Cumulative Impacts: Similar to the Proposed action.
Mitigation/Residual Effects: Similar to the Proposed action.

FOREST MANAGEMENT

Affected Environment: Substantial changes have taken place in the forest condition on Front Range of Colorado over the past 150 years. The tree species found within the RGFO are hardy, drought tolerant trees that are well suited to the landscape. Forest management recommendations to ensure optimum tree health include providing adequate space, water, and avoid the wounding of the trees. There are a wide variety of forest types found throughout the Royal Gorge Field Office. These are pinyon pine, one-seed and Rocky Mountain juniper, Douglas-fir, white fir, quaking aspen, Engelmann and Blue spruce, lodgepole pine, ponderosa pine, Gambel oak, Bristlecone pine, limber pine, narrowleaf and Eastern cottonwood along the riparian zones. Russian Olive, Salt Cedar, Siberian Elm, Tree of Heaven are known non-native tree species found on BLM lands within the RGFO.

Invasive plants are plants that are not part of (if exotic), or are a minor component of (if native), the original plant community or communities that have the potential to become a dominant or co-dominant species on the site if their future establishment and growth are not actively controlled by management interventions. Many of the forested stands in the RGFO were once dominated by shade intolerant species such as ponderosa pine are being displace by the more shade tolerant species such as Douglas-fir or white fir. Many of the forested stands in the RGFO were once dominated by fire adapt species such as ponderosa pine are being displace by species less fire-adapt such as pinyon pine, juniper or white fir.

Dwarf Mistletoe is a native parasitic plant that attacks trees of all sizes and affects several conifer species including ponderosa pine, Douglas-fir and lodgepole pine. Impacts from mistletoe include the formation of witch's brooms in the crowns and branches, reduced tree growth and seed production; and increased susceptibility to insect attack, root disease and storm damage. Clear-cutting is the most effective means of eradicating mistletoe from a stand. Thinning is likely to spread mistletoe unless all of the infected trees are removed.

Recent Public Land Health Assessments have identified many of the forested acres within the RGFO as Not Meeting Standards due to poor forest health. Generally, there are too many trees per acre competing for limited nutrients, water and sunlight. An overcrowded forest is more susceptible to catastrophic wildfire, insect infestations and diseases. Currently, trees in the Colorado are dying in unprecedented numbers, mainly due to bark beetles. The site domination and canopy closure by trees can lead to a loss of species richness and diversity. Many desired low growing plant species are unable to compete for sunlight with the taller trees.

Environmental Effects

Proposed Action
Direct and Indirect Impacts: There shall be minor short term impacts for long term benefits to native plant communities. Herbicides could come into contact with non-target native trees but this

should be minimal following the Standard operating Procedures outline in the 2007 *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement and in (*PEIS) and the BMP's in appendix B are implemented. The mechanical and hand tree removal activities are likely to result in desired healthy plant communities and work towards restoring sustainable forests.

Cumulative Impacts: There shall be minor short term impacts for long term benefits to native plant communities.

Mitigation/Residual Effects: All projects that involve other application methods that would be used where appropriate include aerial spraying from helicopter or fixed wing aircraft, stem injection, and broadcast herbicide spraying (using vehicle mounted booms or nozzles) shall be review by the RGFO forester prior to implementation.

All projects plans that involve the mechanical treatments described below or manual hand cutting of woody species shall be reviewed by the RGFO forester prior to implementation. Mechanical treatments involve the use of vehicles such as wheeled tractors, crawler-type tractors, or specially designed vehicles with attached implements designed to cut, uproot, or chop existing vegetation. Mechanical methods that may be used by the BLM include chaining, root plowing, tilling and drill seeding, mowing, roller chopping and cutting, blading, grubbing, mulching and feller-bunching.

No Action Alternative

Direct and Indirect Impacts: Similar to the Proposed action.
Cumulative Impacts: Similar to the Proposed action.
Mitigation/Residual Effects: Similar to the Proposed action.

FIRE/FUELS MANAGEMENT

Affected Environment: The planning area covered by the Proposed Action covers a wide range of fire regimes and fuel types ranging from alpine tundra to low elevation grasslands. Some of these fire regimes can change dramatically as a result of invasive vegetation when some sort of population control is lacking or removed. For example, much of the ponderosa pine forest land within the planning area historically had frequent, low/mixed intensity fire that suppressed the survival of younger ponderosa pine. With most fires being suppressed for the last century, the forests have become stocked with dense populations of younger trees resulting in more infrequent, more intense fires. Another example is cheat grass. Cheat grass is an annual non-native invasive grass that greens up quickly in the spring out-competing other grasses for soil moisture. It then cures early in the summer leaving high amounts of fine flashy fuels that are more susceptible to ignition and can carry rapidly.

Environmental Effects:

Proposed Action

Direct and Indirect Impacts: The Proposed Action would manage invasive vegetation in several different ways, including chemical, biological and mechanical. The removal or reduction

of these species could have anywhere from an immeasurable to moderate impact on the fire regime over the short and long term depending on the size and type of treatment. Larger scale treatments that are focused on the reduction of a large, woody fuel build up due to the lack of fire could greatly change the fire regime from that of one dominated by relatively infrequent, intense fire to one of more frequent, low intensity fire. On the other hand, small spot treatments of non-native weeds would have no impact on fire regimes or fuel build up.

Cumulative Impacts: Cumulatively, the Proposed Action would be one more vegetation management option that managers would have. The addition of the resulting projects would be added to the current fuels, forestry, range and other programs that manipulate vegetation for desired outcomes. Across the landscape, these projects can all add up to changing the fire regime over large areas. In general, the changed fire regime would be to that of one with lower fire intensity.

Mitigation/Residual Effects: No mitigation would be necessary.

No Action Alternative

Direct and Indirect Impacts: Under the No-Action Alternative, invasive species management would continue as it has historically within the field office; therefore no new impacts would occur. The new options that are proposed in the Proposed Action would not be available and could result in less effective invasive vegetation management.

Cumulative Impacts: Similar to the Proposed Action.

Mitigation/Residual Effects: Similar to the Proposed Action.

OTHER ELEMENTS:

The resources or issues below were dismissed due to their not being present or applicable. If one of these elements are present and need to be brought forth for analysis, follow the instructions after the table

Resource/Issue	**Rationale for dismissal**
Cadastral Survey	See above
Law Enforcement	There are no law enforcement issues associated with this action.
Noise	This action will not result in any impacts due to noise or result in any increased noise levels.
Socio-Economics	This action will not result in significant impacts to the socio economics of the region.

CUMULATIVE IMPACTS SUMMARY:

The cumulative impacts for the Proposed Action and the No Action Alternative are similar. Under the No Action Alternative, current methods of managing invasive plants would not be as

effective as those available under the proposed action. This would result in an increased potential for invasive plant populations to establish and or grow in size on lands managed by the BLM. An increase in invasive plants on BLM lands would lead to increases on other federal, state, and private lands. Conversely, reduction or eradication of specific invasive plants on BLM lands will reduce their spread to the rest of the state of Colorado and neighboring states. Based on noxious weed acres treated in the past and funding that is likely to be available in the future, it is unlikely that more than .005 percent of the lands managed by the RGFO will be treated for noxious weeds in any given year.

The use of mechanical treatment methods or other mechanized off road equipment that results in soil disturbance can impact a number of resources including: Cadastral monuments; Cultural; and Paleontological resources. Cumulative effects on historic properties cannot be specifically identified until cultural resources inventories are completed and historic properties have been identified. Mitigation measures will limit impacts of ground disturbing equipment to resources.

The Vegetation Treatments Using Herbicides Final Programmatic EIS addresses the effects of herbicides and other plant control strategies in detail with specific discussion by treatment type and evaluates cumulative affects at the national scale. Cumulative impact summary for RGFO is similar in all respects for wetland and aquatic resources. RGFO could not reliably know the quantity of adjacent landowners treatment chemicals, but BLM treatments would be cumulative to those because of RGFO's fractured public-private land pattern. On a landscape scale however, RGFO potential treatments, though incrementally cumulative to perhaps larger-scale agriculture herbicide application, are individually generally minor in size. Treatments in riparian areas will generally be conducted by a small crew, and of limited acreage. SOP's focus treatment to targeted plants and given the patchy nature of typical outbreaks, the treatments size in riparian areas cumulative to total weed treatment is minor. The additional use of the four new herbicides by BLM would have negligible effect on soils, water, riparian, aquatic and wetlands resources.

Vectors (livestock, vehicles, recreationists, water, wind, wildlife) for the dispersal of noxious weed seeds and other plant parts and disturbances (roads, natural gas development, grazing, fuel treatments, water developments, recreation developments, etc.) will continue to be present on BLM lands managed by the RGFO. These factors have contributed in the past and present to the establishment of invasive plant populations. Project-specific mitigations, incorporated into all new projects help to reduce the risk of new infestations and the spread of weeds associated with new disturbance. Many projects, including mineral development, have measures included for post project invasive plant control, as well as weed prevention measures, (e.g. equipment cleaning, weed free hay/mulch, revegetation, etc). Adjacent to the BLM lands, on Forest Service, State, and private lands, invasive plant control efforts are underway. There is a slight risk of damage to native plants from unforeseen environmental conditions. Severe thunderstorms or windstorms, for example, could move some herbicides away from target species. Because of the protection of non-target species by the direct application method; following the herbicide label requirements; the relatively short degradation time of the herbicides; and the small amount of herbicide being used; no long term adverse effects are expected from the Proposed Action or No Action Alternative.

For cumulative impacts to terrestrial wildlife and sensitive species see attached Section 7 Biological Assessment and the BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (Appendix D) for complete description of impacts by species. Refer to the BLM's Vegetation Treatments Using Herbicides Final Programmatic EIS addressing impacts to wildlife resources (pp 4-96 to pp 4-118) for landscape level description. Other activities on the project area do occur that could affect non-target plant and animal species and water quality associated with this issue. Those activities are generally multiple use activities common to the Bureau of Land Management system lands, such as livestock grazing, recreation, timber harvesting, minerals activities, and travel management. However, it is important to note that there are long term benefits to all resources with implementation of a noxious weed control program. Control of noxious weeds and the establishment of native vegetation is expected to decrease negative cumulative effects of non-target species and in some cases would be considered a mitigation action.

The cumulative effect of treatment of noxious weeds and projects in fuels, forestry, range and other programs that manipulate vegetation for desired outcomes is decidedly positive. Negative cumulative impacts are negligible due to the BLM's SOP's, mitigation measures and the herbicide label restrictions that are followed during herbicide application, along with the relatively small percentage of RGFO lands that are subject to herbicide treatments. For a thorough analysis of cumulative effect by resource, refer to the BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (pp 4-202).

PERSONS / AGENCIES CONSULTED:

The RGFO consulted with Fremont and Chaffee County Weed Control departments, who are close cooperators with the RGFO weed program and fellow members of the Upper Arkansas Area Cooperative Weed Management Area, while developing the proposed action. The USFWS was consulted by the RGFO. Local scoping was also completed. The BLM consulted with many national, state, and county governmental agencies, non-governmental organizations, Indian tribes, and Cooperative Weed Management Areas during the development of the *2007 Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement.*

INTERDISCIPLINARY TEAM REVIEW		
NAME	**TITLE**	**AREA OF RESPONSIBILITY**
Matt Rustand	Wildlife Biologist	Terrestrial Wildlife, T&E, Migratory Birds
Jeff Williams	Range Management Spec.	Range, Vegetation
Chris Cloninger	Range Management Spec.	Range, Vegetation
John Lamman	Range Management Spec.	Range, Vegetation, Farmland, Weeds
Dave Gilbert	Fisheries Biologist	Aquatic Wildlife, Riparian/Wetlands
Stephanie Carter	Geologist	Minerals, Wastes –hazardous/solid
Melissa Smeins	Geologist	Minerals, Paleontology

John Smeins	Hydrologist	Hydrology, Water Quality/Rights, Soils
Ty Webb	Prescribed Fire Specialist	Air Quality
Tony Mule’	Cadastral Surveyor	Cadastral Survey
Kalem Lenard	Recreation	Recreation, Wilderness, Visual, ACEC, W&S Rivers
Ken Reed	Forester	Forestry
Martin Weimer	NEPA Coordinator	Environmental Justice, Noise, SocioEconomics
Monica Weimer	Archaeologist	Cultural, Native American
Erin Watkins	Archaeologist	Cultural, Native American
Vera Matthews	Realty Specialist	Realty
Hugh Wolfe	Realty Specialist	Realty
	Law Enforcement Ranger	Law Enforcement

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DOI-BLM-CO-200-2010-0075 EA

Based on review of the EA and the supporting documents, I have determined that the project in not a major federal action and will not have a significant effect on the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects from any alternative assessed or evaluated meet the definition of significance in context or intensity, as defined by 43 CFR 1508.27. Therefore, an environmental impact statement is not required. This finding is based on the context and intensity of the project as described below:

RATIONALE:

Context: Under the proposed action, the RGFO would continue an IPM approach to treat invasive plants on all RGFO lands as needed, but would utilize 18 herbicide active ingredients analyzed and approved for use on BLM land in the 2007 PEIS, using ground or aerial application methods. These herbicides include 4 active ingredients not previously analyzed for use in the RGFO's current programmatic weed management EA.

The BLM RGFO is located in Colorado and manages approximately 680,000 acres of BLM lands east of the Continental Divide to the Kansas border and from the Wyoming border south to the New Mexico border, excluding the San Luis Valley and North Park. The vegetation types managed by the RGFO are very diverse, and range from shortgrass prairie on the eastern plains to alpine tundra in the Mosquito Range. The RGFO controls invasive species using chemical methods, mechanical methods and biological methods. In many cases, chemical methods are required to effectively control invasive species, and the proposed action allows the RGFO to use the most effective herbicides approved for use on BLM lands, and allows the use of aerial application of herbicides. The chemicals and application methods in the proposed action were analyzed as the preferred alternative of the *2007 Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement*, which was approved on September 29, 2007.

Intensity:
I have considered the potential intensity/severity of the impacts anticipated from the implementation of the proposed action decision relative to each of the ten areas suggested for consideration by the CEQ. With regard to each:

Impacts that may be beneficial and adverse:

The positive impacts of the proposed action include the ability to effectively control invasive species using the most effective, economical and environmentally responsible active ingredients and methods. This benefits all aspects of land management within RGFO. Adverse impacts include damage to desirable plants due to offsite drift, water and soil contamination and

adverse effects to some animal species due to the exposure to some of the active ingredients. These adverse effects are minimal, because BLM SOP's, mitigation measures and herbicide manufacturers' labels are followed during the application of herbicides.

Public health and safety:

Risks to public health and safety are minimal because BLM SOP's, mitigation measures and herbicide manufacturers' labels are followed during the application of herbicides.

Unique characteristics of the geographic area: The geographic area varies widely. It is located east of the Continental Divide to the Kansas border and from the Wyoming border south to the New Mexico border, excluding the San Luis Valley and North Park. The vegetation types managed by the RGFO are very diverse, and range from shortgrass prairie on the eastern plains to alpine tundra in the Mosquito Range.

Degree to which effects are likely to be highly controversial: Invasive vegetation management is a priority for land management agencies, governments of all levels and outside interests, and it is widely accepted that the use of herbicide is the most effective option in many cases. Therefore, the effects are not controversial.

Degree to which effects are highly uncertain or involve unique or unknown risks: RGFO currently treats invasive vegetation with herbicide, and these treatments have been very effective. The risks have been identified, are well known, and mitigations are followed, so there are no uncertain effects or unique or unknown risks.

Consideration of whether the action may establish a precedent for future actions with significant impacts: This action should not establish a precedent for future actions.

Consideration of whether the action is related to other actions with cumulatively significant impacts: Overall, the negative cumulative impacts are negligible due to the BLM's SOP's, mitigation measures and the herbicide label restrictions that are followed during herbicide application. There is a relatively small percentage of RGFO managed lands that are subject to herbicide treatments due to minimal presence of invasive species.

Scientific, cultural or historical resources, including those listed in or eligible for listing in the National Register of Historic Places: Because no cultural resources inventories have been completed and historic properties have not yet been found, it is not possible to identify specific mitigation measures. However, BLM has developed the following process for evaluation of impacts:

1. Literature reviews will be conducted for all proposed weed treatment requests to identify historic properties that might be affected. If the literature review suggests that historic properties are likely to be found in the area of potential effect, an intensive inventory will be conducted, unless BLM determines that the proposed treatment will not affect cultural resources.

2. If known historic properties are present in the area of potential effect, BLM will analyze the impact of the undertaking on the historic property, including a field visit to the property if necessary.

3. If the literature review indicates that historic properties might be found in the area of potential effect, BLM may choose to conduct an intensive inventory or simply monitor the work.

4. If historic properties in the area of potential effect cannot be avoided, BLM will prepare a plan to mitigate effect of the weed treatment. SHPO concurrence with BLM's mitigation plan will be required before the weed treatment commences. The range of possible mitigation activities possible is quite large, but a non-exhaustive list includes avoidance (always the first choice), testing, excavation (salvage, partial, or total) and data recovery in the form of archival recording (for standing structures and other historic-era phenomena).

Threatened and endangered species and their critical habitat: During preparation of the Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS) and the PER described above, the BLM prepared a programmatic biological assessment (PBA), to evaluate likely impacts to threatened, endangered, or proposed species and their critical habitats from chemical, manual, and biological weed treatments. One outcome of the consultation was that BLM field offices implementing a weed management program must prepare local-level analyses of potential impacts on federally listed/proposed threatened and endangered species and their critical habitats.

The purpose of this PBA is to:

- Evaluate the effects on threatened, endangered, proposed, and candidate (TEPC) species and their critical habitat of non-chemical (manual and biological) weed treatments. See Table 2 for a list of TEPC species addressed in this BA.
- Evaluate the effects on threatened, endangered, proposed, or candidate (TEPC) species and or their critical habitat of chemical (herbicide) weed treatments.
- Satisfy the requirement under the PBA for ESA Section 7 consultation for threatened and endangered species in relation to the development of VTMP Plans at the field office level. It is BLM policy not to consult or conference in regards to candidate species. However, if a candidate species is listed once consultation is complete, BLM will amend this document to seek concurrence for the affected species.

The Bureau of Land Management-Royal Gorge Field Office completed a PBA and received concurrence from the United States Fish and Wildlife Service on April 16, 2012. In total, impacts to 16 species that occupy and/or have habitat within the project boundary were analyzed by the PBA, and conservation measures to minimize or eliminate impacts to TEPC were developed (Appendix D). The conclusion derived is the proposed action, with implementation of conservation actions, will yield a determination of "may affect, not likely to adversely affect" to all 16 species known to occur or have habitat within the project boundary.

Any effects that threaten a violation of Federal, State or local law or requirements imposed for the protection of the environment: The proposed action conforms with the provisions of NEPA (U.S.C. 4321-4346) FNWA,(7 U.S.C. 2801 et seq.; 88 Stat. 2148) and FLPMA (43

U.S.C. 1701 et seq.) and is compliant with the Clean Water Act and The Clean Air Act, the National Historic Preservation Act and the Endangered Species Act.

NAME OF PREPARER: John Lamman

SUPERVISORY REVIEW: Melissa Garcia

NAME OF ENVIRONMENTAL COORDINATOR: /s/ Martin Weimer

DATE: 7/29/13

SIGNATURE OF AUTHORIZED OFFICIAL: /s/ Keith E. Berger
Keith E. Berger, Field Manager

DATE SIGNED: 7/29/13

APPENDICES:
ATTACHMENTS:

DECISION RECORD
DOI-BLM-CO-200-2010-0075 EA

DECISION: It is my decision to authorize the Proposed Action as described in the attached EA. The proposed action is to continue an IPM approach to treat invasive plants on all RGFO lands as needed, utilizing 18 herbicide active ingredients analyzed and approved for use on BLM land in the 2007 PEIS. The 18 herbicide active ingredients are: 2,4-D; bromacil; chlorsulfuron; clopyralid; dicamba; diuron; glyphosate; hexazinone; imazapyr; metsulfuron methyl; picloram; sulfometuron methyl; tebuthiuron; triclopyr; imazapic; diquat; diflufenzopyr (in formulation with dicamba); and fluridone. In addition, the BLM would be able to use diflufenzopyr as a stand-alone active ingredient if it becomes registered for herbicidal use. Possible treatment methods are listed in Appendix A of the EA.

This office completed an Environmental Assessment and reached a Finding of No Significant Impact indicating that the action has been analyzed in the EA and the selected alternative will have no significant effect. Therefore an EIS will not be prepared.

RATIONALE: The selection of the proposed action alternative allows the RGFO BLM to meet their legal obligations to manage invasive and noxious plant species under federal and state laws. By implementing the proposed action, environmental impacts to public resources will be reduced. The control or elimination of invasive plants in the RGFO will help restore native vegetative communities. A broad selection of treatment methods, including herbicides, will help meet agency goals and objectives from which both domestic animals and wildlife will benefit. The attached EA and this Decision Record tier to the *17 Western States Programmatic Environmental Impact Statement* (PEIS) and Record of Decision.

MITIGATION MEASURES: Mitigation measures are located in appendix D (Mitigation Measure**s**) of appendix D (Section 7 consultation with USFWS) of the EA).

COMPLIANCE/MONITORING (optional): Table 3. (Management Objectives, Monitoring Methods and Measures of Effectiveness) of appendix D (Section 7 consultation with USFWS) of the EA).

PROTEST/APPEALS: This decision shall take effect immediately upon the date it is signed by the Authorized Officer, and shall remain in effect while any appeal is pending unless the Interior Board of Land Appeals issues a stay (43 CFR 2801.10(b)). Any appeal of this decision must follow the procedures set forth in 43 CFR Part 4. Within 30 days of the decision, a notice of appeal must be filed in the office of the Authorized Officer at the Royal Gorge Field Office, 3028 E Main Street, Canon City, Colorado, 81212. If a statement of reasons for the appeal is not included with the notice, it must be filed with the Interior Board of Land Appeals, Office of Hearings and Appeals, U.S. Department of the Interior, 801 North Quincy St., Suite 300, Arlington, VA 22203 within 30 days after the notice of appeal is filed with the Authorized Officer.

SIGNATURE OF AUTHORIZED OFFICIAL: /s/ Keith E. Berger
Keith E. Berger, Field Manager

DATE SIGNED: 7/29/13

APPENDICES: Appendix A (TREATMENT METHODS), B (STANDARD OPERATING PROCEDURES), C (Major Land Resource Areas (MLRAs)), appendix D (Section 7 consultation with USFWS), and E (SHPO letter)

APPENDIX A: TREATMENT METHODS

Method	Description
Manual	
Hand pulling	Pulling or uprooting plants can be effective against some shrubs, tree saplings, and herbaceous plants. Annuals and tap-rooted plants are particularly susceptible to control by hand pulling. It is not as effective against many perennial plants with deep underground stems and roots that are often left behind to re-sprout. The advantages of pulling include its small ecological impact, minimal damage to neighboring plants, and low (or no) cost for equipment or supplies. The key to effective hand pulling is to remove as much of the root as possible while minimizing soil disturbance. For many species, any root fragments left behind have the potential to re-sprout, and pulling is not effective on plants with deep and/or easily broken roots.
Pulling Using Tools	Most plant-pulling tools are designed to grip the plant stem and provide the leverage necessary to pull its roots out. Tools vary in their size, weight, and the size of the plant they can extract. The Root Talon is inexpensive and lightweight, but may not be as durable or effective as the all-steel Weed Wrench, which is available in a variety of sizes. Both tools can be cumbersome and difficult to carry to remote sites. Both work best on firm ground as opposed to soft, sandy, or muddy substrates.
Clipping	“Clipping” means to cut or remove seed heads and/or fruiting bodies to prevent germination. This method is labor-intensive and effective for small and spotty infestations.
Clipping and pulling	Clipping and pulling” means cutting a portion of the invasive plant stem and pulling it from its substrate, generally the bole of a tree. This method is labor intensive, but can be effective for larger infestations.
Stabbing	Some plants can be killed by severing or injuring (stabbing) the carbohydrate storage structure at the base of the plant. Depending on the species, this structure may be a root corm, storage rhizome (tuber), or taproot. These organs are generally located at the base

	of the stem and under the soil. Cutting off access to these storage structures can help “starve” or greatly weaken some species.
Mechanical	
Mowing, cutting, brushing, trimming, weed eating	Mowing and cutting can reduce seed production and restrict invasive plant growth, especially in annuals cut before they flower and set seed. Some species however, re-sprout vigorously when cut, replacing one or a few stems with many that can quickly flower and set seed. These treatments are used as primary treatments to remove aboveground biomass in combination with herbicide treatments to prevent resprouting, or as follow up treatments to treat target plants missed by initial herbicide use. Also, mowing and cutting can be used, in conjunction with herbicide treatments, to reduce vegetative materials and to promote vigorous growth in order to decrease the amount of herbicide application needed, and to increase herbicide effectiveness.
Biological	
Grazing goats, sheep, livestock Classical biological control (insects, pathogens, nematodes, mites)	Grazing could either promote or reduce invasive plant abundance at a particular site. When grazing treatments are combined with other control techniques, such as herbicides, severe infestations could be reduced and small infestations may be eliminated. Grazing animals may be particularly useful in areas where herbicides cannot be applied (e.g., near water) or are prohibitively expensive (e.g., large infestations). Animals also could be used as part of a restoration program by breaking up the soil and incorporating in seeds of desirable native plants. Goats prefer broadleaf herbs and have been used to control leafy spurge (Euphorbia esula), Russian knapweed (Acroptilon repens), and toadflax (Linaria spp.). These animals appear to be able to neutralize the phytochemicals toxic to other animals that are present in these and other forbs. Goats could control woody species because they climb and stand on their hind legs, and browse on vegetation other animals cannot reach. Classical biological control agents can be introduced to an invasive plant infestation to directly damage plant tissue. Although invasive plants do not die quickly, increasing plant stress allows native

	plants to compete better. Biological control treatments are best used in larger infestation sites where invasive plants are well established and where short term control is not a management objective. Biological control does not eradicate invasive plants and is commonly used in conjunction with herbicide applications.
Herbicide	
Hand/Selective Treatment	Selective treatment of individual plants to avoid spraying other desirable plants. There is a low likelihood of drift or delivery of herbicides away from treatment sites. This method is used in sensitive areas, such as near water, to avoid getting any herbicide on the soil or in the water. Hand/Selective methods could be done under more variable conditions than spot spraying or broadcast spraying). Specific methods include: a. Wicking and Wiping - Involves using a sponge or wick on a long handle to wipe herbicide onto foliage and stems. Use of a wick eliminates the possibility of spray drift or droplets falling on non-target plants. Herbicide can drip or dribble from some wicks. b. Foliar Application - These methods apply herbicide directly to the leaves and stems of a plant. An adjuvant or surfactant is often needed to enable the herbicide to penetrate the plant cuticle, a thick, waxy layer present on leaves and stems of most plants. There are several types of foliar application tools available. c. Basal Bark - This method applies a 6 to 12 inch band of herbicide around the circumference of the trunk of the target plant, approximately one foot above ground. The width of the sprayed band depends on the size of the plant and the species' susceptibility to the herbicide. The herbicide can be applied with a backpack sprayer, hand-held bottle, or wick. d. Frill or Hack and Squirt - The frill method, also called the "hack and squirt" treatment, is often used to treat woody species with large, thick trunks. The tree is cut using a sharp knife, saw, or ax, or drilled with a power drill or other device. Herbicide is then immediately applied to the cut with a backpack sprayer, squirt bottle, syringe, or similar equipment. e. Stem Injection - Herbicides can be injected into herbaceous stems using a needle and syringe. Herbicide pellets can also be injected into the trunk of a tree using a specialized tool. f. Cut-stump - This method is often used on woody species that normally resprout after being cut. Cut down the tree or shrub, and immediately spray or squirt herbicide on the exposed cambium

	(living inner bark) of the stump. The herbicide must be applied to the entire inner bark (cambium) within minutes after the trunk is cut. The outer bark and heartwood do not need to be treated since these tissues are not alive, although they support and protect the tree's living tissues. The cut stump treatment allows for a great deal of control over the site of herbicide application, and therefore, has a low probability of affecting non-target species or contaminating the environment. It also requires only a small amount of herbicide to be effective.
Spot Spraying	Spot applicators spray herbicide directly onto small patches or individual target plants only and avoid spraying other desirable plants. These applicators range from motorized rigs with spray hoses to backpack sprayers, to hand-pumped spray or squirt bottles, which can target very small plants or parts of plants.
Broadcast (Boom) Spraying	A boom, a long horizontal tube with multiple spray heads, may be mounted or attached to a tractor, ATV (all terrain vehicle) or other vehicle. The boom is then carried above the invasive plants while spraying herbicide, allowing large areas to be treated rapidly with each sweep of the boom. Offsite movement due to vaporization or drift and possible treatment of non-target plants can be of concern when using this method. The herbicide is carried in a tank and reaches the nozzles via tubing. All herbicides are metered out from the nozzles in a controlled manner. The nozzle controls the droplet size, the area (or cone) being covered by the herbicide and it could be turned on/off with ease. Some nozzles could rotate. All this flexibility permits the operator to carefully apply herbicide at specific rates over specific areas. Many of the new boom spray operations have very sophisticated electronic monitoring that delivers exact amounts of herbicides and keeps records on rates and areas covered. Offsite movement due to drift and possible treatment of non-target plants could be of concern when using this method. Not all broadcast methods include a boom; boom-less nozzles are currently in use that can reduce the risk of non-target effects. Backpacks may also be used as a broadcast tool, if not directed at individual plants.
Aerial	Herbicides applied aerially by helicopter or fixed-wing aircraft.

APPENDIX B: STANDARD OPERATING PROCEDURES

Resource Element	Standard Operating Procedure
Guidance Documents	BLM Handbook H-9011-1 (*Chemical Pest Control*); and manuals 1112 (*Safety*), 9011 (*Chemical Pest Control*), 9012 (*Expenditure of Rangeland Insect Pest Control Funds*), 9015 (*Integrated Weed Management)*, and 9220 (*Integrated Pest Management*)
General	• Prepare spill contingency plan in advance of treatment. • Conduct a pretreatment survey before applying herbicides. • Select herbicide that is least damaging to environment while providing the desired results. • Select herbicide products carefully to minimize additional impacts from degradates, adjuvants, inert ingredients, and tank mixtures. • Apply the least amount of herbicide needed to achieve the desired result. • Follow product label for use and storage. • Have licensed applicators apply herbicides. • Use only USEPA-approved herbicides and follow product label directions and "advisory" statements. • Review, understand, and conform to the "Environmental Hazards" section on the herbicide label. This section warns of known pesticide risks to the environment and provides practical ways to avoid harm to organisms or to the environment. • Consider surrounding land use before assigning aerial spraying as a treatment method and avoid aerial spraying near agricultural or densely populated areas. • Minimize the size of application areas, when feasible. • Comply with herbicide-free buffer zones to ensure that drift will not affect crops or nearby residents/landowners. • Post treated areas and specify reentry or rest times, if appropriate. • Notify adjacent landowners prior to treatment. • Keep copy of Material Safety Data Sheets (MSDSs) at work sites. MSDSs available for review at http://www.cdms.net/. • Keep records of each application, including the active ingredient, formulation, application rate, date, time, and location. • Avoid accidental direct spray and spill conditions to minimize risks to resources. • Consider surrounding land uses before aerial spraying. • Avoid aerial spraying during periods of adverse weather conditions (snow or rain imminent, fog, or air turbulence). • Make helicopter applications at a target airspeed of 40 to 50 miles per hour (mph), and at about 30 to 45 feet above ground. Take precautions to minimize drift by not applying herbicides when winds exceed >10 mph (>6 mph for aerial applications) or a serious

	rainfall event is imminent. • Use drift control agents and low volatile formulations. • Conduct pre-treatment surveys for sensitive habitat and special status species within or adjacent to proposed treatment areas. • Consider site characteristics, environmental conditions, and application equipment in order to minimize damage to non-target vegetation. • Use drift reduction agents, as appropriate, to reduce the drift hazard to non-target species. • Turn off applied treatments at the completion of spray runs and during turns to start another spray run. • Refer to the herbicide label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. • Clean OHVs to remove seeds.
Air Quality See Manual 7000 (Soil, Water, and Air Management)	• Consider the effects of wind, humidity, temperature inversions, and heavy rainfall on herbicide effectiveness and risks. • Apply herbicides in favorable weather conditions to minimize drift. For example, do not treat when winds exceed 10 mph (6 mph for aerial applications) or rainfall is imminent. • Use drift reduction agents, as appropriate, to reduce the drift hazard. • Select proper application equipment (e.g., spray equipment that produces 200- to 800-micron diameter droplets [spray droplets of 100 microns and less are most prone to drift]). • Select proper application methods (e.g., set maximum spray heights, use appropriate buffer distances between spray sites and non-target resources).
Soil See Manual 7000 (Soil, Water, and Air Management)	• Minimize treatments in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected. • Minimize use of herbicides that have high soil mobility, particularly in areas where soil properties increase the potential for mobility. • Do not apply granular herbicides on slopes of more than 15% where there is the possibility of runoff carrying the granules into non-target areas.
Water Resources See Manual 7000 (Soil, Water, and Air Management)	• Consider climate, soil type, slope, and vegetation type when developing herbicide treatment programs. • Select herbicide products to minimize impacts to water. This is especially important for application scenarios that involve risk from active ingredients in a particular herbicide, as predicted by risk assessments. • Use local historical weather data to choose the month of treatment. Considering the phenology of the target species, schedule treatments based on the condition of the water body and existing water quality

	conditions. • Plan to treat between weather fronts (calms) and at appropriate time of day to avoid high winds that increase water movements, and to avoid potential stormwater runoff and water turbidity. • Review hydrogeologic maps of proposed treatment areas .Note depths to groundwater and areas of shallow groundwater and areas of surface water and groundwater interaction. Minimize treating areas with high risk for groundwater contamination.. • Conduct mixing and loading operations in an area where an accidental spill would not contaminate an aquatic body. • Do not rinse spray tanks in or near water bodies. Do not broadcast pellets where there is danger of contaminating water supplies. • Maintain buffers between treatment areas and water bodies. Buffer widths should be developed based on herbicide- and site-specific criteria to minimize impacts to water bodies. • Minimize the potential effects to surface water quality and quantity by stabilizing terrestrial areas as quickly as possible following treatment.
Wetlands and Riparian Areas	• Use a selective herbicide and a wick or backpack sprayer. • Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths of 100 feet for aerial, 25 feet for vehicle, and 10 feet for hand spray applications.
Vegetation See Handbook H-4410-1 (National Range Handbook), and manuals 5000 (Forest Management) and 9015 (Integrated Weed Management)	• Refer to the herbicide label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. • Use native or sterile species for revegetation and restoration projects to compete with invasive species until desired vegetation establishes • Use weed-free feed for horses and pack animals. Use weed-free straw and mulch for revegetation and other activities. • Identify and implement any temporary domestic livestock grazing and/or supplemental feeding restrictions needed to enhance desirable vegetation recovery following treatment. Consider adjustments in the existing grazing permit, needed to maintain desirable vegetation on the treatment site.
Pollinators	• Complete vegetation treatments seasonally before pollinator foraging plants bloom. • Time vegetation treatments to take place when foraging pollinators are least active both seasonally and daily. • Design vegetation treatment projects so that nectar and pollen sources for important pollinators and resources are treated in patches rather than in one single treatment.

	• Minimize herbicide application rates. Use typical rather than maximum rates where there are important pollinator resources. • Maintain herbicide free buffer zones around patches of important pollinator nectar and pollen sources. • Maintain herbicide free buffer zones around patches of important pollinator nesting habitat and hibernacula. • Make special note of pollinators that have single host plant species, and minimize herbicide spraying on those plants (if invasive species) and in their habitats.
Fish and Other Aquatic Organisms See manuals 6500 (Wildlife and Fisheries Management) and 6780 (Habitat Management Plans)	• Use appropriate buffer zones based on label and risk assessment guidance. • Minimize treatments near fish-bearing water bodies during periods when fish are in life stages most sensitive to the herbicide(s) used, and use spot rather than broadcast or aerial treatments. • Use appropriate application equipment/method near water bodies if the potential for off-site drift exists. • For treatment of aquatic vegetation, 1) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management; 2) use the appropriate application method to minimize the potential for injury to desirable vegetation and aquatic organisms; and 3) follow water use restrictions presented on the herbicide label.
Wildlife See manuals 6500 (Wildlife and Fisheries Management) and 6780 (Habitat Management Plans)	• Use herbicides of low toxicity to wildlife, where feasible. • Use spot applications or low-boom broadcast operations where possible to limit the probability of contaminating non-target food and water sources, especially non-target vegetation over areas larger than the treatment area. • Use timing restrictions (e.g., do not treat during critical wildlife breeding or staging periods) to minimize impacts to wildlife. • Avoid using glyphosate formulations that include R-11 in the future, and either avoid using any formulations with POEA, or seek to use the formulation with the lowest amount of POEA available, to reduce risks to amphibians.
Threatened, Endangered, and Sensitive Species See Manual 6840 (Special Status Species)	• Survey for special status species before treating an area. Consider effects to special status species when designing herbicide treatment programs. • Use a selective herbicide and a wick or backpack sprayer to minimize risks to special status plants. • Avoid treating vegetation during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for special status species in area to be treated.
Livestock See Handbook H-4120-1 (Grazing	• Whenever possible and whenever needed, schedule treatments when livestock are not present in the treatment area. Design treatments to take advantage of normal livestock grazing rest periods, when

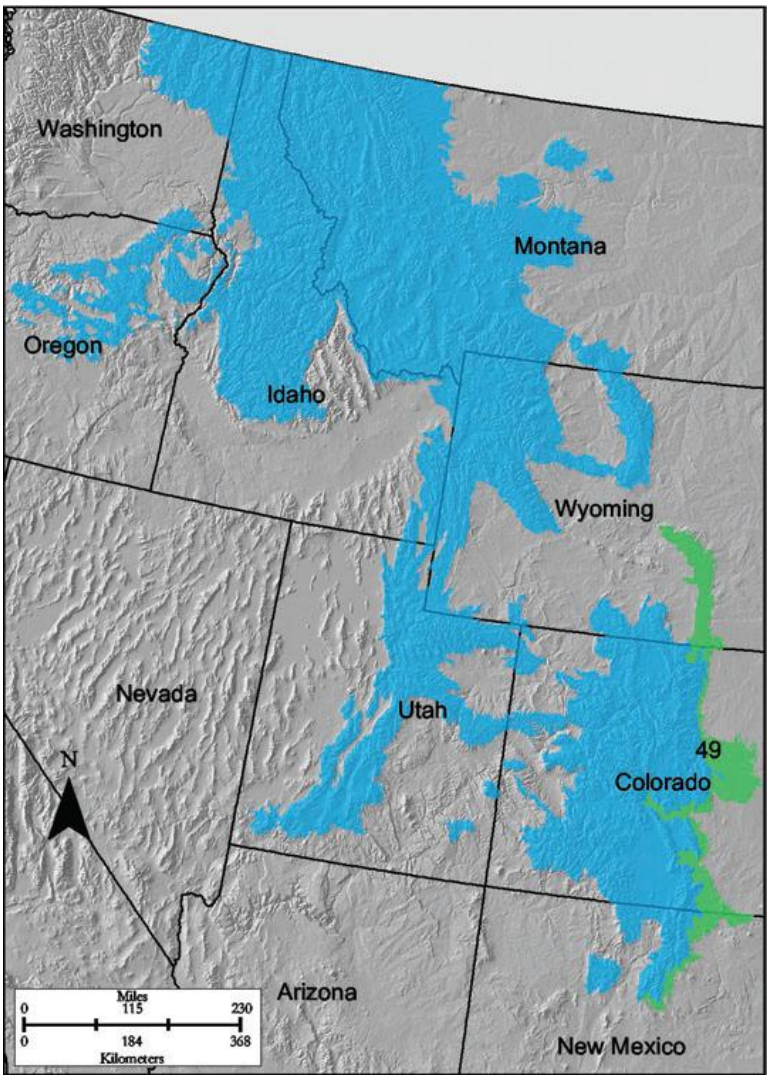
Management)	possible. • As directed by the herbicide label, remove livestock from treatment sites prior to herbicide application, where applicable. • Use herbicides of low toxicity to livestock, where feasible. • Take into account the different types of application equipment and methods, where possible, to reduce the probability of contamination of non-target food and water sources. • Avoid use of diquat in riparian pasture while pasture is being used by livestock. • Notify permittees of the project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. • Notify permittees of livestock grazing, feeding, or slaughter restrictions, if necessary. • Provide alternative forage sites for livestock, if possible.
Wild Horses and Burros	• Minimize using herbicides in areas grazed by wild horses and burros. • Use herbicides of low toxicity to wild horses and burros, where feasible. • Remove wild horses and burros from identified treatment areas prior to herbicide application, in accordance with label directions for livestock. • Take into account the different types of application equipment and methods, where possible, to reduce the probability of contaminating non-target food and water sources.
Cultural Resources and Paleontological Resources See handbooks H-8120-1 (Guidelines for Conducting Tribal Consultation) and manuals 8100 (The Foundations for Managing Cultural Resources), and 8120 (Tribal Consultation Under Cultural Resource Authorities), See also: Programmatic Agreement among the Bureau of Land	• Follow standard procedures for compliance with Section 106 of the National Historic Preservation Act as implemented through the Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act and state protocols or 36 CFR Part 800, including necessary consultations with State Historic Preservation Officers and interested tribes. • Consult with tribes to locate any areas of vegetation that are of significance to the tribe and that might be affected by herbicide treatments. • Work with tribes to minimize impacts to these resources. • Follow guidance under Human Health and Safety in areas that may be visited by Native peoples after treatments.

Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act.	
Visual Resources See handbooks H-8410-1 (Visual Resource Inventory) and H-8431-1 (Visual Resource Contrast Rating), and manual 8400 (Visual Resource Management)	• Minimize the use of broadcast foliar applications in sensitive watersheds to avoid creating large areas of browned vegetation. • Consider the surrounding land use before assigning aerial spraying as an application method. • Minimize off-site drift and mobility of herbicides (e.g., do not treat when winds exceed 10 mph; minimize treatment in areas where herbicide runoff is likely; establish appropriate buffer widths between treatment areas and residences) to contain visual changes to the intended treatment area. • If the area is a Class I or II visual resource, ensure that the change to the characteristic landscape is low and does not attract attention (Class I), or if seen, does not attract the attention of the casual viewer (Class II). • Lessen visual impacts by: 1) designing projects to blend in with topographic forms; 2) leaving some low-growing trees or planting some low-growing tree seedlings adjacent to the treatment area to screen short-term effects; and 3) revegetating the site following treatment. • When restoring treated areas, design activities to repeat the form, line, color, and texture of the natural landscape character conditions to meet established Visual Resource Management (VRM) objectives.
H-8270-1 (General Procedural Guidance for Paleontological Resource Management), and 8270 (Paleontological Resource Management),	• Follow BLM Handbook H-8270-1 (General Procedural Guidance for Paleontological Resource Management) to determine known Condition I and Condition 2 paleontological areas, or collect information through inventory to establish Condition 1 and Condition 2 areas, determine resource types at risk from the proposed treatment, and develop appropriate measures to minimize or mitigate adverse impacts. •
Wilderness and Other Special Areas See handbooks H-	• Encourage backcountry pack and saddle stock users to feed their livestock only weed-free feed for several days before entering a wilderness area.

8550-1 (Management of Wilderness Study Areas (WSAs)), and H-8560-1 (Management of Designated Wilderness Study Areas), and Manual 8351 (Wild and Scenic Rivers)	• Encourage stock users to tie and/or hold stock in such a way as to minimize soil disturbance and loss of native vegetation. • Revegetate disturbed sites with native species if there is no reasonable expectation of natural regeneration. • Provide educational materials at trailheads and other wilderness entry points to educate the public on the need to prevent the spread of weeds. • Use the "minimum tool" to treat invasive vegetation, relying primarily on use of ground-based tools, including backpack pumps, hand sprayers, and pumps mounted on pack and saddle stock. • Use chemicals only when they are the minimum method necessary to control weeds that are spreading within the wilderness or threaten lands outside the wilderness. • Give preference to herbicides that have the least impact on non-target species and the wilderness environment. • Implement herbicide treatments during periods of low human use, where feasible. • Address wilderness and special areas in management plans. • Maintain adequate buffers for Wild and Scenic Rivers (¼ mile on either side of river, ½ mile in Alaska).
Recreation See Handbook H-1601-1 (Land Use Planning Handbook, Appendix C)	• Schedule treatments to avoid peak recreational use times, while taking into account the optimum management period for the targeted species. • Notify the public of treatment methods, hazards, times, and nearby alternative recreation areas. • Adhere to entry restrictions identified on the herbicide label for public and worker access. • Post signs noting exclusion areas and the duration of exclusion, if necessary. • Use herbicides during periods of low human use, where feasible.
Social and Economic Values	• Consider surrounding land use before selecting aerial spraying as a method, and avoid aerial spraying near agricultural or densely-populated areas. • Post treated areas and specify reentry or rest times, if appropriate. • Notify grazing permittees of livestock feeding restrictions in treated areas, if necessary, as per label instructions. • Notify the public of the project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. • Control public access until potential treatment hazards no longer exist, per label instructions.

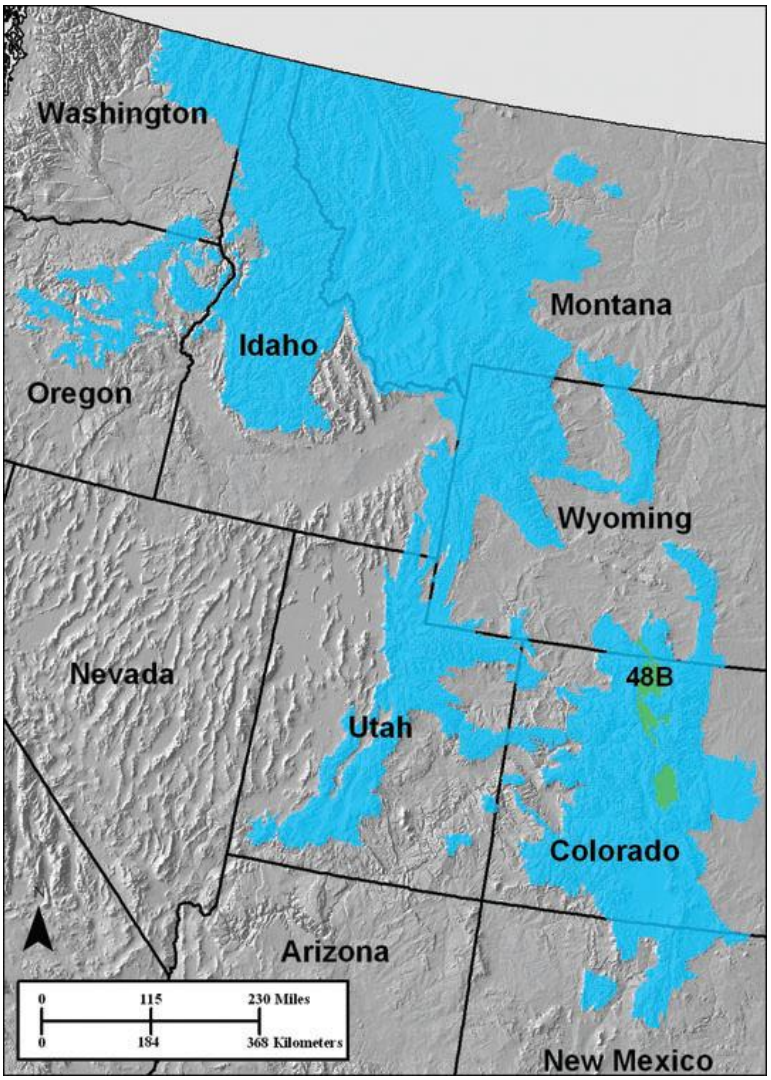
	• Observe restricted entry intervals specified by the herbicide label. • Notify local emergency personnel of proposed treatments. • Use spot applications or low-boom broadcast applications where possible to limit the probability of contaminating non-target food and water sources, especially vegetation over areas larger than the treatment area. • Consult with Native American tribes and Alaska Native groups to locate any areas of vegetation that are of significance to the tribe and that might be affected by herbicide treatments. • To the degree possible within the law, hire local contractors and workers to assist with herbicide application projects and purchase materials and supplies, including chemicals, for herbicide treatment projects through local suppliers. • To minimize fears based on lack of information, provide public educational information on the need for vegetation treatments and the use of herbicides in an Integrated Pest Management program for projects proposing local use of herbicides.
Rights-of-way	• Coordinate vegetation management activities where joint or multiple use of a ROW exists. • Notify other public land users within or adjacent to the ROW proposed for treatment. • Use only herbicides that are approved for use in ROW areas.
Human Health and Safety	• Establish a buffer between treatment areas and human residences based on guidance given in the HHRA, with a minimum buffer of ¼ mile for aerial applications and 100 feet for ground applications, unless a written waiver is granted. • Use protective equipment as directed by the herbicide label. • Post treated areas with appropriate signs at common public access areas. • Observe restricted entry intervals specified by the herbicide label. • Provide public notification in newspapers or other media where the potential exists for public exposure. • Have a copy of MSDSs at work site. • Notify local emergency personnel of proposed treatments. • Contain and clean up spills and request help as needed. • Secure containers during transport. • Follow label directions for use and storage. • Dispose of unwanted herbicides promptly and correctly.

MLRA 49 - Southern Rocky Mountain Foothills



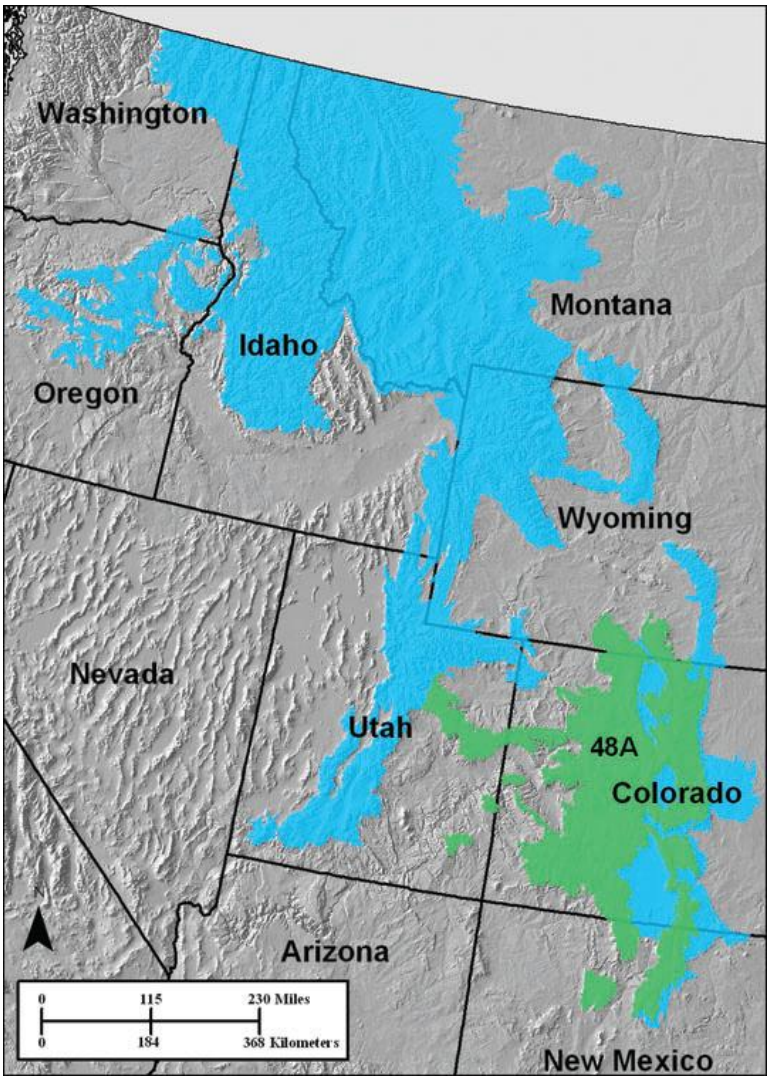
This area supports grassland, shrub-grassland, and forestland vegetation. Grassland that supports blue grama, buffalograss, and wheatgrasses is common at the lower elevations. Pinyon pine, juniper, true mountain mahogany, blue grama, needleandthread, and wheatgrasses are common in the southern Colorado portions of the MLRA. Ponderosa pine, Gambel oak, Douglas-fir, white fir, kinnikinnick, Parry's oatgrass, and Arizona fescue are common at the higher elevations of the MLRA. Cottonwood grows along the major streams.

MLRA 48B - Southern Rocky Mountain Parks



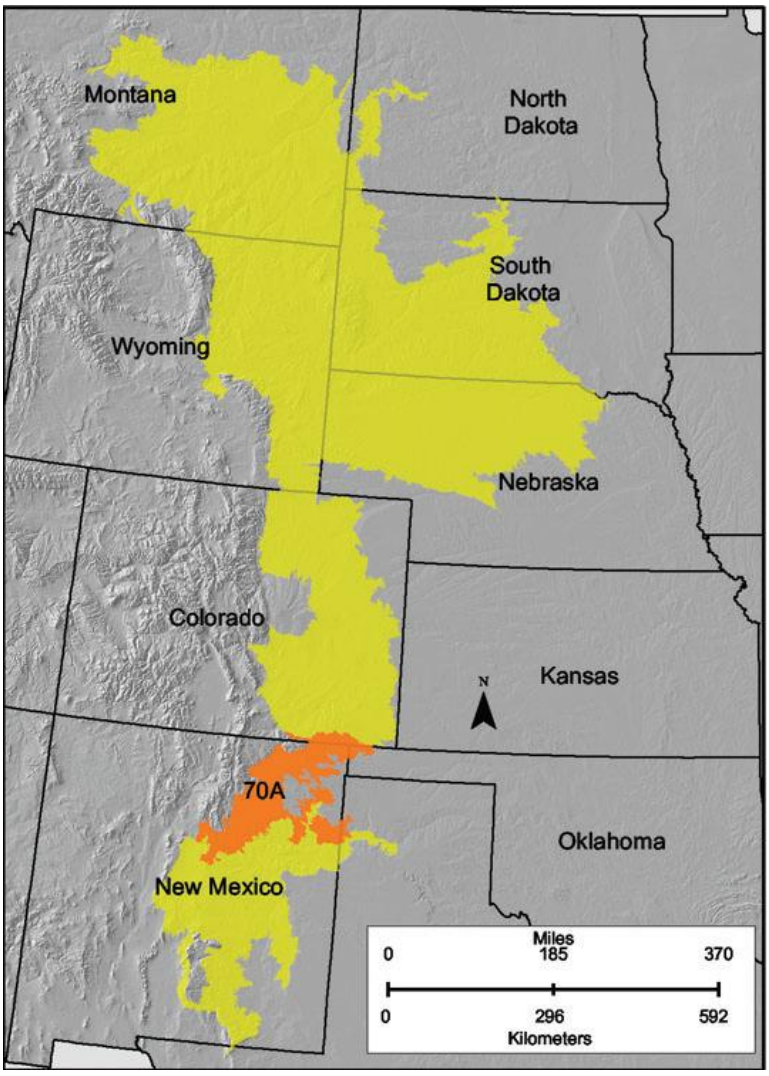
This area supports grass and grass-shrub vegetation. Mountain big sagebrush, Idaho fescue, bluebunch wheatgrass, streambank wheatgrass, and muttongrass are the common plants in North Park and Middle Park. Western wheatgrass, Arizona fescue, mountain muhly, needleandthread, and Parry's oatgrass are common in South Park.

MLRA 48A - Southern Rocky Mountains



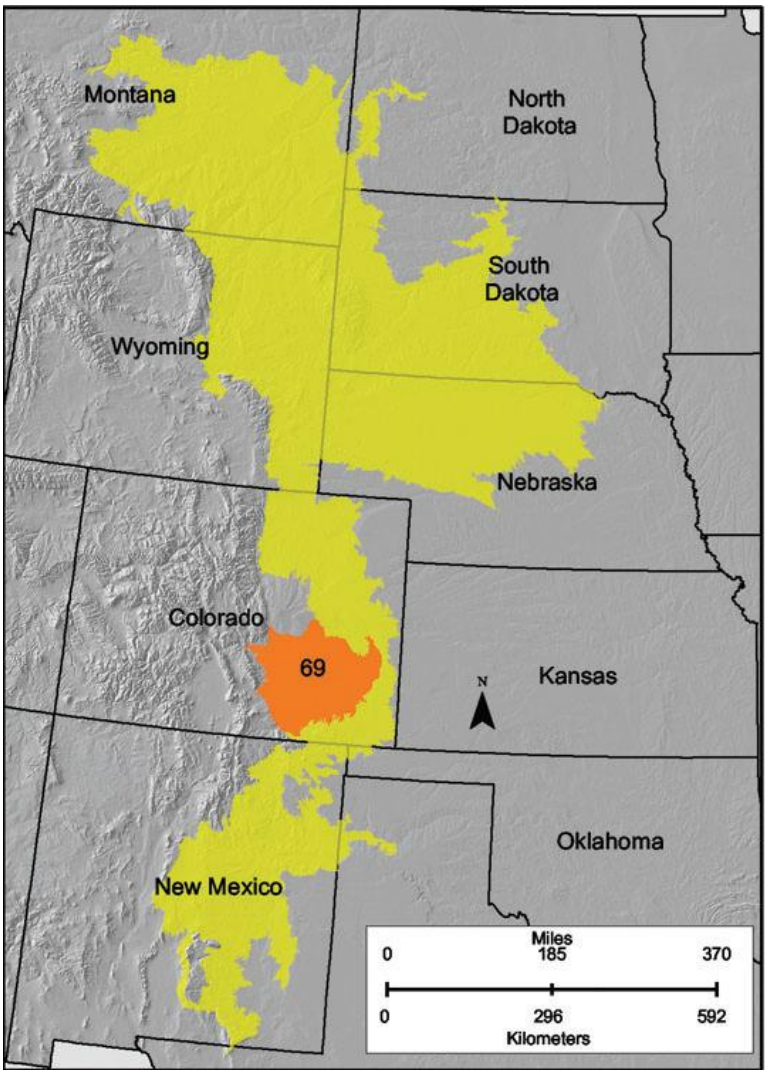
The potential vegetation in this area is grass and sagebrush at the lower elevations, montane and subalpine coniferous forest and some grassland at the mid and high elevations, and alpine tundra on the mountain peaks above timberline (at an elevation of about 11,500 feet, or 3,505 meters). Some common plants are mountain big sagebrush, western wheatgrass, and needleandthread at the lower elevations; ponderosa pine, Rocky Mountain Douglas-fir, white fir, Arizona fescue, mountain muhly, common snowberry, Parry's oatgrass, and mountain brome at mid elevations; Engelmann spruce, subalpine fir, corkbark fir, lodgepole pine, limber pine, bristlecone pine, grouse whortleberry, elk sedge, and Thurber's fescue at the higher elevations; and kobresia, alpine bluegrass, alpine clover, and golden avens above timberline.

MLRA 70A - Canadian River Plains and Valleys



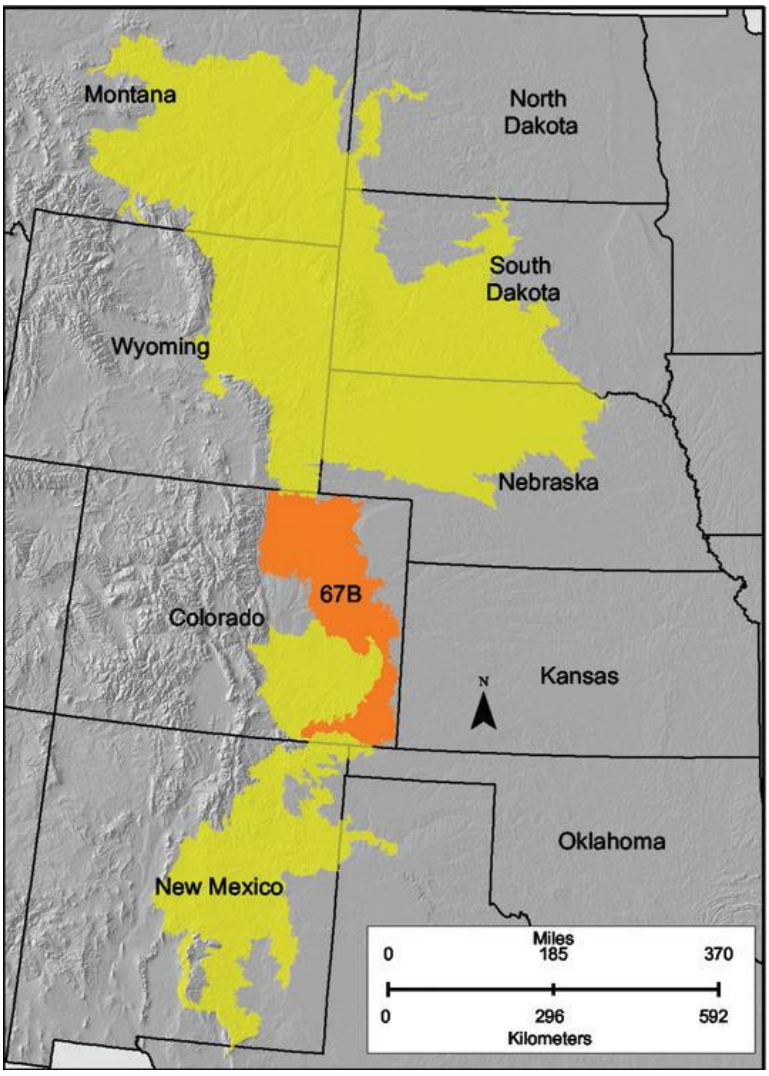
The native vegetation in this area consists of short or mid prairie grasses in the lowlands and pinyon and juniper at the higher elevations and on breaks. Fine textured soils support vegetation characterized by western wheatgrass, blue grama, sideoats grama, and galleta. Alkali sacaton and western wheatgrass dominate drainageways. Soils along natural escarpments and shallow soils support little b1uestem, sideoats grama, and blue grama and species of oak, juniper, pinyon, mountain mahogany, sumac, and Apache plume.

MLRA 69 - Upper Arkansas Valley Rolling Plains



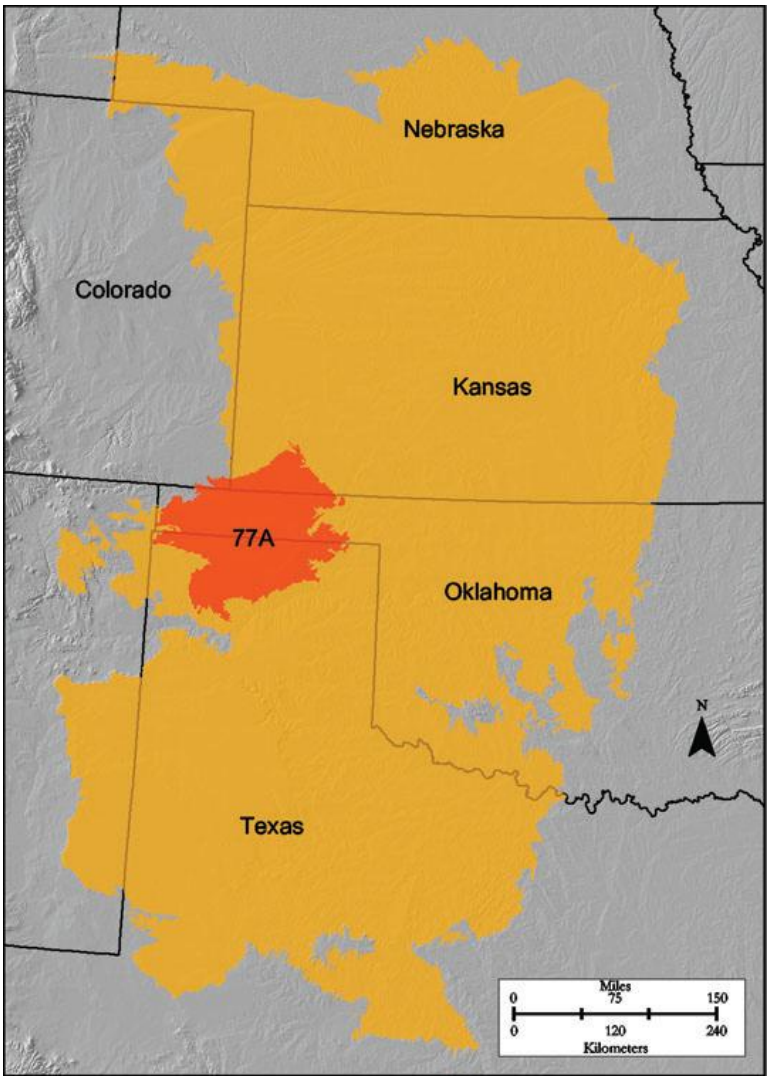
This area supports short prairie grasses. Blue grama, galleta, cholla, threeawn, ring muhly, and alkali sacaton are the major species. Cottonwood is common along the major streams. Stony and rocky soils support a mixed stand of pinyon and juniper with understory species similar to those in nearby openings and grasslands.

MLRA 67B - Central High Plains, Southern Part



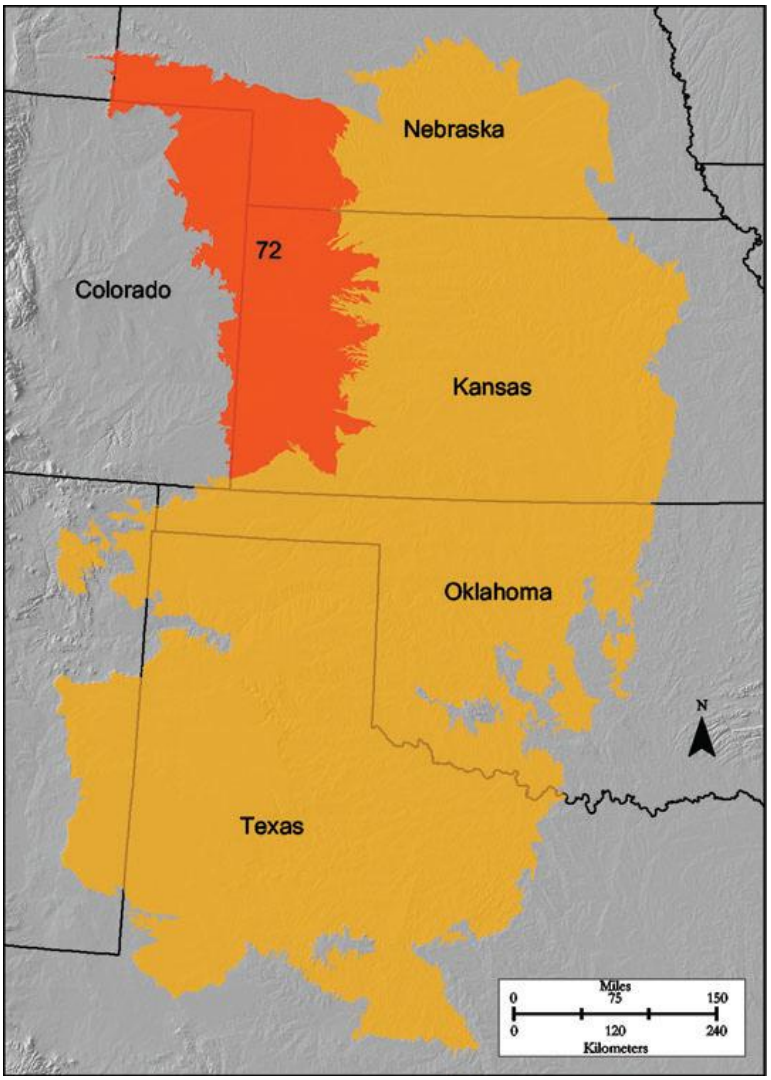
Most of this area supports short prairie grasses. Needleandthread, prairie junegrass, blue grama, galleta, cholla, threeawn, ring muhly, and alkali sacaton are the major species. Cottonwood is common along the major streams. Stony and rocky soils support a mixed stand of pinyon and juniper with understory species similar to those in nearby openings and grasslands. Sand sage is the potential natural vegetation on rolling plains with grass-stabilized sand dunes and sheets.

MLRA 77A - Southern High Plains, Northern Part



This area dominantly supports short or mid prairie grasses. Nearly level plains dominated by fine textured soils are characterized by a plant community of short grasses with a few mid grasses. Blue grama and buffalograss are common; blue grama is the dominant species. On very gently sloping and gently sloping plains dominated by moderately fine textured soils, the plant community is characterized by short and mid grasses and sideoats grama is the dominant species. In areas of sandy soils on gently to moderately sloping plains and sandhills, the plant community is characterized by tall grasses. Little bluestem and sand bluestem make up nearly half of these tall grasses. The woody shrubs on sandy soils include sand sage and shin oak.

MLRA 72 - Central High Tableland



This area supports short prairie grasses. Blue grama and buffalograss are the dominant species. Sideoats grama, blue grama, hairy grama, and little bluestem grow on the steeper valley walls along the major rivers.

APPENDIX D: Section 7 consultation with USFWS.

United States Department of the Interior
Bureau of Land Management
Royal Gorge Field Office
3028 East Main Street
Cañon City, Colorado 81212

TAKE PRIDE IN AMERICA

In Reply Refer To:
6502 (COF020, MR)

Susan C. Linner, Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
Colorado Field Office
P.O. Box 25486 – Denver Federal Center
Denver, CO 80225

Dear Susan,

Enclosed is a Biological Assessment (BA) titled "Programmatic Vegetation Treatment Plan for the Bureau of Land Management, Royal Gorge Field Office, Colorado". The Royal Gorge Field Office (RGFO) requests your written concurrence on this BA. The RGFO has been working with your office on this effort for the past year. Leslie Ellwood has been notified and consulted with by BLM Wildlife Biologist Matt Rustand regarding this BA. A response as soon as possible would be greatly appreciated.

If any questions arise, please contact Matt Rustand at (719) 269-8520.

Sincerely,

Keith E. Berger
Field Manager
Royal Gorge Field Office

Enclosure:
Biological Assessment – Programmatic Vegetation Treatment Plan

United States Department of the Interior
Bureau of Land Management
Royal Gorge Field Office
3028 East Main Street
Cañon City, Colorado 81212

In Reply Refer To:
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Sincerely,

Keith E. Berger
Field Manager
Royal Gorge Field Office

Enclosure:
Biological Assessment – Programmatic Vegetation Treatment Plan

Bureau of Land Management-Royal Gorge Field Office, Colorado

Programmatic Vegetation Treatment Plan

A BIOLOGICAL ASSESSMENT:
In fulfillment of Requirements Addressed in Section 7 of the Endangered Species Act of 1973

Prepared and Submitted by

Matthew Rustand, Wildlife Biologist

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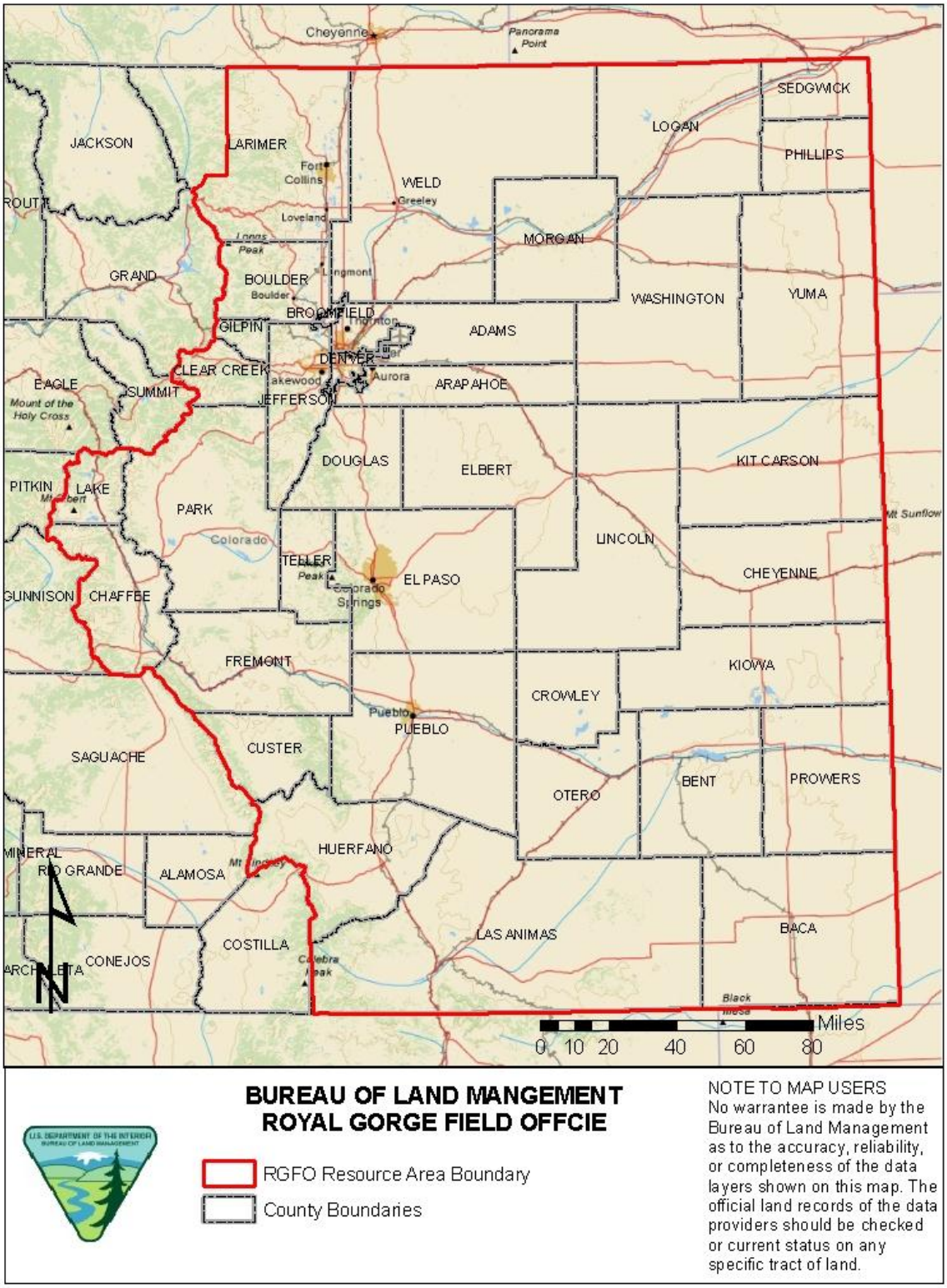
INTRODUCTION

BACKGROUND

The Royal Gorge Field Office (RGFO) proposes to implement a programmatic Vegetation Treatment Management Plan (VTMP). The VTMP is needed to reduce the adverse impacts associated with an increase in noxious and invasive weeds in the Royal Gorge Resource Area (RGRA). The VTMP also provides a basis for evaluating a range of treatment options or combination of options for eradicating and/or controlling populations of noxious and other invasive weed species. The RGFO encompasses the entire front range of Colorado, containing BLM, national forest, national park, state, and private lands. The BLM manages approximately 680,000 surface acres within the RGFO and an additional 6.8 million acres of subsurface minerals underlying private and state lands (Figure 1). In recent years, infestations of noxious and invasive weeds have significantly increased in number and extent. This is due to oil and gas development, livestock grazing, off-highway vehicle (OHV) use and other types of ground-disturbing activities. The recent increase in noxious and invasive weeds has contributed to a downward trend in the health of native plant communities in some parts of the RGFO. This has also reduced the quality and quantity of habitat and forage for wildlife and livestock, altered soil productivity, increased the potential for soil erosion and adverse impacts on water quality, and caused a loss of riparian area function.

Figure 1. Bureau of Land Management-Royal Gorge Field Office boundary and county map.



The proposed RGFO VTMP and environmental assessment (EA) is tiered to the *Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS) (BLM 2007a), which analyzed the impacts of using herbicides (chemical control methods) to treat noxious weeds and other invasive weeds on western public lands. In addition, the EA incorporates, by reference, the *Vegetation Treatments on BLM Lands in 17 Western States Programmatic Environmental Report* (PER) (BLM 2007b), which evaluated the general effects of non-herbicide treatments (i.e., biological, physical, cultural, and prescribed fire) on public lands.

The RGFO has begun conducting systematic, landscape-wide inventories for noxious weeds, as well as mapping known infestations. The focus of these surveys will include the inventory and mapping of noxious weed species that are considered the most harmful or pose the greatest threat of spreading into new areas. In 2009, the RGFO chemically treated approximately 30 acres of noxious weeds. In 2010, approximately 128 acres where chemically treated.

"Noxious weeds" are those listed by State of Colorado (Table 1). Note that species are grouped into three categories, with three different management objectives as follows: List A – designated for statewide eradication; List B – managed for containment; and List C – not designated for control because of wide distribution. "Invasive weeds" are those that are not listed by the State but considered by BLM as problematic in terms of habitat degradation and interference with reclamation.

Table 1. State of Colorado Noxious Weed List & Known RGFO Occurrences by County.

List A - Designated for Statewide Eradication	
Species	**Primary Occurrence**
African Rue	Las Animas County, 8+ infested acres.
Camelthorn	None Known.
Common Crupina	None Known.
Cypress Spurge	Larimer, Yuma, El Paso, and Douglas Counties, 38+ infested acres statewide.
Dyer's Woad	Boulder County, 2+ acres statewide.
Giant Salvina	None Known.
Hydrilla	None Known.
Meadow Knapweed	None Known.
Mediterranean Sage	Boulder and Larimer Counties, 30+ infested acres statewide.
Medusahead	None Known.
Myrtle Spurge	Larimer, Weld, Yuma, Boulder, Adams, Arapahoe, Jefferson, Douglas, Teller, El Paso, Freemont, Custer, and Huerfano Counties, 465+ acres statewide.
Orange Hawkhead	Larimer, Boulder, Jefferson, Douglas, Teller, and El Paso Counties, 75+ infested acres statewide.
Purple Loosestrife	Larimer, Weld, Morgan, Logan, Boulder, Adams, Arapahoe, Jefferson, Dougals, El Paso, and Kiowa Counties. 325+ infested acres statewide.
Rush Skeletonweed	None Known.
Serica Lespedeza	None Known.
Squarrose Knapweed	None Known.
Tansy Ragwort	None Known.
Yellow Starthistle	Larimer, Boulder, and El Paso Counties. 46+ infested acres statewide.

Table 1. Continued . . .

List B - Managed for Containment	
Species	**Primary Occurrence**
Absinth Wormwood	Weld County. 431+ acres infested statewide.
Black Henbane	Larimer, Park, Chaffee, Lake, and Custer Counties. 579+ infested acres statewide.
Boucingbet	None Known.
Bull Thistle	Scattered, moderate populations throughout RMA.
Canada Thistle	Scattered, moderate populations throughout RMA.
Chinese Clematis	Jefferson and El Paso Counties. 1059+ infested acres statewide.
Common Tansy	None Known.
Common Teasel	None Known.
Corn Chamomile	None Known.
Cutleaf Teasel	None Known.
Dalmatian Toadflax (broad leaved)	Scattered, moderate populations throughout RMA.
Dalmatian Toadflax (narrow leaved)	None Known.
Dame's Rocket	Larimer, Logan, Boulder, Adams, Arapahoe, and Pueblo Counties. 1,158+ infested acres statewide.
Diffuse Knapweed	Scattered, small populations throughout RMA.
Eurasian Watermilfoil	Larimer, Weld, Boulder, Jefferson, Arapahoe, Freemont, Pueblo, and Huerfano counties. 247+ infested acres statewide.
Hoary Cress	Scattered, moderate populations throughout RMA.
Houndstongue	Scattered, large populations throughout RMA.
Leafy Spurge	Scattered, moderate to large populations throughout RMA.
Mayweed Chamomile	None Known.
Moth Mullein	None Known.
Musk Thistle	Scattered, moderate populations throughout RMA.
Oxeye Daisy	Larimer, Boulder Jefferson, Teller, El Paso, and Custer. 24,229+ acres statewide.
Perennial Pepperweed	Scattered, moderate populations throughout RMA.
Plumeless Thistle	Isolated, small populations
Quackgrass	None Known.
Redstem Filaree	None Known.
Russian Knapweed	Scattered, small populations throughout RMA.
Russian-Olive	Scattered, moderate to large populations along riparian corridors.
Salt-Cedar (Tamarisk)	Scattered, moderate to large populations along riparian corridors.
Scentless Chamomile	Boulder, Gilpin, Clear Creek, Park, Adams, Chaffee, Lake, and El Paso Counties. 17,354+ infested acres statewide.
Scotch Thistle (Onopordum acanthium)	Scattered, small to large populations throughout RMA.
Scotch Thistle (Onoporfum tauricum)	None Known.
Spotted Knapweed	Scattered, small to large populations throughout RMA.
Spurred Anoda	Small infestation in Freemont County, >1 acre.
Sulfur Cinquefoil	Larimer, Boulder, Jefferson, Gilpin, Adams, and Teller Counties. 1,139+ acres infested statewide.

Table 1. Continued . . .

Species	Primary Occurrence
Venice Mallow	Larimer and Logan Counties. 390+ infested acres statewide.
Wild Caraway	None Known.
Yellow Nutsedge	None Known.
List C - Not Designated for Control Due to Statewide Distribution	
Chicory	None Known.
Common Burdock	Scattered, small populations throughout RMA.
Common Mullein	Scattered, large populations throughout RMA.
Common St. Johnswort	None Known.
Downy Brome	Heavy infestations throughout the RMA.
Field Bindweed	Scattered, moderate populations throughout RMA.
Halogeton	Scattered, moderate populations throughout RMA.
Johnsongrass	None Known.
Jointed Goatgrass	Scattered, moderate populations throughout RMA.
Perennial Sowthistle	None Known.
Poison Hemlock	Scattered, small populations throughout RMA.
Puncturevine	None Known.
Velvetleaf	None Known.
Wild Proso Millet	None Known.

PROPOSED ACTION /PURPOSE OF BIOLOGICAL ASSESSMENT

The proposed VTMP for the RGFO is needed to reduce the adverse impacts associated with an increase in noxious and invasive weeds on BLM-administered lands within the RGRA. The proposed VTMP also provides a mechanism for evaluating a range of treatment options, or combination of options, to eradicate or control weed populations.

During preparation of the *Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS) and the PER described above, the BLM prepared a programmatic biological assessment (PBA), to evaluate likely impacts to threatened, endangered, or proposed species and their critical habitats from chemical, manual, and biological weed treatments. One outcome of the consultation was that BLM field offices implementing a weed management program must prepare local-level analyses of potential impacts on federally listed/proposed threatened and endangered species and their critical habitats.

The purpose of this BA is to:

- Evaluate the effects on threatened, endangered, proposed, and candidate (TEPC) species and their critical habitat of non-chemical (manual and biological) weed treatments. See Table 2 for a list of TEPC species addressed in this BA.
- Evaluate the effects on threatened, endangered, proposed, or candidate (TEPC) species and or their critical habitat of chemical (herbicide) weed treatments.

- Satisfy the requirement under the PBA for ESA Section 7 consultation for threatened and endangered species in relation to the development of VTMP Plans at the field office level. It is BLM policy not to consult or conference in regards to candidate species. However, if a candidate species is listed once consultation is complete, BLM will amend this document to seek concurrence for the affected species.

Table 2. USFWS's Species List within RGFO counties updated July 2010.

Common Name	Scientific Name	Status	Requesting Concurrence for Effects Determination
Least Tern (interior population)[a]	Sternula antillarum	E	x
Mexican spotted owl	Strix occidentalis lucida	T	x
Mountain plover	Charadrius montanus	P	x
Pallid sturgeon[a]	Scaphirhynchuys albus	E	
Piping plover[a]	Charadrius melodus	T	x
Preble's meadow jumping mouse	Zapus hudsonius preblei	T	x
Ute ladies'-tresses orchid	Spiranthes diluvialis	T	x
Western prairie fringed orchid[a]	Platanthera praeclara	T	
Whooping crane[a]	Grus americana	E	
Arkansas darter	Etheostoma cragini	C	x
Lesser prairie chicken	Tympanuchus pallidicinctus	C	x
Canada lynx	Lynx Canadensis	T	x
Colorado butterfly plant	Gaura neomexicana spp. Coloradensis	T	x
Greenback cutthroat trout	Oncorhynchus clarki stomias	T	x
Gunnison's prairie dog	Cynomys gunnisoni	C	
Uncompahgre fritillary butterfly	Boloria acrocnema	E	x
Pawnee montane skipper	Hesperia leonardus montana	T	x
Black-footed ferret	Mustela nigripes	E	x
Penland alpine fen mustard	Eutrema penlandii	T	x
Greater Sage-grouse[b]	Centocercus urophasianus	C	
North Park phacelis[b]	Phacelia formosula	E	
New Mexico meadow jumping mouse	Zapus hudsonius luteus	C	x

[a]Water depletions in the North Platte, South Platte and Laramie River Basins may affect the species and/or critical habitat associated with the Platte River in Nebraska. However, water depletions will not occur as a result of this proposed action; therefore, these species were not analyzed.

[b]Habitat for these species is not found in the RGRA; therefore, they were not carried forward.

The BA would be valid for a 10 year period. Once expired, another BA would need to be conducted to ensure continued compliance with the Threatened and Endangered Species Act. The plan would be implemented in accordance with Federal and State laws, regulations and policies and the RGFO Resource Management Plan (1995).

CONSULTATION HISTORY

The outcome of the interagency consultation for the PEIS and PER via the PBA (BLM 2007c) was concurrence by the USFWS with BLM's determination of "May Affect, Not Likely to Adversely Affect" determination for threatened, endangered, or proposed species as a result of proposed weed treatments. An extensive summary of conservation measures were included and those that the RGFO plans to incorporate (including alterations and additions) into the VTMP can be found in Appendix E.

On February 18, 2011, Matt Rustand (Wildlife Biologist – BLM) contacted Leslie Ellwood (Biologist – USFWS) to inform her of the preparation of the VTMP for the RGFO. Topics of the conversation included which wildlife species the BLM planned to include in the BA and an estimated timeframe of when the USFWS should expect to receive the BA. Since the intial conversation, the BLM and USFWS have remained in contact modifying and revising the BA resulting in the final document that follows.

PROPOSED INTEGRATED WEED MANAGEMENT PLAN

The intent of proposed VTMP is to provide a comprehensive range of management actions to allow resource managers to select actions or combination of actions to meet the objectives of eradicating, significantly reducing, or containing existing weed infestations and preventing the spread of new infestations. The proposed VTMP is intended to be broad in scope and to apply to weed control associated with any resource management decisions under RGFO's current or future land use plans and plan amendments. The plan includes efforts to prevent the spread of weeds or establishment of new infestations through education and cooperation with public and private groups. Weed infestations on the BLM will be inventoried and mapped to aid in prioritizing treatment areas and to aid in monitoring the efficacy of various treatment programs. Treatment methods include a wide range of options from manual control methods (e.g. hand-pulling weeds) to biological control methods (e.g. prescribed grazing) to chemical control methods (i.e. herbicide application). A management strategy for a specific weed infestation may often include a combination of treatment methods.

The proposed VTMP would incorporate the BMPs for preventing weed infestations , standard operating procedures (SOP), mitigation measures, and conservation measures for implementing weed treatments (see Appendices B, C, D, E, and F). These appendices were largely taken from PEIS and PER (BLM 2007a and 2007b) and adapted to site-specific conditions in the RGFO area.

PREVENTION, EDUCATION, AND COORDINATION

The proposed VTMP focuses on preventing new weed infestations by requiring that a range of best management practices (BMP) be incorporated in all (i.e. both internal and external) future project proposals. Examples of prevention measures can be found in Appendix B. Many of the prevention measures (e.g. avoid hiking through weed infestations whenever possible**)** assumes that people are able to distinguish weed species from native, desirable species. BLM employees would receive training that would include identification of weed species and the process for reporting infestations. To increase the general public's awareness of weeds, a variety of outreach efforts would be considered such as assisting county governments and other organizations in the publication and distribution of brochures and other types of educational materials. The RGFO plans to continue and enhance cooperation and coordination with other Federal agencies, State and county/local governments, other organizations and private landowners in an effort to more effectively manage noxious and invasive weeds. Examples of coordination include cooperative agreements with local governments to treat infestations that are located near or across jurisdictional boundaries and the exchange of weed mapping data.

INVENTORY, MAPPING, AND MONITORING

Information on the location and distribution of noxious weeds is fundamental to all subsequent management efforts. Funding constraints to date have precluded a complete inventory of the RGFO. Areas of high human use and high resource value would be selected for inventory priority. These would include, at minimum:

- Areas proposed for ground-disturbing activities
- Burned areas
- Areas of Critical Environmental Concern (ACEC)
- Habitat for special status species
- Riparian areas
- Developed recreation sites
- Heavily used roads and trails
- Wildland-Urban Interfaces (WUIs)
- Big game winter range

Once located, noxious weed infestations would be mapped using GIS (geographic information system). Mapping a weed infestation provides information about the extent of the infestation, possible transport vectors, and potential high priority un-infested areas to be protected.

Mapped locations would be monitored. Evaluating the effectiveness of control techniques and ensuring that mitigation and conservation measures are implemented appropriately are critical components of the VTMP. If all mature plants are eliminated, monitoring would continue in order to detect and eliminate new plants arising from seed, propagule, or root stock for the duration of the seed longevity for that species. The monitoring of infestations where the management objectives are control or containment would continue at periodic intervals for an indefinite period. Table 3 lists the general methods used to evaluate treatment effectiveness and are based on the management objective for a given infestation.

Table 3. Management Objectives, Monitoring Methods and Measures of Effectiveness.

Management Objective	Monitoring Method	Measure of Effectiveness
Eradication	Visually inspect infested area.	Absence after a period of time (depends on seed longevity of the weed species).
Control or Suppression	Measure percent cover via quadrants or transects.	Reduction in percent cover
Containment	Measure area of infestation by mapping via GPS or recording length and width of infestation.	Reduction in area of infestation.

If monitoring demonstrates that a treatment has not been effective in achieving the management goal, corrective actions (e.g., retreatment with the same or different method or combination of methods) would be identified and implemented to enhance the level of success. Data on treatment effectiveness collected during monitoring would be entered into the National Invasive Species Information Management System (when available). In the interim, these data would be entered into a RGFO weed management database.

TREATMENT METHODS

The proposed RGFO VTMP utilizes a variety of treatment methods including manual methods, biological control, and chemical control. Noxious and invasive weeds would be treated using the best available weed control technique(s) at the appropriate times based on the life history of the target species and cost-effectiveness. Total area of weed treatments under the Proposed Action would not exceed **5,000** acres per year, of which up to **1,000** acres would be treated aerially. (Note that the treatment acreage is calculated based on the amount of herbicide used and not based on mapped areas.) Potential treatment methods for use by BLM or project proponents in the RGFO are described in Table 4.

Table 4. Summary of Potential Treatment Methods under the VTMP*.

Manual
Description: Involves the use of hand tools and hand-operated power tools to cut, clear or prune herbaceous and woody species. Treatments include cutting undesired plants above ground level; pulling, grubbing or digging out root systems of undesired plants to prevent sprouting and regrowth; cutting at ground level or removing competing plants around desired species; or placing mulch around desired vegetation to limit weed germination and growth (BLM 1991b). Hand tools include a handsaw, axe, shovel, rake, machete, grubbing hoe, mattock, Pulaski, brush hook, hand clippers, motorized chainsaws, weed whacker, and power brush saw.

Table 4. Continued . . .

Effectiveness: Manual treatments are most effective when weed infestations are small and complete removal of the roots is possible (Rees et al. 1996). Manual treatments work well for annual or biennial species with tap roots or shallow roots that do not resprout from tissue remaining in the soil. Sandy or gravelly soils allow for easier root removal. Repeated treatmentsare often necessary due to soil disturbance and residual weed seeds in the seed bank. Manual control can be used with minimal impacts and are useful in sensitive habitats, such as wetlands or riparian areas, or where special status species occur. However, manual treatments are labor intensive compared to other treatment methods such as herbicide and biological control. Typical manual vegetation control costs $70 to $700 per acre (BLM 2007b).
Biological Control
Description: Biological controls involve the intentional use of domestic animals, insects, nematodes, mites or pathogens (agents such as bacteria or fungi) that weaken or destroy vegetation. The use of domestic livestock to control weeds requires "prescribed grazing" in which the kind of animals and the amount and duration of grazing are designed to control a particular species while minimizing impacts to perennial native vegetation. In order for prescribed grazing to be effective, the right combination of animals, stocking rates, timing and rest must be used. Grazing should occur when the target plant is palatable and viable seeds can be reduced.
Effectiveness: Biological control agents are not currently available for many weed species. They are most effective for large populations of weeds, but it is unlikely that they would completely eradicate a weed population because as the population of the host plant decreases, populations of the agent would also decline. Biological control agents can take many years to get established and bring about the desired level of control, but can be a useful tool in reducing the initial size or density of a weed infestation, making other treatments more feasible. Biological treatments are most effective when followed with other treatments. Biological control using insects, nematodes, mites or other pathogens can range from $80 to $150 per release for ground applications. Treatment of weeds using domestic animals is relatively inexpensive, costing $12 to $15 per acre. Biological control agents such as insects, nematodes, mites or pathogens that are approved by the BLM have undergone rigorous testing by the USDA Agricultural Research Service to ensure they are host specific and would feed only on the target plants and not on crops, native flora or endangered or threatened plant species. Before releasing a new agent, an environmental analysis is prepared by APHIS (Agricultural Plant Health Inspection Service). Once approved, a biological control can be released only in states covered by the environmental assessment. The RGFO would only use those biological controls approved by APHIS for release in Colorado. Biological control agents would be used in accordance with BLM Manual 9014 (BLM 1990). When releasing biological agents on BLM lands, the following process would be followed: - A Biological Control Agent Release Proposal (BCARP) is an internal BLM document that includes the type of biological control agent, collection origin, number of specimens planned for release, planned release date number of releases, target pest species and estimated treatment acres. A BCARP also includes a discussion of sensitive aspects and precautions and mitigations to minimize impacts to non-target vegetation. A BCARP requires review and approval by the Originator, Field Office Manager, State Pest Management Specialist and Deputy State Director. - A Biological Control Agent Release Record (BCARR) must be completed within 24 hours after release of the biological control. These records must be kept for 10 years. Information on the BCARR includes location of release, actual area (acres) or release, weather conditions and weed species treated.

Table 4. Continued . . .

Chemical Control
Description: Chemical control involves the use of herbicides to kill or surpass target plants and chemicals applied with the herbicides that improve their efficacy ("adjuvants"). Herbicides can be used selectively to control specific vegetation types or non-selectively to clear all vegetation in a particular area (e.g., bare-ground treatments on oil and gas pads.) Manual (i.e., spot) applications are effective for small infestations, areas inaccessible by vehicle or areas where minimizing potential impacts to non-target plants is desired. Manual applications include spraying from a backpack unit or spray bottle or wiping (wicking) directly onto the foliar tissue. In remote areas and areas where mechanized equipment is not appropriate (e.g., wilderness areas and wilderness study areas), herbicides may be carried and applied using pack animals. Larger weed infestations in highly disturbed areas with good accessibility can be treated by sprayers mounted on ATVs or trucks. Oil and gas pads, pipeline corridors and roadsides can be effectively treated in this manner. Herbicides could be applied aerially with helicopters or fixed-wing aircraft for large infestations of weeds in areas where it's not economically and/or physically feasible to treat on the ground (e.g., areas burned in wildfires, cheatgrass treatments, wildlife habitat treatments). When applying herbicides on BLM lands, the following process would be followed: - Applicator must be present certified pesticide applicator's license. - A Pesticide Use Proposal (PUP) must be approved by the BLM State Office. (A PUP is an internal document that includes the type of herbicide, application rate, application dates, number of applications and estimated treatment acres. A PUP also includes a discussion of sensitive aspects and precautions and mitigations that will be taken to minimize impacts to non-target vegetation). A PUP requires review and approval by Certified Pesticide Applicator, Field Office Weed Coordinator, Field Office Manager, State Office PUP Coordinator, and Deputy State Director. A PUP is valid for 3 years and requires renewal after that time. - The pesticide applicator would fill out a Pesticide Application Record (PAR) within 24 hours of applying herbicides on BLM lands. The pesticide applicator must keep these records for 10 years according to State law. Information on the PAR includes location of application, which and how much herbicide was applied, weather conditions, equipment used, weed species treated and number of acres treated. Applicators are required to turn these records into the RGFO at the end of each year. - The RGFO would prepare an annual Pesticide Application Report (PAR) which would be submitted to the BLM State Office. This report includes a total of all pesticides applied in the RGFO RMA. **Effectiveness:** The proper use of herbicides at the optimum time can be the most effective method for controlling persistent weeds, including perennial species. Not all herbicides are equally effective on all weeds, nor can every herbicide be used in every situation. Herbicides can damage or kill non-target plants and can be toxic or cause health problems in humans, livestock and wildlife. Weed populations may develop a resistance to a particular herbicide over time. Herbicide control is less labor intensive than manual methods and is able to more effectively control larger weed infestations. The cost of herbicide application Is generally $20 to $250 per acre (BLM 2007b).

Manual Control Methods

As mentioned above in Table 4, manual methods work best for species where complete removal of the roots is possible or for species that do not resprout from any tissue remaining in the soil if complete removal is not possible. Manual removal is also used when weeds have flowed and are ready to set seed. The goal of manual treatments at this stage is to prevent seed dissemination. Since manual control methods can be labor intensive, it is typically applied to small infestations.

Biological Control Methods

Prescribed grazing may also be used a biological control method. However, a site-specific Environmental Assessment will be conducted for each prescribed grazing treatment. Additional consultation with the USFWS will occur at that time if there is the potential for impacts to TEPC species.

Chemical Control Methods

Chemical treatments using selective or non-selective herbicides would comply with the EPA label directions, follow BLM procedures outlined in Handbook H-9011-1 (*Chemical Pest Contro*l, BLM 2006a) and BLM Manual Sections 1112 (*Safety*) (BLM 2000) and 9015 (*Integrated Weed Management*) (BLM 1992). Herbicide applications would adhere to all State and Federal pesticide laws. All applicators that apply herbicides on lands administered by the RGFO (i.e., certified applicators or those directly supervised by a certified applicator) would comply with the application rates, uses and handling instructions specified on the herbicide label or, where more restrictive, the rates, uses and handling instructions developed by the BLM.

Chemical control includes the potential use of any of the 18 herbicide active ingredients approved in the PEIS (i.e. 2,4-D, bromacil, chlorsulfuron, clopyralid, dicamba, diflufenzopyr, diquat, diuron, fluridone, glyphosate, hexazinone, imazapic, imazapyr, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron and triclopyr). Four of these – diquat, difufenzopyr, fluridone and imazapic – had not previously been approved for use. Currently diflufenzopyr is only approved as a formulation with dicamba (i.e. Overdrive®). BLM could approve diflufenzopyr as a stand-alone herbicide in the future if registered by the EPA under the federal insecticide, fungicide and rodenticide act (FIFRA). See Appendix A for a complete listing or herbicides and adjuvants currently approved for use on BLM lands.

Revegetation and/or Temporary Resting from Grazing

Areas disturbed by weeds may be reseeded or planted with desirable vegetation following treatment if the native plant community is considered unlikely to recover on its own. DOI policy states, "Natural recovery by native plant species is preferable to planting or seeding, either of natives or non-natives. However, planting or seeding should be used only if necessary to prevent erosion or resist competition from non-native invasive species" (BLM 2004). Where practicable, seed would be installed by drill-seeding to a maximum depth of 1 inch. Where drill-seeding is impracticable, seed may be installed by broadcast-seeding, possibly followed by raking or harrowing. If the site needs to be cultivated (disced) prior to seeding, cultural and biological surveys would be conducted prior to ground disturbance and a site-specific NEPA document would be prepared.

In cases of very large and severe infestations where natural recovery or revegetation are expected to be difficult, the area may be rested from grazing by up to 2 years to hasten the reestablishment of desirable vegetation. Exceptions may include situations in which the treated area represents a

small portion of the allotment or where the timing, duration and intensity of use by livestock would not impede recovery.

Risk Assessment Description

Ecological risk assessments were completed by the BLM for all herbicides of concern in this biological assessment. Details regarding this assessment can be found in appendix C of the Environmental Impact Statement (BLM 2007a). This method has been developed by United States Environmental Protection Agency Office of Pesticide Program (EPA) and a simplified narrative describing this process follows. Risk quotients (RQ) were calculated by dividing the estimated exposure concentration (EEC) for described scenarios (e.g. direct spray (absorption), ingestion, surface run-off, etc.) by a toxicity reference value (e.g. lethal concentration to 50% of organisms, lethal dose to 50% of organisms, etc.), which was obtained from toxicology data for the species of concern or, if data was not present, a surrogate species. The levels of concern (LOC), values established by the EPA, are based on a scale from 0-1, 0 being of no concern and 1 is of high concern.

Using this data, risk categories were designated following the formulas below:
0 = No Risk (RQ<LOC)
L = Low Risk (RQ=1-10x LOC)
M = Moderate Risk (RQ=10-100x LOC)
H = High Risk (RQ>100x LOC)

Whenever the RQ exceeded the LOC it is assumed that negative health effects to the TEPS in question could potentially occur under the exposure scenario.

This Environmental Impact Statement identifies human health and ecological risks associated with USEPA-registered herbicide active ingredients, as well as inerts and degradates for which information is available and not constrained by confidential business information (CBI) restrictions (BLM 2007a). Preparing a risk assessment for every conceivable combination of herbicide, tank mix, surfactant, adjuvant, and other possible mixture is not feasible, as the BLM cannot prepare hundreds of risk assessments, and the cost would be exorbitant. To the degree a toxic substance is known to pose a significant human or ecological risk, the BLM has undertaken the necessary analysis to assess its impacts through risk assessments.

AFFECTED SPECIES AND EFFECTS ANALYSIS

PLANTS

Ute Ladies'-Tresses

Ute Ladies'-Tresses: Status, Natural History, and Location of Habitat within RGFO

The species is known from a wide range of riparian-related plant communities, however, it is less common in shrub or tree dominated areas. Populations are widely scattered across 8 western states, at elevations between approximately 4300' and 7000'. The presence of Ute Ladies'-Tresses has been suspected to occur on BLM-controlled lands on the RGFO in Boulder and Jefferson counties (Fertig et al. 2005) (Figure 2). Prior to 1992, extant populations of Ute ladies'-tresses were known only from Jefferson and Boulder counties along Clear, Boulder, and South Boulder creeks within the Clear and St. Vrain watersheds. Historical (and presumed extirpated) occurrences were also known from Weld and El Paso counties (Jennings 1989) in the Middle South Platte-Cherry Creek and Fountain watersheds, but have not been observed since 1896. Since 1992, additional populations have been recorded from St. Vrain and Left Hand creeks in Boulder County (St. Vrain watershed), Claymore Lake near Fort Collins in Larimer County, Cache La Poudre watershed (Fertig et al. 2005)(Table 5).

Figure 2. Distribution of Ute Ladies'-Tresses (*Spiranthes diluvialis*) within the Bureau of Land Management-Royal Gorge Field Office boundary, 2012.

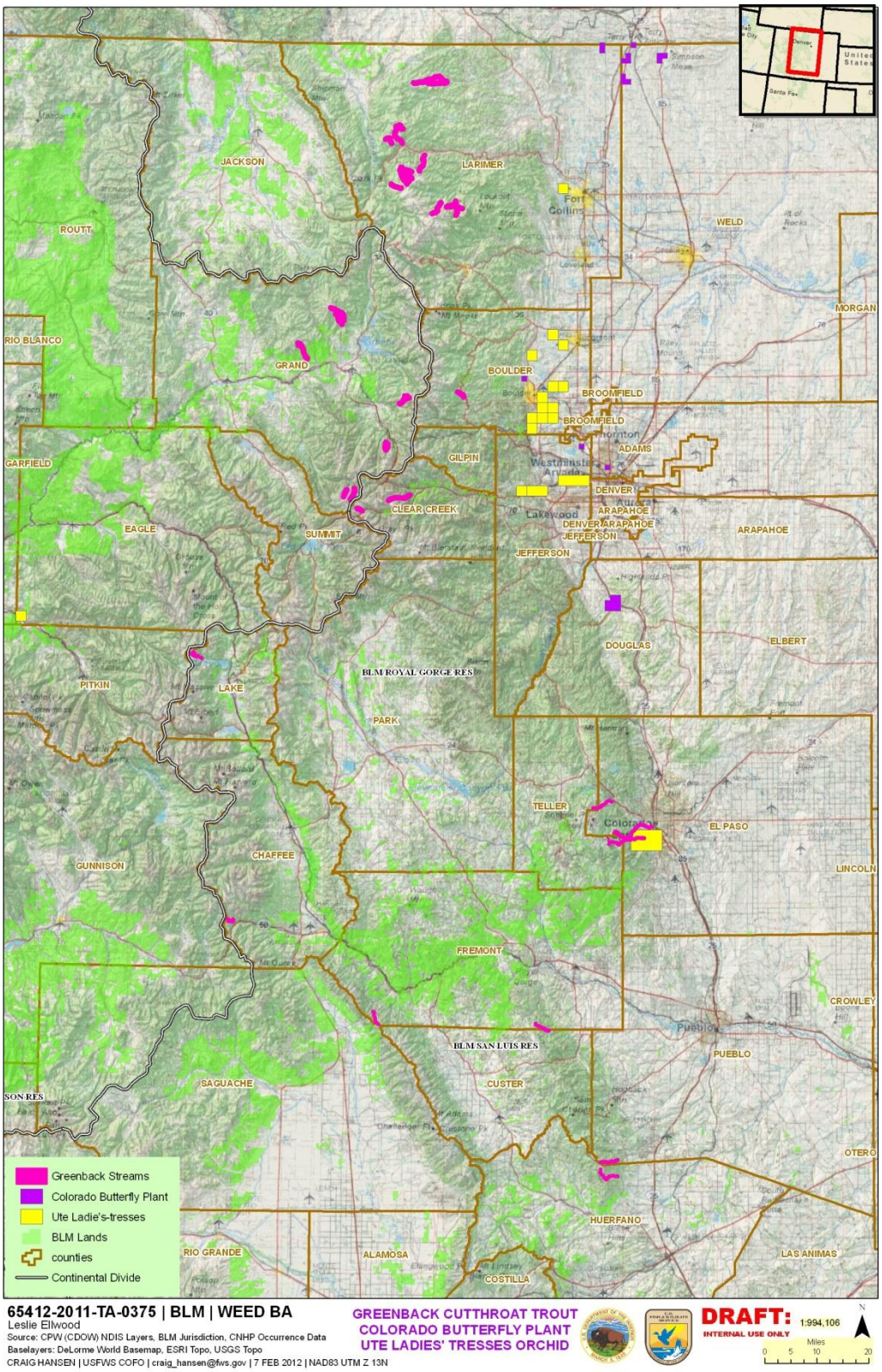


Table 5. Current known locations of Ute Ladies'-Tresses within the Royal Gorge Resource Area, 2012 (Fertig et al. 2005).

Location	Ownership	Land Use	Population Size	Acres
Jefferson County: Clear Creek (Wheat Ridge)	Prospect Park, city of Wheat Ridge	Recreation	2004: 0 plants	1
Jefferson County: Clear Creek Canyon (Golden)	Private	Recreation	2004: 271 plants	10
Jefferson County: Clear Creek Canyon (Indian Gulch)	Private	Recreation	1992: 6 plants	1
Jefferson County: Clear Creek Canyon	CO Department of Transportation	Recreation	1994: 21 plants	0.1
Jefferson County: Clear Creek Canyon (Clear Creek)	Private	Recreation	1994: 9 plants	1
Boulder County: Boulder Creek (Foothills Parkway)	Private	Road Corridor and open space in urban development	1990: 19 plants	2
Boulder County: Boulder Creek	Private	Recreation	1993: 30 plants	0.2
Boulder County: Boulder Creek	City of Boulder Open Space	Open Space	2001: 3 plants	0.2
Boulder County: Boulder Creek	City of Boulder Open Space	Open Space	2000: 3 plants	10
Boulder County: Boulder Creek	Private	Conservation Easement	2004: 151 plants	1
Boulder county: South Boulder Creek	City of Boulder Open Space	Recreation	2004: 463 plants	40
Boulder county: South Boulder Creek	City of Boulder Open Space	Agriculture	2004: 1 plant	0.5
Boulder county: St Vrain Creek	Boulder County Open Space	Agriculture	1993: 5 plants	0.5
Boulder County: Left Hand Creek	Private	Agriculture	1998: 0 plants	0.3
Boulder County: Left Hand Creek	Private	Agriculture	1994: 5 plants	0.3
Larimer County: Claymore Lake South	Colorado State University, Private	Agriculture	1996: 87 plants	6.6

Highly manipulated environments, such as irrigated hay meadows, moderately grazed pastures with river access, areas of increased sediment deposits and intact floodplains with mid-seral, light-penetrating vegetation, were primarily exhibited on private lands. These latter environments are considered more likely to contain suitable habitats. These environments also qualify this orchid's habitats as a terrestrial rather than true aquatic (emergent or sub-emergent) species. Therefore, the effects analysis and herbicide buffer distances for terrestrial TEPC plants apply to Ute Ladies'-Tresses (Table 7). Terrestrial buffer distances are typically larger than those for aquatic plants which may be less susceptible to injury or mortality from direct spray or aerial drift.

No effect to *Spiranthes diluvialis* potential habitats would be expected with respect to VTMP treatments of Russian olive and tamarisk. Areas with a dominant Russian olive and tamarisk overstory will be presumed to be non-habitat for Ute ladies tresses. Therefore, pre-survey, conservation measures, BMP's, SOP's, and related standards, will only apply to VTMP treatments on RGFO riparian habitats that contain manipulated environments or areas of open, herbaceous, riparian vegetation devoid of noxious shrub dominated overstory. Herbaceous noxious weeds found on the RGFO that could occur in orchid habitats would include Canada thistle, Leafy spurge, Poison hemlock, Yellow toadflax, Field bindweed, and knapweed species.

Colorado Butterfly Plant

Colorado Butterfly Plant: Status, Natural History, and Location of Habitat within RGFO
Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) is endemic to moist soils in mesic or wet meadows of floodplain areas in north central Colorado, extreme western Nebraska, and southeastern Wyoming (Figure 3, Table 6). This subspecies occurs primarily in habitats created and maintained by streams active within their floodplains, with vegetation that is relatively open and not overly dense or overgrown. Colonies are often found in low depressions or along bends in wide, active, meandering stream channels a short distance upslope of the actual channel. The plant requires early- to mid-successional riparian habitat. It commonly occurs in communities dominated by redtop and Kentucky bluegrass on wetter sites, and wild licorice, Flodman's thistle, curlytop gumweed, and smooth scouring rush on drier sites.

Figure 3. Distribution of Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) within the Bureau of Land Management-Royal Gorge Field Office boundary, 2012.

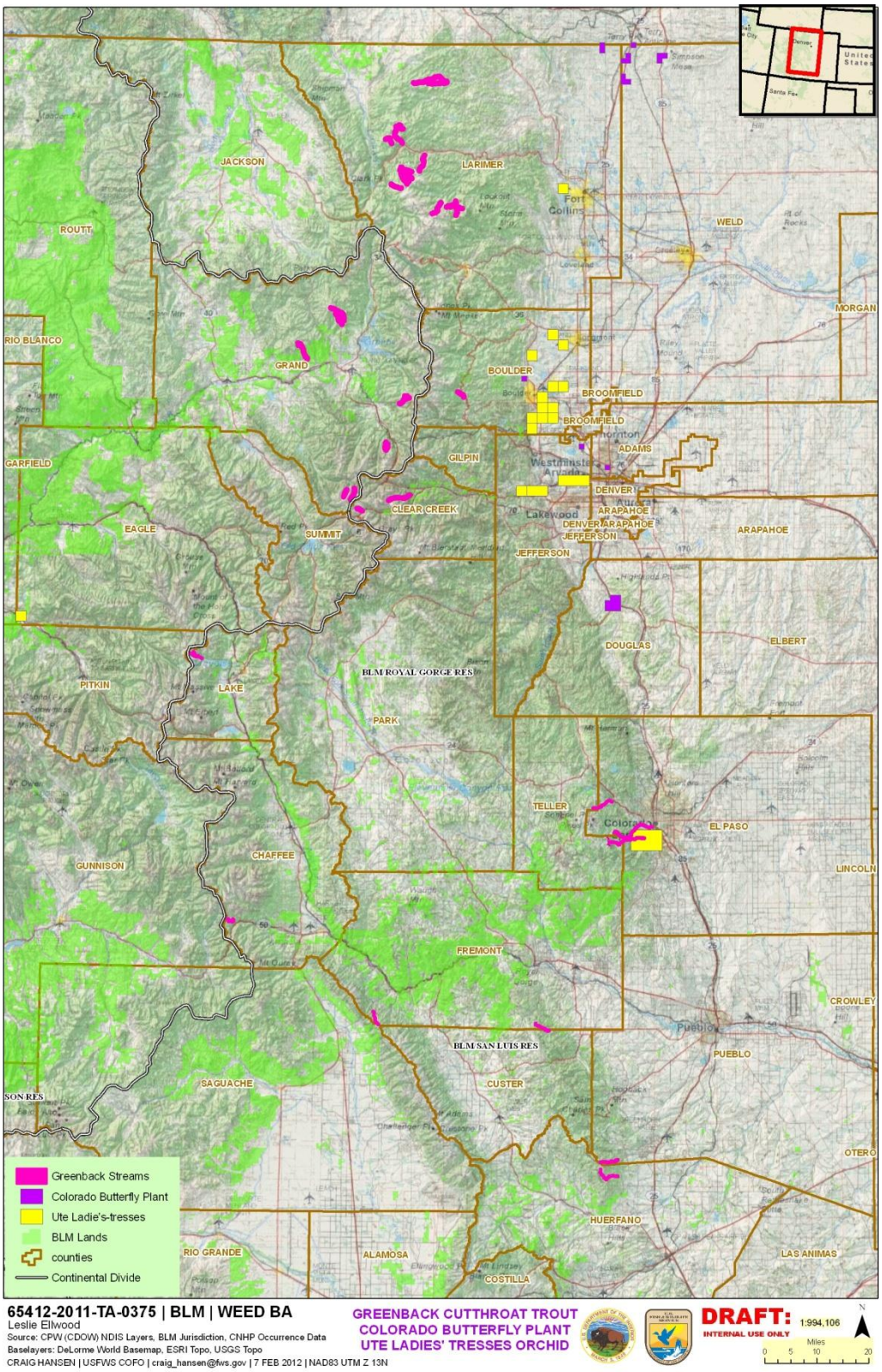


Table 6. Documented locations of Colorado Butterfly Plant within the Royal Gorge Resource Area, 2011 (Fertig 2000, USFWS 2010).

Location	Population Size	Trend
Weld County: Lonetree Creek, 3.3-3.7 miles south of the Wyoming border along interstate 25	1992: 0 plants	Not known
Weld County: Lonetree Creek east of I-25, 0.5 miles south of the Wyoming border	1989: 0 plants	Presumed extirpated
Larimer County: "meadow east of Poudre"	1984: 0 plants	Presumed extirpated
Larimer County: "30 miles north of Fort Collins"	1944: ?	Presumed extirpated
Boulder County: Lee Hill Road, 0.6 miles west of junction with foothills highway north of Boulder	1984: 1 plant	Presumed extirpated
Weld County: Meadow Springs Ranch, 0.5 miles south of Exit 293, I-25	1998: 1000 plants	Stable in short-term
Jefferson County: Chambers Preserve	2004: small pop.	Stable
Larimer County: Soapstone Prairie Natural Area	2005:35,000-47,000	Stable

Colorado butterfly plant is a perennial herb that lives vegetatively for several years before bearing fruit once and then dying. Only a few flowers are open at any one time, and these are located below the rounded buds and above the hard, nutlike fruits. Nonflowering plants consist of a stemless, basal rosette of leaves. Colorado butterfly plant is an early successional plant that is adapted to use periodically disturbed stream channel sites. Historically, flooding was probably the main cause of disturbances in the plant's habitat, although wildfire and grazing by native herbivores also may have been important. Although flowering and fruiting stems may undergo increased mortality because of these events, vegetative rosettes appear to be little affected (Mountain West Environmental Services 1985). In addition, the establishment and survival of seedlings appears to be enhanced at sites where tall and dense vegetation has been removed by some form of disturbance. In the absence of occasional disturbance, the plant’s habitat can become choked out by dense growth of willows, grasses, and non-native plants.

All currently known populations are within a small area (17,000 acres) in southeastern Wyoming, western Nebraska, and north-central Colorado. Two of the populations occur on F.E. Warren Air Force Base in Cheyenne, Wyoming, and five small populations on state land (Chambers Preserve, Colorado; Oliver Reservoir State Recreation Area, Nebraska; and state school trust land, Wyoming). One population occurs on the Meadow Springs Ranch, northern Colorado (owned by City of Fort Collins). The remaining populations occur on privately-owned lands.

The Colorado butterfly plant was federally listed as threatened on October 18, 2000. On January 5, 2005, USFWS designated 8,486 acres along approximately 113.1 stream miles in Laramie and Platte counties; however, no critical habitat was designated within Colorado or BLM-RGFO managed lands. Threats include the indiscriminate spraying of broadleaf herbicides and the disturbance of riparian areas that contain native grasses, water diversions, channelization, and urban development. The “Recovery Outline for *Gaura neomexicana* ssp. *coloradensis*” recommends no use of herbicide within 100 feet of known populations (USFWS, 2010).

Penland Alpine Fen Mustard

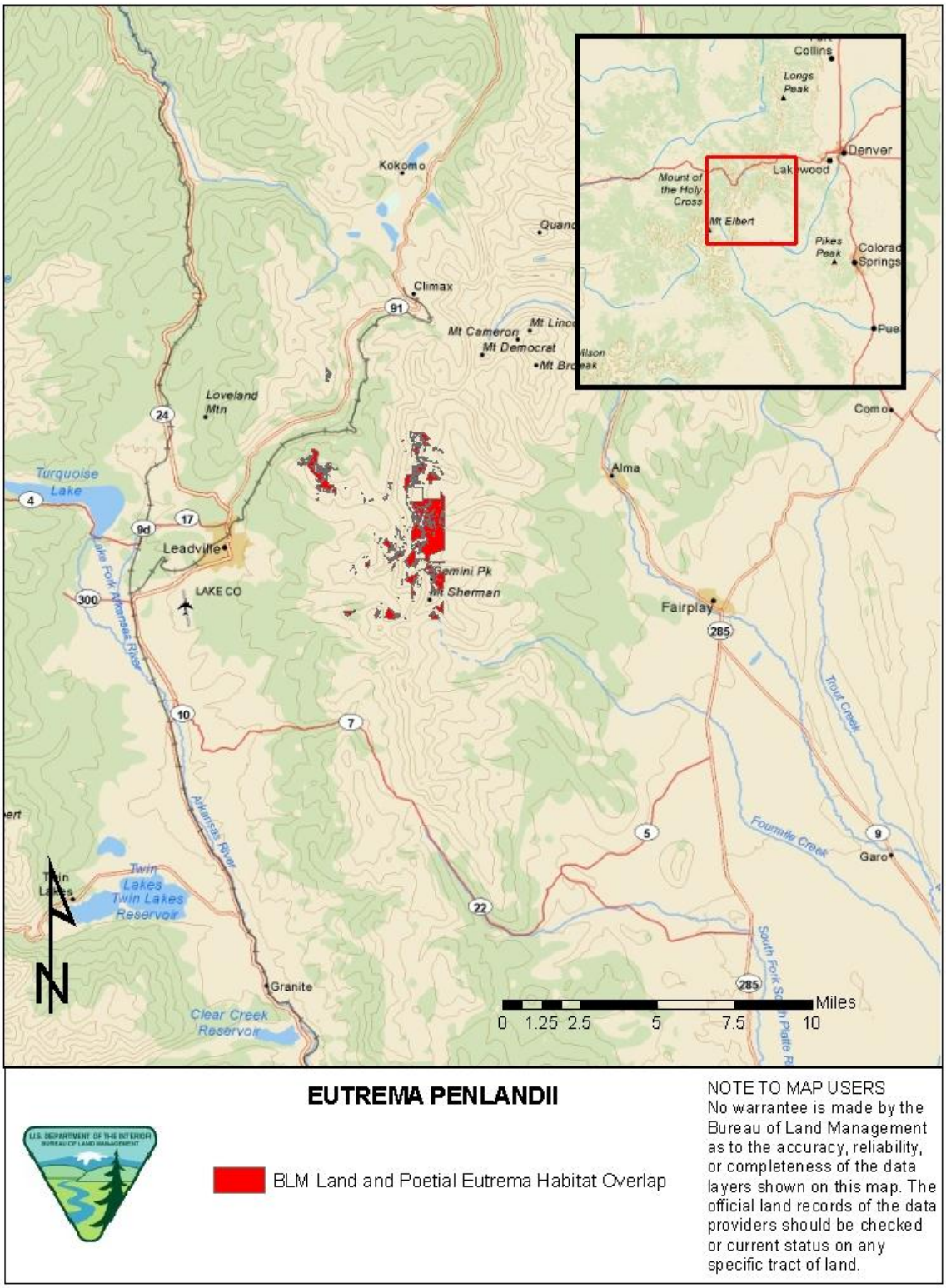
Penland Alpine Fen Mustard: Status, Natural History, and Location of Habitat within RGFO
The Penland alpine fen mustard (*Eutrema penlandii*) occurs in alpine tundras of Colorado, where small populations of the plant are distributed in a 25-mile stretch of the Continental Divide (Figure 4). The species is habitat-specific, growing only in oligotrophic (nutrient deficient), rheotrophic (groundwater fed) alpine marshes (Weber and Shushan 1955). It grows in a macroclimate of long, cold, wet winters and cool, windy summers, and a microclimate of relatively protected, wet, springy bogs (Johnston et al. 1981). Major components of its microenvironment include moss-covered peat fens, perennial subirrigation, and high elevations (above 12,150 feet).

The peat mats on which the alpine fen mustard grows form on small, flat to gently sloping benches in steep-walled, rounded glacial valleys. Water required for the development and sustenance of these peat mats comes from snowfields that persist through the summer. Conditions for maintaining these persistent snowfields exist along the east-west trending portion of the Continental Divide, where the plant is found on slopes (Schwendinger et al. 1991). The alpine fen mustard is found on deep organic soils in moist areas that are usually adjacent to clear running water from snowmelt. Plant emergence at a site appears to be dependent on the availability and timing of sufficient water to continuously moisten the mosses in which the plants are rooted, but not so much water as to flood them.

The Penland alpine fen mustard is a small, herbaceous, perennial plant that grows up to about 3 inches in height. Clusters of small, white flowers grow atop the plants' stems. A plant of the Colorado alpine tundra, the alpine fen mustard grows in a harsh environment, with a growing season that may only last 70 days per year (Colorado Native Plant Society 1989). In addition, freezing and thawing soil, drying winds, and windblown snow and ice crystals diminish plant productivity (Zwinger and Williard 1972).

The Penland alpine fen mustard was federally listed as threatened on July 28, 1993. Critical habitat has not been designated for the species. The wetland habitat in which the species occurs is fragile, and sensitive to watershed alterations that divert flows of surface water. Direct impacts to plants and habitats occur from mining, and from OHV use and other forms of recreation. In addition the few small populations of the species on small areas of specialized habitat make it particularly vulnerable to human disturbances as well as random environmental occurrences. The USFWS *Eutrema* recovery team has generated a potential habitat map based on geology, elevation, soils, and hydrology required to maintain populations. This model has documented potential habitat on BLM-RGFO managed lands in the Mosquito Range of Colorado.

Figure 4. Distribution of potential Penland alpine fen mustard (*Eutrema penlandii*) on Bureau of Land Management-Royal Gorge Field Office managed lands, 2012.



Potential Special Status Plant Species Impacts

For this analysis, effects are considered to be similar for all TEPC plant species. In general, vegetation treatments have the potential to affect most plant species in much the same way: All are intended to cause mortality or injury to target plants, which may vary in intensity and extent. Species with the lowest numbers or most limited distribution are the most sensitive to impacts.

Proposed SOPs, BMPs, buffer distances (Table 7), and the plant conservation measures below are expected to avoid or minimize potential adverse impacts to TEPC plants. However, if the measures are **NOT** properly implemented, the following impacts could occur.

Table 7. Herbicide Buffer Distances from Terrestrial TEPC Plant Species.[1, 2]

Active Ingredient	Buffer Width	Method(s) to Which Applied
2,4-D	0.5 mile	All
Bromacil	1,200 feet	All
Chlorsulfuron	1,200 feet	Ground
	1,500 feet	Aerial
Clopyralid	900 feet	Ground, typical rate
	0.5 mile	Ground, maximum rate; aerial
Dicamba	1,050 feet	Ground
Diflufenzopyr	100 feet	Low boom, typical rate
	500 feet	Low boom, maximum rate; high boom
	900 feet	Aerial
Diquat	900 feet	Ground, typical rate
	1,000 feet	Ground, maximum rate
	1,200 feet	Aerial
Diuron	1,100 feet	All
Fluridone	0.5 mile	All
Glyphosate	50 feet	Ground, typical rate
	300 feet	Ground, maximum rate; aerial
Hexazinone	300 feet	Ground, typical rate
	900 feet	Ground, maximum rate
Imazapic	25 feet	Ground, typical or maximum rates
	300 feet	Aerial, typical rate
	900 feet	Aerial, maximum rate
Imazapyr	900 feet	Ground or aerial, typical rate
	0.5 mile	Ground or aerial, maximum rate
Metsulfuron Methyl	900 feet	Ground or aerial, typical rate
	0.5 mile	Ground or aerial, maximum rate
Overdrive®	100 feet	Low boom, typical rate
	900 feet	Low boom, maximum rate; high boom
Picloram	0.5 mile	All
Sulfometuron Methyl	1,500 feet	All

Table 7. Continued . . .

Active Ingredient	Buffer Width	Method(s) to Which Applied
Tebuthiuron	25 feet	Low boom, typical rate
	50 feet	Low boom, maximum rate; high boom, typical rate
	900 feet	High boom, maximum rate
Triclopyr	300 feet	Ground, typical rate
	500 feet	Aerial, typical rate
	0.5 mile	Ground or aerial, maximum rate

1 Source: BLM 2007a

2 See Appendix C for information related to aquatic species and other specific situations (e.g., areas vulnerable to wind erosion of treated soil.

If herbicide treatments were to occur in TEPC plant habitat, plants could be crushed by trucks and/or ATVs during ground applications, causing injury or mortality. The ecological risk assessments (ERAs) incorporated into the PEIS and PBA predicted the potential for TEPC plants to suffer negative effects as a result of exposure from BLM-approved herbicides. Modes of exposure include direct spray of plants, accidental spills, off-site drift, surface runoff, and wind transport of soils from treatment sites. Possible negative effects could include one or more of the following: mortality, loss of photosynthetic foliage, reduced vigor, abnormal growth, or reduced reproductive output. The buffer recommendations for TECP plant species found in Table 7, are a result of these assessments.

Biological control by selective grazing with domestic livestock could cause mortality and injury to TEPC plants through consumption and trampling. Biological control agents such as insects and pathogens do not typically have an effect on non-target plant species or habitats, but some have been known to attack species in addition to the target plant. According to the PEIS, "as a general rule, it is assumed that bio-control agents that attack target species in the same genus as a TEPC plant would have a negative effect on that TEPC plant species, unless extensive research has shown otherwise" (BLM 2007a).

In general, the adverse impacts on TEPC plants of manual weed treatments would be minimal because of both the low level of environmental impact of this method and the limited area in which manual methods are feasible. TEPC plants could be directly killed or injured if accidentally removed during a treatment or if tread upon by workers treating a site.

Weed treatments would alter species composition of the treated community. In most situations, elimination or reduction of non-native species would be likely to improve habitat quality for TEPC plant species. However, such gains could be more than offset if conservation measures to avoid or minimize impacts to the TEPC plants are not properly implemented.

Biological control using domestic grazers could lead to soil compaction from soil trampling, increased soil erosion from loss of plant cover, and loss of biological soil crusts which have an important role in hydrology and nutrient cycling—in addition to undesirable herbivory on TEPC species or on other species needed to sustain them (e.g., species critical to pollinators). Biocontrol agents such as insects and pathogens would be expected to have long-term positive effects on TEPC plants by controlling undesirable vegetation in occupied or potential habitats.

Competition for resources would be reduced, and more suitable habitat conditions would become available for TEPC plant species.

A long-term beneficial effect to TEPC plant species would also be expected to result from manual treatments. Removal of undesirable competing vegetation could increase the health or vigor of existing TEPC populations or increase habitat suitability of unoccupied sites. Soil disturbance and risks of erosion would be minimal with manual methods due to the limited number of plants to be killed or removed.

Revegetation could increase desirable vegetation around TEPC plants, creating more competition and limiting resources available. It could also create a beneficial effect to TEPC plants by restoring the site with native vegetation that was present before weeds dominated the area.

Cumulative effects include impacts of future State, tribal, local, or private actions that are reasonably certain to occur in the action area. Future Federal actions unrelated to the VTMP Plan are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

Counties will continue to treat noxious weeds on private lands, and private landowners will continue to treat weeds both for agricultural purposes and because they are required by the State to control noxious weeds on their property. The Colorado Department of Transportation (CDOT) will continue to treat weeds along major thoroughfares. Chemical, manual, mechanical, and biological controls are currently employed by these entities.

Ground-disturbing activities will continue to occur, creating new weed infestations. If weeds are not effectively controlled, TEPC plant populations could decline or be extirpated.

Conservation Measures

During the annual planning for weed treatments, the RGFO would identify areas where treatment is most needed, based on the priorities described previously. No treatments would be planned in any habitat known or reasonably likely to support TEPC plants (suitable habitat), until a survey has been conducted to determine the presence or absence and location of such plants. Suitable habitat will be delineated from the best available data sources such as: Colorado Natural Heritage Program, Colorado Rare Plants Field Guide, United States Fish and Wildlife Service, etc. Once these data are available, and if RGFO continues to desire weed treatments within TEPC occupied habitat (e.g., to reduce the potential for spreading to other areas or to reduce competition with the TEPC or other special status species), additional NEPA preparation with consultation will apply.

In addition, the SOPs, BMP's, buffer distances, and conservation measures in Appendices B and C, respectively, are taken from the PEIS and the accompanying PBA (BLM 2007a, c) and modified as appropriate to reflect species and conditions specific to the RGFO. The following guidance must be considered in all annual management plans in which herbicide treatments are proposed to minimize or avoid risks to TEPC species. The exact conservation measures to be included in management plans would depend on the herbicide that would be used, the desired mode of application, and the conditions of the site. Given the potential for offsite drift and surface runoff, populations of TEPC species on lands not administered by the BLM would need to be considered if they are located near proposed herbicide treatment sites.

- Herbicide treatments will not be conducted in areas where TEPC plant species may be subject to direct spray by herbicides during treatments.
- Suitable buffer zones will be established between treatment sites and occupied habitats of TEPC plant species to avoid negative effects from aerial drift, runoff, or wind erosion during and following treatments. (Application of Table 7)
- Applicators will be required to review, understand, and conform to the "Environmental Hazards" section on herbicide labels (this section warns of known pesticide risks and provides practical ways to avoid harm to organisms or the environment).
- Applicators will be required to follow all instructions, SOPs, and BMPs to avoid spills and direct spraying into aquatic habitats that support TEPC plant species.
- Applicators will be required to follow all SOPs for avoiding herbicide treatments during weather conditions that could increase the likelihood of aerial drift or surface runoff into non-target areas.
- Off-highway use of motorized vehicles associated with treatments should be avoided in suitable or occupied habitat.
- Survey in any RGFO areas mapped as potential habitat, or otherwise considered potential habitat for TECP species, prior to VTMP implementation.
    - Ute ladies tresses: riparian edges, gravel bars, old oxbows, high flow channels, moist to wet meadows along perennial streams, stable wetland and seep areas associated with old landscape features within historical floodplains of major rivers, and wetland and seep areas near freshwater lakes or springs.
    - Colorado butterfly plant: habitats created and maintained by streams active within their floodplains, with vegetation that is relatively open and not overly dense or overgrown in Weld, Larimer, and Boulder counties.
    - Penland alpine fen mustard: USFWS mapped potential habitat.
- Standard buffers and measures presented in this document, for terrestrial species, will apply to Ute Ladies'-Tresses and Colorado butterfly plants. Highly manipulated environments, such as irrigated hay meadows, moderately grazed pastures with river access, areas of increased sediment deposits, intact floodplain areas, and areas of open, herbaceous, riparian vegetation devoid of noxious shrub-dominated overstory will be pre-surveyed for these plants during blooming season (late July) prior to VTMP treatments.

Use of biological control for noxious weed treatments will not occur if the agent(s) have demonstrated the ability to attack other species within the same genus as listed plant species

The conservation measures listed in Appendix C include measures of general applicability as well as measures specific to each herbicide, each treatment method, and each resource category. The buffer distances listed for each herbicide summarized in Table 7 are conservative estimates for broadcast spraying based on multiple ERAs cited in the PBA (BLM 2007c). The buffer distances represent the first modeled distances at which no risks were predicted. Additional precautions during spot treatments within buffer zones would be considered while planning local projects and included as mitigation measures in the associated NEPA documents.

Appendix C Riparian section, and in the PEIS, buffer distances for aquatic TEPC plants are typically smaller than those for terrestrial TEPC plants, indicating less susceptibility to injury or mortality from direct spray or aerial drift. The Ute ladies'-tresses orchid and the Colorado butterfly plant. Although a wetland indicator, the plants are terrestrial species, not aquatic

species (i.e., not an emergent or submergent aquatic plant associated with seasonally or permanently inundated sites). Therefore, the larger herbicide buffer distances for terrestrial TEPC plants would apply to any projects in proximity to these plants or their habitats.

In addition to the selection of specific locations, herbicides, application methods, application rates, and buffer distances for specific sites during the annual treatment planning, the RGFO would also consider measures to prevent the spread of weeds in occupied or suitable habitats in conjunction with weed treatments and all projects involving ground-disturbing activities. These measures include the following:

- Seed cleared areas that are prone to invasion by noxious weeds with an appropriate seed mixture to reduce the probability of noxious weeds or other undesirable plants becoming established on the site.
- Where seeding is warranted, seed bare areas (whether from ground disturbance or removal of weeds) as soon as appropriate after treatment, considering the time of year and any waiting period following use of a specific herbicide.
- Use only native species when revegetating bare areas within 200 meters occupied or suitable habitat and use only species that are compatible with the specific habitat or TEPC plant.
- Use only native seed certified free of noxious weed seeds within 200 meters of occupied or suitable TEPC habitat.
- Use only certified weed-free straw and hay bales for mulch or erosion control within 200 meters occupied or suitable TEPC species habitat.
- Wash vehicles and heavy equipment used during weed treatment activities prior to arriving at a new location to avoid the transfer of noxious weeds.
- No drilling, discing, or other use of equipment will occur within listed plant suitable and/or occupied habitats without further USFWS consultation.

Determination of effects for TEPC Plants
Assuming populations of threatened and endangered plants occurred on BLM lands, with implementation of the proposed conservation measures, BMPs, SOPs, and buffer distances as proposed in Table 7, we conclude that the proposed RGFO VTMP ***"may affect, not likely to adversely affect"*** possible the above threatened and endangered individuals or populations of plants.

AFFECTED SPECIES AND EFFECTS ANALYSIS (Wildlife)

FISH

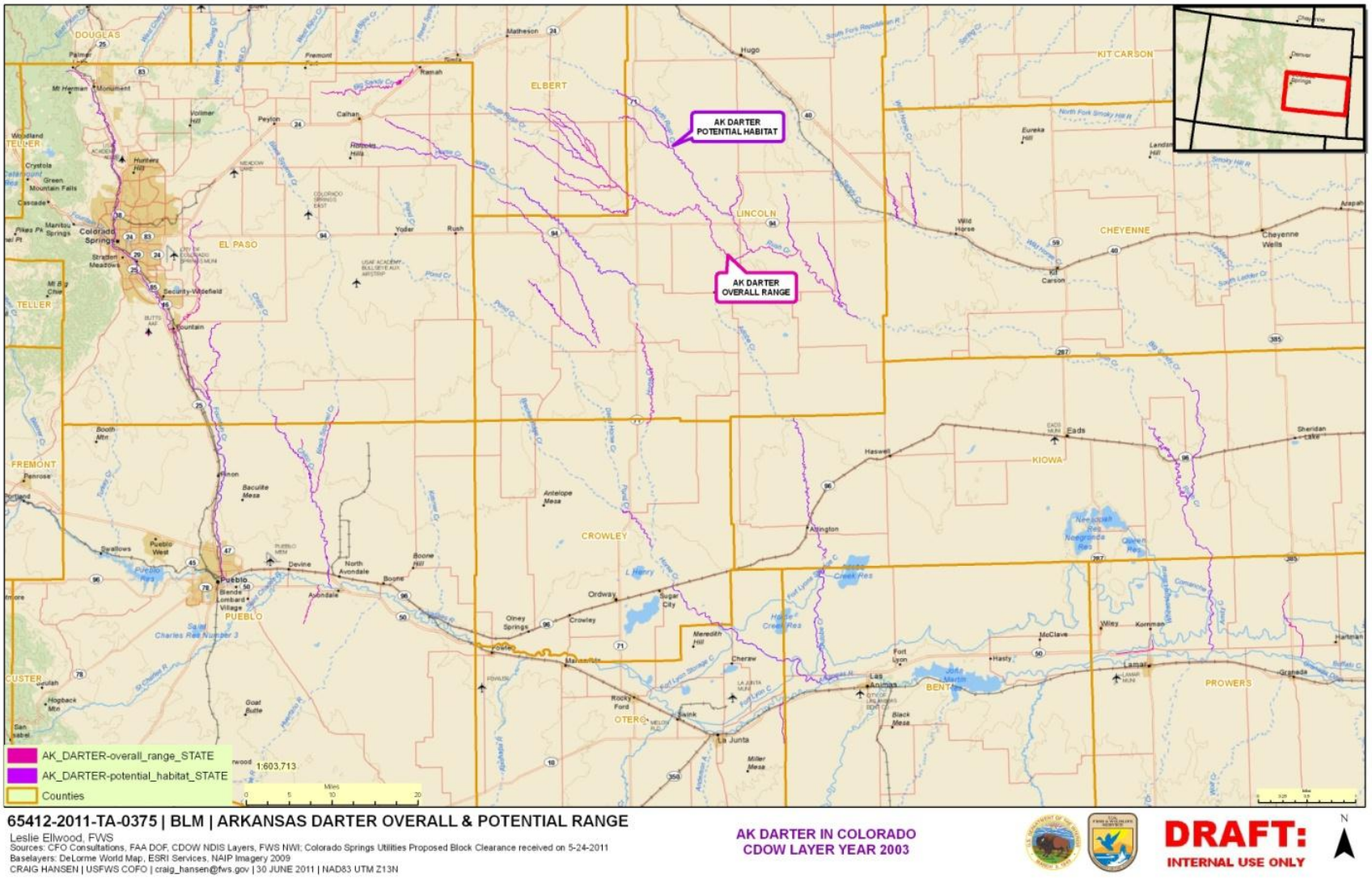
Arkansas Darter

Arkansas Darter: Status, Natural History, and Location of Habitat within RGFO
The Arkansas darter (*Etheostoma cragini*) is a small, 2.5 inch fish in the perch family native to portions of the Arkansas River basin (Figure 5). It is listed as threatened in Colorado and is a candidate for protection under the federal Endangered Species Act. The species is most often found in small spring-fed streams with sand substrate and aquatic vegetation. The population appears stable at most sites where spring flows persist, and has declined in areas where spring

flows have decreased or been eliminated. Estimates state there are approximately 145 locality occurrences of the Arkansas darter distributed across the 5 States. Currently, the BLM-RGFO does not manage any lands that contain Arkansas darter habitat.

In Colorado, the species is found in the Upper Arkansas, Adobe Creek, Fountain Creek, Horse Creek, Upper Arkansas at John Martin, Big Sandy Creek, Rush Creek, Black Squirrel Creek and Chico Creek drainages. Their distribution has not changed significantly based on comparisons of historic data, particularly since 1979. Darter populations in Colorado persist in large, deep pools during late summer low-water periods when streams may become intermittent. Major threats to the species include stream dewatering resulting from groundwater pumping in the western portion of the species' range, and development pressures in portions of its eastern range. Spills and runoff from confined animal feeding operations also threaten the species locally throughout its range.

Figure 5. Distribution of the Arkansas darter ((*Etheostoma cragini*) within the Bureau of Land Management-Royal Gorge Field Office management boundary, 2012.

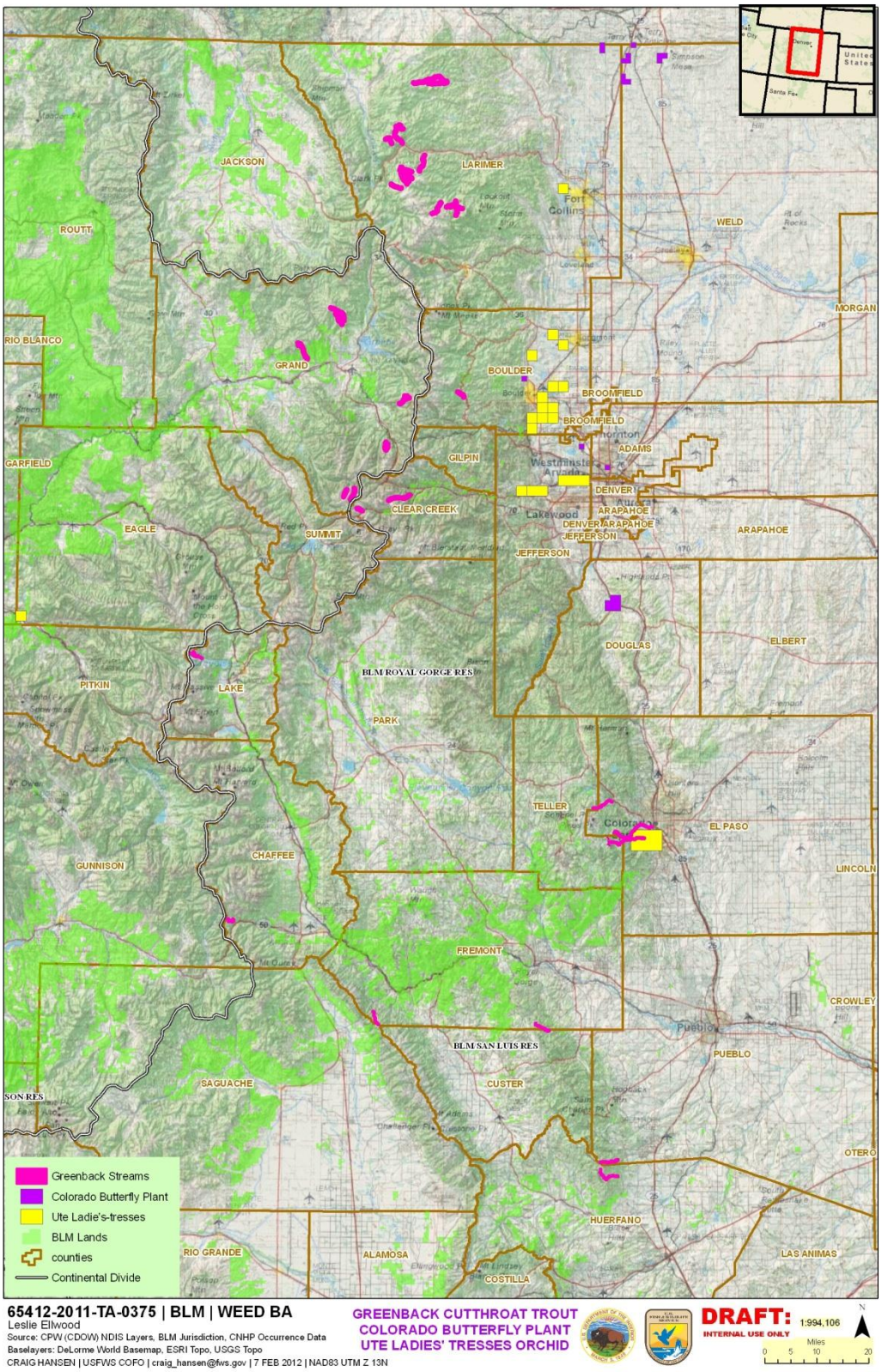


Greenback Cutthroat Trout

Greenback Cutthroat Trout: Status, Natural History, and Location of Habitat within RGFO
Greenback cutthroat trout (*Oncorhynchus clarki stomias*) are listed as Threatened under the ESA and are included in the USFWS's TEPC species list for Boulder, Clear Creek, Custer, Douglas, El Paso, Huerfano, Lake, Larimer, Park and Pueblo counties. The historic range of greenback cutthroat trout included the South Platte and Arkansas River basins in Colorado and a few tributaries of the South Platte River in Wyoming (BLM 2007c). Greenback populations are managed by hydrological units that are scattered throughout the RGRA (Figure 2). However, BLM-RGFO does not manage any stream segment that currently has Greenback populations.

The greenback cutthroat trout is one of three subspecies of cutthroat that currently reside in Colorado, inhabiting cold water streams and lakes. Greenbacks primarily feed on aquatic and terrestrial insects. Thorough descriptions of greenback cutthroat trout natural history (BLM 2007c) are available upon request.

Figure 6. Distribution of the Colorado cutthroat trout (*Oncorhynchus clarki stomias*) within the Bureau of Land Management-Royal Gorge Field Office management boundary, 2012.



Effects of Manual Treatments on Arkansas Darter and Greenback Cutthroat Trout
Manual removal of weeds would not typically result in substantial disturbance to fish or their habitat. Manual removal of weeds typically occurs with small infestations. A notable exception would be cut stump treatments that target Russian olive and tamarisk within the 100-year flood plain of a river. Efforts to control exotic vegetation along river systems with cutthroat and darter habitat would strongly complement recovery goals by promoting the redevelopment of native riparian vegetation which contributes to maintaining proper functioning condition of the river's channel.

Effects of Biological Control Arkansas Darter and Greenback Cutthroat Trout
Any use of prescribed grazing as a weed treatment method within the RGFO will be analyzed under a site-specific Environmental Assessment. If the proposed prescribed grazing treatment were to occur within the 100-year floodplain of the river containing greenback cutthroat trout or Arkansas darter, additional Section 7 Consultation would be initiated with the USFWS.

Any other forms of biological control that maybe initiated will require addition section 7 Consultations.

Effects of Herbicide Treatments on Arkansas Darter and Greenback Cutthroat Trout
Fish could be exposed to herbicides if chemicals were to enter aquatic habitats as the result of direct application (including accidental sprays and spills), by off-site drift, or by surface run-off. Fish may also be impacted due to reduced prey availability (of small fish or invertebrates) or by bioaccumulation due to ingestion of contaminated food items. There are no known toxicity studies specific to greenback subspecies of cutthroat trout or the Arkansas darter. It is assumed that that this species would be affected in the same manner as other fish in stream habitats. Not all of the application scenarios were evaluated under the Ecological Risk Assessments for all of the herbicides (Table 8, 9, 10); however, interpolations of results from risk assessments can provide a complete analysis. For example, 2,4-D was not analyzed for impacts from off-site drift; however, it has no effect for direct spray into a stream, therefore one could assume that impacts from off-site drift would also result in a no effect (Table 8, 9, 10). A simplified description of the risk assessment process can be located in Appendix F.

Table 8. Summary of effects[1] to threatened, endangered, and proposed fish from exposure to herbicides in streams, as predicted by risk assessments – Adapted from Table 5-2 in the PBA (BLM 2007c).

Herbicide	Direct Spray	Off-site Drift	Spill[2]	Surface Run
2,4-D	No effects	Not addressed in ERA	Negative effects	No effects
Bromacil	Negative effects	No effects	Negative effects	No effects
Chlorsulfuron	No effects	No effects	No effects	No effects
Clopyralid	No effects	Not addressed in ERA	Negative effects	No effects
Dicamba	No effects	No effects	No effects	No effects
Diflufenzopyr	No effects	No effects	No effects	No effects
Diquat[3]	Negative effects	NA	Negative effects	NA
Diuron	Negative effects	Negative effects (maximum rate application)	Negative effects	Negative effects
Fluridone[3]	Negative effects (maximum rate application)	NA	Negative effects	NA
Glyphosate	Negative effects (maximum application rate; typical and maximum rates using more toxic formulation)	Not addressed in ERA	Negative effects	No effects
Hexaxinone	No effects	Not addressed in ERA	Not addressed in ERA	No effects
Imazapic	No effects	No effects	No effects	No effects
Imazapyr	No effects	Not addressed in ERA	Negative effects	No effects
Metsulfuron methyl	No effects	Not addressed in ERA	Negative effects (maximum rate application)	No effects
Overdrive®	No effects	No effects	No effects	No effects
Picloram	Negative effects	Not addressed in ERA	Negative effects	No effects
Sulfometuron methyl	No effects	No effects	No effects	No effects
Tebuthiuron	No effects	No effects	Negative effects	No effects
Triclopyr acid	No effects[4]	Not addressed in ERA	Negative effects	No effects
Triclopyr BEE	Negative effects	Not addressed in ERA	Negative effects	Negative effects (maximum rate application)

[1] Both acute and chronic effects were considered, and "negative effects" include either acute or chronic effects, or both. For more information on acute vs. chronic effects, please see Appendix C of the PEIS. Unless otherwise indicated, "negative effects" means ERAs predicted risks at both typical and maximum application rates. "No effects" indicates that ERAs did not predict risks to TEP fish under the modeled scenario at typical or maximum application rates.

[2] Since the BLM ERAs did not assess the risks associated with spills into a stream, results for spills into a pond are presented here.

[3] Diquat and fluridone are used to control aquatic weeds; direct application into a pond or stream is a typical use. Off-site drift and surface runoff scenarios do not apply, since these herbicides would not be applied in upland areas.

[4] For this herbicide, "direct spray" also considers a normal aquatic application directly into the water column.

NA = Not applicable.

Sources: Ecological risk assessments for herbicides (Syracuse Environmental Research Associates, Inc. 2001; ENSR 2005a-j).

Table 9. Risk Categories Used to Describe BLM-evaluated Herbicide Effects on Special Status Fish & Aquatic Invertebrates According to Exposure Scenario – Adapted from Table 4-20 of the PEIS (BLM 2007a) for Scenarios Relevant to Arkansas Darter and Greenback Cutthroat Trout.

Application Scenario	**BROM[1]**		**CHLOR**		**DICAM**		**DIFLU**		**DIQUAT**		**DIURON**		**FLUR**		**IMAZ**		**OVER**		**SULFM**		**TEBU**	
	T[2]	M	T	M	T	M	T	M	T	M	T	M	T	M	T	M	T	M	T	M	T	M
Direct Spray to Stream - Fish	M[3]	M	0	0	0	0	0	0	M	M	H	H	0	L	0	0	0	0	0	0	0	0
Direct Spray to Stream - Aquatic Invertebrates	0	L	0	0	0	0	0	0	H	H	M	H	0	L	0	0	0	0	0	0	L	M
Off-Site Drift or Surface Runoff to Stream - Fish & Aquatic Invertebrates	0	0	0	0	0	0	0	0	NE	NE	0	0	NE	NE	0	0	0	0	0	0	0	0

[1]BROM = Bromacil; CHLOR = Chlorosulfuron; DICAM = Dicamba; DIFLU = Difluenzopyr; FLUR = Fluridone; IMAZ = Imazapic; OVER = Overdrive®; SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron

[2]T = Typical application rate; M = Maximum application rate

[3]Risk categories: 0 = No Risk, L = Low Risk, M = Moderate Risk, H = High Risk, NE = Not Evaluated

Table 10. Risk Categories Used to Describe Forest Service-evaluated Herbicide Effects on Fish and Aquatic Invertebrates According to Exposure Scenario[1] – Adapted from Table 4-18 of the PEIS (BLM 2007a) for Scenarios Relevant to Arkansas Darter and Greenback Cutthroat Trout.

	2,4-D		Clopyralid		Glyphosate[2]		Hexazinone		Imazapyr		Metsulfuron Methyl		Picloram[3]		Triclopyr[4]	
Application Scenario	Typ[5]	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max
Acute/Accidental Exposures																
Fish (sensitive species)-accidental spill	L[6]	M	L	L	H	H	NE	NE	M	H	0	L	H	H	L/H	M/H
Fish (tolerant species)-accidental spill	NE	NE	0	0	H	H	NE	NE	0	L	0	0	L	L	NE/NE	NE/NE
Fish (sensitive species)-acute exposure, peak EEC	0	0	0	0	M	M	0	0	0	0	0	0	L	L	0/M	0/H
Fish (tolerant species)-acute exposure, peak EEC	NE	NE	0	0	L	M	0	0	0	0	0	0	0	0	NE/NE	NE/NE
Aquatic Invertebrates-accidental spill	L	M	L	M	M	H	NE	NE	0	L	0	0	L	M	L/M	H/H
Aquatic invertebrates-acute exposure, peek EEC	0	0	0	0	L	L	0	0	0	0	0	0	0	0	0/L	0/M
Chronic Exposure																
Fish-chronic exposure	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0	0/0
Aquatic invertebrates-chronic exposure	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0	0/0

[1] Risk levels are presented for the maximum application rate in aquatic applications.
[2] Risk levels for the more toxic glyphosate formulation are presented here.
[3] Sensitive and tolerant aquatic invertebrates were evaluated for picloram. Information is presented for sensitive aquatic invertebrates.
[4] Fist value is for triclopyr acid formulation (TEA) and second value is for triclopyr butoxythel formulation (BEE).
[5] Typ = typical application rate; and Max = maximum application rate.
[6] Risk categories: 0 = No risk (HQ < LOC); L = Low risk (HQ = 1 to 10 x LOC); M = Moderate risk (HQ = 10 to 100 x LOC); H = High risk (HQ > 100 LOC); and NE = Not evaluated. Risk categories are based on upper estimates of hazard quotients and the BLM LOCs of 0.1 for acute scenarios and 1.0 for chronic scenarios. The reader should consult the text of this section of the individual Forest Service risk assessments to evaluate risks at central estimates of hazard quotients. Fish sensitive species include coldwater fish, such as trout and salmon, while fish tolerant species include warmwater fish, such as fathead minnows.

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For direct spray or accidental spill scenarios, most of the proposed herbicides had no effects or posed a low risk to fish in stream habitats, however negative effects would be associated with bromacil, diquat, diuron, 2,4-D, glyphosate, picloram, imazapyr, and triclopyr. For direct spray on a stream, there were moderate risks from bromacil or diquat and a high risk from diuron (Table 8). For accidental spills, there was a moderate risk from imazapyr at the typical application rate and from 2,4-D or triclopyr TEA at the maximum application rates. There was a high risk from accidental spill scenarios involving glyphosate or picloram at any application rate and from imazapyr and triclopyr (TEA and BEE) at the maximum application rate (Table 9).

For most of the proposed herbicides, off-site drift and surface run-off did not result in negative effects to either fish or aquatic invertebrates (Table 8, 9, 10). The PEIS recommended minimum buffer distances to minimize risk to fish and aquatic organisms from off-site drift of diuron (BLM 2007a, p4-98), even though the risk assessment specifically for off-site drift and surface run-off of diuron anticipates no risk (Table 8, 9, 10). This may be in response to the fact that diuron is highly toxic to aquatic invertebrates, aquatic plants, and fish (and has the potential to bioaccumulate).

In addition to guidelines found in the BMPs, SOPs, and Mitigation Measures (Appendices B,C, and D), the RGFO would incorporate the following conservation measures from the PBA in regards to weed treatments to help minimize risks to listed fish species:

- Do not use diquat, fluridone, terrestrial formulations of glyphosate, or triclopyr BEE, to treat aquatic vegetation within the 100-year floodplain of the Arkansas River or the South Platte River Basins.
- Do not use glyphosate formulations that include R-11 or POEA.
- Follow all instructions and SOPs to avoid spill and direct spray scenarios into aquatic habitats. Special care should be followed when transporting and applying 2,4-D, bromacil, clopyralid, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray diuron, glyphosate, picloram, or triclopyr BEE in upland habitats adjacent to the 100-year floodplain of all streams within the Arkansas River or the South Platte River watersheds under conditions that would likely result in off-site drift.
- Do not apply bromacil, diuron, tebuthiuron, or triclopyr BEE in upland habitats within ½ mile upslope of the 100-year floodplain of the Arkansas River or the South Platte River watersheds under conditions that would likely result in surface runoff (BLM 2007c).
    - Bromacil: Where precipitation is greater than 5 inches per year.
    - Diuron: Where precipitation is greater than 5 inches per year.
    - Tebuthiuron: Sandy soils will have negative effects where annual precipitation is greater than 5 inches; other soil types could have negative effecs where annual precipition is greater than 10 inches.
    - Triclopyr Bee: Negative effects under certain site conditions (e.g., in areas with clay soils and moderate to high annual rainfall).
- For aquatic habitats that support Arkansas darter or Greenback cutthroat trout, maintain the following minimum buffers for broadcast applications of diuron:
    - Typical Rate, High Boom (50 inches): 100 ft Minimum Buffer
    - Maximum Rate, Low Boom (20 inches): 100 ft Minimum Buffer

- Maximum Rate, High Boom: 900 ft Minimum Buffer

The RGFO would also include the following mitigation in addition to the above conservation measures:

- In order to minimize the amount of chemical entering aquatic habitats, buffer strips will be provided for streams and riparian areas when using terrestrial formulations. A minimum buffer strip of 25 ft (7.6m) will be provided for vehicle applications (e.g. ATV boom sprayers). Within 25 ft (7.6m) of water, herbicides will be applied using a backpack or handheld spot spray gun. Herbicides that pose a moderate to high risk to fish (e.g. bromacil, diquat, diuron, terrestrial formulations of glyphosate, imazapyr, picloram, and triclopyr BEE at any application rate or 2,4-D and triclopyr TEA at maximum application rates) will not be used within 10 ft (3m) of water.
- When possible (i.e. when compatible with specific chemical formulations or tank mixes), Agri-Dex shall be the preferred surfactant to use within 10 ft (3m) of riparian areas that support special status fisheries or critical habitat.

Cumulative Effects

As mentioned in the analysis for TEPC plants, State, county, and local governments along with private property owners are expected to continue to treat weeds on their property. They may use similar methods as those described in the VTMP but they are not limited to only those methods.

Determination of Effects

Based on proposed treatment techniques (including BMPs, SOPs, and the conservation measures listed above) and the intent of the VTMP to minimize infestations of invasive weeds as much as practical, we conclude that the proposed RGFO VTMP ***"may affect, not likely to adversely affect"*** Arkansas darter or greenback cutthroat trout. Unless the proposed action is altered, no further consultation with the USFWS is warranted for this project in regards to listed fish species.

TERESTRIAL VERTEBRATES

Piping Plover

Piping Plover: Status, Natural History, and Location of Habitat within RGFO

The piping plover (*Charadrius melodus*) is a small North American shorebird. Piping plovers breed in three discrete areas of North America: The northern Great Plains, the Great Lakes, and the Atlantic Coast. There is only one breeding population in the project area: the northern Great Plains population. The northern Great Plains breeding range extends from southern Alberta, northern Saskatchewan, and southern Manitoba, south to eastern Montana, the Dakotas, southeastern Colorado, Iowa, Minnesota, and Nebraska, and east to north-central Minnesota. The majority of the U.S. pairs in this population are in the Dakotas, Nebraska, and Montana (USFWS 2001). Occasionally, Great Plains birds nest in Oklahoma and Kansas. Generally, piping plovers favor open sand, gravel, or cobble beaches for breeding. Breeding sites are generally found on islands, lakeshores, coastal shorelines, and river margins. Currently the only known piping plover habitat within the administrative boundaries of BLM-RGFO exists near Las Animas, Colorado (Figure 7).

Piping plovers winter in coastal areas of the U.S. from North Carolina to Texas. They also winter along the coast of eastern Mexico and on Caribbean islands from Barbados to Cuba and the Bahamas. Wintering habitats include beaches, mud flats, sand flats, algal flats, and washover passes (areas where breaks in the sand dunes result in an inlet).

Piping plovers begin arriving on the wintering grounds in July, with some late-nesting birds arriving in September. A few individuals can be found on the wintering grounds throughout the year, but sightings are rare in late May, June, and early July. Migration is poorly understood, but most piping plovers probably migrate non-stop from interior breeding areas to wintering grounds). Most of the time on wintering grounds is spent foraging, which usually takes place on moist or wet sand, mud, or fine shell. In some cases, this substrate may be covered by a mat of blue-green algae. Primary prey includes polychaete marine worms, various crustaceans, insects, and occasionally bivalve mollusks. When not foraging, plovers can be found roosting, preening, bathing, in aggressive encounters (with other piping plovers and other species), and moving among available habitat locations. Individual plovers tend to return to the same wintering sites year after year. In late February, piping plovers begin leaving the wintering grounds to migrate back to breeding sites. Northward migration peaks in late March, and by late May most birds have left the wintering grounds.

The population of piping plovers that breeds in the Great Lakes States is listed as endangered, while all other piping plovers are threatened species. All piping plovers are considered threatened species when on their wintering grounds. Critical habitat was designated for wintering populations on August 9, 2001, and includes 137 areas along the coasts of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas. This critical habitat includes approximately 1,800 miles of mapped shoreline and approximately 165,200 acres of mapped area along the Gulf and Atlantic coasts and along margins of interior bays, inlets, and lagoons. Critical habitat for the northern Great Plains breeding population was proposed on December 28, 2001, but has not yet been designated. The proposed designation includes 11 areas of prairie alkali wetlands and reservoir lakes in 5 counties in Montana, 18 counties in North Dakota, and 1 county at Lake-of-the-Woods, Minnesota, totaling approximately 196,576 acres. It also includes five areas on portions of four rivers in the States of Montana, North Dakota, South Dakota, and Nebraska, totaling approximately 1,338 miles of river.

Breeding census results show a marked decline of the population breeding in the northern Great Plains of the U.S.. Shoreline development, river flow alteration, channelization, and reservoir construction have all resulted in the loss of plover breeding habitat. Overall winter habitat loss is difficult to document; however, a variety of human-caused disturbance factors have been noted that may affect plover survival or utilization of wintering habitat. These factors include recreational activities (motorized and pedestrian), inlet and shoreline stabilization, dredging of inlets that can affect spit (a small point of land, especially sand, running into water) formation, beach maintenance and renourishment (renourishing the beach with sand that has been lost to erosion), and pollution (e.g., oil spills).

Least Tern (Interior)

Least Tern: Status, Natural History, and Location of Habitat within RGFO

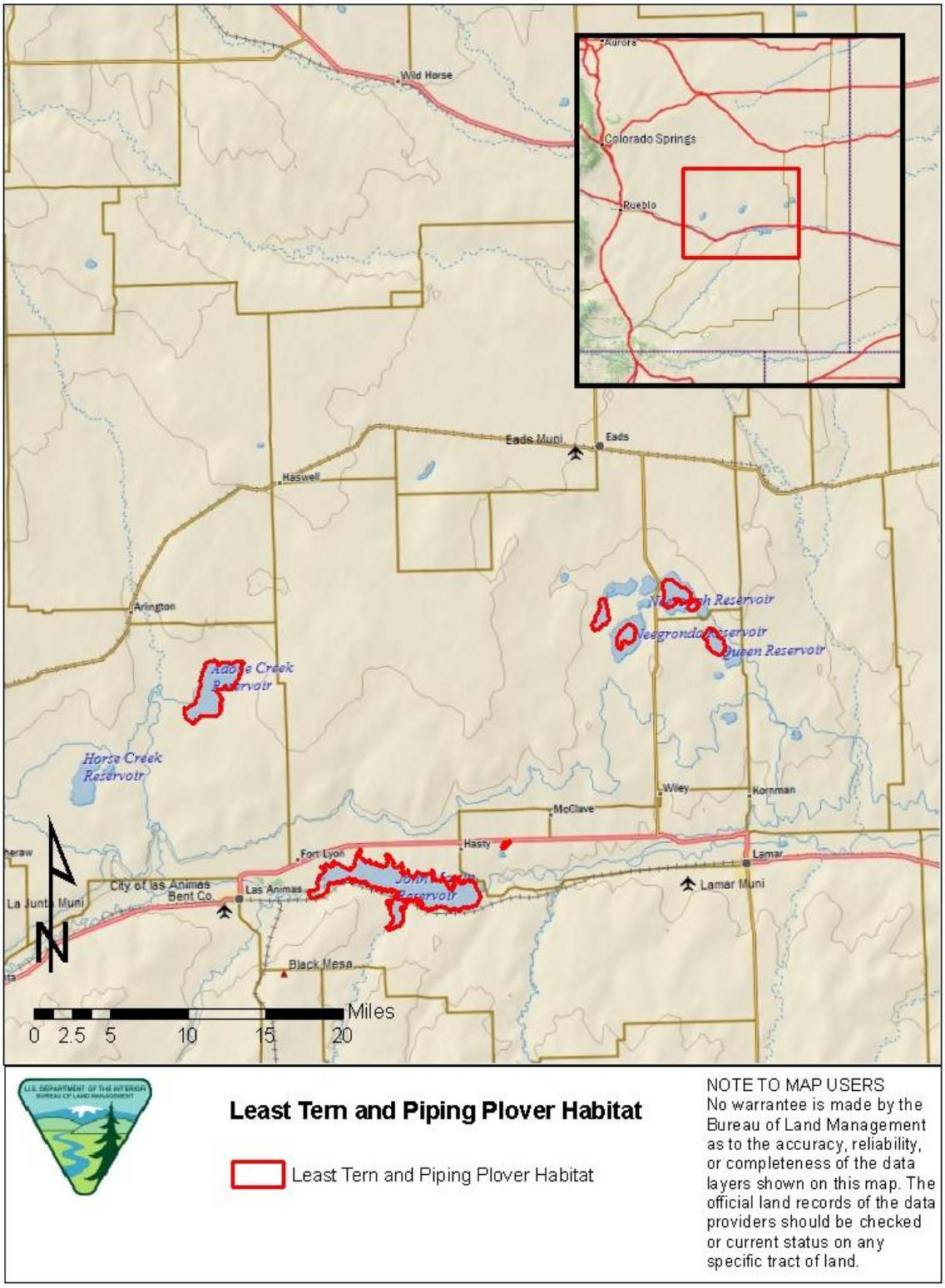
The least tern (*Sterna antillarum*), the smallest member of the tern family, is represented by three distinct subspecies. The interior least tern (*Sterna a. athalassos*) breeds locally along the major tributaries of the Mississippi River drainage basin from eastern Montana south to Texas and east to western Illinois, Missouri, Arkansas and Louisiana. The interior least tern has distinct breeding and wintering areas (Lackey 1997). Most breeding occurs on interior rivers, and wintering is thought to occur on beaches along the Central American coast and along the northern coast of South America from Venezuela to northeastern Brazil. Wintering least terns have been reported in Guyana, El Salvador, and Guatemala. The occurrence of breeding least terns is localized and is highly dependent on the presence of dry, exposed sandbars and favorable river flows that support a forage fish supply and isolate the sandbars from the riverbanks. Characteristic riverine nesting sites are dry, flat, sparsely vegetated sandbars and gravel bars within a wide, unobstructed, water-filled river channel. Currently the only known least tern habitat within the administrative boundaries of BLM-RGFO exists near Las Animas, Colorado (Figure 7).

Interior least terns consume small fish captured in the shallow water of rivers and lakes. They hunt by hovering, searching, and then diving from a height of a few feet to 30 feet above the surface to snatch small fish in their bill. Interior least terns nesting at sandpits and other off-river sites often fly up to 2 miles to forage at river sites. Interior least terns nesting on riverine sandbars usually forage close to the nesting colony. Fish of 1 to 3 inches long are consumed by adults.

Interior least terns usually arrive on their breeding grounds in early to mid-May and begin to establish feeding and nesting territories. During the breeding season, the terns' home range is generally limited to a 2-mile stretch of river associated with the nesting colony. Interior least terns nesting at sandpits along rivers use the adjoining river as well as the sandpit lake itself for foraging. Interior least terns are semi-colonial nesters that benefit from the anti-predator behavior exhibited by the entire colony when the nesting territory is invaded. The piping plover, a state and federally threatened shorebird species, is often found nesting in the midst of interior least tern colonies in Nebraska. Presumably the piping plover benefits from the defensive group behavior of the nesting terns as well.

Upon arrival on breeding grounds, interior least terns begin to engage in aerial courtship displays. During the ground phase of courtship, male terns offer small fish to females to help secure the pair bond. Courtship feeding is one of the most important parts of the courtship process and is continued through the incubation period. Nests are initiated only after spring and early summer flows recede and dry areas on sandbars are exposed, usually on higher elevations away from the water's edge. Artificially created nesting sites, such as sand and gravel pits, dredge islands, reservoir shorelines, and power plant ash disposal areas, also are used.

Figure 7. Known Piping Plover (*Charadrius melodus*)and Least Tern (*Sterna antillarum*) habitat within the administrative boundaries of Bureau of Land Management-Royal Gorge Field Office, 2012.



Soon after pair formation, both sexes participate in making many shallow nest scrapes dispersed in open, gravelly or sandy areas. Although several scrapes might be built by each pair, only one is used for nesting. Nest scrapes are sometimes located near small pieces of wood or debris or near clusters of small stones. After the female selects a suitable scrape, two or three eggs are laid on consecutive days. Both adults begin to alternate incubation duties after the first egg is laid. If a first clutch of eggs is lost, interior least terns will renest up to two times, each renesting attempt taking place at a new site. Incubation lasts about 21 days, after which the eggs begin to hatch on consecutive days. The newly hatched young are weak and helpless and are continuously brooded by the adults during the first day. The nesting season ends by early August, and departure from breeding areas usually is complete by early September.

Following the breeding season, interior least terns gather in small flocks along rivers to feed and prepare for migration. In fall they probably follow the same migration routes that they use in spring, but their movements are less regular and more casual.

The interior least tern was federally listed as endangered on May 28, 1985. Critical habitat has not been designated. Loss of habitat has contributed to the decline of this species. River channelization, irrigation diversions, and the construction of dams have contributed to the destruction of much of the terns' sandbar nesting habitat. In addition, human-related disturbances (e.g., foot traffic, unleashed pets, swimmers, canoeists, and OHVs) can limit the reproductive success of this species.

Effects Common to All Treatment Methods

These species nest in sparsely vegetated, sandy habitats next to water, and require bare sand for nesting. In some places, the invasion of non-native beach grasses, or other vegetation (including native species) that encroaches onto suitable nesting areas has reduced the amount of available breeding habitat for these species. Although the natural disturbances that created habitat for these species were primarily flooding and other water-based disturbances, their net result was the removal of vegetation to expose bare sand. Therefore, any vegetation treatment method that removes invading plant species from beach/sandbar habitats would be expected to have a long-term positive effect on the western snowy plover, the piping plover, and the interior least tern.

Effects of Herbicide Treatments

The presence of workers and vehicles in plover or tern habitats during herbicide treatments would temporarily disturb some birds. If treatments were to occur near nesting birds, negative effects to breeding success could occur. Although most birds would flee the area, some birds (particularly young, flightless birds) could inadvertently be exposed to direct spray of herbicides. Based on risks predicted by the ERAs for terrestrial vertebrate species (Table 11, 12), direct spray of birds by 2,4-D, clopyralid, glyphosate, hexazinone, picloram, or triclopyr at the typical application rate, or by imazapyr or metsulfuron methyl at the maximum application rate, would potentially result in negative effects to listed plovers or terns.

After an herbicide treatment program, plovers and/or terns in or near the treated area could be exposed to herbicides through contact with contaminated foliage. Via this exposure pathway, negative health effects to birds could occur if vegetation was sprayed by 2,4-D at the typical application rate, or by glyphosate, hexazinone, or triclopyr at the maximum application rate.

Table 11. Summary of effects[1] to threatened, endangered, proposed, and candidate terrestrial vertebrates from dermal exposure to herbicides, as predicted by risk assessments.

Herbicide	Direct Spray	Level of Risk[2]	Dermal Contact with Sprayed Vegetation	Level of Risk
2,4-D	Negative effects	Typical rate: M Maximum rate terrestrial: M	Negative effects	Typical rate: L Maximum rate terrestrial: L
Bromacil	No effects	--	No effects	--
Chlorsulfuron	No effects	--	No effects	--
Clopyralid	Negative effects	Typical rate: L Maximum rate: L	No effects	--
Dicamba	No effects	--	No effects	--
Diflufenzopyr	No effects	--	No effects	--
Diquat[3]	No effects	--	No effects	--
Diuron	No effects	--	No effects	--
Fluridone[3]	No effects	--	No effects	--
Glyphosate	Negative effects	Typical rate: L Maximum Rate: M	Negative effects	Typical rate: N/A Maximum Rate: L
Hexaxinone	Negative effects	Typical rate: L Maximum Rate: M	Negative effects	Typical rate: N/A Maximum Rate: L
Imazapic	No effects	--	No effects	--
Imazapyr	Negative effects	Typical rate: N/A Maximum Rate: L	No effects	--
Metsulfuron methyl	Negative effects	Typical rate: N/A Maximum Rate: L	No effects	--
Overdrive®	No effects	--	No effects	--
Picloram	Negative effects	Typical rate: L Maximum Rate: L	No effects	--
Sulfometuron methyl	No effects	--	No effects	--
Tebuthiuron	No effects	--	No effects	--
Triclopyr acid	Negative effects	Typical rate: L Maximum Rate: M	Negative effects	Typical rate: N/A Maximum Rate: L
Triclopyr BEE	Negative effects	Typical rate: L Maximum Rate: M	Negative effects	Typical rate: N/A Maximum Rate: L

[1] Both acute and chronic effects were considered, and "negative effects" include either acute or chronic effects, or both. For more information on acute vs. chronic effects, please see Appendix C of the PEIS. "No effects" indicates that ERAs did not predict risks to TEP terrestrial vertebrates under the modeled scenario at typical or maximum application rates.

[2] L = Low risk; M = medium risk; H = high risk; N/A = ERAs did not predict risk at this application rate.

Note: Diquat and fluridone are aquatic herbicides that would not be used by the BLM in terrestrial applications. For 2,4-D, the maximum terrestrial application rate, rather than the maximum aquatic application rate, is the maximum rate that would be used in terrestrial applications.

Sources: Ecological risk assessments for herbicides (ENSR 2005a-j; Syracuse Environmental Research Associates, Inc. 2001).

Table. 12. Summary of effects[1] to threatened, endangered, proposed, and candidate birds from ingestion of food contaminated by herbicides, as predicted by risk assessments.

Herbicide	Ingestion of Invertebrate Prey		Ingestion of Vegetation		Ingestion of Small Vertebrate Prey	
	Effect[2]	Risk Level[3]	Effect	Risk Level	Effect	Risk Level
2,4-D	Negative effects	Typical rate: H Maximum rate terrestrial: H	Negative effects	Typical rate: M Maximum rate terrestrial: H	Negative effects	Typical rate: L Maximum rate terrestrial: L
Bromacil	No effects	--	Negative effects	Typical rate: N/A Maximum rate terrestrial: L	Negative effects	Typical rate: N/A Maximum rate terrestrial: L
Chlorsulfuron	No effects	--	No effects	--	No effects	--
Clopyralid	Negative effects	Typical rate: N/A Maximum rate terrestrial: L	Negative effects	Typical rate: N/A Maximum rate terrestrial: L	No effects	--
Dicamba	No effects	--	No effects	--	No effects	--
Diflufenzopyr	No effects	--	No effects	--	No effects	--
Diquat	Negative effects	Typical rate: L Maximum rate: M	Negative effects	Typical rate: L Maximum rate: H	Negative effects	Typical rate: N/A Maximum rate: L
Diuron	Negative effects	Typical rate: L Maximum rate: L	Negative effects	Typical rate: N/A Maximum rate: M	Negative effects	Typical rate: L Maximum rate: L
Fluridone	No effects	--	No effects	--	No effects	--
Glyphosate	Negative effects	Typical rate: L Maximum rate: M	Negative effects	Typical rate: L Maximum rate: L	No effects	--
Hexaxinone	Negative effects	Typical rate: M Maximum rate: M	Negative effects	Typical rate: L Maximum rate: M	Unknown[4]	Unknown
Imazapic	No effects	--	No effects	--	No effects	--
Imazapyr	Negative effects	Typical rate: N/A Maximum rate: L	Negative effects	Typical rate: N/A Maximum rate: L	No effects	--
Metsulfuron methyl	No effects	--	No effects	--	No effects	--
Overdrive®	No effects	--	No effects	--	No effects	--
Picloram	No effects	--	Negative effects	Typical rate: N/A Maximum rate: L (chronic risk only)	No effects	--
Sulfometuron methyl	No effects	--	No effects	--	No effects	--
Tebuthiuron	No effects	--	Negative effects	Typical rate: N/A Maximum rate: L	No effects	--

Table 12. Continued . . .

Herbicide	Ingestion of Invertebrate Prey		Ingestion of Vegetation		Ingestion of Small Vertebrate Prey	
	Effect[2]	Risk Level[3]	Effect	Risk Level	Effect	Risk Level
Triclopyr acid	Negative effects	Typical rate: L Maximum rate: M	Negative effects	Typical rate: L Maximum rate: M	No effects	--
Triclopyr BEE	Negative effects	Typical rate: L Maximum rate: M	Negative effects	Typical rate: L Maximum rate: M	No effects	--

[1] Both acute and chronic effects were considered, and "negative effects" include either acute or chronic effects, or both. For more information on acute vs. chronic effects, please see Appendix C of the PEIS. "No effects" indicates that ERAs did not predict risks to TEP birds under the modeled scenario at the typical or maximum application rate.
[2] Only ERAs for 2,4-D, clopyralid, glyphosate, metsulfuron methyl, picloram, and triclopyr assessed risks to carnivorous birds. For all other herbicides, carnivorous mammals were used as surrogates when completing risk assessments.
[3] L = Low risk; M = medium risk; H = high risk; and N/A = ERAs did not predict risks at this application rate.
[4] Unknown = ERAs did not assess risks to birds for this herbicide via this exposure pathway.
Sources: Ecological risk assessments for herbicides (ENSR 2005a-j; Syracuse Environmental Research Associates, Inc. 2001).

Birds could also be exposed to herbicides by consuming contaminated food items. In the case of the western snowy and piping plovers, food would include various aquatic invertebrates, and in the case of the least tern, food would include fish. According to the ERAs, exposure to herbicides by consumption of fish exposed to 2,4-D or hexazinone at the typical application rate would potentially result in negative effects to birds (see Table 6-4). Birds that ingested aquatic invertebrates sprayed by 2,4-D, diquat, diuron, glyphosate, hexazinone, or triclopyr at the typical application rate, or by clopyralid or imazapyr at the maximum application rate, could potentially experience negative health effects.

Because the piping plover and interior least tern nest in open, sandy areas, vegetation removal through herbicide treatments would be unlikely to negatively affect the habitat of these species. Furthermore, treatments that control invasive plant species to maintain or recover the open conditions favored by these species could have a long-term positive effect by increasing the suitability of habitat.

Effects of Manual Treatments

Heavy equipment and machinery used to remove vegetation in plover and tern habitats could crush nests, eggs, and newborn chicks.

The noise and human presence associated with mechanical treatments could severely impact the success of breeding, with the extent of this impact dependent on the scale and duration of the treatment. Disturbances to plovers and terns interfere with nesting, feeding, and roosting, all of which can reduce the success of the birds. These birds are highly susceptible to human interference, and if disturbed, may be chased off their nest, exposing eggs and chicks to environmental stresses and/or predators (USFWS 2001m). Mechanical control could also result in large-scale removal of vegetation, which could destroy vegetation used for cover from predators.

Because of the high sensitivity of plovers and terns to human disturbances, the use of manual control during the breeding season would likely have some effect on bird populations. The presence of humans in breeding areas could cause birds to abandon their nests. In addition, since eggs and chicks are camouflaged, even careful workers may be unable to spot them, and could trample them.

Effects of Biological Treatment Methods

Domestic animals could trample nesting and brood-rearing habitat, destroy eggs, and disturb nesting birds. It is likely that animals released close to a water source would approach the water's edge to drink, and that these animals would therefore walk back and forth through plover and/or tern nesting habitat. The presence of herds of animals in shore bird habitat could also cause disturbances to nesting birds, potentially interfering with reproductive success. Disturbances can also prevent plovers from feeding and flush them from roost sites (USFWS 2001m).

The release of biological control agents into plover habitats would likely entail the presence of humans in these areas, which could disturb birds (see above). These disturbances would be of

short duration. The biological control agents themselves are unlikely to affect birds, as they target particular non-native species, and have a gradual effect on the vegetation. However, given the limited knowledge in the arena of biological control, there is still a chance that unforeseen effects to native species and the ecosystem in general could occur.

Conservation Measures

The following conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect TEP species.

Survey for piping plovers and interior least terns (and their nests) in suitable areas on proposed treatment areas, prior to developing treatment plans (Figure 7).

- Do not treat vegetation in nesting areas during the breeding season (as determined by a qualified biologist).
- Do not allow human (or domestic animal) disturbance within ¼ mile of nest sites during the nesting period.
- Ensure that nest sites are at least 1 mile from downwind smoke effects during the nesting period.
- Conduct beachgrass treatments during the plant's flowering stage, during periods of active growth.
- Closely follow all application instructions and use restrictions on herbicide labels; in wetland habitats use only those herbicides that are approved for use in wetlands.
- Do not use 2,4-D in western snowy plover, piping plover, or interior least tern habitats; do not broadcast spray 2,4-D within ¼ mile of western snowy plover, piping plover, or interior least tern habitat.
- Where feasible, avoid use of the following herbicides in western snowy plover and piping plover habitat: clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr; in interior least tern habitat avoid the use of clopyralid, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in piping plover habitat; do not broadcast spray these herbicides in areas adjacent to piping plover habitat under conditions when spray drift onto the habitat is likely.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in interior least tern habitat; do not broadcast spray these herbicides in areas adjacent least tern habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying imazapyr or metsulfuron methyl in or adjacent to piping plover or interior least tern habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in piping plover or interior least tern habitat, utilize the typical, rather than the maximum, application rate.

Determination of Effects

Given the assumption at the programmatic level that any of the proposed vegetation treatments could occur anywhere on public lands, the proposed treatment program, absent application of conservation measures, may have negative effects on piping plover and least tern and/or their designated critical habitat discussed in this chapter. In recognition of this, the conservation measures discussed in this chapter were designed to reduce the chance of such negative effects

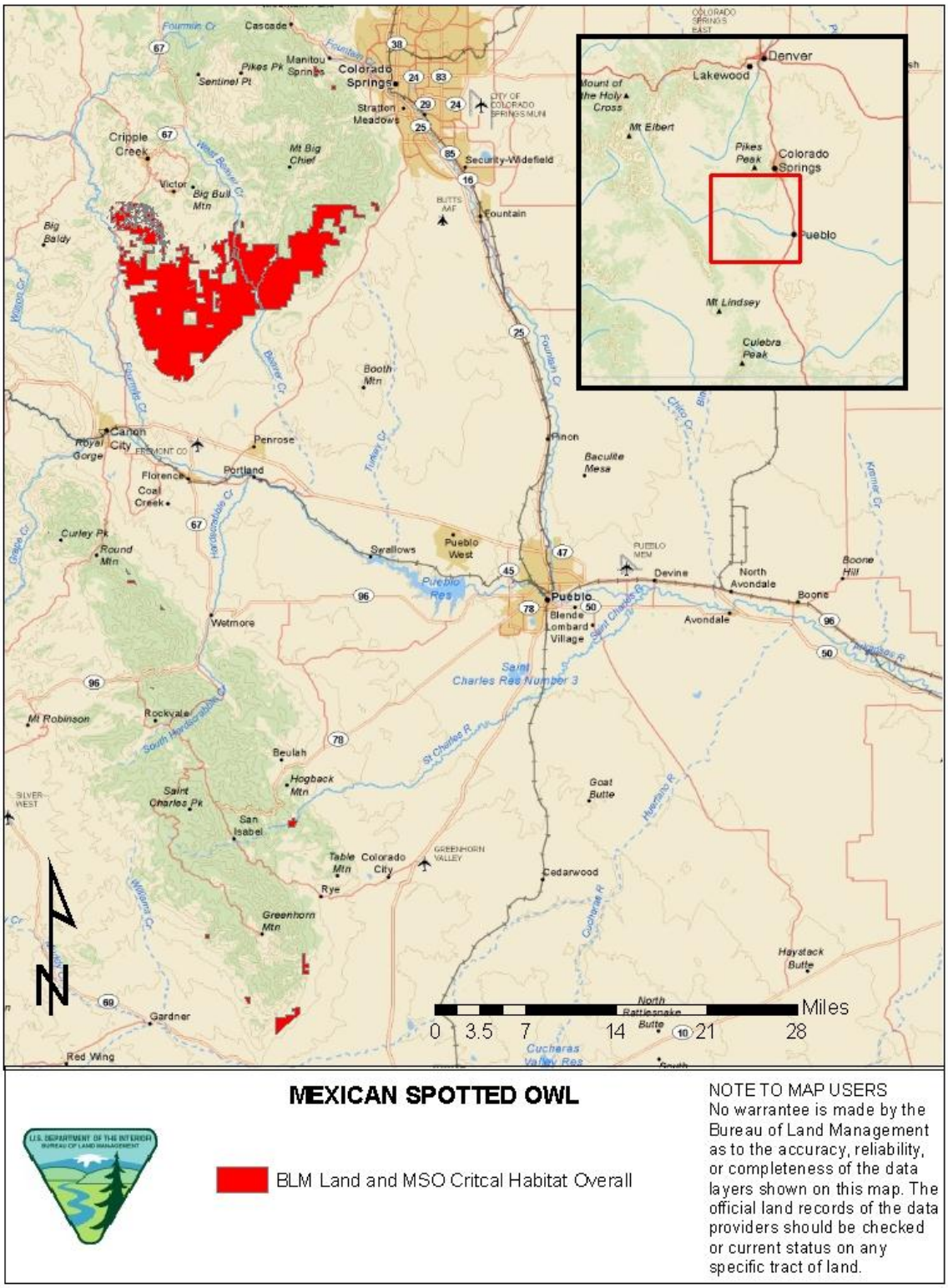
occurring to the point where the likelihood of such effects would be discountable, or to reduce any potential effects to the point where they would be insignificant to the species or their critical habitats, and would never reach the scale where take occurs. As a result, with application of these conservation measures, the action would be **"may affect, not likely to adversely affect"** piping plover and least tern or their federally designated critical habitats at the programmatic level. Given BLM mandates for use of integrated pest management (including vegetation management), and given that it is not possible to forecast site-specific vegetation management needs below the programmatic level, additional evaluations of situation specific effects will be the subject of subsequent "step-down" ESA evaluations. In this manner, any additional specific conservation measures necessary to accommodate site or situation-specific peculiarities not predictable at the programmatic level will be developed and applied prior to local implementation of vegetation management activities.

Mexican Spotted Owl

Mexican Spotted Owl: Status, Natural History, and Location of Habitat within RGFO

The Mexican spotted owl (*Strix occidentalis lucida*) occurs over a broad geographic range, from southern Utah and Colorado, south through the mountains of Arizona, New Mexico, and western Texas, and into the mountains of Mexico. The subspecies occurs in disjunct localities that correspond to isolated mountain systems and canyons. The range of the Mexican spotted owl in the U.S. has been divided into six recovery units (as identified in the recovery plan), with an additional five recovery units in Mexico. The U.S. recovery units, listed in decreasing order of number of known owls, are Upper Gila Mountain, Basin and Range-East, Basin and Range-West, Colorado Plateau, Southern Rocky Mountain-New Mexico, and Southern Rocky Mountain-Colorado. The RGFO lies within the Southern Rock Mountain-Colorado recovery unit. The habitat within the RGFO is primarily narrow, steep walled canyons that offer a cool microclimate with mixed coniferous forest canopy (Figure 8). In 2011, five adults and one fledging were located during BLM-RGFO annual Mexican spotted owl surveys.

Figure 8. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Mexican spotted owl (*Strix occidentalis lucida*) critical habitat, 2012.



Mexican spotted owls nest, roost, forage, and disperse in a diverse array of biotic communities. Nests and roosts are primarily found in closed-canopy forests or rocky canyons. In the northern portion of the range, most nests are in caves or on cliff ledges in steep-walled canyons. Elsewhere, the majority of nests appear to be in trees (Fletcher and Hollis 1994). Forests used for roosting and nesting often contain mature or old-growth stands that are structurally complex (Skaggs and Raitt 1988; Ganey and Balda 1989, 1994; McDonald et al. 1991). These forests are typically uneven-aged and multi-storied, with high canopy closure. Although a variety of tree species are used for nesting and roosting, Douglas-fir appears to be the most commonly utilized species for both of these activities (Fletcher and Hollis 1994).

Mexican spotted owls typically locate prey from an elevated perch by sight or sound, then pounce on the prey and capture it with their talons. In general, owls appear to forage more in unlogged forests than in selectively logged forests (Ganey and Balda 1994). Common prey items include species of rodent, bat, bird, reptile, and arthropod that use unique habitats. Thus it appears that diverse habitats for prey species provide owls with a diverse prey base.

Mexican spotted owls breed sporadically, but do not nest every year (Ganey 1998). Reproductive chronology varies somewhat across the range of the subspecies. Spotted owls observed in Arizona begin courtship and roosting in March, with eggs laid in either late March or early April. Incubation, which is performed exclusively by the female parent, begins shortly after the first egg is laid, and lasts for approximately 30 days. During incubation and the first half of the brooding period, the female leaves the nest only rarely (Forsman et al. 1984; Ganey 1998). Eggs hatch in early May, and young owls fledge 4 to 5 weeks after hatching, dispersing sometime between mid-September and early October.

The Mexican spotted owl was federally listed as a threatened species on April 15, 1993. On January 18, 2001, the USFWS designated 830,000 acres in Arizona, 525,000 acres in Colorado, 54,000 acres in New Mexico, and 3.2 million acres in Utah as critical habitat for the species. Primary threats to the subspecies are the continued alteration of habitat as a result of even-aged silvicultural practices, and the danger of catastrophic wildfire. Additional threats vary by Recovery Unit, and include such factors as indiscriminate fuelwood cutting, overgrazing, recreation, and fragmentation of habitat. There are estimated to be between 800 and 1,600 Mexican spotted owls in the southwestern U.S. (National Audubon Society 2002b).

Effects of manual treatments on Mexican spotted owl

The use of manual control treatment methods in forested areas would be expected to have few effects on spotted owls. There could be some disturbances associated with the presence of field crews, which could be large enough to disrupt activities such as breeding or feeding. However, these effects would likely be short in duration and temporary.

Effects of biological control Treatments

Use of domestic animals to control weeds in forested habitats used spotted owls would have few direct effects on birds. All of these species nest in tall, old trees or cliffs that would be safely out of the way of domestic animals. Heavy grazing could have long-term negative effects on habitat by preventing the replacement of existing old-growth habitat parameters that are necessary

for/preferred by this species. There is also potential for reducing the productivity of habitat for the owl's prey base.

The use of biological control agents to control non-native species in forested habitats would not be expected to have direct effects on spotted owls. There could be minor disturbances associated with field crews releasing the agents, and follow-up monitoring, but these disturbances would be temporary. Unforeseen unspecified effects from biological control agents are possible but not reasonably foreseeable.

Effects of Herbicide Treatments

Herbicide treatments would involve workers and possibly the use of vehicles (trucks/ATVs) or aircraft, which could potentially disturb spotted owls. Disturbance would be temporary, and effects would be greatest during the breeding season, when reproductive success could be reduced. While it is unlikely that owls would be exposed to herbicides during treatments, it is conceivable that inadvertent direct exposure to herbicide spray could occur. According to the ERAs, such an exposure to 2,4-D, clopyralid, glyphosate, hexazinone, picloram, or triclopyr at the typical application rate, or by imazapyr or metsulfuron methyl at the maximum application rate, could potentially result in negative health effects to spotted owls (Table 11,12).

Spotted owls also could be exposed to herbicides by touching contaminated vegetation or ingesting contaminated prey. Contact with plant materials that have been sprayed by 2,4-D at the typical application rate, or by glyphosate, hexazinone, or triclopyr at the maximum application rate, could potentially result in negative health effects to owls. Ingestion of prey sprayed by 2,4-D or diuron at the typical application rate, or by bromacil or diquat at the maximum application rate, by Mexican spotted owls could potentially cause negative health effects. Since the ERA for hexazinone did not assess the potential risks to carnivorous species through ingestion of contaminated prey, the potential for negative effects to spotted owls from exposure to hexazinone via this exposure pathway cannot be determined.

Herbicide treatments should not have a substantial effect on spotted owl habitat. Some alteration of the composition of lower canopy layers could occur, but key habitat components such as snags and woody debris would not be affected.

Conservation Measures

The following programmatic-level conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect the Mexican spotted owl based on ERAs conducted in the Programmatic Biological Assessment (BLM 2007c).

- Survey for Mexican spotted owls (and their nests) on proposed treatment areas containing primary constituent elements (presence of water, clumps or stringers of mixed-conifer, pine-oak, pinyon-juniper, and/or riparian, canyon walls containing crevices, ledges, or caves, and a high percent of ground litter and woody debris) prior to developing treatment plans.
- Delineate a 100-acre buffer around nests prior to mechanical treatments.
- Do not allow weed treatments within ¼ mile Protected Activity Centers or nest sites during the nesting and brood rearing period (as determined by a local biologist).

- Protect and retain the structural components of known or suspected nest sites during treatments; evaluate each nest site prior to treatment and protect it in the most appropriate manner.
- Do not conduct treatments that alter forest structure in old-growth stands.
- Avoid use of the following herbicides in areas containing primary constituent elements: 2,4-D, bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray 2,4-D, diuron, clopyralid, glyphosate, hexazinone, picloram, or triclopyr in areas within a ¼ mile to areas containing primary constituent elements under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, diquat, imazapyr or metsulfuron methyl within a ¼ mile to areas containing primary constituent elements, apply at the typical, rather than the maximum, application rate.

Determination of effect for Mexican Spotted Owl

Given the assumption that any of the proposed vegetation treatments could occur anywhere on public lands, the proposed treatment program, absent application of conservation measures, may have negative effects on Mexican spotted owl and/or their designated critical habitat discussed in this chapter. In recognition of this, the conservation measures discussed in this chapter were designed to reduce the chance of such negative effects occurring to the point where the likelihood of such effects would be discountable, or to reduce any potential effects to the point where they would be insignificant to the species or their critical habitat, and would never reach the scale where take occurs. As a result, with application of these conservation measures, the action would be **"*may effect, not likely to adversely affect*"** Mexican spotted owl or their federally designated critical habitat.

Preble's and New Mexico Meadow Jumping Mouse

Preble's Meadow Jumping Mouse: Status, Natural History, and Location of Habitat within RGFO

Preble's meadow jumping mouse (*Zapus hudsonius preblei*) is found along the foothills in southeastern Wyoming, southward along the eastern edge of the Front Range of Colorado to Colorado Springs, El Paso County (Hall 1981; Clark and Stromberg 1987; Fitzgerald et al. 1994). The BLM-RGFO manages several small parcels of land that are located within Preble's overall range (Figure 9-12). The overall range is described by Colorado Parks and Wildlife, the creators of the data set, as the area which encompasses the probable range of Preble's Meadow Jumping Mouse along the Front Range of Colorado below 7600' elevation eastward to include those hydro-units identified by the Preble's Technical Working Group. Preble's Meadow Jumping Mouse is primarily associated with riparian corridors of small intermittent and perennial streams where riparian herbaceous and riparian shrub (primarily willow) dominate.

The subspecies is likely an Ice Age relict (Hafner et al. 1981; Fitzgerald et al. 1994) that was confined to riparian systems where moisture was more plentiful after the glaciers receded from the Front Range of Colorado and the foothills of Wyoming and the climate became drier. The semi-arid climate in southeastern Wyoming and eastern Colorado limits the extent of riparian corridors and restricts the range of the Preble's meadow jumping mouse in this region. The

eastern boundary for the subspecies is likely defined by the dry shortgrass prairie, which may present a barrier to eastward expansion (Beauvais 2001). The western boundary of Preble's range in both states appears related to elevation along the Laramie Range and Front Range; the general upward limit of the subspecies' habitat in Colorado is 7,600 feet (USFWS 1998). Currently, there is no designated critical habitat and no known occurrences of Preble's on BLM managed lands.

Typical habitat for the Preble's meadow jumping mouse comprises well-developed plains riparian vegetation with adjacent, undisturbed grassland communities and a nearby water source. Well-developed plains riparian vegetation typically includes a dense combination of grasses, forbs, and shrubs; a taller shrub and tree canopy may be present (Bakeman 1997). When present, the shrub canopy is often willow, although shrub species including snowberry, chokecherry, hawthorn, gambel oak, gray alder, river birch, skunkbrush, wild plum, lead plant, red-osier dogwood, and others also may occur (Bakeman 1997, Shenk and Eussen 1998). Preble's meadow jumping mice regularly use uplands at least as far out as 330 feet beyond the 100-year floodplain for feeding and resting (Ryon 1999, Shenk 2002). The subspecies can also move considerable distances along streams, as far as 1 mile in one evening (Ryon 1999, Shenk and Sivert 1999a).

Figure 9. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Preble's meadow jumping mouse (*Zapus hudsonius preblei*) overall habitat near Fort Collins, Colorado, 2012.

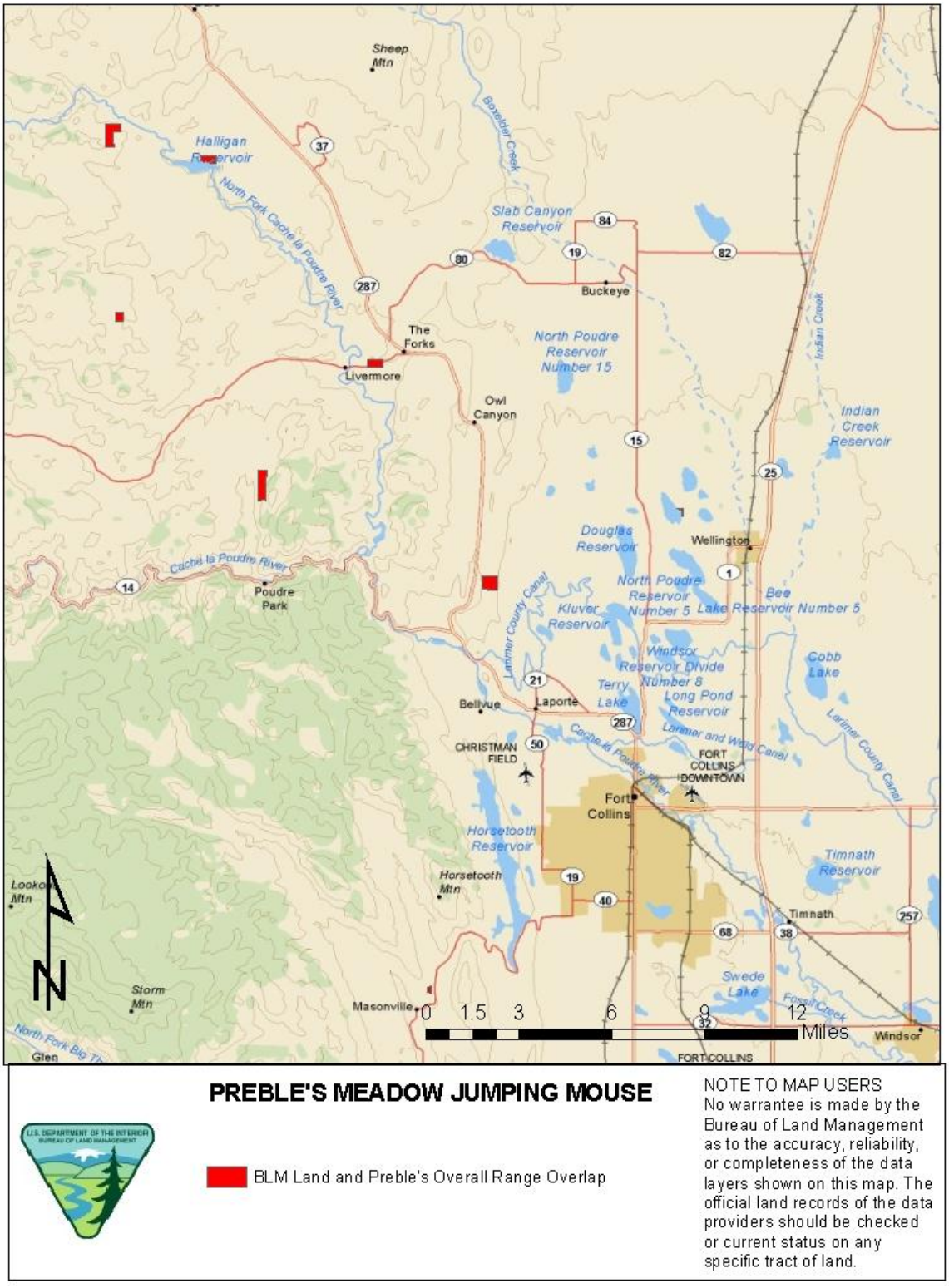


Figure 10. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Preble's meadow jumping mouse (*Zapus hudsonius preblei*) overall habitat near Denver, Colorado, 2012.

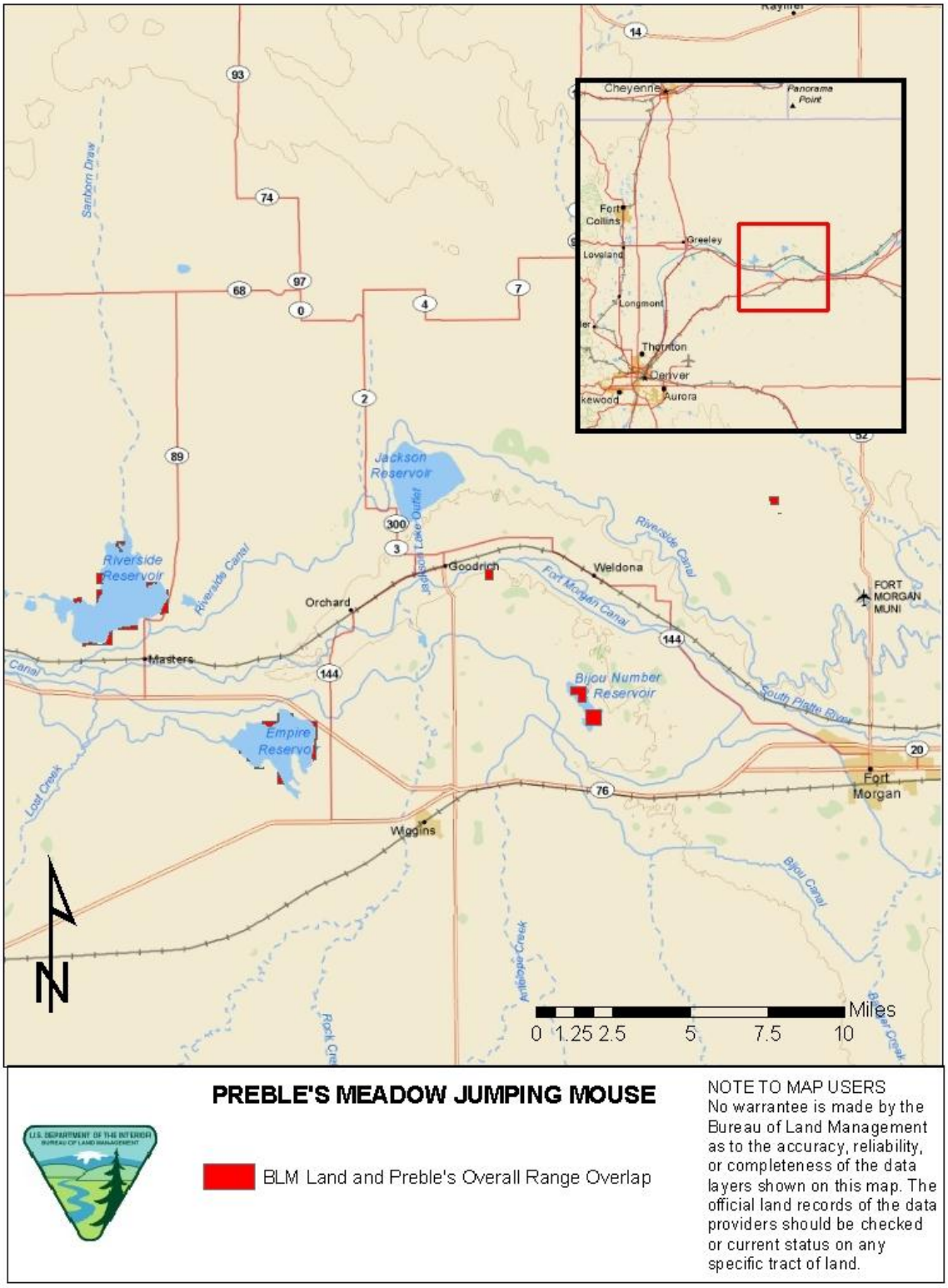


Figure 11. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Preble's meadow jumping mouse (*Zapus hudsonius preblei*) overall habitat near Denver, Colorado, 2012.

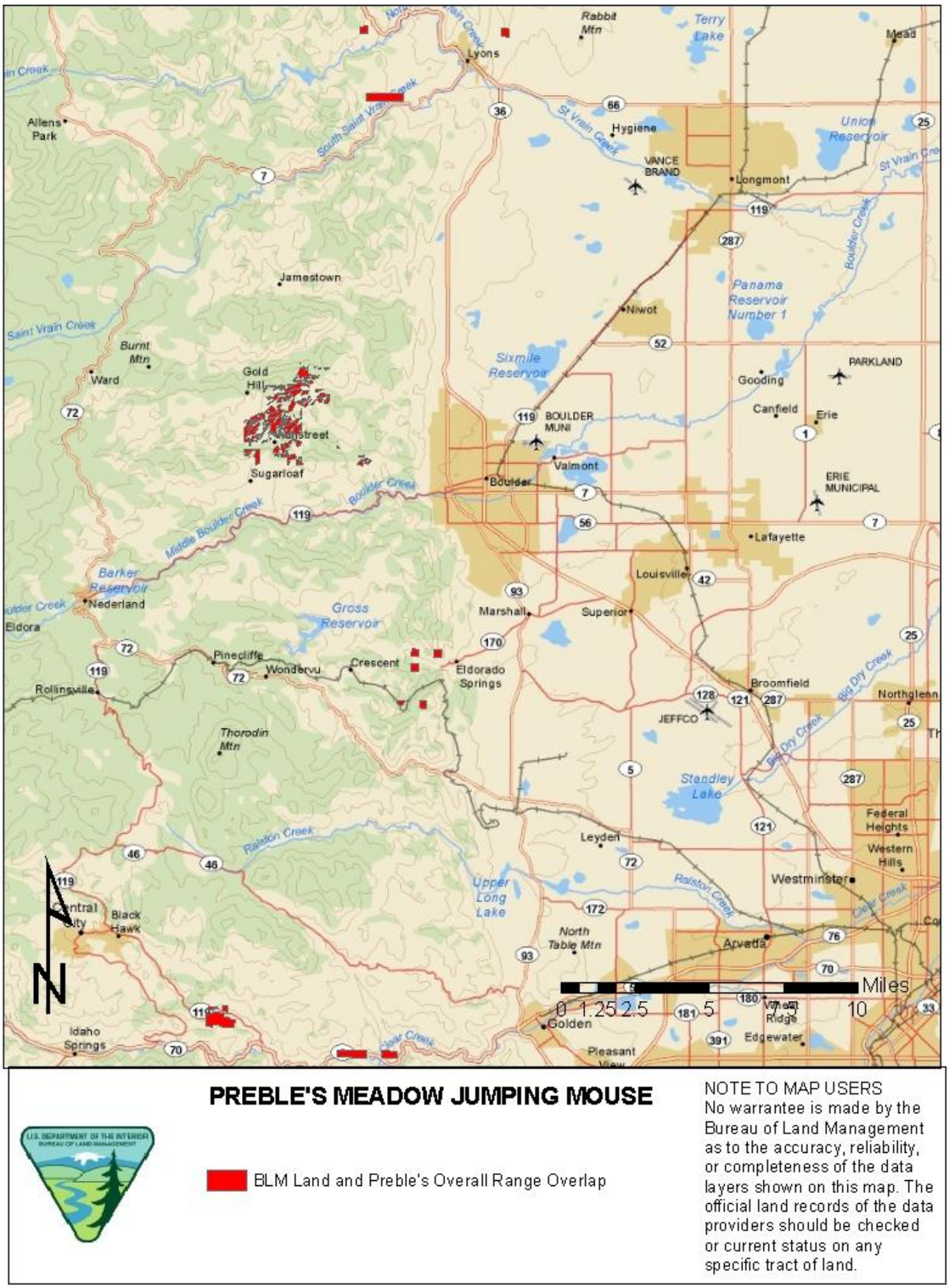
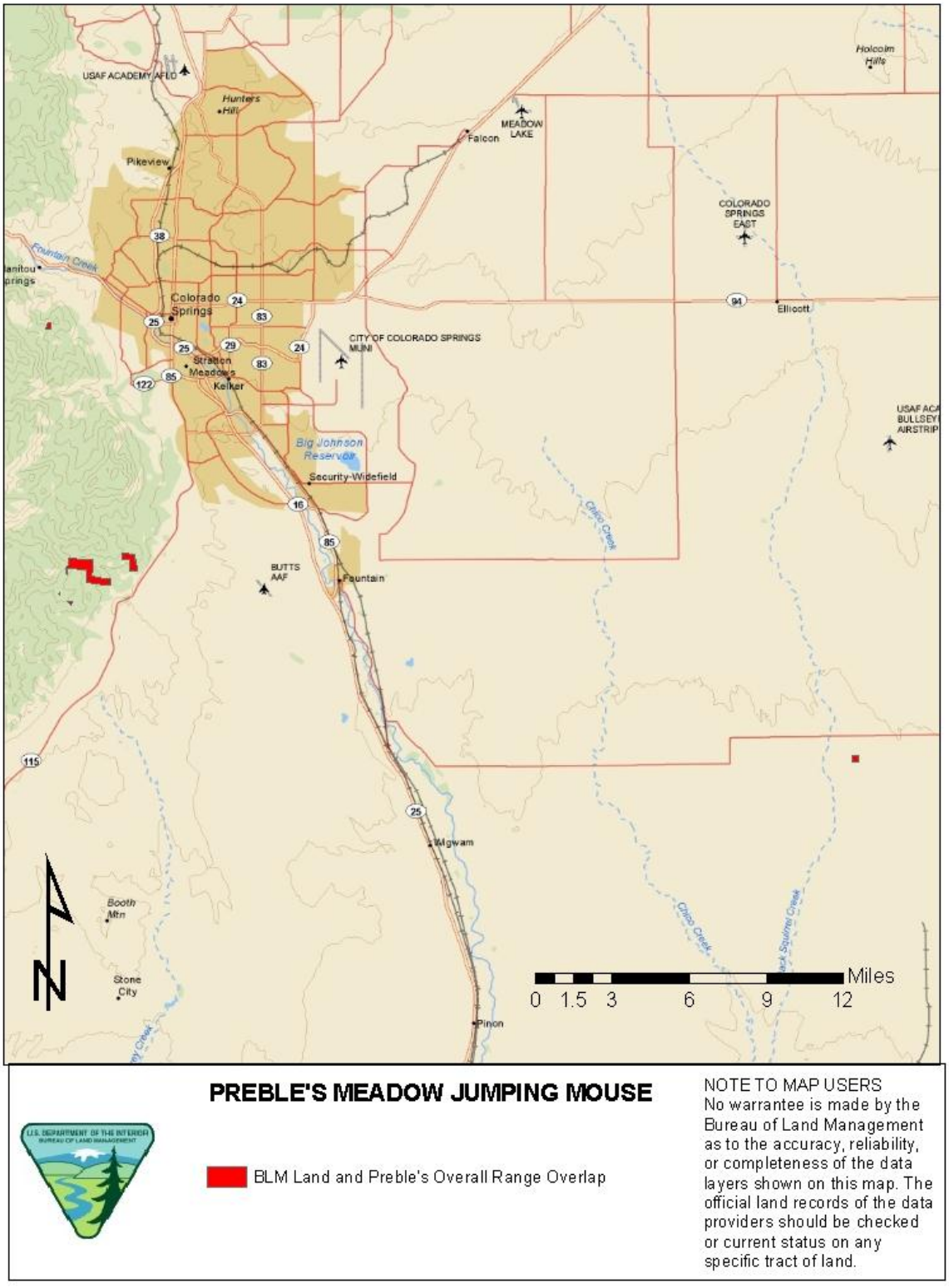


Figure 12. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Preble's meadow jumping mouse (*Zapus hudsonius preblei*) overall habitat near Colorado Springs, Colorado, 2012.



New Mexico Meadow Jumping Mouse: Status, Natural History, and Location of Habitat within RGFO

The New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) is endemic to New Mexico, Arizona, and a small area of southern Colorado in Las Animas County. Surveys conducted in 2005 and 2006 documented a drastic decline in the number of occupied localities and suitable habitat across the range of the species in New Mexico and Arizona. Of the original 98 known historical localities, there are now only 10 known extant localities in New Mexico, one in Arizona, and an additional eight localities that have not been surveyed since the early to mid-1990s. However, there is no designated critical habitat and no known occurrences on BLM lands.

The New Mexico meadow jumping mouse nests in dry soils, but uses moist, streamside, dense riparian/wetland vegetation up to an elevation of about 8,000 feet (Frey 2006). It appears to only utilize two riparian community types: 1) persistent emergent herbaceous wetlands (i.e., beaked sedge and reed canary grass alliances); and 2) scrub-shrub wetlands (riparian areas along perennial streams that are composed of willows and alders). It especially uses microhabitats of patches or stringers of tall dense sedges on moist soil along the edge of permanent water. Home ranges vary between 0.37 and 2.7 acres and may overlap (Smith 1999).

The primary threats to New Mexico meadow jumping mice include excessive grazing pressure, water use and management, highway reconstruction, development, and recreation. Moreover, the highly fragmented nature of its distribution is a major contributor to the vulnerability of this species and increases the likelihood of very small, isolated populations being extirpated.

The only known location of New Mexico meadow jumping mouse in Colorado is within Lake Dorothey Stat Wildlife Area; however, few surveys have been conducted elsewhere (pers. comm. Eric Hein 2/6/2012)

Effects of Manual Treatments

Use of manual control to reduce small populations of weeds and other undesirable vegetation is unlikely to have major negative effects on these two endangered species or their habitat. The disturbance to wetland habitats by this treatment method would be minimal. In the long-term, the resulting reduction in populations of non-native plant species would have positive effects mouse habitat. It would be best to conduct manual treatments after the onset of hibernation (November 1) and before emergence from hibernation (April 31).

Effects of Biological Control Treatments

Grazing has been identified as a threat to these species, as well as to their habitats. Because these species are found wetlands and riparian areas, their habitat is easily degraded by trampling by domestic animals. Furthermore, the lush vegetation that is present in these areas is a preferred food of grazers, and therefore attracts domestic animals to the area. The resulting trampling and overgrazing removes food for mice, and reduces their ability to hide from predators. Domestic animals may also reduce water levels by drinking, and their waste products may contaminate the water.

The release of other biological control agents would be unlikely to affect the meadow jumping mouse. Disturbances associated with releasing these agents would be minimal. However, there is limited knowledge about the long-term impacts.

Effects of Herbicide Treatments

Use of ATVs, trucks, or horses to apply herbicides could cause some mortality or injury to these small TEP mammals as a result of crushing. Since meadow jumping mice utilize vegetation for cover from predators, and may have aboveground nests, it is conceivable that some animals could be sprayed inadvertently during herbicide treatments. Based on the results of the ERAs, direct spray by 2,4-D, clopyralid, glyphosate, hexazinone, picloram, or triclopyr at the typical application rate, or by imazapyr or metsulfuron methyl at the maximum application rate, could potentially result in negative effects to small mammals (Table 13 and 14). Furthermore, if mammals were to come into contact with vegetation that had been sprayed by 2,4-D at the typical application rate, or by glyphosate, hexazinone, or triclopyr at the maximum application rate, negative effects could potentially occur. Therefore, it is assumed that use of these herbicides in habitats that support the Preble's and New Mexico meadow jumping mice could have negative effects on populations of these species

If mice were to ingest plant materials sprayed by 2,4-D, diquat, or diuron at the typical application rate, or by bromacil, fluridone, glyphosate, hexazinone, or tebuthiuron at the maximum application rate, negative health effects could potentially occur (Table 10 and 11). If mice were to ingest insects sprayed by 2,4-D, clopyralid, diquat, glyphosate, hexazinone, imazapyr, picloram, or triclopyr at the typical application rate, or by diuron or metsulfuron methyl at the maximum application rate, negative health effects would be possible. These scenarios assume that 100% of the animal's diet consists of contaminated food items, which is unlikely.

Table 13. Risk Categories Used to Describe BLM-evaluated Herbicide Effects on Non Special Status Wildlife According to Exposure Scenario –Adapted from Table 4-22 of the PEIS (BLM 2007a).

Application Scenario	BROM[1]		CHLOR		DICAM		DIFLU		DIQUAT		DIURON		FLUR		IMAZ		OVER		SULFM		TEBU	
	T[2]	M	T	M	T	M	T	M	T	M	T	M	T	M	T	M	T	M	T	M	T	M
Direct spray of a small mammal, 1st order absorption	0[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Direct spray of a small mammal, 100% absorption	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ingestion of contaminated food items by a large mammalian carnivore[4]	0	L	0	0	L	L	0	0	0	0	L	L	0	0	0	0	0	0	0	0	0	0
Consumption of contaminated food items by a small mammalian herbivore[4]	0	L	0	0	0	L	0	0	L	M	L	M	0	0	0	0	0	0	0	0	0	L

[1]BROM = Bromacil; CHLOR = Chlorosulfuron; DICAM = Dicamba; DIFLU = Difluenzopyr; FLUR = Fluridone; IMAZ = Imazapic; OVER = Overdrive®; SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron

[2]T = Typical application rate; M = Maximum application rate

[3]Risk categories: 0 = No Risk, L = Low Risk, M = Moderate Risk, H = High Risk

[4]Ingestion of contaminated food items includes acute and/or chronic effects with the highest risk category being reported.

Table 14. Risk Categories Used to Describe Forest Service-evaluated Herbicide Effects on Wildlife According to Exposure Scenario – Adapted from Table 4-23 of the PEIS (BLM 2007a).

Application Scenario	2,4-D		Clopyralid		Glyphosate		Hexazinone		Imazapyr		Metsulfuron		Picloram		Triclopyr	
	Typ[1]	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max
Direct spray of a small mammal, 1st order absorption	L[2]	L	0	0	0	0	0	L	0	0	0	0	0	0	L	M
Direct spray of a small mammal, 100% absorption	M	M	L	L	L	M	L	M	0	L	0	L	L	L	L	M
Consumption of a contaminated small mammal by a predatory mammal	L	L	0	0	0	0	0	0	0	0	0	0	0	0	0	L
Chronic consumption of contaminated vegetation by a small mammal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1]Typ = Typical application rate; Max = Maximum application rate

[2]Risk categories: 0 = No Risk, L = Low Risk, M = Moderate Risk, H = High Risk

Herbicide treatments in mouse habitat could reduce vegetative cover, temporarily exposing animals to increased predation. In addition, the availability of food could be reduced temporarily. Use of trucks or ATVs could also crush aboveground nests present on the treatment site. Treatments would also help to maintain or improve the quality of wetland habitats, which would likely benefit these species over the long term.

Conservation Measures

The following programmatic-level conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect the meadow jumping mouse based on information provided in Table 13 and 14 and the ESAs conducted in the Programmatic Biological Assessment (BLM 2007c).

- Address meadow jumping mice in all management plans prepared for treatments within areas that contain suitable habitat for these species.
- Do not graze, or conduct mechanical treatments within wetlands and/or riparian areas that support these species.
- Use manual spot application of herbicides rather than broadcast treatments.
- Closely follow all application instructions and use restrictions on herbicide labels; in wetland and riparian habitats use only herbicides that are approved for use in those areas.
- Do not use 2,4-D, diquat, or diuron in meadow jumping mouse habitat; do not broadcast spray these herbicides within ¼ mile of meadow jumping mouse habitat.
- Do not broadcast spray herbicides within meadow jumping mouse habitat.
- Where feasible, avoid use of the following herbicides in meadow jumping mouse habitat: clopyralid, fluridone, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, imazapyr, picloram, or triclopyr in areas adjacent to meadow jumping mouse habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, fluridone, metsulfuron methyl, or tebuthiuron within ¼ mile of meadow jumping mouse habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of bromacil, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in meadow jumping mouse habitat, utilize the typical, rather than the maximum, application rate.

These measures represent the minimum that is required of the BLM to protect these species from negative impacts during vegetation treatments. Additional project-specific conservation measures would also need to be developed if project is outside the scope of this BA.

Determination of effects for Preble's and New Mexico Meadow Jumping Mouse

Given the assumption the proposed vegetation treatments could occur anywhere on public lands, the proposed treatment program, absent application of conservation measures, may have negative effects on meadow jumping mice and/or their habitat. In recognition of this, the conservation measures discussed were designed to reduce the chance of such negative effects occurring to the point where the likelihood of such effects would be discountable, or to reduce any potential effects to the point where they would be insignificant to the species or their critical habitats, and would never reach the scale where take occurs. As a result, with application of these conservation measures, the action would be ***"may affect, not likely to adversely affect".***

Lesser Prairie Chicken

Lesser Prairie Chicken: Status, Natural History, and Location of Habitat within RGFO
The lesser prairie chicken (*Tympanuchus pallidicinctus*) is an Endangered Species Act candidate species and a proposed rule on listing is expected approximately in August 2012. The BLM has been issued guidance not to conference on candidate species; however, mandates require that BLM authorized actions cannot contribute to the need to list.

Lesser prairie chickens were likely resident in six counties in Colorado prior to European settlement (Giesen 2000). At present, lesser prairie chickens (LEPC) are known to occupy portions of Baca, Cheyenne, Prowers, and Kiowa counties, but are not known to persist in Bent and Kit Carson counties (Figure 13 and 14). Critical habitat has not been designated for the LEPC; however the CDOW has designated LEPC production areas in and around known leks. Currently, populations in Kiowa and Cheyenne counties number less than 100 individuals and appear to be isolated from other populations in Colorado and adjacent states (Giesen 2000). The CDOW estimated 800 to 1,000 LEPC in the state in 1997. Giesen (2000) estimated the population size, as of 2000, to be less than 1,500 breeding individuals. There are very few, small parcels of BLM land within the overall range of LEPC.

A new survey method was initiated in 2004 designed to cover a much broader range of habitat types and a larger geographic area, particularly to include lands enrolled in the CRP. The new methodology resulted in the discovery of more leks and the documented use of CRP fields by LEPC in Colorado. The number of LEPC counted in 2005 was 203 birds, with high-count totals of 151 males, 21 females, and 31 of unknown sex. In 2005, 32 active leks were found--13 in Baca County, 1 in Kiowa County, and 18 in Prowers County, including 7 new leks. No known leks in Cheyenne County were surveyed in 2005. Results in 2006 suggest that the population in Baca County continued to decline while the Prowers County population is increasing, with three new lek sites discovered there. Limited data suggest LEPC populations in Kiowa and Cheyenne counties are stable to increasing.

LEPC numbers in Colorado declined 75 percent from 2006 to 2007, from 296 birds observed to only 74. Active leks also declined from 34 in 2006 to 18 in 2007. Due to heavy snowfall, no cover and little food existed in southern Kiowa, Prowers, and most of Baca counties for over 60 days. The impacts of drought conditions in 2006, coupled with the severe winter weather, probably account for the decline in the number of LEPC observed in 2007.

In 2008, Colorado adopted a dual-frame sampling methodology consisting of a list frame and an area frame. The list frame consisted of known lek locations that have been active at least once within the past ten years. The area frame consisted of areas of unknown LEPC occupancy within the potential range in southeastern Colorado. Opportunistic searches also were conducted, as time permitted, in areas where the public had reported LEPC sightings or in CRP grasslands outside of the area frame.

Total LEPC detected in 2009 was 75 birds, down from 116 birds detected in 2008 and almost identical to the number (74) of LEPC that were detected in 2007 using a different methodology. The total number of active leks detected was 13, down slightly from 17 in 2008 and 18 in 2007.

In 2009, 6 leks were detected from Baca County, 1 in Cheyenne County, and 6 in Prowers County. As in 2008, no active leks were counted in Kiowa County during standard survey efforts. Access restrictions prohibited searches of every known lek and active leks may have been present but undetected. An active lek was detected in Kiowa County in 2008. Nesting and brood rearing conditions in the spring of 2008 were not favorable due to drought conditions in southeastern Colorado. Habitat and moisture conditions improved in 2009. CRP lands continue to be important for LEPC, particularly in Prowers County.

As a compliment to CDOW surveys, counts are completed on the USFS Comanche National Grassland in Baca County. On the Comanche National Grassland, surveys revealed that the estimated area occupied by the LEPC over the past 20 years was approximately 27,373 ha (65,168 ac). Surveys conducted during 1984 - 2005 identified 53 different leks on or immediately adjacent to USFS lands. Leks were identified based on the presence of at least three birds on the lek. Lek censuses conducted from 1980 to 2005 showed the number of males counted per lek since 1989 has steadily declined. The corresponding population estimate, based on number of males observed at leks, on the Comanche National Grassland was highest in 1988 with 348 birds and the lowest in 2005 with approximately 64 birds and only 8 active leks. The estimate of males per lek in 2005 declined over 80 percent from that of 1988, from 174 males per lek to 32 males per lek, respectively. In 2009, each historic lek was surveyed 2-3 times and 4 active leks were observed (Shively 2009b). A lek is considered active when at least three males are observed displaying on the lek. A high count of 25 males were observed using these four leks. In the spring of 2008, five active leks and 34 birds were observed.

Figure 13. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and lesser prairie chicken (*Tympanuchus pallidicinctus*) overall habitat near Granada, Colorado, 2012.

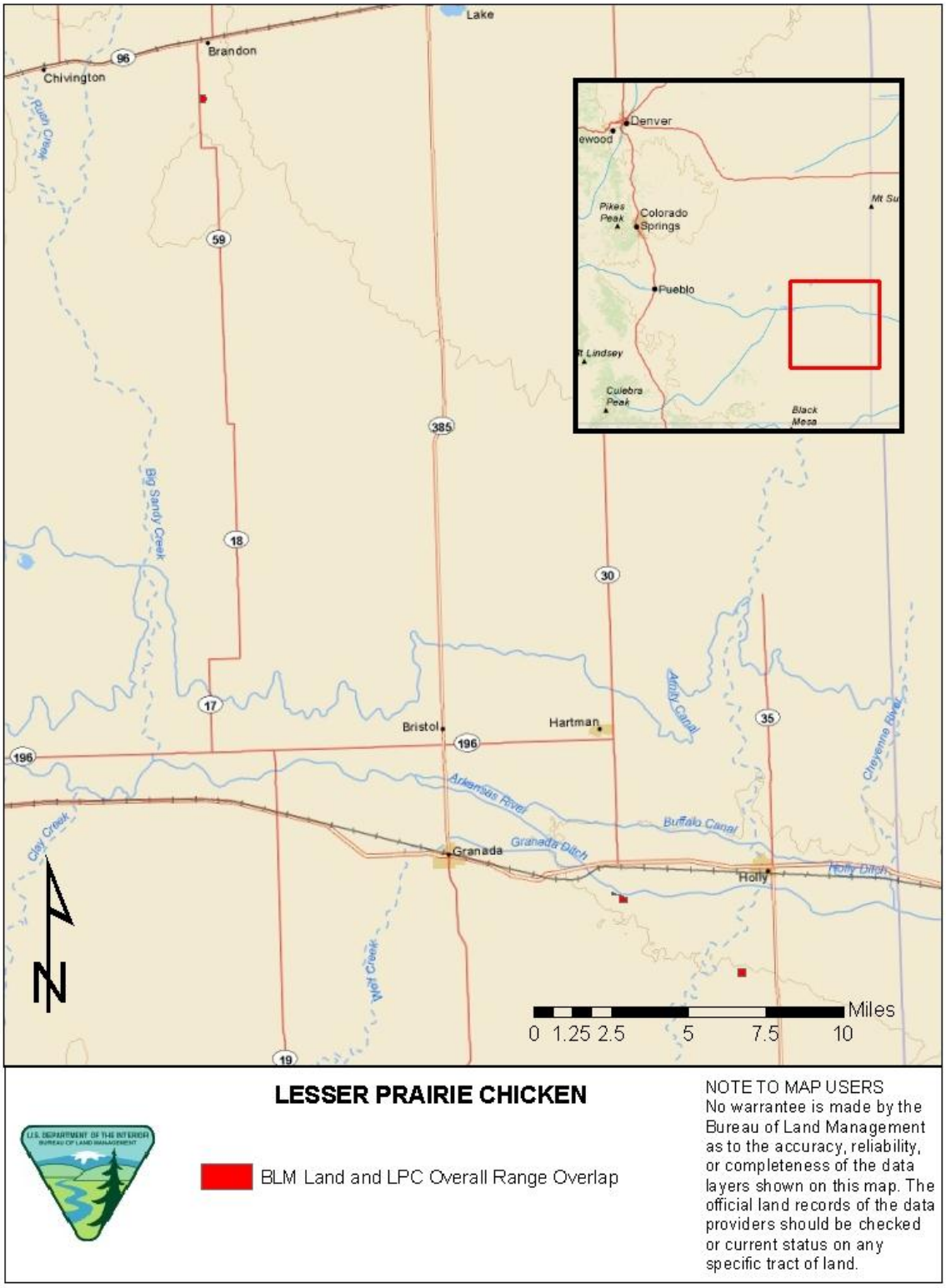
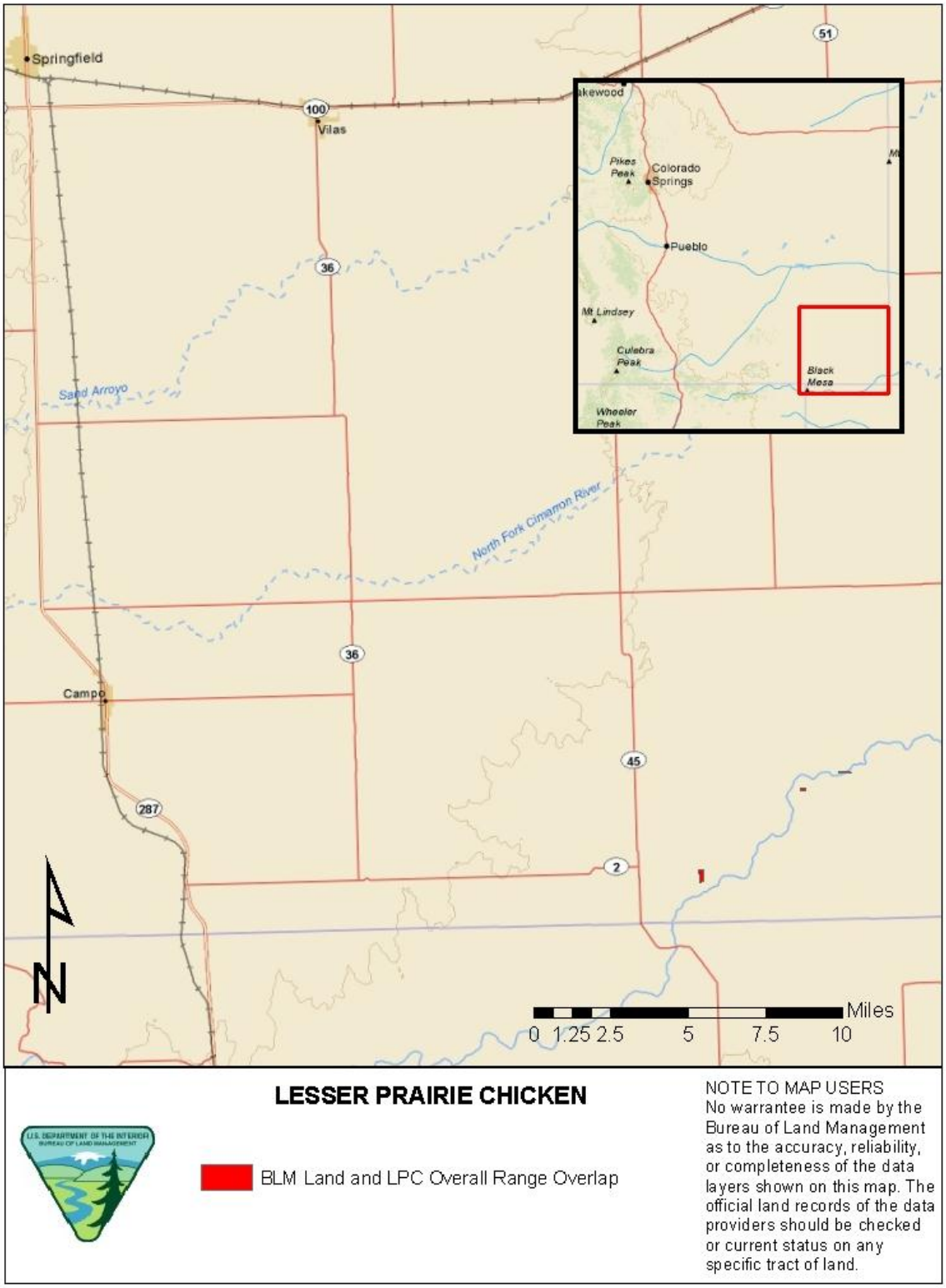


Figure 14. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and lesser prairie chicken (*Tympanuchus pallidicinctus*) overall habitat near Springfield, Colorado, 2012.



Effects of Manual Treatments on Lesser Prairie Chicken
Manual treatments would cause some disturbance associated with the presence of humans; however, these disturbances should be minimal and only short-term in duration to chickens and their habitat. Manual removal of weeds typically occurs with small infestations. Removal of weed infestations before they occur in large tracts of habitat would be beneficial.

Effects of Biological Control Treatments on Lesser Prairie Chicken
Any use of prescribed grazing as a weed treatment method within the RGFO will be analyzed under a site-specific Environmental Assessment. If the proposed prescribed grazing treatment were to occur within habitat for lesser prairie chicken, then additional Section 7 Consultation would be initiated with the USFWS.

Introduction of biocontrol agents for spotted knapweed or tamarisk are expected to have no effect on lesser prairie chickens since large infestations of these weeds are not present in or near their habitat and since the release sites are not in, or in close proximity to, suitable habitat.

Effects of Herbicide Treatments on Lesser Prairie Chicken
Use of ATVs, trucks, or horses to apply herbicides could cause some mortality or injury to LEPC as a result of crushing. It is conceivable that some animals could be sprayed inadvertently during broadcast herbicide treatments, but they are unlikely to be sprayed during spot treatments. Based on the results of the ERAs, direct spray by 2,4-D, clopyralid, glyphosate, hexazinone, picloram, or triclopyr at the typical application rate, or by imazapyr or metsulfuron methyl at the maximum application rate, could potentially result in negative effects to terrestrial vertebrates (Table 11, 12) Furthermore, if terrestrial vertebrates were to come into contact with vegetation that had been sprayed by 2,4-D at the typical application rate, or by glyphosate, hexazinone, or triclopyr at the maximum application rate, negative effects could potentially occur. Therefore, it is assumed that use of these herbicides in habitats that support LEPC could have negative effects on populations of these species

If LEPC were to ingest plant materials sprayed by 2,4-D, diquat, or diuron at the typical application rate, or by bromacil, fluridone, glyphosate, hexazinone, or tebuthiuron at the maximum application rate, negative health effects could potentially occur (Table 11-12). If LEPC were to ingest insects sprayed by 2,4-D, diquat, diuron, glyphosate, hexazinone, or triclopyr at the typical application rate, or by clopyralid or imazapyr at the maximum application rate, negative health effects would be possible. If LEPC were to ingest vegetation sprayed by 2,4-D, diquat, glyphosate, hexazinone, or triclopyr at the typical application rate, or by bromacil, clopyralid, diuron, imazapyr, picloram, or tebuthiuron at the maximum application rate, negative health effects would be possible.

Table. Summary of effects[1] to threatened, endangered, proposed, and candidate terrestrial vertebrates from dermal exposure to herbicides, as predicted by risk assessments.

Conservation Measures
The PBA did not specifically address impacts of weed treatments to LEPC; however, all bird species analyzed had similar conservation measures attached. The RGFO would incorporate the following conservation measures based on Tables 11 and 12 and from recommendations for most

bird species from the PBA in regards to weed treatments to help minimize these risks to LEPC (BLM 2007c).

- Where feasible, avoid use of the following herbicides in LEPC overall range as mapped by CDOW or production areas, defined as a 2.2 mile buffer zone around active LEPC leks (Figure 13 and 14): 2,4-D, clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, and triclopyr.
- If spraying bromacil, imazapyr, metsulfuron methyl, or tebuthiuron in LEPC production areas or overall range use the typical rather than the maximum application rate.
- Avoid implementation of any weed treatment activities in production areas from April-July. This timeframe encompasses the entire reproductive cycle of LEPC, from the attendance of leks through brood rearing.

Determination of effects for Lesser Prairie Chickens

Given the assumption the proposed vegetation treatments could occur anywhere on public lands, the proposed treatment program, absent application of conservation measures, may have negative effects on LEPC and/or potential designated critical habitat. In recognition of this, the conservation measures discussed were designed to reduce the chance of such negative effects occurring to the point where the likelihood of such effects would be discountable, or to reduce any potential effects to the point where they would be insignificant to the species or their habitat, and would never reach the scale where take occurs. As a result, with application of these conservation measures, the action ***"may affect, not likely to adversely affect"*** LEPC within the RGFO.

Black-Footed Ferret and Gunnison's Prairie Dog

Black-Footed Ferret: Status, Natural History, and Location of Habitat within RGFO

Currently, there are no known populations of black-footed ferrets (*Mustela nigripes*) within the RGFO, but potential habitat does exist. All black-tailed prairie dog (*Cynomys ludovicianus*) habitats have been block cleared for the presence of ferrets within the BLM-RGFO.

Black-footed ferrets are obligate associates of prairie dogs (*Cynomys* spp.) for both prey and shelter. Ferrets use prairie dog burrow systems for hunting and shelter, spending a vast majority of their time underground. While ferrets may consume other small mammals (e.g. mice, rabbits, carrion, etc), their primary prey is prairie dogs. Ferrets are active year-round. They breed in February and March and kits emerge from natal burrows in mid-July. Thorough descriptions of ferret natural history and the local reintroduction efforts can be found in the PBA (BLM 2007c) and in "A Review of Black-Footed Ferret Reintroduction in Northwest Colorado, 2001-2006" (Holmes 2008), respectively, and are available upon request.

Weed species that are currently likely to occur within black-footed habitat include cheatgrass, halogeten, spotted knapweed, Russian knapweed, musk thistle, Canada thistle, and bull thistle.

Gunnison's Prairie Dog: Status, Natural History, and Location of Habitat within RGFO

The Gunnison's prairie dog (Cynomys gunnisoni) is an Endangered Species Act candidate species. The BLM has been issued guidance not to conference on candidate species; however, mandates require that BLM authorized actions cannot contribute to the need to list.

The Gunnison's prairie dog (GDP) is limited to the high mountain valleys and plateaus in the southern Rocky Mountains (Figure 15 and 16). Its distribution centers on the Four Corners region where the states of Utah, Colorado, New Mexico, and Arizona meet. The northernmost population of the species is found in South Park, CO, while the southernmost population resides near the Mogollon Mountains in southwestern New Mexico.

Gunnison's prairie dog is a stout-bodied creature whose total length varies from 309 to 373 mm. Males are larger than females on average, and subspecies differ slightly in color and size. The dorsal pelage of these animals is yellowish buff intermixed with blackish hairs, while the top of the head, sides of the cheeks, and eyebrows are noticeably darker than the other portions of the pelage. The onset of reproduction is somewhat variable and dependent on latitude, elevation, and seasonal variation. Females are capable of reproducing at 1 year of age and bear a single litter per year (average size is 4.78 young) after a 30 day gestation period. Gunnison's prairie dogs are adapted to an almost exclusively graminivorous diet. In addition, analyses of the stomach contents of GPD have shown that these creatures also eat forbs, sedges, and shrubs (Pizzimenti and Hoffmann 1973).

Compared to the habitats of other prairie dog species, the habitat of GPD varies greatly with respect to topography and vegetation. In addition, the burrow systems of GPD are more similar to those of ground squirrels than they are to other species of prairie dogs. Entrances are usually located on slopes or small hummocks rather than in depressions, which protects the burrows from flooding. Most of the impacts to GPD can be attributed to predators, disease, and disturbance by man. Human caused impacts include fragmentation and loss of habitat from development, shooting and poisoning (Pizzimenti and Hoffmann 1973). Predators include such animals as badgers, coyotes, weasels, and several species of raptors, and an occasional pup may be lost to the rattlesnakes that often inhabit the burrow systems (Cully 1991 and Pizzimenti and Hoffmann 1973).

The GPD is considered a Candidate species by the US Fish and Wildlife Service and a Sensitive species by BLM.

Figure 15. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Gunnison's Prairie Dog (*Cynomys gunnisoni*) overall habitat near Hartsel, Colorado, 2012.

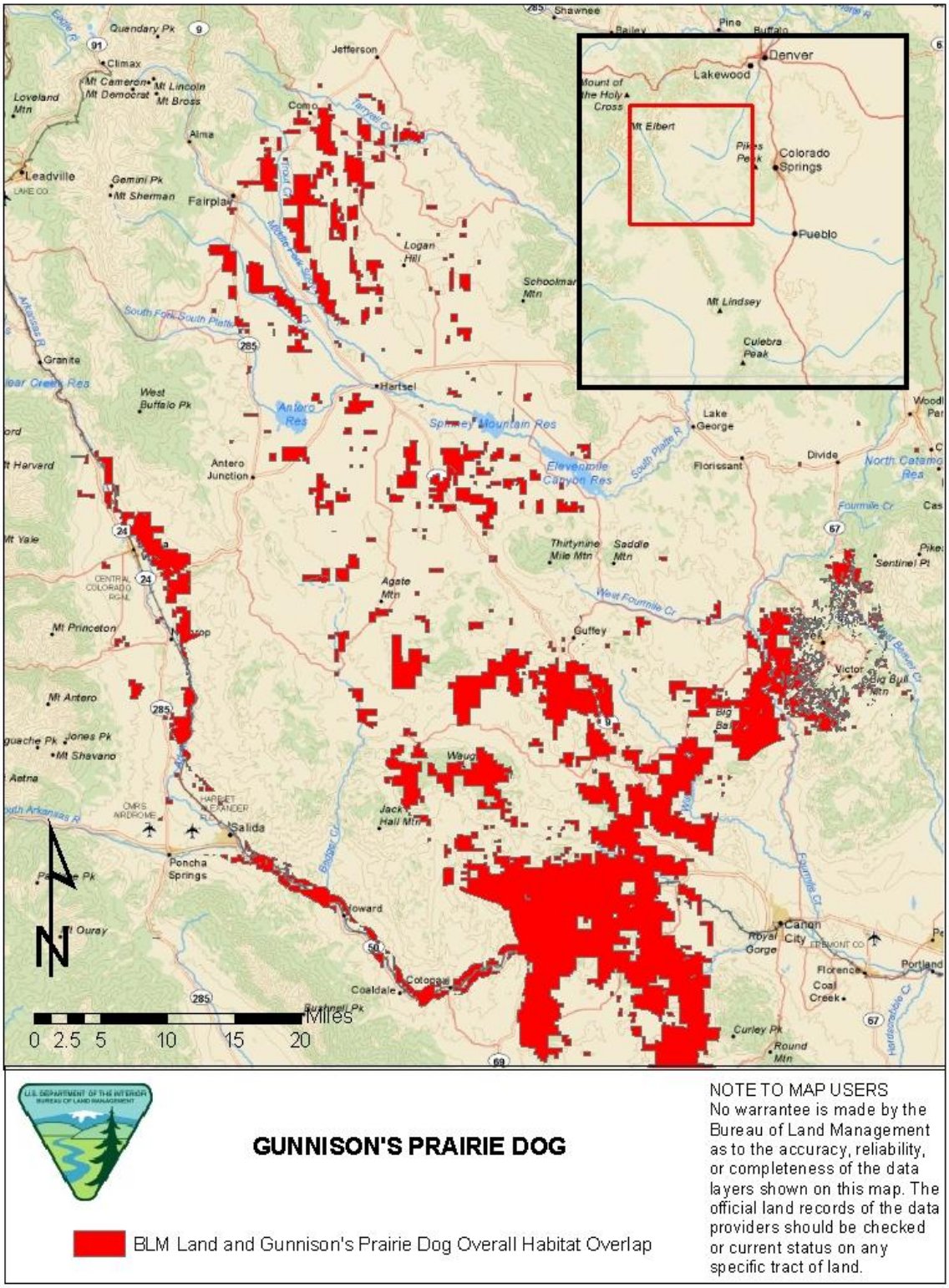
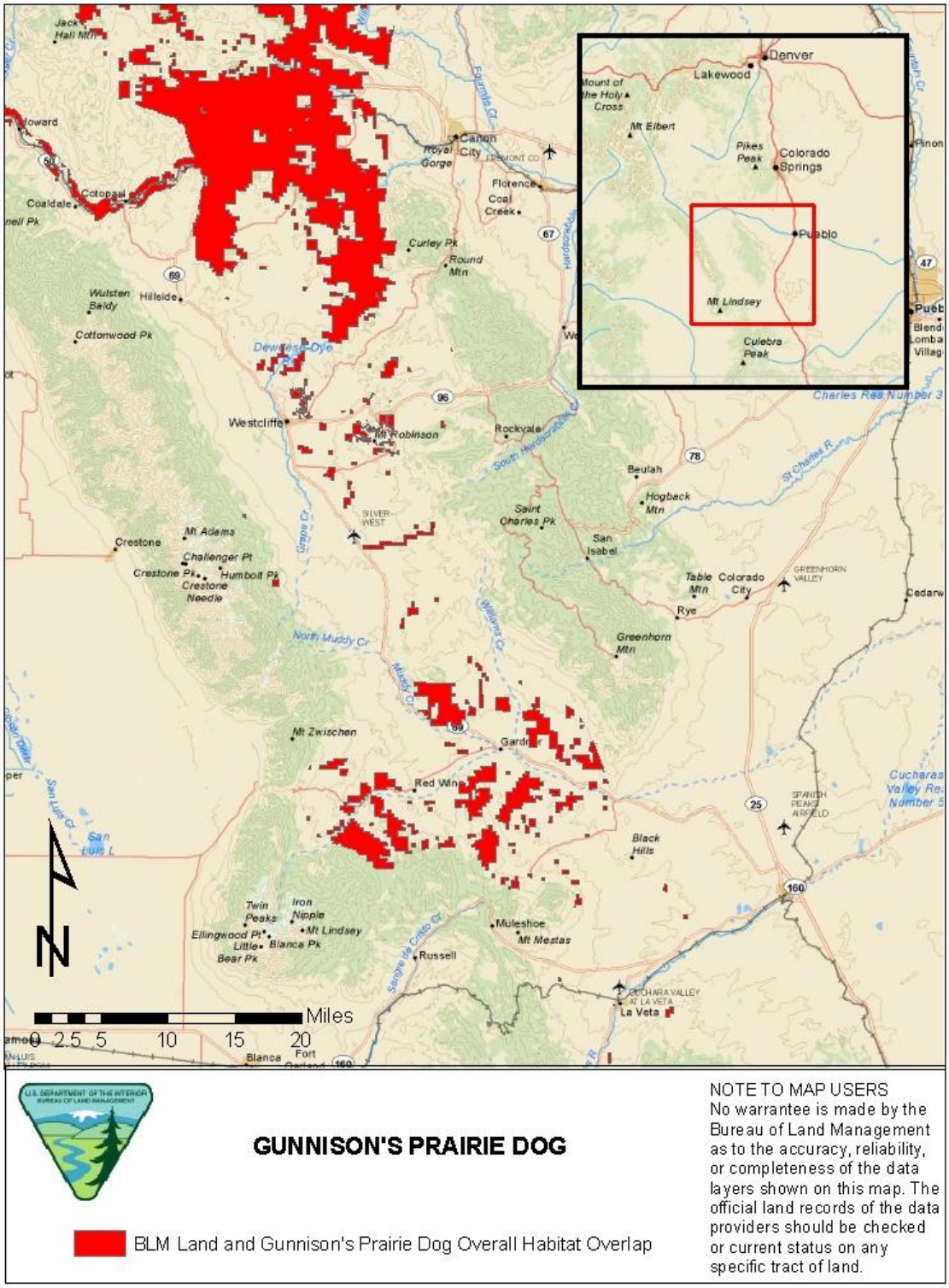


Figure 16. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Gunnison's Prairie Dog (*Cynomys gunnisoni*) overall habitat near Westcliffe, Colorado, 2012.



Effects of Manual Treatments on Black-Footed Ferrets and Gunnison's Prairie Dog
Manual removal of weeds would not result in substantial disturbance to ferrets and prairie dogs or their habitat. Manual removal of weeds typically occurs with small infestations. Removal of weed infestations before they occur in large tracts of habitat would be beneficial.

Effects of Biological Control Treatments on Black-Footed Ferrets and Gunnison's Prairie Dog
Any use of prescribed grazing as a weed treatment method within the RGFO will be analyzed under a site-specific Environmental Assessment. If the proposed prescribed grazing treatment were to occur within habitat for black-footed ferrets or GPD, then additional Section 7 Consultation would be initiated with the USFWS.

Introduction of bio-control agents for spotted knapweed or tamarisk are expected to have no effect on ferrets, GPD or lynx since large infestations of these weeds are not present in or near their habitat and since the release sites are not in, or in close proximity to, suitable habitat.

Effects of Herbicide Treatments on Black-Footed Ferrets and Gunnison's Prairie Dog
There are no known toxicity studies specific to ferrets or prairie dogs and it is assumed that these species would be affected in the same manner as other mammals. For most exposure scenarios that were evaluated in the PEIS, there was no risk to mammals due to direct spray or ingestion of contaminated food items (Tables 13and 14). There was a low risk to mammals due to direct spray (100% absorption) of glyphosate, hexazinone, or triclopyr at the typical application rate, or imazapyr or metsulfuron at the maximum application rate, or clopyralid and picloram at any application rate. The highest risk to mammals was a moderate risk associated with direct spray of glyphosate, hexazinone, or triclopyr at the maximum application rate or 2,4-D at any application rate. Ferrets are nocturnal animals that spend the daylight hours underground in prairie dog burrows thus it is highly unlikely that ferrets would ever be sprayed during herbicide application (e.g. aerial applications). It is practically inconceivable that that GPD would be sprayed by herbicides applied as spot spray treatments. For ground broadcast applications, it is assumed that GPD would retreat within burrow systems and thus it is unlikely that they would be directly exposed to chemicals. It is more likely that they would be directly exposed to herbicides during an aerial broadcast application. To minimize the risk of direct exposure to chemicals, the RGFO will not use aerial broadcast as an application method within known GPD colonies.

However, it is possible that ferrets and GPD would be exposed to herbicide through ingestion of contaminated food items (i.e. prairie dogs, vegetation). Ferrets may also be indirectly affected by herbicide treatments if herbicides were to negatively impact prairie dogs to the extent that it reduced the available prey base. Prairie dogs may be directly exposed if the herbicide were applied aerially since they occur in many of the places in the RGFO where there are expansive stands of noxious weeds and thus occur in locations were larger scale treatments may be employed. Prairie dogs and other possible prey species may also be exposed due to ingestion of contaminated vegetation. Most of the proposed herbicides pose no risk to small mammalian herbivores due to consumption of contaminated vegetation. There is a low risk associated diquat or diuron at the typical application rate or bromacil, dicamba, or tebuthiuron applied at the maximum application rate. The highest risk was a moderate risk associated with consumption of vegetation contaminated by diquat and diuron applied at the maximum application rates (Table 13). Most of the proposed herbicides pose no risk to mammalian carnivores that may consume

contaminated prey. There is a low risk associated with consumption of contaminated prey from applications of dicamba, diuron, and 2,4-D at any application rate and from application of bromacil and triclopyr at the maximum application rate (Tables 13 and 14).

Conservation Measures

The RGFO would incorporate the following conservation measures from the PBA in regards to weed treatments to help minimize these risks even further:

- Do not use of the following herbicides in occupied black-footed ferret or GPD habitat: 2, 4-D, clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, and triclopyr.
- If spraying bromacil, Imazapyr, metsulfuron methyl, or tebuthiuron in occupied black-footed ferret or GPD habitat, apply at the typical, rather than the maximum application rate.
- Do not broadcast spray 2,4-D, diquat, or diuron within ¼ mile of occupied black-footed ferret or GPD habitat.
- Do not broadcast spray glyphosate at rates higher than 0.375 lbs of acid equivalent per acre within ¼ mile of occupied black-footed ferret and GPD habitat under conditions when spray drift onto the habitat is likely.

In contrast to weed treatments (where the goal is to remove weed species and restore native vegetation communities), the RGFO also authorizes bare ground treatments where the goal is complete removal of all vegetation. Bare ground treatments typically use herbicides such as Round Up (glyphosate), Krovar (bromacil and diuron), Sahara (diuron and imazapyr) and Karmex DF (diuron) to achieve long-term results.

The proposed treatments would be confined to fenced industrial facility yards and the immediate vicinity of oil and gas production and transportation equipment that has been maintained in a heavily disturbed and non-vegetated state and provide no practical cover or forage component for wildlife. Short duration and localized herbicide application activities would have no further influence on nearby habitats than periodic well and pipeline inspection and maintenance activities.

For the described bare ground treatments, the RGFO would include the following conservation measures:

- Hand spraying application of glyphosate, bromacil, diuron, and imazapyr would be permitted for bare ground treatments within occupied black-footed ferret and GPD habitat. No aerial application would be used for bare ground treatments.
- For bare ground treatments, the area to be treated will be limited to a distance of up to 10 feet (3m) from the edge of well heads, meter houses, tanks, etc. Equipment enclosed in fences would be protected from the encroachment of vegetation out to the fence.

Cumulative Effects

As mentioned in the analysis for TEPC plants, State, county, and local governments along with private property owners are expected to continue to treat weeds on their property. They may use similar methods as those described in the VTMP but they are not limited to only those methods.

Determination of Effects
There is no known existence of ferrets within the RGFO; therefore, there will be ***"no effect"*** to black-footed ferrets. If ferrets are located within RGFO managed lands, implementation of the conservation measures would lead to a ***"may affect, but not likely to adversely affect"*** determination. Based on proposed treatment techniques (including BMPs, SOPs, and the conservation measures listed above) and the intent of the VTMP to minimize infestations of invasive weeds as much as practical, we conclude that the proposed RGFO VTMP will not jeopardize the continued existence of any prairie dog population within the RGFO and ***"may affect, but not likely to adversely affect"*** GPD. No further consultation for site specific weed treatments or annual weed plans as long as they are within the scope of this project.

Canada Lynx

Canada Lynx: Status, Natural History, and Location of Habitat within RGFO
Canada lynx (*Lynx canadensis*) are listed as Threatened under the ESA. There is no designated critical habitat for this species within Colorado. There are documented occurrences of lynx on BLM land within the RGFO. Within the RGFO, habitat classified as denning, winter, or "other" within the LAUs is considered Canada lynx habitat (Figure 17-22).

Lynx occur in sub-alpine coniferous forests and in riparian shrub communities (e.g. willow, alder). Large woody debris (e.g. downed logs) is used as den sites and provide kittens with both thermal cover and cover from predators. The primary prey of lynx is snowshoe hare (*Lynx canadensis*), but they will also consume other small mammals and birds. Lynx breed in late winter/early spring and produce one litter every one to two years. Thorough descriptions of lynx natural history can be found in the PBA (BLM 2007c) and in the "Canada Lynx Conservation Assessment and Strategy" (Ruediger et al. 2000), which are available upon request. A map detailing the spatial arrangement of habitat types (i.e. denning, winter, other, unsuitable, etc) within the LAUs on BLM is also available upon request.

Weed species that are currently likely to occur within the LAUs include yellow toadflax, Canada thistle, bull thistle, musk thistle, spotted knapweed, Russian knapweed, cheatgrass, and houndstongue.

Figure 17. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Canada lynx (*Lynx canadensis*) overall habitat near Salida, Colorado, 2012.

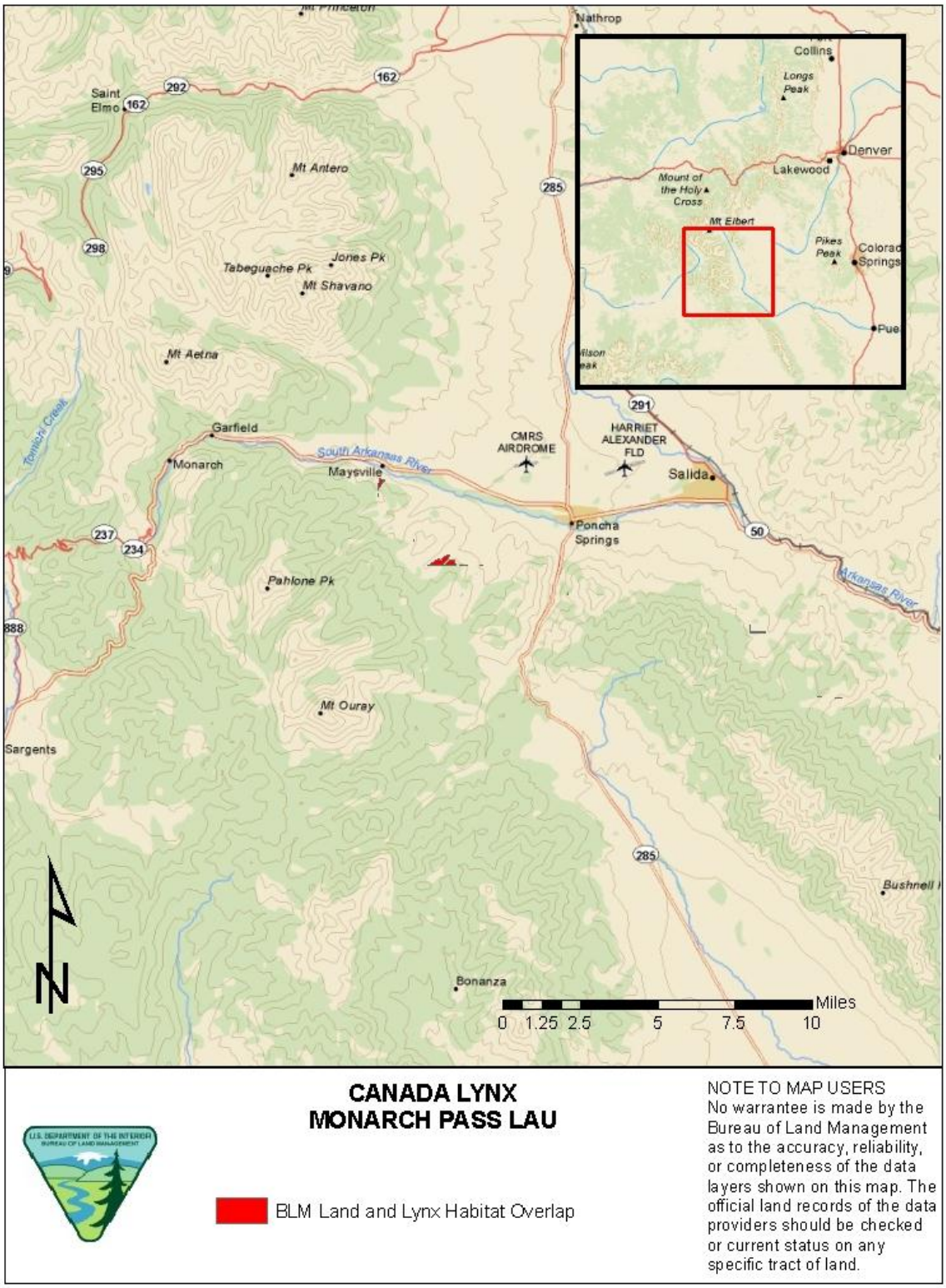


Figure 18. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Canada lynx (*Lynx canadensis*) overall habitat near Gardner, Colorado, 2012.

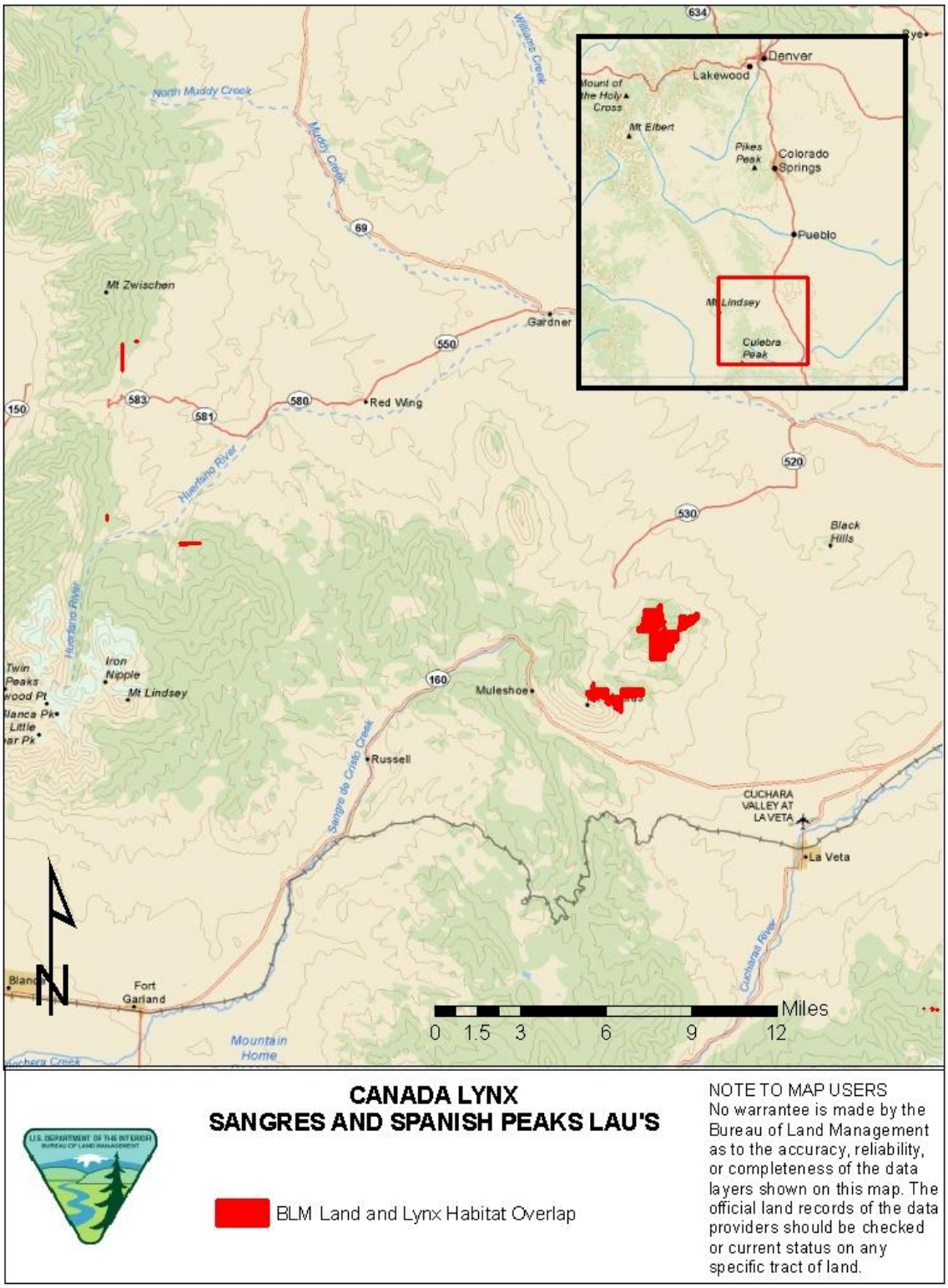


Figure 19. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Canada lynx (*Lynx canadensis*) overall habitat near Cotopaxi, Colorado, 2012.

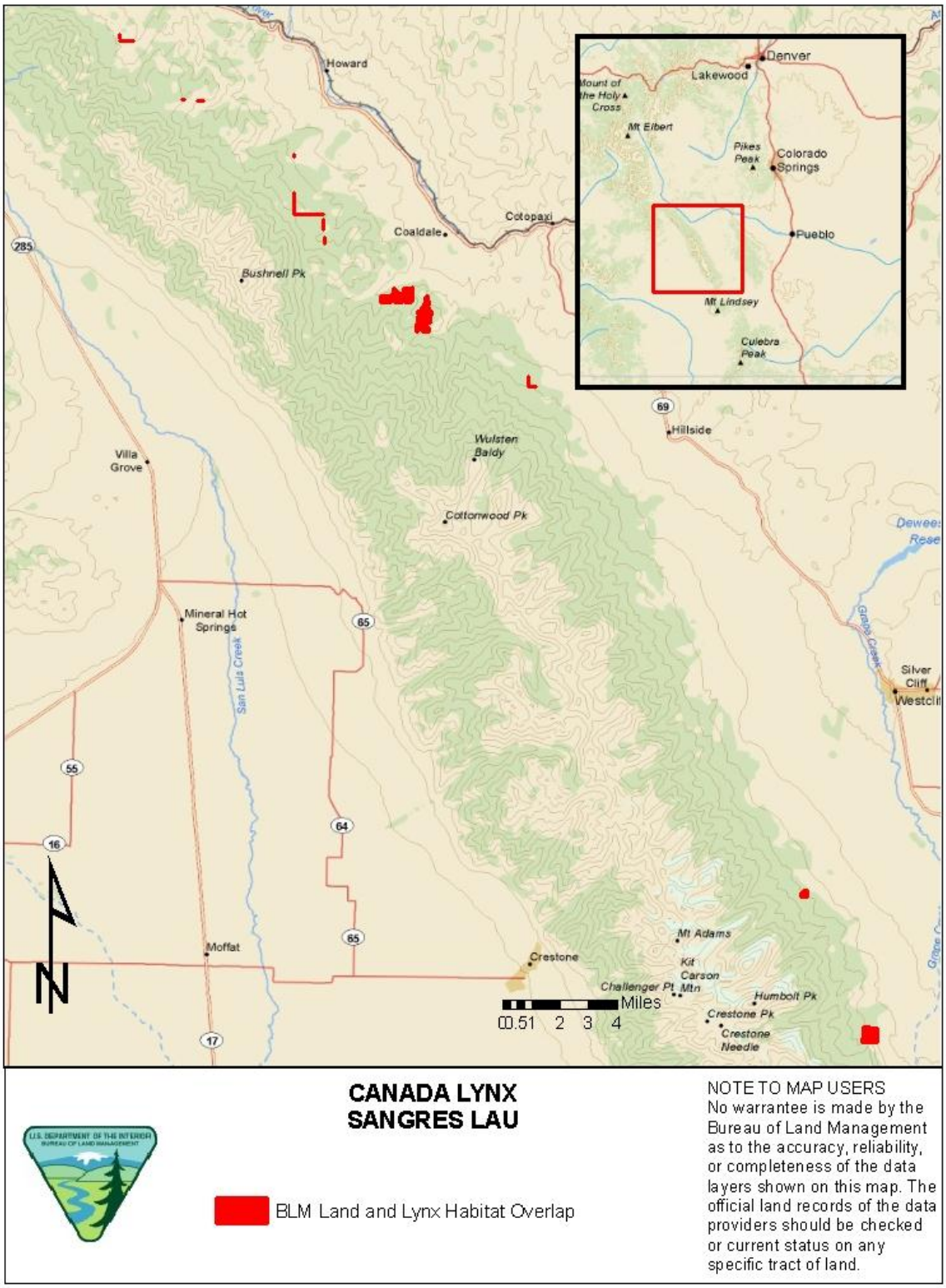


Figure 20. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Canada lynx (*Lynx canadensis*) overall habitat near Wetmore, Colorado, 2012.

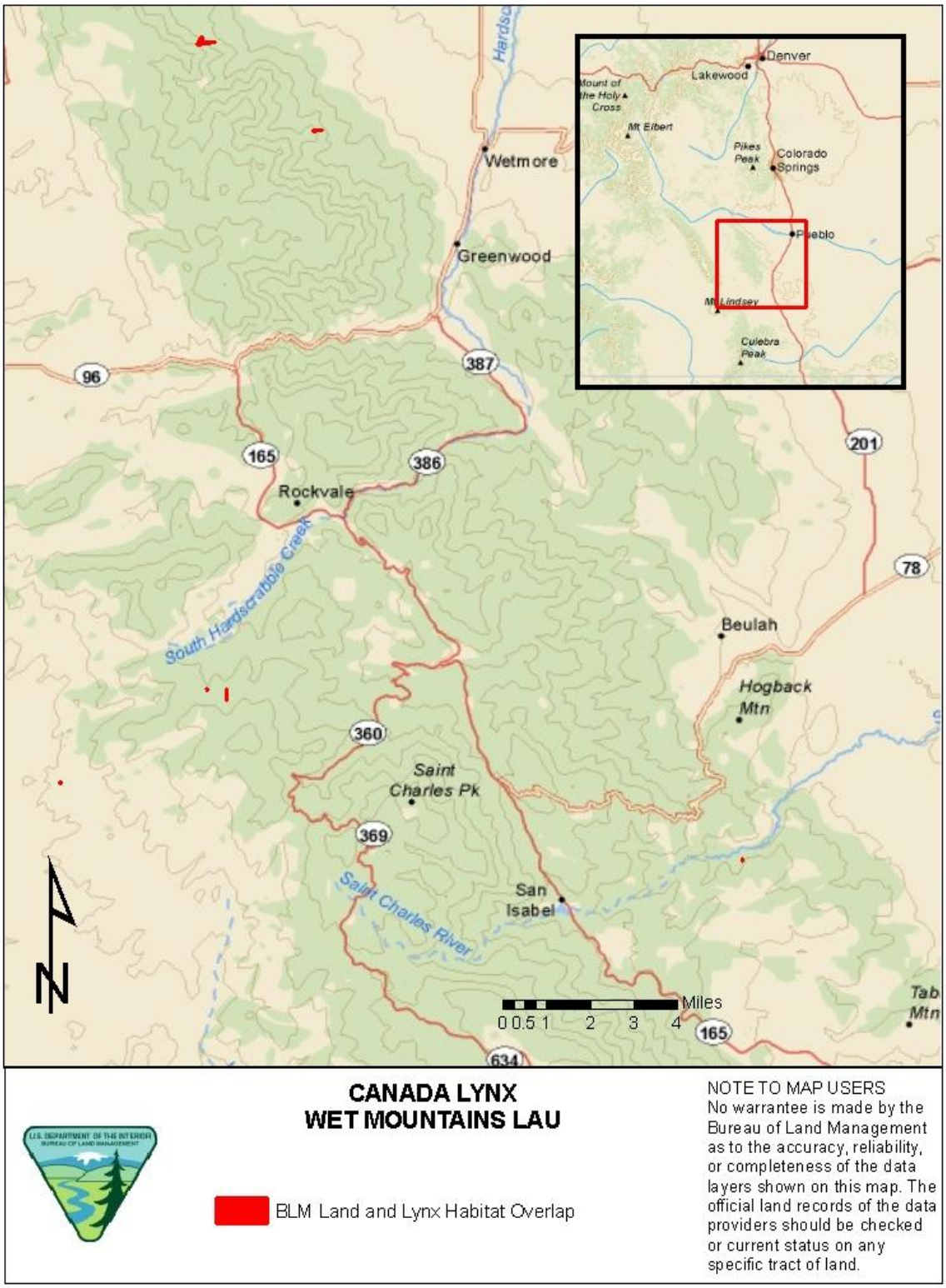


Figure 21. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Canada lynx (*Lynx canadensis*) overall habitat near Central City, Colorado 2012.

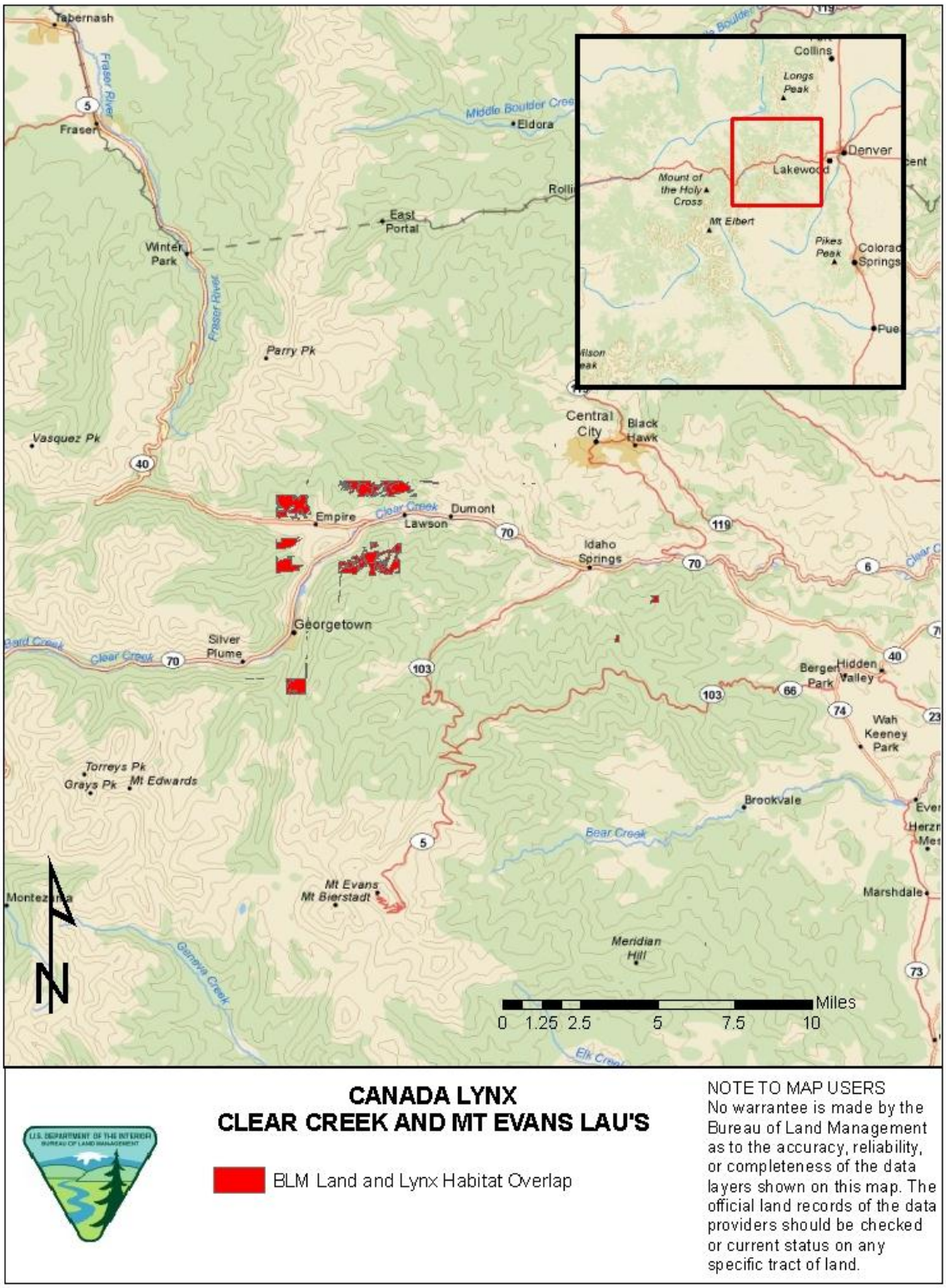
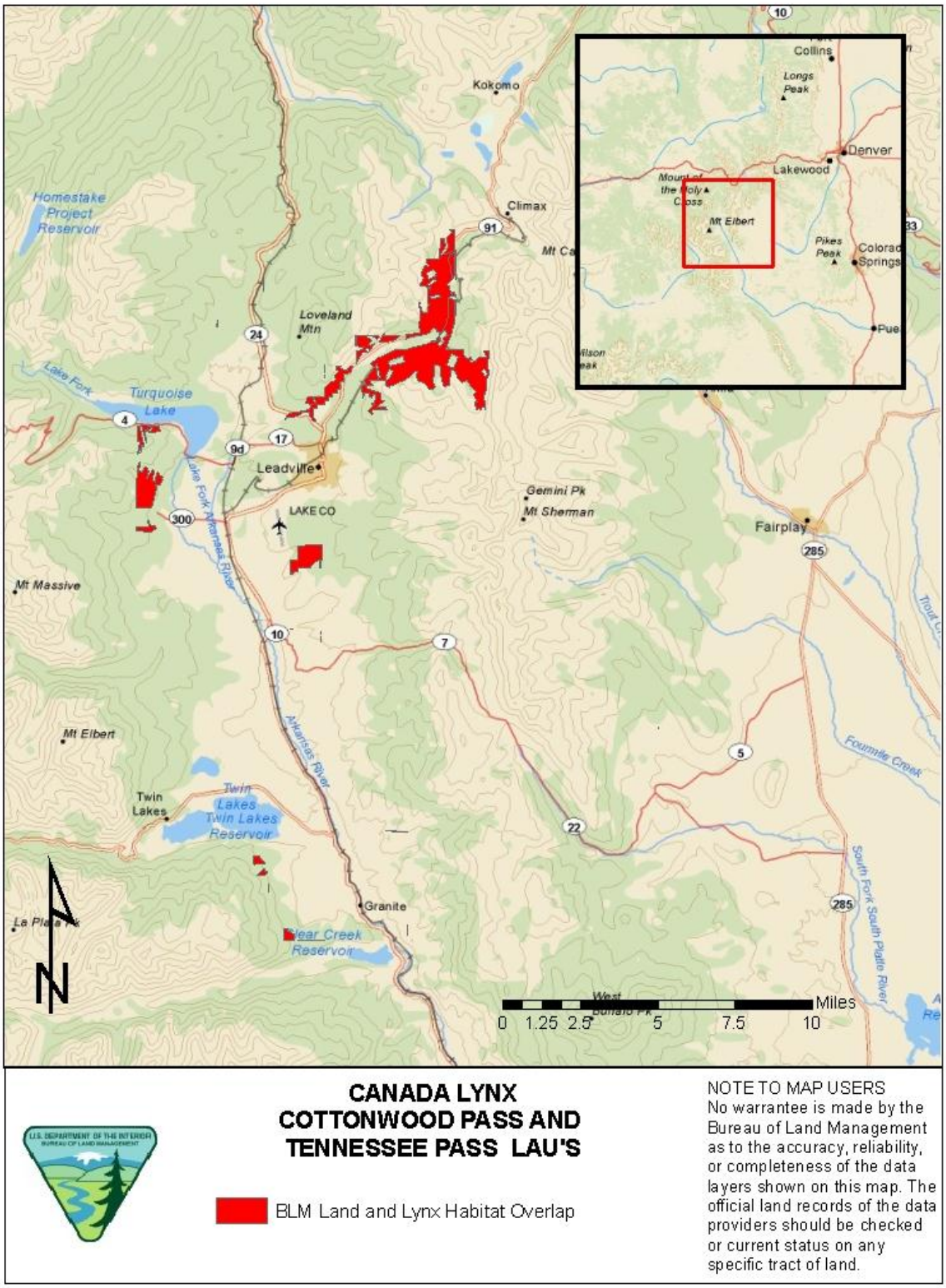


Figure 22. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Canada lynx (*Lynx canadensis*) overall habitat near Leadville, Colorado, 2012.



Effects of Manual Treatments on Canada Lynx
Manual removal of weeds would not result in substantial disturbance to lynx or their habitat. Manual removal of weeds typically occurs with small infestations. Removal of weed infestations before they occur in large tracts of habitat would be beneficial.

Effects of Biological Control Treatments on Canada Lynx
Any use of prescribed grazing as a weed treatment method within the RGFO will be analyzed under a site-specific Environmental Assessment. If the proposed prescribed grazing treatment were to occur within habitat for Canada lynx then additional Section 7 Consultation would be initiated with the USFWS.

Introduction of bio-control agents for spotted knapweed or tamarisk are expected to have no effect on lynx since large infestations of these weeds are not present in or near their habitat and since the release sites are not in, or in close proximity to, suitable habitat.

Effects of Herbicide Treatments on Canada Lynx
There are no known toxicity studies specific to lynx and it is assumed that these species would be affected in the same manner as other mammals. For most exposure scenarios that were evaluated in the PEIS, there was no risk to mammals due to direct spray or ingestion of contaminated food items (Tables 13 and 14). There was a low risk to mammals due to direct spray (100% absorption) of glyphosate, hexazinone, or triclopyr at the typical application rate, or imazapyr or metsulfuron at the maximum application rate, or clopyralid and picloram at any application rate. The highest risk to mammals was a moderate risk associated with direct spray of glyphosate, hexazinone, or triclopyr at the maximum application rate or 2,4-D at any application rate. It is practically inconceivable that that lynx would be sprayed by herbicides applied as spot spray treatments. For ground broadcast applications, it is assumed that lynx would temporarily move out of the area during the application process and thus it is unlikely that they would be directly exposed to chemicals. It is more likely that they would be directly exposed to herbicides during an aerial broadcast application. To minimize the risk of direct exposure to chemicals, the RGFO will not use aerial broadcast as an application method within LAUs. Thus, it is unlikely that lynx would ever be directly exposed to any of the herbicides.

However, it is possible that lynx would be exposed to herbicide through ingestion of contaminated food items. Lynx may also be indirectly affected by herbicide treatments if herbicides were to negatively impact hares to the extent that it reduced the available prey base. Snowshoe hares may be exposed to herbicides directly during broadcast applications (ground). Snowshoe hares and other possible prey species may also be exposed due to ingestion of contaminated vegetation. Most of the proposed herbicides pose no risk to small mammalian herbivores due to consumption of contaminated vegetation. There is a low risk associated diquat or diuron at the typical application rate or bromacil, dicamba, or tebuthiuron applied at the maximum application rate. The highest risk was a moderate risk associated with consumption of vegetation contaminated by diquat and diuron applied at the maximum application rates (Table 13). Most of the proposed herbicides pose no risk to mammalian carnivores that may consume contaminated prey. There is a low risk associated with consumption of contaminated prey from applications of dicamba, diuron, and 2,4-D at any application rate and from application of bromacil and triclopyr at the maximum application rate (Tables 13 and 14).

Conservation Measures

The RGFO would incorporate the following conservation measures from the PBA in regards to weed treatments to help minimize these risks even further:

- Do not use of the following herbicides in Canada lynx habitat: 2, 4-D, clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, and triclopyr.
- If spraying bromacil, Imazapyr, metsulfuron methyl, or tebuthiuron in Canada lynx habitat, apply at the typical, rather than the maximum application rate.
- Do not broadcast spray 2,4-D, diquat, or diuron within ¼ mile of Canada lynx habitat.
- Do not broadcast spray glyphosate at rates higher than 0.375 lbs of acid equivalent per acre within ¼ mile of Canada lynx habitat under conditions when spray drift onto the habitat is likely.

In contrast to weed treatments (where the goal is to remove weed species and restore native vegetation communities), the RGFO also authorizes bare ground treatments where the goal is complete removal of all vegetation. Bare ground treatments typically use herbicides such as Round Up (glyphosate), Krovar (bromacil and diuron), Sahara (diuron and imazapyr) and Karmex DF (diuron) to achieve long-term results.

The proposed treatments would be confined to fenced industrial facility yards and the immediate vicinity of oil and gas production and transportation equipment that has been maintained in a heavily disturbed and non-vegetated state and provide no practical cover or forage component for wildlife. Short duration and localized herbicide application activities would have no further influence on nearby habitats than periodic well and pipeline inspection and maintenance activities.

For the described bare ground treatments, the RGFO would include the following conservation measures:

- Hand spraying application of glyphosate, bromacil, diuron, and imazapyr would be permitted for bare ground treatments within Canada lynx habitat. No aerial application would be used for bare ground treatments.
- For bare ground treatments, the area to be treated will be limited to a distance of up to 10 feet (3m) from the edge of well heads, meter houses, tanks, etc. Equipment enclosed in fences would be protected from the encroachment of vegetation out to the fence.

Cumulative Effects

As mentioned in the analysis for TEPC plants, State, county, and local governments along with private property owners are expected to continue to treat weeds on their property. They may use similar methods as those described in the VTMP but they are not limited to only those methods.

Determination of Effects

Based on proposed treatment techniques (including BMPs, SOPs, and the conservation measures listed above) and the intent of the VTMP to minimize infestations of invasive weeds as much as practical, we conclude that the proposed RGFO VTMP will not jeopardize the continued existence of Canada lynx within the RGFO and ***"may affect, but not likely to adversely affect"*** Canada lynx. No further consultation for site specific weed treatments or annual weed plans as long as they are within the scope of this project.

TERRESTIRAL INVERTEBRATES

Uncompahgre Fritillary Butterfly and Montane Pawnee Skipper

Uncompahgre Fritillary Butterfly: Status, Natural History, and Location of Habitat within RGFO

The Uncompahgre fritillary was federally listed as endangered on June 24, 1991. Critical habitat has not been designated. Over-collection is considered the greatest human-caused threat to the species. Its sedentary nature, weak flying ability, and tendency to fly low to the ground make it easy to collect. Other actual or potential effects to the species include negative climatic changes, small population size, and low genetic variability. There is also a minor potential threat from the trampling of larvae by livestock and humans.

The Uncompahgre fritillary butterfly (*Boloria acrocnema*) has the smallest total range of any North American butterfly species. Its habitat is limited to two verified areas (inhabited by three colonies), and possibly an additional two small colonies in the San Juan Mountains and southern Sawatch Range in Gunnison, Hinsdale, and Chaffee counties in southwestern Colorado. All colonies known to the USFWS are associated with patches of snow willow, which provides larval food and cover, and are located above 12,500 feet. The species has been found only on northeast-facing slopes, which are the coolest and wettest microhabitat available in the San Juan Mountains (Scott 1982, Brussard and Britten 1989). Adults nectar on a range of flowering alpine plants.

The females usually lay their eggs on snow willow plants, or in litter within snow willow patches. It is believed that the species has a biennial life history, requiring 2 years to complete its life cycle (Scott 1982, Brussard and Britten 1989). Eggs laid in even years are caterpillars during the following odd year, and then mature into adults during the following even year. Although odd- and even-year broods may function as essentially separate populations, evidence of gene flow between the two (Brussard and Britten 1989) suggests that at times, larvae hatched early in the summer can develop into adults the following year.

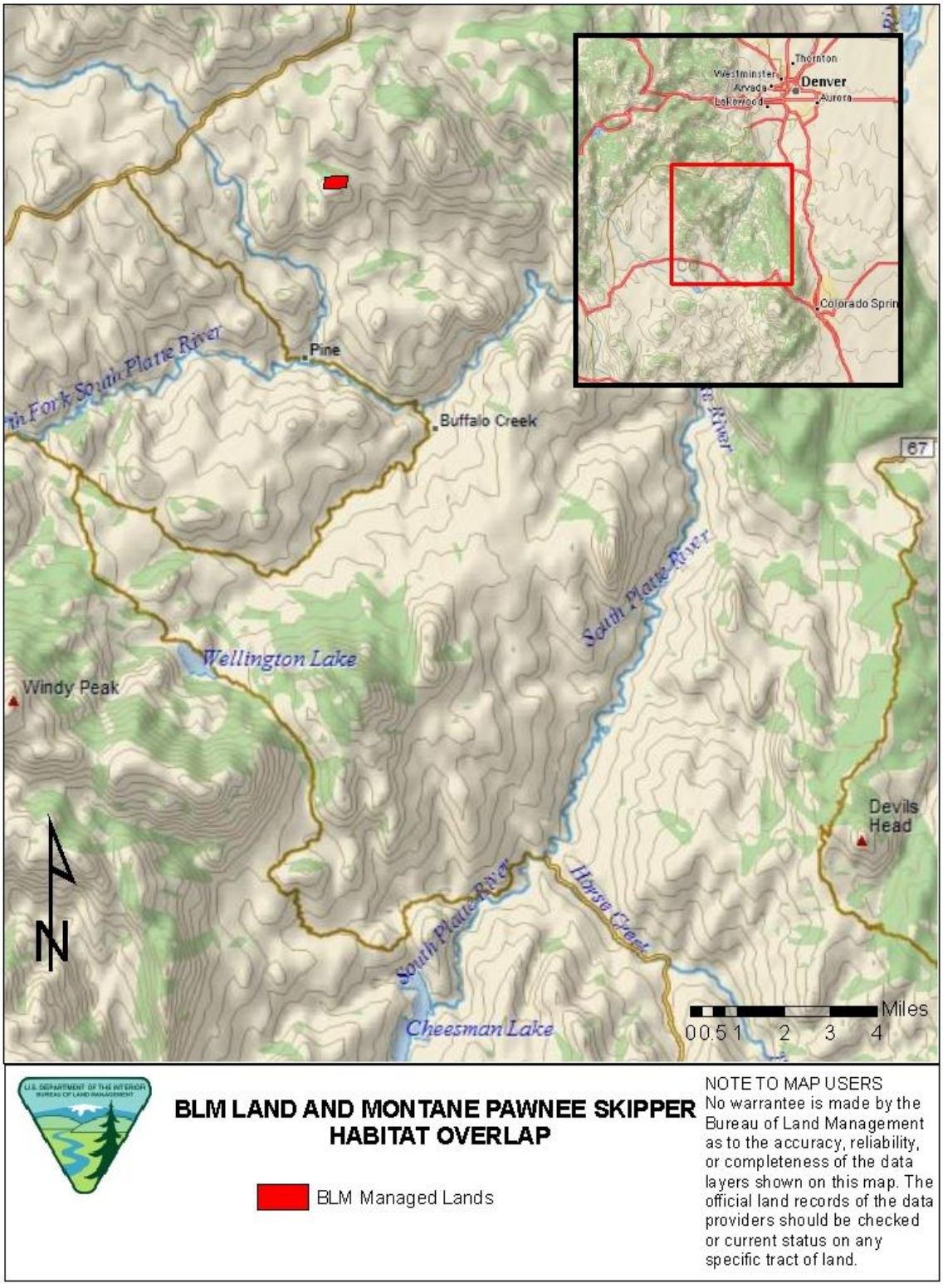
Montane Pawnee Skipper: Status, Natural History, and Location of Habitat within RGFO

The Pawnee montane skipper (*Hesperia leonardus montana*) occurs only on the Pikes Peak Granite Formation in the South Platte River drainage system in Colorado, involving portions of Jefferson, Douglas, Teller, and Park Counties.

An intensive distribution survey was conducted within the South Platte drainage by the consulting firms of Environmental Research & Technology, Inc. (ERT) and Professional Entomological Services Technology, Inc. (PEST) during August and September 1985. They found the range of the skipper to be centered at Deckers, Colorado, and to extend northwestward just beyond Pine, Colorado, and southward to the point where the county lines of Teller, Park, Jefferson, and Douglas Counties nearly converge. This total area is roughly 23 miles long and *5* miles wide. The total known habitat within this range is estimated to be 37.9 square miles. The area occupied by the skipper is owned and/or administered by the U.S. Forest Service (Pike National Forest), Jefferson County, Colorado State Land Board, and the Bureau of Land

Management. Denver Water Department and private individuals own the rest of the habitat. The BLM-RGFO manages approximately 80 acres four miles north of Pine, Colorado within the described range of the skipper (Figure 23)

Figure 23. Overlap of Bureau of Land Management-Royal Gorge Field Office managed lands and Montane Pawnee Skipper (*Hesperia leonardus montana*) overall habitat near Denver, Colorado, 2012.



The skippers occur in dry, open, Ponderosa pine woodlands at an elevation range of 6,000 to 7,500 feet. The slopes are moderately steep with soils derived from Pikes Peak granite. The understory is limited in the pine woodlands. Blue grama grass, the larval food plant, and the prairie gayfeather, the primary nectar plant, are two necessary components of the ground cover strata. Small clumps of blue grama occur throughout the warm, open slopes inhabited by skippers. Prairie gayfeather occurs throughout the ponderosa pine woodlands. Skippers are very uncommon in pine woodlands with a tall shrub understory (Keenan et al. 1986) or where young conifers dominate the understory (ERT 1986).

Based on quantitative skipper occurrence studies (ERT 1986), general characteristics of Pawnee montane skipper habitat include:

- Tree canopy cover of 30 percent.
- Ponderosa pine crown cover of 25 percent, Douglas fir crown cover of *5* percent.
- Tree density of less than 120 trees/acre in the smallest size class (0 to *5* feet diameter breast high); overall tree density of less than 200/acre.
- Shrub and grass cover generally less than 10 percent.
- Prairie gayfeather flower stem density ranging from 50 to 500/acre.
- Blue grama cover *5* percent or less, present nearly everywhere.

Population estimates for 1985, 1986 and 1987 were based on census survey transects and distribution survey counts (ERT 1986a, 1986b, 1988). The distribution surveys were done by plotting a 200-pace transect within each quarter/quarter section (40 acres) of each quarter section assigned for sampling. Observers counted gayfeather, blue grama and skippers along transects. The census surveys were done on 48 randomly sampled 400 meter transects. The 1985 population estimate was 80,000 to 140,000; in 1986 the estimate was 67,900 to 166,100; and in 1987, the estimate was 116,000.

Effects of Manual Treatments on Uncompahgre Fritillary Butterfly and Montane Pawnee Skipper

There would likely be some direct effects to butterflies from trampling by field crews performing manual control. Even people that are trying to avoid butterflies can easily step on larvae or damage eggs, which can be difficult to see.

Manual treatment methods are typically precise treatments that target certain undesirable species. Field crews would be able to avoid most damage to host plants or nectar plants. Therefore, the potential short-term effects to butterflies would be much less severe than those caused by, biological control, mechanical control, or herbicides.

Effects of Biological Control Treatments on Uncompahgre Fritillary Butterfly and Montane Pawnee Skipper

Introduction of domestic animals into butterfly habitat to contain weeds would directly affect TEPC species populations, should large herbivores trample larvae and eggs. The extent of these effects would depend on the timing and intensity of the treatment, and the amount of area covered.

During weed containment, domestic animals might graze on or cause damage to host and nectar plants, indirectly affecting butterflies by reducing the availability of food. Long-term effects of moderate levels of grazing would likely be positive, as domestic animals can control the invasion of open areas by trees and shrubs. Containment of weeds adjacent to occupied habitat could have long-term positive effects by increasing the suitability of habitat for future inhabitance by TEPC butterfly species.

There could be some trampling of larvae, eggs, and adults by workers releasing biological control agents into butterfly and moth habitats. This disturbance would be minimal, and of short duration. Over the long term, there is the potential for unforeseen impacts to butterflies and resulting from the release of biological control agents. The likelihood of such an occurrence is very slim and not anticipated; however, the USFWS will be consulted if biological control treatments are proposed.

Effects of Herbicide Treatments on Uncompahgre Fritillary Butterfly and Montane Pawnee Skipper

During herbicide treatments in areas where listed butterflies occur, trucks and/or ATVs used to apply herbicides could crush larvae, eggs, and adults. Horses, or workers on foot with backback sprayers, could also trample butterflies in the treatment area, resulting in injury or mortality.

Inadvertent exposure of TEPC butterflies to herbicides would be likely if treatments were to occur in areas where these species occur. Reasonable exposure pathways include direct spray (particularly during sedentary phases of the life cycle) and dermal contact with vegetation that has been treated with herbicides. According to ERAs (BLM 2007c), direct spray of butterflies by 2,4-D, bromacil, diquat, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr at the typical application rate, or clopyralid, imazapyr, or picloram at the maximum application rate, would potentially result in negative health effects. In addition, contact with vegetation treated by diquat, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr at the maximum application rate, or by 2,4-D at the typical application rate, could result in negative health effects to TEPC butterflies. Negative health effects could include mortality, reduced reproductive output, behavioral modification, and/or increased susceptibility to environmental stresses. These toxicological effects could lead to a further decrease in the size and viability of affected populations. Small, fragmented populations could potentially be extirpated or become more susceptible to future extirpation by environmental stresses and other factors.

Listed butterfly species could suffer indirect effects from herbicide treatments if non-target host and nectar plants were sprayed by herbicides. Indirect effects to non-target plant species are predicted as a result of direct spray by all herbicides approved for use by the BLM. In addition, non-target plants could be impacted by off-site drift and surface runoff of several herbicides approved for use by the BLM. Localized elimination or a reduction in numbers of host and/or nectar plants could result in negative population-level effects to the listed butterfly species that rely on these plants.

Conservation Measures

Many local BLM offices already have management plans in place that ensure the protection of these species during activities on public lands. The following conservation measures are the

minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect TEPC species.

Each local BLM office is required to draw up management plans related to treatment activities that identify any TEPC butterfly or moth species or their critical habitat that are present in the proposed treatment areas, as well as the measures that will be taken to protect these species. Management plans should, at a minimum, follow this general guidance:

- Use an integrated pest management approach when designing programs for managing pest outbreaks.
- Minimize the disturbance area with a pre-treatment survey to determine the best access routes. Areas with butterfly/moth host plants and/or nectar plants should be avoided.
- Minimize mechanical treatments and OHV activities on sites that support host and/or nectar plants.
- Carry out weed removal in small areas, creating openings of 5 acres or less in size.
- Wash equipment before it is brought into the treatment area.
- To protect host and nectar plants from herbicide treatments, follow recommended buffer zones and other conservation measures for TEPC plants species when conducting herbicide treatments in areas where populations of host and nectar plants occur (Table 7).
- Do not broadcast spray herbicides in habitats occupied by TEPC butterflies or moths; do not broadcast spray herbicides in areas within ¼ mile to TEPC butterfly/moth habitat under conditions when spray drift onto the habitat is likely.
- When conducting herbicide treatments in or within ¼ mile of habitat used by TEPC butterflies or moths, avoid use of the following herbicides: 2,4-D, bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, tebuthiuron, and triclopyr.
- When conducting herbicide treatments in or within ¼ mile of habitat used by TEPC butterflies or moths, use the following chemicals at the typical rather than maximum application rate: clopyralid, imazapyr, and picloram.

Determination of Effects

Given the assumption that any of the proposed vegetation treatments could occur anywhere on public lands, the proposed treatment program, absent application of conservation measures, may have negative effects on butterflies and/or their critical habitats discussed. In recognition of this, the conservation measures discussed in this chapter were designed to reduce the chance of such negative effects occurring to the point where the likelihood of such effects would be discountable, or to reduce any potential effects to the point where they would be insignificant to the species or their critical habitats, and would never reach the scale where take occurs. As a result, with application of these conservation measures, the action would be ***"may affect, not likely to adversely affect"*** butterflies or their federally designated critical habitats at the programmatic level.

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Appendix A

Herbicides and Adjuvants Approved for Use on BLM-Administered Lands in Colorado

Herbicides Approved for Use on BLM-Administered Lands in Colorado (Updated 9/28/07)*

Active Ingredient	Trade Name	Manufacturer	EPA Registration Number
Bromacil	Hyvar X	DuPont	352-287
	Hyvar XL	DuPont	352-346
Bromacil + Diuron	Kroval I DF	DuPont	352-505
	Weed Blast Res. Weed Cont.	Loveland Products Inc.	34704-576
	DiBro 2+2	Nufarm Americas Inc.	228-227
	DiBro 4+4	Nufarm Americas Inc.	228-235
	DiBro 4+2	Nufarm Americas Inc.	228-386
	Weed Blast 4G	SSI Maxim Co., Inc.	34913-19
Chlorsulfuron	Telar DF	DuPont	352-522
	Telar XP	DuPont	352-654
Clopyralid	Spur	Albaugh Inc.	42750-89
	Pyramid R&P	Albaugh Inc.	42750-94
	Clopyralid 3	Alligare, LLC	42750-94-81927
	Reclaim	Dow AgroSciences	62719-83
	Stinger	Dow AgroSciences	62719-73
	Transline	Dow AgroSciences	62719-259
	CleanSlate	Nufarm Americas Inc.	228-491
Clopyralid + 2,4-D	Curtail	Dow AgroSciences	62719-48
	Commando	Albaugh Inc.	42750-92
2,4-D	Agrisolution 2,4-D LV6	Agriliance, LLC	1381-101
	Agrisolution 2,4-D Amine 4	Agriliance, LLC	1381-103
	Agrisolution 2,4-D LV4	Agriliance, LLC	1381-102
	2,4-D Amine 4	Albaugh Inc./Agri Star	42750-19
	2,4-D LV 4	Albaugh Inc./Agri Star	42750-15
	Solve 2,4-D	Albaugh Inc./Agri Star	42750-22
	2,4-D LV 6	Albaugh Inc./Agri Star	42750-20
	Five Star	Albaugh Inc./Agri Star	42750-49
	D-638	Albaugh Inc./Agri Star	42750-36
	2,4-D LV6	Helena Chemical Co.	4275-20-5905
	2,4-D Amine	Helena Chemical Co.	5905-72
	Opti-Amine	Helena Chemical Co.	5905-501
	Barrage HF	Helena Chemical Co.	5905-529
	HardBall	Helena Chemical Co.	5905-549
	Unison	Helena Chemical Co.	5905-542
	Amine 4CA 2,4-D Weed Killer	Loveland Products Inc.	34704-5
	Clean Amine	Loveland Products Inc.	34704-120
	Low Vol 4 Ester Weed Killer	Loveland Products Inc.	34704-124
	Low Vol 6 Ester Weed Killer	Loveland Products Inc.	34704-125
	LV-6 Ester Weed Killer	Loveland Products Inc.	34704-6
	Saber	Loveland Products Inc.	34704-803
	Saber CA	Loveland Products Inc.	34704-803
	Salvo	Loveland Products Inc.	34704-609

Active Ingredient	Trade Name	Manufacturer	EPA Registration Number
2,4-D (continued)	Savage DF	Loveland Products Inc.	34704-606
	Aqua-Kleen	NuFarm Americas Inc.	71368-4
	Esteron 99C	NuFarm Americas Inc.	62719-9-71368
	Weedar 64	NuFarm Americas Inc.	71368-1
	Weedone LV-4	NuFarm Americas Inc.	228-139-71368
	Weedone LV-4 Solventless	NuFarm Americas Inc.	71368-14
	Weedone LV-6	NuFarm Americas Inc.	71368-11
	Formula 40	Nufarm Americas Inc.	228-357
	2,4-D LV 6 Ester	Nufarm Americas Inc.	228-95
	Platoon	Nufarm Americas Inc.	228-145
	WEEDstroy AM-40	Nufarm Americas Inc.	228-145
	Hi-Dep	PBI Gordon	2217-703
	2,4-D Amine	Setre (Helena)	5905-72
	Barrage LV Ester	Setre (Helena)	5905-504
	2,4-D LV4	Setre (Helena)	5905-90
	2,4-D LV6	Setre (Helena)	5905-93
	Clean Crop Amine 4	UAP-Platte Chemical Co.	34704-5 CA
	Clean Crop Low Vol 6 Ester	UAP-Platte Chemical Co.	34704-125
	Salvo LV Ester	UAP-Platte Chemical Co.	34704-609
	2,4-D 4# Amine Weed Killer	UAP-Platte Chemical Co.	34704-120
	Clean Crop LV-4 ES	UAP-Platte Chemical Co.	34704-124
	Savage DF	UAP-Platte Chemical Co.	34704-606
	Cornbelt 4 lb. Amine	Van Diest Supply Co.	11773-2
	Cornbelt 4# LoVol Ester	Van Diest Supply Co.	11773-3
	Cornbelt 6# LoVol Ester	Van Diest Supply Co.	11773-4
	Amine 4	Wilbur-Ellis	2935-512
	Lo Vol-4	Wilbur-Ellis	228-139-2935
	Lo Vol-6 Ester	Wilbur-Ellis	228-95-2935
Dicamba	Dicamba DMA	Albaugh Inc./Agri Star	42750-40
	Vision	Albaugh Inc.	42750-98
	Clarity	BASF Ag. Products	7969-137
	Rifle	Loveland Products Inc.	34704-861
	Banvel	MicroFlo Company	51036-289
	Diablo	Nufarm Americas Inc.	228-379
	Vanquish Herbicide	Nufarm Americas Inc.	228-397
Dicamba + 2,4-D	Outlaw	Albaugh Inc./Agri Star	42750-68
	Range Star	Albaugh Inc./Agri Star	42750-55
	Weedmaster	BASF Ag. Products	7969-133
	Rifle-D	Loveland Products Inc.	34704-869
	KambaMaster	Nufarm Americas Inc.	71368-34
	Veteran 720	Nufarm Americas Inc.	228-295
Dicamba + Diflufenzopyr	Distinct	BASF Ag. Products	7969-150
	Overdrive	BASF Ag. Products	7969-150
Diquat	Reward	Syngenta Crop Prot., Inc.	100-1091

Active Ingredient	Trade Name	Manufacturer	EPA Registration Number
Diuron	Diuron 80DF	Agriliance, LLC	9779-318
	Karmex DF	Griffin Company	1812-362
	Direx 80DF	Griffin Company	1812-362
	Direx 4L	Griffin Company	1812-257
	Direx 4L-CA	Griffin Company	1812-257
	Diuron 4L	Loveland Products Inc.	34704-854
	Diuron 80 WDG	Loveland Products Inc.	34704-648
	Diuron 4L	Makteshim Agan of N.A.	66222-54
	Diuron 80WDG	UAP-Platte Chemical Co.	34704-648
	Vegetation Man. Diuron 80 DF	Vegetation Man., LLC	66222-51-74477
	Diuron-DF	Wilbur-Ellis	00352-00-508-02935
Fluridone	Avast!	SePRO	67690-30
	Sonar AS	SePRO	67690-4
	Sonar Precision Release	SePRO	67690-12
	Sonar Q	SePRO	67690-3
	Sonar SRP	SePRO	67690-3
Glyphosate	Aqua Star	Albaugh Inc./Agri Star	42750-59
	Forest Star	Albaugh Inc./Agri Star	42570-61
	Gly Star Original	Albaugh Inc./Agri Star	42750-60
	Gly Star Plus	Albaugh Inc./Agri Star	42750-61
	Gly Star Pro	Albaugh Inc./Agri Star	42750-61
	Glyphosate 4 PLUS	Alligare, LLC	81927-9
	Glyfos	Cheminova	4787-31
	Glyfos PRO	Cheminova	67760-57
	Glyfos Aquatic	Cheminova	4787-34
	ClearOut 41	Chem. Prod. Tech., LLC	70829-2
	ClearOut 41 Plus	Chem. Prod. Tech., LLC	70829-3
	Accord Concentrate	Dow AgroSciences	62719-324
	Accord SP	Dow AgroSciences	62719-322
	Accord XRT	Dow AgroSciences	62719-517
	Glypro	Dow AgroSciences	62719-324
	Glypro Plus	Dow AgroSciences	62719-322
	Rodeo	Dow AgroSciences	62719-324
	Mirage	Loveland Products Inc.	34704-889
	Mirage Plus	Loveland Products Inc.	34704-890
	Aquamaster	Monsanto	524-343
	Roundup Original	Monsanto	524-445
	Roundup Original II	Monsanto	524-454
	Roundup Original II CA	Monsanto	524-475
	Honcho	Monsanto	524-445
	Honcho Plus	Monsanto	524-454
	Roundup PRO	Monsanto	524-475
	Roundup PRO Concentrate	Monsanto	524-529
	Roundup PRO Dry	Monsanto	524-505

Active Ingredient	Trade Name	Manufacturer	EPA Registration Number
Glyphosate (cont.)	GlyphoMate 41	PBI Gordon Corp.	2217-847
	Aqua Neat	Nufarm Americas Inc.	228-365
	Foresters	Nufarm Americas Inc.	228-381
	Razor	Nufarm Americas Inc.	228-366
	Razor Pro	Nufarm Americas Inc.	228-366
	Rattler	Setre (Helena)	524-445-5905
	Buccaneer	Tenkoz	55467-10
	Buccaneer Plus	Tenkoz	55467-9
	Mirage Herbicide	UAP-Platte Chemical Co.	524-445-34704
	Mirage Plus Herbicide	UAP-Platte Chemical Co.	524-454-34704
	Glyphosate 4	Vegetation Man., LLC	73220-6-74477
Glyphosate + 2,4-D	Landmaster BW	Albaugh Inc./Agri Star	42570-62
	Campaign	Monsanto	524-351
	Landmaster BW	Monsanto	524-351
Glyphosate + Dicamba	Fallowmaster	Monsanto	524-507
Hexazinone	Velpar ULW	DuPont	352-450
	Velpar L	DuPont	352-392
	Velpar DF	DuPont	352-581
	Pronone MG	Pro-Serve	33560-21
	Pronone 10G	Pro-Serve	33560-21
	Pronone 25G	Pro-Serve	33560-45
	Pronone Power Pellet	Pro-Serve	33560-41
Hexazinone + Sulfometuron	Westar	DuPont Crop Protection	352-626
Imazapic	Plateau	BASF	241-365
	Panoramic 2SL	Alligare, LLC	66222-141-81927
Imazapic + Glyphosate	Journey	BASF Ag. Products	241-417
Imazapyr	Arsenal Railroad Herbicide	BASF Ag. Products	241-273
	Chopper	BASF Ag. Products	241-296
	Arsenal Applicators Conc.	BASF Ag. Products	241-299
	Arsenal	BASF Ag. Products	241-346
	Arsenal PowerLine	BASF Ag. Products	241-431
	Stalker	BASF Ag. Products	241-398
	Habitat	BASF Ag. Products	241-426
	Imazapyr E-Pro 2 –VM & Aquatic Herbicide	Etigra	81959-8
	Polaris RR	Nufarm Americas Inc.	241-273-228
	Polaris SP	Nufarm Americas Inc.	241-296-228
	Polaris AC	Nufarm Americas Inc.	241-299-228
	Polaris AQ	Nufarm Americas Inc.	241-426-228
	Polaris Herbicide	Nufarm Americas Inc.	241-346-228
	SSI Maxim Arsenal 0.5G	SSI Maxim Co., Inc.	34913-23
	Ecomazapyr 2 SL	Vegetation Man., LLC	74477-6
	Imazapyr 2 SL	Vegetation Man., LLC	74477-4
	Imazapyr 4 SL	Vegetation Man., LLC	74477-5
Imazapyr + Diuron	Mojave 70 EG	Alligare, LLC	74477-9-81927

	Sahara DG	BASF Ag. Products	241-372
Active Ingredient	**Trade Name**	**Manufacturer**	**EPA Registration Number**
Imazapyr + Diuron (cont.)	SSI Maxim Topsite 2.5G	SSI Maxim Co., Inc.	34913-22
Metsulfuron methyl	Escort	DuPont	352-439
	Escort XP	DuPont	352-439
	Metsulfuron Methyl DF	Vegetation Man., L.L.C.	74477-2
	Patriot	Nufarm Americas Inc.	228-391
	PureStand	Nufarm Americas Inc.	71368-38
	MSM E-AG 60 EG Herbicide	Etigra	81959-14
	MSM E-Pro 60 EG Herbicide	Etigra	81959-14
Metsulfuron methyl + Dicamba + 2,4-D	Cimarron MAX	DuPont	352-615
Picloram	Triumph K	Albaugh, Inc.	42750-81
	Triumph 22K	Albaugh, Inc.	42750-79
	Picloram K	Alligare, LLC	42750-81-81927
	Picloram 22K	Alligare, LLC	42750-79-81927
	Grazon PC	Dow AgroSciences	62719-181
	OutPost 22K	Dow AgroSciences	62719-6
	Tordon K	Dow AgroSciences	62719-17
	Tordon 22K	Dow AgroSciences	62719-6
Picloram + 2,4-D	Picloram + D	Alligare, LLC	42750-80-81927
	Tordon 101M	Dow AgroSciences	62719-5
	Tordon 101 R Forestry	Dow AgroSciences	62719-31
	Tordon RTU	Dow AgroSciences	62719-31
	Grazon P+D	Dow AgroSciences	62719-182
	HiredHand P+D	Dow AgroSciences	62719-182
	Pathway	Dow AgroSciences	62719-31
	GunSlinger	Albaugh, Inc.	42750-80
Sulfometuron methyl	Oust	DuPont	352-401
	Oust XP	DuPont	352-601
	SFM 75	Vegetation Man., LLC	72167-11-74477
	Spyder	Nufarm Americas Inc.	228-408
Tebuthiuron	Spike 20P	Dow AgroSciences	62719-121
	Spike 80W	Dow AgroSciences	62719-107
	Spike 1G	Dow AgroSciences	1471-104
	Spike 40P	Dow Agro Sciences	62719-122
	Spike 80DF	Dow AgroSciences	62719-107
	SpraKil S-5 Granules	SSI Maxim Co., Inc.	34913-10
Tebuthiuron + Diuron	SpraKil SK-13 Granular	SSI Maxim Co., Inc.	34913-15
	SpraKil SK-26 Granular	SSI Maxim Co., Inc.	34913-16
Triclopyr	Element 3A	Dow AgroSciences	62719-37
	Element 4	Dow AgroSciences	62719-40
	Forestry Garlon XRT	Dow AgroSciences	62719-553
	Garlon 3A	Dow AgroSciences	62719-37
	Garlon 4	Dow AgroSciences	62719-40
	Garlon 4 Ultra	Dow AgroSciences	62719-527

	Remedy	Dow AgroSciences	62719-70
Active Ingredient	**Trade Name**	**Manufacturer**	**EPA Registration Number**
Triclopyr (cont.)	Remedy Ultra	Dow AgroSciences	62719-552
	Pathfinder II	Dow AgroSciences	62719-176
	Tahoe 3A	Nufarm Americas Inc.	228-384
	Tahoe 3A	Nufarm Americas Inc.	228-518
	Tahoe 4E	Nufarm Americas Inc.	228-385
	Ecotriclopyr 3 SL	Vegetation Man., LLC	72167-49-74477
	Triclopyr 3 SL	Vegetation Man., LLC	72167-49-74477
Triclopyr + 2,4-D	Crossbow	Dow AgroSciences	62719-260
Triclopyr + Clopyralid	Redeem R&P	Dow AgroSciences	62719-337

* Refer to the complete label before considering the use of any herbicide formulation. Label changes can impact the intended use, e.g., through the creation or elimination of Special Local Need (SLN) or 24(c) registrations; changes in application sites, rates, and timing; and county restrictions.

APPENDIX B

Best Management Practices for Preventing Infestations Of Noxious and Invasive Weeds

Best Management Practices for Noxious and Invasive Weed Prevention

This list incorporates many suggested practices under many types of land management operation types and is designed to allow managers to pick and choose those practices that are most applicable and feasible for each situation (DOI 2005).

A. Site-Disturbing Projects

Pre-project Planning

- Environmental analyses for projects and maintenance programs should assess weed risks, analyze high-risk sites for potential weed establishment and spread, and identify prevention practices.

- Determine site-specific restoration and monitoring needs and objectives at the onset of project planning.

- Learn to recognize noxious and invasive weeds.

- Inventory all proposed projects for weeds prior to ground-disturbing activities. If weeds are found, they would be treated (if the timing was appropriate) or removed (if seeds were present) to limit weed seed production and dispersal.

- Restrict movement of equipment and machinery *from* weed-contaminated areas *to* noncontaminated areas.

- Locate and use weed-free project staging areas. Avoid or minimize travel through weed infested areas, or restrict travel to periods when spread of disseminules is least likely.

- Identify sites where equipment can be cleaned. Remove mud, dirt, and plant parts from project equipment before moving it into a project area. Seeds and plant parts should be collected and incinerated when possible.

- If certified weed-free gravel pits become available in the county, the use of certified weed-free gravel would be required wherever gravel is applied to public lands (e.g., roads).

- Maintain stockpiled, non-infested material in a weed-free condition. Topsoil stockpiles should be promptly revegetated to maintain soil microbial health and reduce the potential for weeds.

- Use native seed mixes when practical. A certified seed laboratory should test each lot according to Association of Official Seed Analysts standards (which include an all-state noxious weed list) and provide documentation of the seed inspection test. The seed should contain no noxious, prohibited, or restricted weed seeds and should contain no more than 0.5 percent by weight of other weed seeds. Seed may contain up to 2.0 percent of "other crop" seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended.

Project Implementation

- Minimize soil disturbance. To the extent practicable, native vegetation should be retained in and around project activity areas, and soil disturbance kept to a minimum.

- If a disturbed area must be left bare for a considerable length of time, cover the area with weed barrier until revegetation is possible.

Post-project

- Clean all equipment before leaving the project site when operating in weed infested areas.

- Inspect, remove, and properly dispose of weed seed and plant parts found on clothing and equipment. Proper disposal means bagging and incinerating seeds and plant parts or washing equipment in an approved containment area.

- Revegetate disturbed soil where appropriate to optimize plant establishment for that specific site.Define revegetation objectives for each site. Revegetation may include topsoil replacement, planting, seeding, fertilization, and certified weed-free mulching as necessary. Use native material where appropriate and feasible.

- Monitor sites where seed, hay, straw, or mulch has been applied. Eradicate weeds before they form seed. In contracted projects, contract specifications could require that the contractor control weeds for a specified length of time.

  • Inspect and document all ground-disturbing activities in noxious weed infested areas for at least three growing seasons following completion of the project. For ongoing projects, continue to monitor until reasonably certain that no weeds are present. Plan for follow-up treatments based on inspection results.

B. Roads and Utilities

Pre-project Planning

- Communicate with contractors, local weed districts or weed management areas about projects and best management practices for prevention.

- Remove mud, dirt, and plant parts from project equipment before moving it into a project area. Seeds and plant parts should be collected and incinerated when practical, or washed off in an approved containment area.

- Avoid acquiring water for road dust abatement where access to water is through weed-infested sites.

- Treat weeds on travel rights-of-ways before seed formation so construction equipment doesn’t spread weed seed.

- Schedule and coordinate blading or pulling of noxious weed-infested roadsides or ditches in consultation with the local weed specialist. When it is necessary to blade weed-infested roadsides or ditches, schedule the activity when disseminules are least likely to be viable.

Project Implementation

- Retain shade to suppress weeds by minimizing the removal of trees and other roadside vegetation during construction, reconstruction, and maintenance; particularly on south aspects.

- Do not blade or pull roadsides and ditches infested with noxious weeds unless doing so is required for public safety or protection of the roadway. If the ditch must be pulled, ensure weeds remain onsite. Blade from least infested to most infested areas.

Post-project

- Clean all equipment (power or high-pressure cleaning) of all mud, dirt, and plant parts before

leaving the project site if operating in areas infested with weeds. Seeds and plant parts should be collected and incinerated when possible.

- When seeding has been specified for construction and maintenance activities, seed all disturbed soil (except travel route) soon after work is completed.

- Use a certified weed-free seed mix suitable for local environmental conditions that includes fast, early growing (preferably native) species to provide quick revegetation. Consider applying weed free mulch with seeding.

- Periodically inspect roads and rights-of-way for noxious weeds. Train staff to recognize weeds and report locations to the local weed specialist. Follow-up with treatment when needed.

- When reclaiming roads, treat weeds before roads are made impassable. Inspect and follow up based on initial inspection and documentation.

- To avoid weed infestations, create and maintain healthy plant communities whenever possible, including utility rights-of-ways, roadsides, scenic overlooks, trailheads, and campgrounds.

C. Wilderness Recreation

- Inspect and clean mechanized trail vehicles of weeds and weed seeds.

- Wash boots and socks before hiking into a new area. Inspect and clean packs, equipment, and bike tires.

- Avoid hiking through weed infestations whenever possible.

- Keep dogs and other pets free of weed seeds.

- Avoid picking unidentified "wildflowers" and discarding them along trails or roadways.

- Maintain trailheads, campgrounds, visitor centers, boat launches, picnic areas, roads leading to trailheads, and other areas of concentrated public use in a weed-free condition. Consider high-use recreation areas as high priority sites for weed eradication.

- Sign trailheads and access points to educate visitors on noxious and invasive weeds and the consequences of their activities.

- In areas susceptible to weed invasion, limit vehicles to designated, maintained travel routes. Inspect and document travel corridors for weeds and treat as necessary.

D. Watershed Management

- Frequently and systematically inspect and document riparian areas and wetlands for noxious weed establishment and spread. Eradicate new infestations immediately since effective tools for riparian-area weed management are limited.

- Promote dense growth of desirable vegetation in riparian areas (where appropriate) to minimize the availability of germination sites for weed seeds or propagules transported from upstream or upslope areas.

- Address the risk of invasion by noxious weeds and other invasive species in watershed restoration projects and water quality management plans.

E. Grazing Management

- Consider prevention practices and cooperative management of weeds in grazing allotments. Prevention practices may include: altering season of use, minimizing ground disturbance, exclusion, preventing weed seed transportation, maintaining healthy vegetation, revegetation, inspection, education, reporting.

- Provide certified weed-free supplemental feed in a designated area so new weed infestations can be detected and treated immediately. Pelletized feed is unlikely to contain viable weed seed.

- If livestock may contribute to seed spread in a weed-infested area, schedule livestock use prior to seed-set or after seed has fallen.

- If livestock were transported from a weed-infested area, annually inspect and treat entry units for new weed infestations.

- Consider closing infested pastures to livestock grazing when grazing will either continue to exacerbate the condition or contribute to weed seed spread. Designate those pastures as unsuitable range until weed infestations are controlled.

- Manage the timing, intensity (utilization), duration, and frequency of livestock activities to maintain the competitive ability of desirable plants and retain litter cover. The objective is to prevent grazers from selectively removing desirable plant species and leaving undesirable species.

- Exclude livestock grazing on newly seeded areas with fencing to ensure that desired vegetation is well established, usually after 2-3 growing seasons.

- Reduce ground disturbance, including damage to biological soil crusts. Consider changes in the timing, intensity, duration, or frequency of livestock use; location and changes in salt grounds; restoration or protection of watering sites; and restoration of yarding/loafing areas, corrals, and other areas of concentrated livestock use.

- Inspect areas of concentrated livestock use for weed invasion, especially watering locations and other sensitive areas that may be particularly susceptible to invasion. Inventory and manage new infestations.

- Defer livestock grazing in burned areas until vegetation is successfully established, usually after 2-3 growing seasons.

F. Outfitting / Recreation Pack and Saddle Stock Use

- Allow only certified weed-free hay/feed on BLM lands.

- Inspect, brush, and clean animals (especially hooves and legs) before entering public land. Inspect and clean tack and equipment.

- Regularly inspect trailheads and other staging areas for backcountry travel. Bedding in trailers and hay fed to pack and saddle animals may contain weed seed or propagules.

- Tie or contain stock in ways that minimize soil disturbance and prevent loss of desirable native species.

- Authorized trail sites for tying pack animals should be monitored several times per growing season to quickly identify and eradicate new weeds. Trampling and permanent damage to desired

plants are likely. Tie-ups should be located away from water and in shaded areas where the low light helps suppress weed growth.

- Educate outfitters to look for and report new weed infestations.

G. Wildlife

- Periodically inspect and document areas where wildlife concentrate in the winter and spring and cause excess soil disturbance.

- Use weed-free materials for all wildlife management activities.

- Incorporate weed prevention into all wildlife habitat improvement project designs.

H. Fire

Incident Planning

- Increase weed awareness and weed prevention by providing training to new and/or seasonal fire staff on invasive weed identification and prevention.

- For prescribed burns, inventory the project area and evaluate potential weed spread with regard to the fire prescription. Areas with moderate to high weed cover should be managed for at least 2 years prior to the prescribed burn to reduce the number of weed seeds in the soil. Continue weed management after the burn.

- Ensure that a weed specialist is included on a Fire Incident Management Team when wildfire or prescribed operations occur in or near a weed-infested area. Include a discussion of weed prevention operational practices in all fire briefings.

- Use operational practices to reduce weed spread (e.g., avoid weed infestations when locating fire lines).

- Identify and periodically inspect potential helispots, staging areas, incident command posts, base camps, etc. and maintain a weed-free condition. Encourage network airports and helibases to do the same.

- Develop a burned-area integrated weed management plan, including a monitoring component to detect and eradicate new weeds early.

Fire-fighting

- Ensure that all equipment (including borrowed or rental equipment) is free of weed seed and propagules before entering incident location.

- When possible, use fire suppression tactics that reduce disturbances to soil and vegetation, especially when creating fire lines.

- Use wet or scratch-lines where possible instead of fire breaks made with heavy equipment.

- Given the choice of strategies, avoid ignition and burning in areas at high risk for weed establishment or spread.

- Hose off vehicles on site if they have traveled through infested areas.

- Inspect clothing for weed seeds if foot travel occurred in infested areas.
- When possible, establish incident bases, fire operations staging areas, and aircraft landing zones in areas that have been inspected and are verified to be free of invasive weeds.
- Cover weed infested cargo areas and net-loading areas with tarps if weeds exist and can't be removed or avoided.
- Flag off high-risk weed infestations in areas of concentrated activity and show weeds on facility maps.
- If fire operations involve travel or work in weed infested areas, a power wash station should be staged at or near the incident base and helibase. Wash all vehicles and equipment upon arrival from and departure to each incident. This includes fuel trucks and aircraft service vehicles.
- Identify the need for possible fire rehab to prevent or mitigate weed invasion during fire incident and apply for funding during the incident.

Appendix C

Standard Operating Procedures for Weed Treatments On BLM-Administered Lands in the RGFO

RESOURCE	STANDARD OPERATING PROCEDURE
GENERAL See BLM Handbook H-9011-1 (*Chemical Pest Control*) and manuals 1112 (*Safety*), 9011 (*Chemical Pest Control*), 9012 (*Expenditure of Rangeland Insect Pest Control Funds*), 9015 (*Integrated Weed Management)*, and 9220 (*Integrated Pest Management*)	• Prepare spill contingency plan in advance of treatment. • Conduct a pretreatment survey before applying herbicides. • Select herbicide that is least damaging to environment while providing the desired results. • Select herbicide products carefully to minimize additional impacts from degradates, adjuvants, inert ingredients, and tank mixtures. • Apply the least amount of herbicide needed to achieve the desired result. • Follow product label for use and storage. • Have licensed applicators apply herbicides. • Use only EPA-approved herbicides and follow product label directions and "advisory" statements. • Review, understand, and conform to the "Environmental Hazards" section on the herbicide label. This section warns of known pesticide risks to the environment and provides practical ways to avoid harm to organisms or the environment. • Consider surrounding land use before assigning aerial spraying as a treatment method and avoid aerial spraying near agricultural or densely populated areas. • Minimize the size of application areas, when feasible. • Comply with herbicide-free buffer zones to ensure that drift will not affect crops or nearby residents/landowners. • Post treated areas and specify reentry or rest times, if appropriate. • Notify adjacent landowners prior to treatment. • Keep copy of Material Safety Data Sheets (MSDSs) at work sites. MSDSs available for review at http://www.cdms.net/. • Keep records of each application, including the active ingredient, formulation, application rate, date, time, and location. • Avoid accidental direct spray and spills to minimize risks to resources. • Avoid aerial spraying during periods of adverse weather conditions (snow or rain imminent, fog, or air turbulence). • Make helicopter applications at a target airspeed of 40 to 50 miles per hour (mph), and at about 30 to 45 feet above ground. • Minimize drift by not applying herbicides when winds exceed 10 mph (6 mph for aerial applications) or a serious rainfall event is imminent. • Conduct pre-treatment surveys for sensitive habitat and special status species within or adjacent to proposed treatment areas. • Consider site characteristics, environmental conditions, and application equipment in order to minimize damage to non-target vegetation. • Use drift reduction agents and low volatility formulations, as appropriate, to reduce the drift hazard to non-target species. • Turn off applied treatments at the completion of spray runs and during turns to start another spray run. • Refer to the herbicide label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. • Clean OHVs to remove seeds.

RESOURCE	STANDARD OPERATING PROCEDURE
Air Quality See Manual 7000 (Soil, Water, and Air Management)	• Consider the effects of wind, humidity, temperature inversions, and heavy rainfall on herbicide effectiveness and risks. • Apply herbicides in favorable weather conditions to minimize drift. For example, do not treat when winds exceed 10 mph (6 mph for aerial applications) or rainfall is imminent. • Use drift reduction agents, as appropriate, to reduce the drift hazard. • Select proper application equipment (e.g., spray equipment that produces 200- to 800-micron diameter droplets [spray droplets of 100 microns and less are most prone to drift]). • Select proper application methods (e.g., set maximum spray heights, use appropriate buffer distances between spray sites and non-target resources).
Soil See Manual 7000 (Soil, Water, and Air Management)	• Minimize treatments in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected. • Minimize use of herbicides that have high soil mobility, particularly in areas where soil properties increase the potential for mobility. • Do not apply granular herbicides on slopes of more than 15% where there is the possibility of runoff carrying the granules into non-target areas.
Water Resources See Manual 7000 (Soil, Water, and Air Management)	• Consider climate, soil type, slope, and vegetation type when developing herbicide treatment programs. • Select herbicide products to minimize impacts to water. This is especially important for application scenarios that involve risk from active ingredients in a particular herbicide, as predicted by risk assessments. • Use local historical weather data to choose the month of treatment. Considering the phenology of the target species, schedule treatments based on the condition of the water body and existing water quality conditions. • Plan to treat between weather fronts (calms) and at appropriate time of day to avoid high winds that increase water movements, and to avoid potential stormwater runoff and water turbidity. • Review hydrogeologic maps of proposed treatment areas .Note depths to groundwater and areas of shallow groundwater and areas of surface water and groundwater interaction. Minimize treating areas with high risk for groundwater contamination. • Conduct mixing and loading operations in an area where an accidental spill would not contaminate a water body. • Do not rinse spray tanks in or near water bodies. Do not broadcast pellets where there is danger of contaminating water supplies. • Maintain buffers between treatment areas and water bodies. Buffer widths should be developed based on herbicide- and site-specific criteria to minimize impacts to water bodies. • Minimize the potential effects to surface water quality and quantity by stabilizing terrestrial areas as quickly as possible following treatment.
Wetlands and Riparian Areas	• Use a selective herbicide and a wick or backpack sprayer. • Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths of 100 feet for aerial, 25 feet for vehicle, and 10 feet for hand-spray applications.

RESOURCE	STANDARD OPERATING PROCEDURE
Vegetation See Handbook H-4410-1(National Range Handbook) and Manuals5000 (Forest Management) and 9015 (Integrated Weed Management)	• Refer to the herbicide label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. • Use native or sterile species for revegetation and restoration projects to compete with invasive species until desired vegetation establishes • Use weed-free feed for horses and pack animals. Use weed-free straw or hay mulch for revegetation and other activities. • Identify and implement any temporary domestic livestock grazing and/or supplemental feeding restrictions needed to enhance desirable vegetation recovery following treatment. Consider adjustments in the existing grazing permit, needed to maintain desirable vegetation on the treatment site.
Pollinators	• Complete vegetation treatments seasonally before pollinator foraging plants bloom. • Time vegetation treatments to take place when foraging pollinators are least active both seasonally and daily. • Design vegetation treatment projects so that nectar and pollen sources for important pollinators and resources are treated in patches rather than in one single treatment. • Minimize herbicide application rates. Use typical rather than maximum rates where there are important pollinator resources. • Maintain herbicide free buffer zones around patches of important pollinator nectar and pollen sources. • Maintain herbicide free buffer zones around patches of important pollinator nesting habitat and hibernacula. • Make special note of pollinators that have single host plant species, and minimize herbicide spraying on those plants (if invasive species) and in their habitats.
Fish and Other Aquatic Organisms See Manuals 6500 (Wildlife and Fisheries Management) and 6780 (Habitat Management Plans)	• Use appropriate buffer zones based on label and risk assessment guidance. • Minimize treatments near fish-bearing water bodies during periods when fish are in life stages most sensitive to the herbicide(s) used, and use spot rather than broadcast or aerial treatments. • Use appropriate application equipment/method near water bodies if the potential for offsite drift exists. • For treatment of aquatic vegetation, 1) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management, 2) use the appropriate application method to minimize the potential for injury to desirable vegetation and aquatic organisms, and 3) follow water use restrictions presented on the herbicide label.
Wildlife See Manuals 6500 (Wildlife and Fisheries Management) and 6780 (Habitat Management Plans)	• Use herbicides of low toxicity to wildlife, where feasible. • Use spot applications or low-boom broadcast operations where possible to limit the probability of contaminating non-target food and water sources, especially non-target vegetation over areas larger than the treatment area. • Use timing restrictions (e.g., do not treat during critical wildlife breeding or staging periods) to minimize impacts to wildlife. • Avoid using glyphosate formulations that include the adjuvant R-11 in aquatic ecosystems and either avoid using formulations with the surfactant POEA or seek to use the formulation with the lowest amount of POEA available to reduce risks to amphibians and aquatic organisms.

RESOURCE	STANDARD OPERATING PROCEDURE
Threatened, Endangered, and Sensitive Species See Manual 6840 (Special Status Species)	• Survey for special status species before treating an area. Consider effects to special status species when designing herbicide treatment programs. • Use a selective herbicide and a wick or backpack sprayer to minimize risks to special status plants. • Avoid treating vegetation during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for special status species in area to be treated.
Livestock See Handbook H-4120-1 (Grazing Management)	• Whenever possible and whenever needed, schedule treatments when livestock are not present in the treatment area. Design treatments to take advantage of normal livestock grazing rest periods, when possible. • As directed by the herbicide label, remove livestock from treatment sites prior to herbicide application, where applicable. • Use herbicides of low toxicity to livestock, where feasible. • Take into account the different types of application equipment and methods, where possible, to reduce the probability of contamination of non-target food and water sources. • Avoid use of diquat in riparian pasture while pasture is being used by livestock. • Notify permittees of the project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. • Notify permittees of livestock grazing, feeding, or slaughter restrictions, if necessary. • Provide alternative forage sites for livestock, if possible.
Visual Resources See Handbooks H-8410-1 (Visual Resource Inventory) and H-8431-1 (Visual Resource Contrast Rating) and Manual 8400 (Visual Resource Management)	• Minimize the use of broadcast foliar applications in sensitive watersheds to avoid creating large areas of browned vegetation. • Consider the surrounding land use before assigning aerial spraying as an application method. • Minimize offsite drift and mobility of herbicides (e.g., do not treat when winds exceed 10 mph; minimize treatment in areas where herbicide runoff is likely; establish appropriate buffer widths between treatment areas and residences) to contain visual changes to the intended treatment area. • If the area is a Class I or II visual resource, ensure that the change to the characteristic landscape is low and not easily seen (Class I) or, if seen, does not attract the attention of the casual viewer (Class II). • Lessen visual impacts by 1) designing projects to blend in with topographic forms, 2) leaving some low-growing trees or planting some low-growing tree seedlings adjacent to the treatment area to screen short-term effects, and 3) revegetating the site following treatment. • When restoring treated areas, design activities to repeat the form, line, color, and texture of the natural landscape character conditions to meet established Visual Resource Management (VRM) objectives.
Wilderness and Other Special Areas See Handbooks H-8550-1(Management of WSAs)and H-8560-1(Management of Designated WSAs) and Manual 8351 (WSRs)	• Encourage backcountry pack and saddle stock users to feed their livestock only weed-free feed for several days before entering a wilderness area. • Encourage stock users to tie and/or hold stock in such a way as to minimize soil disturbance and loss of native vegetation. • Revegetate disturbed sites with native species if there is no reasonable expectation of natural regeneration. Provide educational materials at trailheads and other wilderness entry points to educate the public on the need to prevent the spread of weeds.

RESOURCE	STANDARD OPERATING PROCEDURE
Wilderness and Other Special Areas (cont.)	• Use the "minimum tool" to treat noxious and invasive vegetation, relying primarily on use of ground-based tools, including backpack pumps, hand sprayers, and pumps mounted on pack and saddle stock. • Use chemicals when they are the minimum method to control weeds that are spreading within the wilderness or threaten lands outside the wilderness. • Give preference to herbicides that have the least impact on non-target species and the wilderness environment. • Implement herbicide treatments during periods of low human use, where feasible. • Address wilderness and special areas in management plans. Within 0.25 mile on either side of the river of all eligible or suitable WSRs, proposed treatments must preserve the identified Outstanding Remarkable Values and preliminary classifications.
Recreation See Handbook H-1601-1(Land Use Planning Handbook, Appendix C)	• Schedule treatments to avoid peak recreational use times, while taking into account the optimum management period for the targeted species. • Notify the public of treatment methods, hazards, times, and nearby alternative recreation areas. • Adhere to entry restrictions identified on the herbicide label for public and worker access. • Post signs noting exclusion areas and the duration of exclusion, if necessary. • Use herbicides during periods of low human use, where feasible.
Social and Economic Values	• Consider surrounding land use before selecting aerial spraying as a method, and avoid aerial spraying near agricultural or densely populated areas. • Post treated areas and specify reentry or rest times, if appropriate. • Notify grazing permittees of livestock feeding restrictions in treated areas, if necessary, as per label instructions. • Notify the public of the project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. • Control public access until potential treatment hazards no longer exist. • Observe restricted entry intervals specified by the herbicide label. • Notify local emergency personnel of proposed treatments. • Use spot applications or low-boom broadcast applications where possible to limit the probability of contaminating non-target food and water sources, especially vegetation over areas larger than the treatment area. • Consult with Native American tribes and Alaska Native groups to locate any areas of vegetation that are of significance to the tribe and that might be affected by herbicide treatments. • To the degree possible within the law, hire local contractors and workers to assist with herbicide application projects and purchase materials and supplies, including chemicals, for herbicide treatment projects through local suppliers. • To minimize fears based on lack of information, provide public education on the need for vegetation treatments and the use of herbicides in an Integrated Pest Management program for projects proposing local use of herbicides.
Rights-of-Way	• Coordinate vegetation management activities where joint or multiple use of a ROW exists. • Notify other public land users within or adjacent to the ROW proposed for treatment. • Use only herbicides that are approved for use in ROW areas.

RESOURCE	STANDARD OPERATING PROCEDURE
Human Health and Safety	• Establish a buffer between treatment areas and human residences based on guidance given in the HHRA, with a minimum buffer of 0.25 mile for aerial applications and 100 feet for ground applications, unless a written waiver is granted. • Use protective equipment as directed by the herbicide label. • Post treated areas with appropriate signs at common public access areas. • Observe restricted entry intervals specified by the herbicide label. • Provide public notification in newspapers or other media where the potential exists for public exposure. • Have a copy of MSDSs at work site. • Notify local emergency personnel of proposed treatments. • Contain and clean up spills and request help as needed. • Secure containers during transport. • Follow label directions for use and storage. • Dispose of unwanted herbicides promptly and correctly.
Cultural Resources and Native American Religious Concerns See Handbooks H-8120-1 (Guidelines for Conducting Tribal Consultation) and Manuals 8100 (The Foundations for Managing Cultural Resources), 8120 (Tribal Consultation Under Cultural Resource Authorities).	• Follow standard procedures for compliance with Section 106 of the NHPA, as implemented through the Colorado State protocol. • Consult with tribes to locate any areas of vegetation that are of significance to the tribe and that might be affected by herbicide treatments. • Work with tribes to minimize impacts to these resources. • Follow guidance under Human Health and Safety in areas that may be visited by Native peoples after treatments. • Native American Traditional Cultural Properties (TCPs) are to be considered in the planning and completion of Federal actions in accordance with Section 106 of the NHPA, as amended (Guidelines of Bulletin 38 of the National Register). Physically affecting the integrity of traditional cultural properties, including plant collecting places, should be avoided when possible. To protect and preserve Native American religious practices, the Executive Order of May 24,1996 requires the implementation of "procedures to ensure reasonable notice of Proposed Actions or land management policies that may restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites." This notice further states, "where appropriate, agencies shall maintain the confidentiality of sacred sites." The RGFO will protect TCPs in consultation with the appropriate tribal representatives. • Any person who, without a permit, injures, destroys, excavates, appropriates or removes any historic or prehistoric ruin, artifact, object of antiquity, Native American remains, Native American cultural item, or archaeological resources on public lands is subject to arrest and penalty of law (16 USC 433, 16 USC 470, 18 USC 641, 18 USC 1170, and 18 USC 1361). See also: Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act.

Appendix D

Mitigation Measures

RESOURCE	MITIGATION MEASURES
Air Quality	None proposed
Soil Resources	None proposed
Wetland and Riparian Areas	• See mitigation for Water Resources and Quality and Vegetation.
Vegetation	• Minimize the use of terrestrial herbicides (especially bromacil, diuron, and sulfometuron methyl) in watersheds with downgradient ponds and streams if potential impacts to aquatic plants are of concern. • Establish appropriate (herbicide specific) buffer zones around downstream water bodies, habitats, and species/populations of interest. Consult the ERAs for more specific information on appropriate buffer distances under different soil, moisture, vegetation, and application scenarios. • To protect special status plant species, implement all conservation measures for plants presented in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment*.
Fish and Other Aquatic Organisms	• Limit the use of diquat in water bodies that have native fish and aquatic resources. • Limit the use of terrestrial herbicides in watersheds with characteristics suitable for potential surface runoff, and have fish-bearing streams, during periods when fish are in life stages most sensitive to the herbicide(s) used. • Implement all conservation measures for aquatic animals presented in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment*. • Establish appropriate herbicide-specific buffer zones for water bodies, habitats, or fish or other aquatic species of interest (see Appendix C and recommendations in individual ERAs). • Avoid using the adjuvant R-11® in aquatic environments and either avoid using glyphosate formulations containing the surfactant POEA or seek to use formulations with the least amount of POEA to reduce risks to aquatic organisms.
Wildlife	• To minimize risks to terrestrial wildlife, do not exceed the typical application rate for applications of dicamba, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr, where feasible. • Minimize the size of application areas, where practical, when applying 2,4-D, bromacil, diuron, and Overdrive® to limit impacts to wildlife, particularly through contamination of food items. • Where practical, limit glyphosate and hexazinone to spot applications in rangeland and wildlife habitat areas to avoid contamination of wildlife food items. • Avoid using the adjuvant R-11® in aquatic environments and either avoid using glyphosate formulations containing the surfactant POEA or seek to use formulations with the least amount of POEA to reduce risks to amphibians and aquatic organisms. • Do not apply bromacil or diuron in rangelands, and use appropriate buffer zones (see Section 3.3) to limit contamination of offsite vegetation, which may serve as forage for wildlife.

RESOURCE	MITIGATION MEASURES
Wildlife (continued)	• Do not aerially apply diquat directly to wetlands or riparian areas. • To protect special status species, implement all conservation measures for terrestrial animals presented in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment*. Apply these measures to special status species (refer to conservation measures for a similar size and type of species and same trophic guild).
Livestock	• Minimize potential risks to livestock by applying diuron, glyphosate, hexazinone, tebuthiuron, and triclopyr at the typical application rate, where feasible. • Do not apply 2,4-D, bromacil, dicamba, diuron, Overdrive®, picloram, or triclopyr across large application areas, where feasible, to limit impacts to livestock, particularly through the contamination of food items. • Where feasible, limit glyphosate and hexazinone to spot applications in rangeland. • Do not aerially apply diquat directly to wetlands or riparian areas used by livestock. • Do not apply bromacil or diuron in rangelands, and use appropriate buffer zones to limit contamination of offsite rangeland vegetation.
Cultural Resources and Native American Religious Concerns	• Do not exceed the typical application rate when applying 2,4-D, bromacil, diquat, diuron, fluridone, hexazinone, tebuthiuron, and triclopyr in traditional use areas. • Avoid applying bromacil or tebuthiuron aerially in known traditional use areas. • Limit diquat applications to areas away from high residential and traditional use areas to reduce risks to Native Americans. • A cultural resource inventory shall be conducted and Historic properties will be identified and protected prior to any direct or indirect impact by weed treatments on a project-by-project basis. Consultation with the SHPO, tribes, and other consulting parties will be conducted in accordance to the legal requirements of Section 106 of the NHPA as implemented through the Colorado State protocol.
Visual Resources	None proposed
Wilderness and Other Special Areas	• Mitigation measures that may apply to wilderness and other special area resources are associated with human and ecological health and recreation. Refer to the Vegetation, Fish and Other Aquatic Resources, Wildlife Resources, Recreation, and Human Health and Safety sections.
Recreation	• Mitigation measures that may apply to recreational resources are associated with human and ecological health. Refer to the Vegetation, Fish and Other Aquatic Resources, Wildlife Resources, and Human Health and Safety sections. • Avoid aerial applications of bromacil, diuron, and tebuthiuron in areas likely to receive backcountry use during or within 1 week after spraying.
Social and Economic Values	None proposed

RESOURCE	MITIGATION MEASURES
Human Health and Safety	• Avoid the maximum application rate when using 2,4-D, bromacil, diquat, diuron, fluridone, hexazinone, tebuthiuron, and triclopyr. • Avoid applying bromacil or diuron aerially. • Evaluate the need to use diuron on a case-by-case basis due to moderate or high risks to workers with all application methods. • Avoid applying chlorsulfuron at the maximum application rate when using a broadcast ground spray. • Avoid applying diquat using the horseback or backpack methods. • Avoid applying diquat near residential or subsistence food-gathering areas. • Avoid applying hexazinone using an over-the-shoulder broadcast applicator.
Water Resources and Quality	• Establish appropriate (herbicide-specific) buffer zones to downstream water bodies, habitats, and species/populations of interest.

Appendix E

General Conservation Measures for TEPC Species

General Conservation Measures for TEPC Species

The RGFO would also include the following mitigation in addition to the above conservation measures:

- In order to minimize the amount of chemical entering aquatic habitats, buffer strips will be provided for streams and riparian areas when using terrestrial formulations. A minimum buffer strip of 25 ft (7.6m) will be provided for vehicle applications (e.g. ATV sprayers). Within 25 ft (7.6m) of water, herbicides will be applied using a backpack sprayer. Herbicides that pose a moderate to high risk to fish (e.g. bromacil, diquat, diuron, terrestrial formulations of glyphosate, imazapyr, picloram, and triclopyr BEE at any application rate or 2,4-D and triclopyr TEA at maximum application rates) will not be used within 10 ft (3m) of water.
- When possible (i.e. when compatible with specific chemical formulations or tank mixes), Agri-Dex shall be the preferred surfactant to use within 10 ft (3m) of riparian areas that support special status fisheries or critical habitat.

During the annual planning for weed treatments, the RGFO would identify areas where treatment is most needed, based on the priorities described previously. No treatments would be planned in any habitat known or reasonably likely to support TEPC plants (suitable habitat), until a survey has been conducted to determine the presence or absence and location of such plants. Once these data are available, and if RGFO continues to desire weed treatments within or near TEPC habitat (e.g., to reduce the potential for spreading to other areas or to reduce competition with the TEPC or other special status species), additional NEPA preparation with consultation will apply.

In addition, the SOPs, BMP's, buffer distances, and conservation measures in Appendices B and C, respectively, are taken from the PEIS and the accompanying PBA (BLM 2007a, c) and modified as appropriate to reflect species and conditions specific to the RGFO. The following guidance must be considered in <u>all management plans</u> in which herbicide treatments are proposed to minimize or avoid risks to TEPC species. The exact conservation measures to be included in management plans would depend on the herbicide that would be used, the desired mode of application, and the conditions of the site. Given the potential for offsite drift and surface runoff, populations of TEPC species on lands not administered by the BLM would need to be considered if they are located near proposed herbicide treatment sites.

Herbicide treatments will not be conducted in areas where TEPC plant species may be subject to direct spray by herbicides during treatments.

Suitable buffer zones will be established between treatment sites and occupied and suitable habitats of TEPC plant species to avoid negative effects from aerial drift, runoff, or wind erosion during and following treatments. (Application of Table 7)

Applicators will be required to review, understand, and conform to the "Environmental Hazards" section on herbicide labels (this section warns of known pesticide risks and provides practical ways to avoid harm to organisms or the environment).

Applicators will be required to follow all instructions, SOPs, and BMPs to avoid spills and direct spraying into aquatic habitats that support TEPC plant species.

Applicators will be required to follow all SOPs for avoiding herbicide treatments during weather conditions that could increase the likelihood of aerial drift or surface runoff into non-target areas.

Survey in any RGFO areas mapped as potential habitat, or otherwise considered potential habitat for TECP species, prior to VTMP implementation.

Herbicides used near TECP habitats will be used in conformance with buffer distances provided in Table 7.

Standard buffers and measures presented in this document, for terrestrial species, will apply to Ute Ladies'-Tresses habitats. Highly manipulated environments, such as irrigated hay meadows, moderately grazed pastures with river access, areas of increased sediment deposits, intact floodplain areas, and areas of open, herbaceous, riparian vegetation devoid of noxious shrub-dominated overstory will be pre-surveyed for orchids during blooming season (late July) prior to VTMP treatments.

Conservation measures, BOPs and SOPs apply to RGFO TECP areas designated as *suitable* TECP plant habitats, with the same standards that apply for *occupied* habitats, populations and/or TECP individual plants.

If more aggressive noxious weed removal is required beyond the scope of these conservation measures for RGFO TECP habitats, a separate EA and consultation with the USFWS will occur.

The conservation measures listed in Appendix C include measures of general applicability as well as measures specific to each herbicide, each treatment method, and each resource category. The buffer distances listed for each herbicide summarized in Table 7 are conservative estimates for broadcast spraying based on multiple ERAs cited in the PBA (BLM 2007c). The buffer distances represent the first modeled distances at which no risks were predicted. Additional precautions during spot treatments within buffer zones would be considered while planning local projects and included as mitigation measures in the associated NEPA documents.

Use of biological control for noxious weed treatments will not occur if the agent(s) have demonstrated the ability to attack other species within the same genus as listed plant species.

Appendix F

Risk Category Calculations

Definitions:

Estimated Exposure Concentration (EEC): Estimated exposure concentration cenarios evaluated:

- Direct spray of the receptor or waterbody
- Indirect contact with dislodgeable foliar residue
- Ingestion of contaminated food items
- Off-site drift of spray to terrestrial areas and waterbodies
- Surface runoff from the application area to off-site soils or waterbodies
- Wind erosion resulting in deposition of contaminated dust
- Accidental spills to waterbodies

Toxicity Reference Value (TRV):

- Assessment Endpoint 1: Acute mortality to mammals, birds, invertebrates, and non-target plants. Measures of effect included median lethal effect doses (the dose lethal to 50% of organisms tested [LD50]) from acute toxicity tests with these organisms or suitable surrogates.
- Assessment Endpoint 2: Acute mortality to fish, aquatic invertebrates, and aquatic plants. Measures of effect included median lethal effect concentrations (the concentration lethal to 50% of organisms tested [LC50]) from acute toxicity tests with these organisms or suitable surrogates (e.g., other coldwater fish are used to represent threatened and endangered salmonids).
- Assessment Endpoint 3: Adverse direct effects on growth, reproduction, or other ecologically important sublethal processes. Measures of effect included standard chronic toxicity test endpoints such as the no observed adverse effect level ([NOAEL] the dose or concentration tested at which no adverse effects on test organisms were noted) for both terrestrial and aquatic organisms. Depending on data available for a given herbicide, chronic endpoints reflect either sublethal individual impacts (e.g., survival, growth, physiological impairment, behavior), or population-level impacts (e.g., reproduction [Barnthouse 1993]). For salmonids, careful attention was paid to smoltification (i.e., development of tolerance to seawater and other changes of parr [freshwater stage salmonids] to adulthood), thermoregulation (i.e., ability to maintain body temperature), migratory behavior, and other important life processes, if such data were available. With the exception of non-target plants, standard acute and chronic toxicity test endpoints were used for estimates of direct herbicide effects on RTE species. To add conservatism to the RTE assessment, levels of concern (LOCs) for RTE animals were lower than for typical species. Lowest available germination NOAELs were used to evaluate RTE plants.
- Assessment Endpoint 4: Adverse indirect effects on the survival, growth, or reproduction of salmonids. Measures of effect for this assessment endpoint depended on the availability of appropriate scientific data. Unless literature studies were found that explicitly evaluated the indirect effects of the target herbicides to salmonids and their habitat, estimates of indirect effects were qualitative. Such qualitative estimates of

indirect effects include general evaluations of the potential risks to food (typically represented by acute and/or chronic toxicity to aquatic invertebrates) and cover (typically represented by potential for destruction of riparian vegetation). The USEPA OPP is currently applying approaches similar to these qualitative evaluations for RTE species effects determinations and consultations.

Risk Quotient (RQ): EEC/TRV

Levels of Concern (LOC): Values established by the U.S. Environmental Protection Agency to assess potential risk to non-target organisms.

Risk Categories

The risk categories are calculated based upon the U.S. Environmental Protection Agency Office of Pesticide Programs (USEPA OPP) method of risk assessment.

- No risk (majority of RQs < most conservative LOC for non-special status species)
- Low risk (majority of RQs 1-10x most conservative LOC for non-special status species)
- Moderate risk (majority of RQs 10-100x most conservative LOC for non-special status species)
- High risk (majority of RQs >100 most conservative LOC for non-special status species)
- Not evaluated. The Risk Category is based on the risk level of the majority of risk quotients observed in any of the scenarios for a given exposure group and receptor type.

Table F-1. RQs and LOCs established by the U.S. Environmental Protection Agency for non-target organisms.

Risk Presumption		RQ	LOC
Terrestrial Animals [1]			
Birds	Acute high risk	EEC/LC_{50}	0.5
	Acute restricted use	EEC/LC_{50}	0.2
	Acute RTE species	EEC/LC_{50}	0.1
	Chronic risk	EEC/NOAEL	1
Wild mammals	Acute high risk	EEC/LC_{50}	0.5
	Acute restricted use	EEC/LC_{50}	0.2
	Acute RTE species	EEC/LC_{50}	0.1
	Chronic risk	EEC/NOAEL	1
Aquatic Animals [2]			
Fish and aquatic invertebrates	Acute high risk	EEC/LC_{50} or EC_{50}	0.5
	Acute restricted use	EEC/LC_{50} or EC_{50}	0.1
	Acute RTE species	EEC/LC_{50} or EC_{50}	0.05
	Chronic risk	EEC/NOAEL	1
	Chronic risk, RTE species	EEC/NOAEL	0.5
Plants [3]			
Terrestrial/semi-aquatic plants	Acute high risk	EEC/EC_{25}	1
	Acute RTE species	EEC/NOAEL	1
Aquatic plants	Acute high risk	EEC^2/EC_{50}	1
	Acute RTE species	EEC/NOAEL	1

[1] Estimated Environmental Concentration is in $mg_{prey\ wet\ weight}/kg_{BW}$ for acute scenarios and $mg_{prey\ wet\ weight}/kg_{BW}$/day for chronic scenarios.

[2] Estimated Environmental Concentration is in mg/L.

[3] Estimated Environmental Concentration is in lb/acre.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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IN REPLY REFER TO
ES/CO: BLM/Royal Gorge
Tails: 65412-2011-I-0375

APR 16 2012

Mr. Keith Berger, Field Manager
USDI Bureau of Land Management
Royal Gorge Field Office
3028 East Main Street
Canon City, Colorado 81212

Dear Mr. Berger,

The U.S. Fish and Wildlife Service (Service) received your letter and biological assessment on February 23, 2012, for the Programmatic Vegetation Management Plan for the Royal Gorge Field Office (RGFO), Bureau of Land Management (BLM) in Colorado. The Service provided comments on earlier versions of the biological assessment (April 13, 2011 and January 18, 2012). Additional project discussion occurred on April 13, 2012. Your letter requested concurrence with your determination that implementation of the proposed plan may affect, but is not likely to adversely affect the least tern (*Sterna antillarum*), Mexican spotted owl (*Strix occidentalis lucida*), piping plover (*Charadrius melodus*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), Ute ladies' tresses orchid (*Spiranthes diluvialis*), Canada lynx (*Lynx canadensis*), Colorado butterfly plant (*Gaura neomexicana* spp. *Coloradensis*), greenback cutthroat trout (*Oncorhyncus clarki stomias*), Uncompahgre fritillary butterfly (*Boloria acrocnema*), Pawnee montane skipper (*Hesperia leonardus montana*), black-footed ferret (*Mustela nigripes*), and Penland alpine fen mustard (*Eutrema pendlandii*). The plan also provides conservation measures for candidate species, including Arkansas darter (*Etheostoma cragini*), lesser prairie chicken (*Tympanuchus pallidicinctus*), Gunnison's prairie dog (*Cynomys gunnisoni*), and New Mexican jumping mouse (*Zapus hudsonius luteus*): conferencing will occur with the Service for these species in the event they are designated as a proposed species. These comments have been prepared under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C 1531 et. seq.).

The proposed action involves the implementation of the RGFO's programmatic Vegetation Treatment Management Plan (VTMP). The VTMP is needed to reduce the adverse impacts associated with an increase in noxious and invasive weeds in the Royal Gorge Resource Area (RGRA). The VTMP also provides a basis for evaluating a range of treatment options or combination of options for eradicating and/or controlling populations of noxious and other invasive weed species. Infestations of noxious and invasive weeds have significantly increased in number and extent in recent years due to oil and gas

development, livestock grazing, off-highway vehicle (OHV) use and other types of ground-disturbing activities. The recent increase in noxious and invasive weeds has contributed to a downward trend in the health of native plant communities in some parts of the RGFO. This decrease in native plant communities has also reduced the quality and quantity of habitat and forage for wildlife and livestock, altered soil productivity, increased the potential for soil erosion and adverse impacts on water quality, and caused a loss of riparian area function. The RGFO encompasses the entire front range of Colorado, including approximately 680,000 surface acres within the RGFO and an additional 6.8 million acres of subsurface minerals underlying private and state lands.

The proposed RGFO's VTMP and environmental assessment (EA) is tiered to the *Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS), which analyzed the impacts of using herbicides (chemical control methods) to treat noxious weeds and other invasive weeds on western public lands. In addition, the EA incorporates, by reference, the *Vegetation Treatments on BLM Lands in 17 Western States Programmatic Environmental Report* (PER), which evaluated the general effects of non-herbicide treatments (i.e., biological, physical, cultural, and prescribed fire) on public lands. The RGFO has begun conducting systematic, landscape-wide inventories for noxious weeds, as well as mapping known infestations. The focus of these surveys will include the inventory and mapping of noxious weed species that are considered the most harmful or pose the greatest threat of spreading into new areas. Treatment methods include manual treatment, biological control, and chemical control. As provided in the biological assessment, the Service understands that additional section 7 consultation will occur if biological control methods are proposed within the habitat of federally listed species.

Based on the information provided in the biological assessment, the Service concurs that the proposed action may affect, but is not likely to adversely the species listed above, as well as the critical habitat for those species, where applicable.

If any additional species that are federally listed, proposed for federal listing, or candidate for Federal listing are found in the project area, if critical habitat is designated in the project area, or if new information becomes available that reveals that the action may impact such species in a manner or to an extent that was not previously considered, this office should be contacted to determine if further section 7 consultation will be required. If the Service can be of further assistance, please contact Leslie Ellwood of this office at (303) 236-4747.

Sincerely,

for Susan C. Linner
Colorado Field Supervisor

Ref: Projects\BLM\BLM_Royal Gorge_Veg Mngt Plan 2012_FWSConcur