United States Department of the Interior

NATIONAL PARK SERVICE
Black Canyon of the Gunnison National Park
Curecanti National Recreation Area
102 Elk Creek
Gunnison, Colorado 81230

IN REPLY REFER TO:

N1621CURE

June 30, 2015

Memorandum

To: Ann Timberman, Western Colorado Supervisor, US Fish and Wildlife Service, Ecological Services, Grand Junction, Colorado

From: Bruce Noble, Superintendent, National Park Service, Curecanti National Recreation Area, Gunnison, Colorado; Bruce Noble

Field Manager, Bureau of Land Management, Gunnison Field Office, Gunnison, CO; Scott Armentrout, Forest Supervisor, Grand Mesa, Uncompahgre and Gunnison National Forests, Delta, CO

Subject: Request for concurrence that the Upper Gunnison Basin Gunnison Sage-Grouse Brood-rearing Habitat Restoration and Weed Treatment projects are not likely to adversely affect Gunnison sage-grouse (*Centrocercus minimus*) or critical habitat.

The National Park Service (NPS, Curecanti National Recreation Area), Bureau of Land Management (BLM, Gunnison Field Office) and US Forest Service (USFS, Grand Mesa, Uncompahgre and Gunnison National Forest, Gunnison Ranger District) request concurrence from US Fish and Wildlife Service (USFWS) that the Upper Gunnison Basin Gunnison Sage-Grouse Brood-rearing Habitat Restoration and Weed Treatment projects may affect, but are not likely to adversely affect (NLAA), Gunnison Sage-grouse or critical habitat. A description of the proposed action, the affected area, the effects to the species and critical habitat, and the rationale for interagency NLAA determination is provided below. Appendices and letters authorizing NPS to submit this Biological Assessment on behalf of USFS and BLM are attached. As we move through the informal consultation process, please contact our Wildlife Biologist, Theresa Childers, with any updates, issues or questions that arise. She can be reached at 970-641-2337 ext 250.

I. INTRODUCTION

The National Park Service (NPS), Curecanti National Recreation Area, Bureau of Land Management (BLM), Gunnison Field Office, and U.S. Forest Service, Grand Mesa, Uncompahgre and Gunnison National Forests (GMUG) requests concurrence from the US Fish and Wildlife Service (USFWS) that the Upper Gunnison Basin Gunnison Sage-Grouse Brood-rearing Habitat Restoration and Weed Treatment activities may affect, but is not likely to adversely affect (NLAA), Gunnison sage-grouse and Gunnison Sage-grouse critical habitat. A description of the proposed action, the affected area, the effects to the species and critical habitat and the rationale for the action agency's NLAA determination is provided below. The NPS, Curecanti National Recreation Area is the lead agency in initiating this consultation.

Threatened and endangered species are managed under the authority of the Endangered Species Act of 1973 (PL 93-205, as amended). This biological assessment conforms to legal requirements set forth under Section 7 of the Endangered Species Act (ESA) (19 U.S.C. 1536 (c), 50 CFR 402.12 (f) and 402.14). Section 7(a)(1) of the ESA requires federal agencies to use their authorities to further the conservation of listed species. Section 7(a)(2) requires Federal agencies to ensure that all actions which they authorize, fund, or carry out are not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of their critical habitat.

Pursuant to section 7 of the ESA, this biological assessment (BA) analyzes the potential effects from implementing various habitat restoration techniques and non-native plant treatments in Gunnison sage-grouse designated critical habitat within the Upper Gunnison Basin. This BA describes a variety of federal actions and associated conservation measures and is intended to be a tool to screen these activities on federal lands for coverage under a streamlined programmatic concurrence from U.S. Fish and Wildlife Service. The federal action agencies seek programmatic concurrence and as long as the federal agencies design and manage these specified activities and meet conservation criteria as described in this BA, the federal agencies will have met their ESA consultation requirements for those covered activities.

The actions described in this BA are intended to be implemented for the benefit of Gunnison sage-grouse and other wildlife species that depend on the sagebrush ecosystem. While these actions may have small-scale, short-term direct and indirect effects during implementation, we anticipate long-term beneficial effects in terms of habitat improvement. We fully expect that the long-term benefits will outweigh any short-term impacts that might occur during implementation. We do not anticipate any adverse effects to the species or designated critical habitat from the proposed activities.

II. DESCRIPTION OF THE PROPOSED ACTION

The goal of this project is to improve Gunnison Sage-grouse habitat on federally managed public lands throughout Gunnison Basin Gunnison Sage-grouse designated critical habitat by: 1) restoring proper hydrologic function to degraded wet meadows, non-wetland swales, and perennial, intermittent, and ephemeral drainages, and 2) by reducing noxious and invasive weed infestations. The National Park Service Curecanti National Recreation Area (NPS), Bureau of Land Management Gunnison Field Office (BLM), and United States Forest Service Gunnison Ranger District (USFS) plan to conduct mechanical, chemical, and biological weed treatment activities and to install natural erosion control

structures over the next 20 years. The purpose of weed treatments is to protect natural vegetation communities by reducing or removing noxious and invasive weeds that compete with native vegetation. The purpose of natural erosion control structures are to reconnect the water table to nearby dry meadows, slow the water flow during rain events, sequester sediment, stop headcut advancement, reestablish vegetation at headcuts, and restore sage-grouse brood-rearing habitat. Specific erosion control objectives include:

1. Disperse flows more widely across floodplain surfaces to maximize infiltration and increase bank storage during flood events;
2. Stabilize eroded wet meadow soils to control head-cutting and reduce gully expansion thereby retaining bank storage and extending base flows;
3. Expand the size, extent and distribution of riparian/wetland sites; and
4. Increase health, vigor and density of riparian/wetland vegetation, such as native sedges, rushes, wet-loving grasses and forbs.

Noxious and Invasive Plant Species Treatments

Small scale mechanical, chemical, and biological weed treatments will be dispersed throughout the entire action area within all vegetative communities and will target all federal and state listed noxious and invasive weeds. Mechanical treatments will include hand-pulling or mowing small or dispersed single plant infestations. Mechanical treatments are labor intensive and are only effective for removing annual weeds and seed sources from small, isolated weed patches. Chemical weed treatment will be more extensively used throughout the project area. Chemical treatments include spot broadcasts and aerial spraying. Biological control methods use insects, pathogens, or other disease vectors to inhibit or control vegetation.

The Bureau of Land Management-Gunnison Field Office, National Forest-Gunnison Ranger District, and the National Park Service-Black Canyon of the Gunnison National Park/Curecanti National Recreation Area are proposing continuing Noxious Weed Control Programs in order to improve Gunnison Sage-grouse habitat. In the 2014 Endangered Listing for the Gunnison Sage-grouse, USFWS identified invasive plants as an increasing threat to Gunnison Sage-grouse into the future. Cheatgrass was specifically identified as a threat as it expands its range and changes natural vegetation through shorter fire regimes coupled with expected climate change.

Some of the main invasive plants targeted for treatment in Gunnison Sage-grouse Critical Habitat include Canada Thistle, Oxeye Daisy, Cheatgrass, Dalmation Toadflax, Spotted Knapweed, and Absinth Wormwood. This practice may be applied to control or remove invasive and noxious weeds in order to restore native or desired plant communities and habitat for the bird consistent with the ecological site. It secondarily protects soils, controls erosion, reduces fine-fuels fire hazards, and improves air quality.

For management and planning, the State of Colorado uses a noxious weed list which is updated on a regular basis. Species are categorized by different levels of threat. List A weeds are species identified for immediate eradication. List B are species for which the State Commissioner, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, develops and implements state noxious weed management plans designed to stop the continued spread of these species. List C species are species for which the Commissioner, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, will develop and implement

state noxious weed management plans designed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands. The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species.

The Agencies focus mainly on these species but other problem species such as Kochia or Pennycress may be targeted where high occurrences are found. The Agencies also use discretion on targeting species that have the greatest chance of impacting Gunnison Sage-grouse habitat, such as List C species cheatgrass.

<u>Colorado Noxious Weed Species (Updated December 30, 2014)</u>

List A Species
African rue (*Peganum harmala*)
Camelthorn (*Alhagi maurorum*)
Common crupina (*Crupina vulgaris*)
Cypress spurge (*Euphorbia cyparissias*)
Dyer's woad (*Isatis tinctoria*)
Elongated mustard (*Brassica elongata*)
Giant reed (*Arundo donax*)
Giant salvinia (*Salvinia molesta*)
Hairy willow-herb (*Epilobium hirsutum*)
Japanese knotweed (*Polygonum cuspidatum*)
Gaint knotweed (*Polygonum sachalinense*)
Bohemian knotweed (*Centaureax bohemicum*)
Meadow knapweed (*Centaurea nigrescens*)
Mediterranean sage (*Salvia aethiopis*)
Medusahead (*Taeniatherum caput-medusae*)
Myrtle spurge (*Euphorbia myrsinites*)
Orange hawkweed (*Hieracium aurantiacum*)
Purple loosestrife (*Lythrum salicaria*)
Rush skeletonweed (*Chondrilla juncea*)
Squarrose knapweed (*Centaurea virgata*)
Tansy ragwort (*Senecio jacobaea*)
Yellow starthistle (*Centaurea solstitialis*)

List B Species
Absinth wormwood (*Artemesia absinthium*)
Black henbane (*Hyoscyamus niger*)
Bouncingbet (*Saponaria officinalis*)
Bull thistle (*Cirsium vulgare*)
Canada thistle (*Cirsium arvense*)
Chinese clematis (*Clematis orientalis*)
Common tansy (*Tanacetum vulgare*)
Common teasel (*Dipsacus laciniatus*)
Corn chamomile (*Anthemis arvensis*)
Cutleaf teasel (*Dipsacus laciniatus*)
Dalmatian toadflax, broad-leaved (*Linaria dalmatica*)
Dalmatian toadflax, narrow-leaved (*Linaria genistifolia*)

Dame's rocket (*Hesperis matronalis*)
Diffuse knapweed (*Centaurea diffusa*)
Eurasian watermilfoil (*Myriophyllum spicatum*)
Hoary cress (*Cardaria draba*)
Houndstongue (*Cynoglossum officinale*)
Jointed goatgraa (*Aegilops cylindrical*)
Leafy spurge (*Euphorbia esula*)
Mayweed chamomile (*Anthemis cotula*)
Moth mullein (*Verbascum blattaria*)
Musk thistle (*Caruus nutans*)
Oxeye daisy (*Leucanthemum vulgare*)
Perennial pepperweed (*Lepidium latifolium*)
Plumeless thistle (*Carduus acanthiodes*)
Russian knapweed (*Acroptilon repens*)
Russian-olive (*Elaeagnus angustifolia*)
Salt cedar (*Tamarisk chinensis, T. parviflors, and T. ramosissima*)
Scentless chamomile (*Tripleurospermum perforate*)
Scotch thistle (*Onopordum acanthium, O. tauricum*)
Spotted knapweed (*Centaurea stoebe*)
Sulfur cinquefoil (*Potentilla recta*)
Wild caraway (*Carum carvi*)
Yellow nutsedge (*Cyperus esculentus*)
Yellow toadflax (*Linaria vulgaris*)

List C Species
Bulbour bluegrass (*Poa bulbosa*)
Chicory (*Cichorium intybus*)
Common burdock (*Arctium minus*)
Common mullein (*Verbascum Thapsus*)
Common St.John's Wort (*Hypericium perforatum*)
Downy brome (*Bromus tectorum*)
Field bindweed (*Convolvulus arvensis*)
Halogeton (*Halogeton glomeratus*)
Johnsongrass (*Sorghum halepense*)
Perennial sowthistle (*Sonchus arvensis*)
Poison hemlock (*Conium maculatum*)
Puncturevine (*Tribulus terrestris*)
Quackgrass (*Elymus repens*)
Redstem filaree (*Erodium cictarium*)
Velvetleaf (*Abutilon theophrasti*)
Wild proso millet (*Panicum miliaceum*)

The program will be implemented for the lifespan of this biological assessment and includes chemical (herbicide) treatment of noxious weed and invasive plants on approximately 200 to 2,500 acres annually. Acres treated per year can fluctuate greatly depending on targeted species, funding, and weather patterns. Aerial spraying can also increase treated acreage rapidly so no maximum number of acres will be determined under this consultation. Currently, the agencies weed programs are spraying limited acres (Table 1), but with the threats identified in the listing, priority to treating within Gunnison Sage-grouse Critical Habitat will be increased.

Table 1. 2014 Acres Chemically Treated in Gunnison Sage-Grouse Designated Critical Habitat

Agency	Acres Treated
BLM	60
Forest Service	25
Park Service	32

Other annual weed control actions include manual control, biological releases, and cultural control measures. Invasive plant control evaluations, monitoring, and reporting criteria have also been identified for the proposed program. Each of these control methods are discussed separately below.

Chemical Weed Treatments

Herbicide applications are scheduled and designed to minimize potential impacts to non-target plants and animals, while remaining consistent with the objectives of the program. The rates of application depend on the target species, the presence of non-target vegetation, soil type, persistence of chemicals in soil, presence of water sources, riparian areas, and special status plants, and requirements specified in integrated pest management plans and herbicide labels.

Herbicides

The agencies each have separate herbicide lists and application rates that may be used during application implementation. Herbicides are regulated by the E.P.A. and each Agency also does compliance on chemical use through the National Environmental Policy Act (NEPA).

Table 2 identifies examples of the most common used chemicals utilized by the Agencies within Gunnison Sage-grouse Critical Habitat:

Table 2. Herbicides Commonly Used by the Action Agencies

Brand Name	Active Ingredient	Examples of Target Species
Tordon T22	Picloram	Russian knapweed, musk thistle, yellow toadflax
Milestone	Triisopropanolammonium	Thistle, Absinth wormwood, scentless chamomile, oxeye daisy, knapweed
Telar	Chlorsulfuron	Yellow toadflax, hounds tongue
Escort	Metsulfron methyl	Yellow toadflax
Overdrive	Diflufenzopyr	Yellow toadflax
Plateau	Imazapic	Cheatgrass
Roundup	Glyphosate	Annual and Perennial Invasives
Vista XRT	Fluroxypyr	Kochia
Curtail	Clopyralid	Knapweed, Thistle
Garlon	Triclopyr	Russian Olive, Canada thistle
2,4-D	2,4-D	Thistle, Knapweed, Hounds Tongue

Carriers

Carriers are used to dilute or suspend herbicides during application and allow for proper placement of the herbicide. Water is the carrier that will be used during application implementation and is generally effective with a wide range of herbicides.

Spray Additives/Adjuvants/Surfactants

Spray additives can be included in formulated herbicides, or can be added to the spray mixture to improve mixture effectiveness. Adjuvants are classified by their uses rather than their chemistry, although chemical properties determine their suitability for use with different herbicides. Adjuvants include surfactants, antifoaming agents, compatibility agents, crop oil or crop oil concentrates, activators, and drift control agents. Name brand examples of surfactants commonly used are Noble, Cornbelt Soy-stik, Bio 90, and Activator 90.

For ground application methods, surfactants are mixed at a rate of approximately 4 pints per 100 gallons of tank mix. Spot spraying is the main application but aerial applications would use 4 to 8 pints per acre.

Dye Additives

Spray dyes are often added to the tank mix to colorize the spray formulation so the applicator can easily distinguish treated areas and see the spray pattern of the equipment being used. As needed, dyes will be utilized in sensitive areas to allow for more accurate application. The dye is often a blue colorant which photo-degrades in a period of approximately a week. The dye is added to the spray tank at approximately 8 fluid ounces per 100 gallons of spray. A brand example is Highlight Blue. Dyes are an environmentally friendly benign food grade dye.

Application Methods

Herbicides will be applied either from the air or on the ground. Ground application will include both mechanized and hand equipment to either broadcast or spot treat sites. Herbicide application rates have been analyzed by the Environmental Protection Agency and each Agency has already conducted NEPA in order to spray at Agency application rates, never above and generally lower than spray rates identified on product labels.

Ground Based Application

Examples of mechanized equipment used for ground based herbicide treatments include vehicle mounted tanks, ATV, and UTV mounted sprayers. These sprayers usually have a tank capable of 15 to 200 gallons. They also have spray booms that can be used for broadcast application. This equipment is also equipped with handguns used for spot treatments. The majority of all the acreage sprayed by ground methods are spot applications where operators use the hand gun to selectively apply herbicides to target vegetation.

Ground based application will also use hand methods including horseback sprayers, backpack sprayers, hand pump sprayers, hand spreading granular application, painting, or injecting herbicides.

Aerial Application

Aerial applications will be made from helicopters or small planes using boomed-mounted nozzles for liquids. Aerial application is commonly used to treat larger infested areas and areas located in rugged terrain such as canyons. Cheatgrass is the aerially targeted species within the Gunnison Basin. In past aerial spray efforts, accurately mapped polygons were sprayed totaling 1,200 acres on BLM and private lands within occupied Gunnison Sage-grouse habitat. Areas are mapped with GPS, buffers to any sensitive/buffered areas are identified, and these files are downloaded to the navigational computer. Pilots can then accurately position themselves and avoid these sensitive/buffered areas. Surfactants are added and weather conditions must be met in order to reduce the amount of drift while applying.

Manual Control

Manual control treatments will be conducted on small acreages (15-20 acres) annually. Hand-operated power tools and hand tools are used in manual vegetation to cut, clear, prune, or pull herbaceous and woody species. This method is labor intensive and costly but it is highly species selective and can be used in areas of sensitive habitats or areas that are inaccessible to ground vehicles.

Biological Control

Biological control will include the use of insects, pathogens, or other disease vectors of the target plant. These methods use living organisms to selectively suppress, inhibit, or control herbaceous and woody vegetation. The main use of biological control currently is release of insect agents which are parasitic which target noxious weeds such as Canada thistle. This method does not eradicate weed species, but is used to reduce the target organism to which chemical treatment can be more effective.

Cultural Control Minimization Standards

The Candidate Conservation Agreement for the Gunnison sage-grouse, *Centrocercus minimus* Gunnison Basin Population (2013), which was signed by the three Federal Agencies listed within this biological assessment, contains weed spread minimization BMP's for realty/ROW, recreation, and grazing actions that occur in sage grouse occupied habitat in the Gunnison Basin. These BMP's will be extended to Designated Critical Habitat through this BA. These BMP's are listed in **Appendix A**.

Erosion Control Restoration Structures

This project is part of the Gunnison Basin Climate Change Working Group effort to build resiliency into riparian areas and wet meadows within the sagebrush ecosystem for Gunnison sage-grouse, based on climate change vulnerability assessment work that indicates Gunnison sage-grouse may be highly vulnerable to climate change impacts. This project is a collaborative effort with The Nature Conservancy, Colorado Parks and Wildlife, Natural Resources Conservation Service, Bureau of Land Management, National Park Service, Western State Colorado University, Gunnison County, and private landowners. This project builds upon restoration work completed from 2012 to 2014 on private, BLM, and USFS lands and will continue into the foreseeable future.

Erosion control restoration methods include the design and building of small rock, log, fence, and earthen structures, following the methods described by Zeedyk and Clothier (2014). Habitat restoration methods also include low water crossings and low-standard rural road management of unpaved roads on federal lands to address erosion issues caused by roads. Road management

techniques will follow the concept of harvesting water from roads as an important aspect of maintenance activities, as described by Zeedyk (2010). These habitat restoration methods will be implemented in degraded drainage, mesic sites and riparian areas in sagebrush habitats meeting one or more critical habitat primary constituent elements. Erosion control structure installation involves numerous steps including: site selection and project design, procurement of rock or logs, transportation of materials to site, hand building structures and on-going monitoring and maintenance.

Restoration techniques include grade control structures (one rock dams), flow dispersal structures (plug and spread, media lunas, filter dams, rock baffles, and worm ditches), and headcut control structures (log and fabric structures, Zuni bowls, rock rundowns, and laybacks) following methods from Zeedyk and Clothier (2014). One rock dams, media lunas, filter dams, rock baffles, rock rundowns, and laybacks are small hand-placed rock structures. Log and fabric structures are made of logs and permeable commercial-grade black fabric that allows water to flow through the structure. Plug and spread structures consist of minor earthwork using a 200 series small excavator and/or a small skidster. Worm ditches are small, shallow sinuous ditches dug by hand using a shovel. Site conditions will influence the types of restoration techniques used. Depending on the restoration structure used and site conditions, native seed may be spread at sites and willow plantings may be used.

Restoration structures will be constructed under the supervision of USFS, BLM, and NPS employees in partnership with Natural Resources Conservation Service, Colorado Parks and Wildlife, and The Nature Conservancy (TNC) including several restoration specialists under contract with TNC. Manual labor may be completed with a combination of federal employees, youth crews (Western Colorado Conservation Corps; Youth Conservation Corps), and volunteers including organized volunteer events with groups such as the Wildland Restoration Volunteers and local community members.

Specific restoration methods are described below. For examples of photos of these activities from work completed in the Gunnison Basin from 2012 – 2014, please see **Appendix B**.

Rock Structures: Construction for the rock structures will be accomplished using imported loose rock hauled to previously disturbed areas that will be used as rock staging areas. Staging areas will be along existing open roads. Rocks would be moved from staging areas to restoration sites by truck, front-in-loader and UTV. Native, local rock may also be used when rock is abundant on site. Truck and front-in-loader use will occur primarily on established roads. Cross-country travel by UTV may be needed to deliver rock to specific restoration site locations. Rock structures are built by hand using manual labor and hand tools (shovels, Pulaskis). Rock structures serve to slow runoff, increase soil moisture, recruit vegetation, and ultimately prevent headcuts from migrating further up slope.

Log and Fabric Structures: This structure is used to control headcuts advancing through wet soil areas such as wet meadows and spring seeps. The erosive action can be stopped if a healthy mat of wet soil vegetation can become established to hold the lip of the headwall in place. This was successfully accomplished in 2013 on USFS lands on Flat Top Mountain on a headcut that eroded 60 feet in a 20-year period from 1993 – 2013 (see pictures in Appendix B). A log and fabric structure is built using geotextile fabric and logs arranged in tiers, or layers, stacked even with the lip of the headwall. Log lengths range from four feet to 12 feet in length, with the longest logs at the bottom and shortest logs at the top. The geotextile fabric is placed between the log layers. This method is described in detail by Zeedyk (2014).

Plug and Spread (formerly called plug and pond): The plug and spread structures may be constructed with a bulldozer, skid steer, 200 series small excavator, or a combination of latter two. These structures are limited in depth to 1.5 – 3 feet, do not stay flooded except during rain events or spring runoff from snowmelt, and are intended to fill in with hydrophytic vegetation within a year or two of being built. The plug and spread is a means to plug gullies to raise the water table, increase the size of wetlands, and spread water over a larger area to reconnect the channels with their floodplains. They also function to counteract the effects of channel incision and restore hydrologic connectivity with adjacent wet meadows.

Worm Ditches: As described by Zeedyk (2014), one way to stop a headcut is to starve it of water. This is done by redirecting erosive flows to a well-protected entry point. A worm ditch is a bypass channel dug around a headcut. A worm ditch is an effective treatment for headcuts in wet meadows. Worm ditches help to spread water and re-wet meadows that are drying out due to headcuts causing incised gullies that no longer allow water to infiltrate the meadows as they once did. It is not intended to be used on a stream. Worm ditches are constructed as a meandering channel 12 to 18 inches wide and 6 to 12 inches deep. Worm ditches would only be constructed where the following conditions are met: 1) there is a broad valley with sufficient space between the gully and the hill slope for the worm ditch; 2) there is a well-armored re-entry point downstream of the headcut; and 3) wetland soils are capable of supporting a dense growth of wetland plants such as sedges. This can be an effective method to help maintain wet meadows for the benefit of Gunnison Sage-Grouse brood-rearing habitat.

Road Management and Low Water Crossings: Roads are a significant feature affecting hydrology across the landscape. Where roads are contributing to or the cause of eroded channels and incised gullies, we may build low water crossings, re-grade roads to harvest water, or move portions of roads outside of wet meadows using Zeedyk's methods for low-standard rural roads (Zeedyk 2006). Low water crossings may be constructed or maintained to reduce sedimentation and erosion of streams at eroded stream crossings that have native surface material with inadequate drainage. Low water crossings will also be constructed following methods described in Zeedyk (2006) to address altered water movement across the landscape causing concentrated and accelerated flow and causing soil erosion and gully formation.

Drift Fences: Drift fences may be constructed across meadows or riparian areas to prevent incisions and reduce soil compaction caused by livestock and big game traveling through sensitive areas. Drift fences consist of a linear fence typically about 30 meters (100 ft.) in length constructed with wildlife-friendly techniques consistent with methods described by Colorado Parks and Wildlife, Fencing with Wildlife in Mind (Hanophy 2009) and also consistent with the fence conservation measures described in the Gunnison Basin Candidate Conservation Agreement for the Gunnison Sage-Grouse. Depending on the site, drift fence length could go up to 100 meters. Drift fences will not exclude wildlife and livestock from areas, rather they will affect grazing and trailing behavior by causing animals to "drift" more to the adjacent upland areas instead of traveling on a consistent path in riparian areas and wet meadows that often results in soil compaction or incised gullies.

Restoration Maintenance: There will be a need to re-visit the restoration sites each year to assess how the structures are functioning, to determine if they are functioning properly, and to maintain the structures. Maintenance includes adding additional layers of rock as the structures accumulate sediments over time, until sites are considered restored.

Monitoring: Due to headcuts, eroded channels, and incised gullies traditional wet meadow and riparian habitats within the sagebrush ecosystem are drying out and being encroached by upland plant

species. This results in loss of high quality brood-rearing habitat for Gunnison sage-grouse, as well as important stopover sites for migratory birds and riparian dependent or obligate bird species. Thus, vegetation monitoring will be designed to assess our ability to restore restoration sites such that they become more resilient and persist during drought conditions, and to re-establish conditions that existed prior to erosion degradation.

Vegetation monitoring will be established to assess the following vegetation management objectives within the restored portion of the sites: 1) increase the average cover and density of native sedges, rushes, willows and wetland forbs; and 2) decrease the average cover of rabbitbrush, sagebrush and other upland species encroaching in riparian areas and wet meadows. Vegetation will be monitored using the Line Point Intercept method across restoration sites and control sites.

In partnership with the Audubon Society, Landbird population monitoring following the Rocky Mountain Bird Observatory landbird monitoring protocol (Hanni et al. 2014) will be conducted at erosion control restoration sites and control areas to assess songbird response to restoration treatments.

Timing of Activities: Rock delivery/staging, vegetation monitoring, and construction of restoration structures would take place between July 15 and October 30 each year, with most activities occurring in August. Landbird population monitoring will be implemented May – June each year. Field reconnaissance will take place late May through June at eroded stream channels, wet meadows and non-wetland swales along drainages, and riparian areas to assess site conditions and determine restoration methods that should be applied.

Conservation Measures

To minimize or avoid impacts to Gunnison sage-grouse, the Agencies would apply, at a minimum, the conservation measures listed below:

Noxious and Invasive Plant Species Treatments

- Avoid treatment activities during leking (March 15-May 15th)
- Do not aerially spray 2,4-D within 0.25 mile of occupied habitat.
- Do not aerially spray clopyralid, diuron, hexazinone, picloram, or triclopyr in occupied habitat or in adjacent areas when aerial drift may occur.
- If broadcast spraying bromacil, diquat, imazapyr or metsulfuron methyl in occupied habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr in occupied, use the typical, rather than the maximum, application rate.
- The only herbicides that will be considered by the Agencies for aerial application within occupied or suitable sage-grouse habitat would be glyphosate and imazapic. Application rate for glyphosate would not exceed 12oz/acre, for imazapic rates would not exceed 6oz/acre.

- For active restoration of occupied Gunnison sage-grouse aerial application of Glyphosate or Imazapic will be considered for plant communities that have ≥ 50% composition invasive nonnative annuals. Only nonionic surfactants would be utilized in these scenarios.

- Aerial spraying of imazapic and Glyphosate will be limited to fall season to reduce impacts to native vegetation.

- For fire disturbances in occupied Gunnison sage-grouse aerial application of Glyphosate or Imazapic will be considered for communities that have ≥ 15% composition invasive nonnative annuals. The full array of approved surfactants would be available for use.

- Herbicide application records where Gunnison sage-grouse are involved would be provided to the Service annually.

Erosion Control Restoration Activities

- To protect breeding Gunnison sage-grouse, material transport and all surface-disturbing activities shall not occur from March 15 through July 15. This time frame protects birds during the lek, nesting, and early brood-rearing periods.

- To minimize impacts on big game, sensitive species, and migratory birds, erosion control restoration treatments should occur between July 15 and October 30.

- Gunnison sage-grouse often use relatively steep, rocky slopes as nighttime roost sites. To minimize impacts to potential roost sites, when using local native rock sources do not harvest more than 10% of the rock available at any given location. Spread harvesting evenly throughout the source area.

- When using drift fences as one of the habitat restoration methods, avoid placement within 0.6 mi of leks, unless there are topographic features blocking line of sight with the lek. To avoid animal collisions and creating perch sites for raptors and corvids, install fences consistent with the direction in the Candidate Conservation Agreement for the Gunnison Sage-Grouse, Gunnison Basin Population (CCA page 23, section 4.4.3).

- Off-site rock and logs will be weed-free.

- All vehicular equipment and tools must be cleaned prior to entering public lands to avoid the risk of introducing noxious and invasive weeds in the action area.

- When using vehicles (full-sized pick-up trucks, front-in-loaders, UTVs) are used to transport material (rock, logs, fence materials, hand tools), off-route travel will be minimized as much as possible and any off-route paths will be rehabilitated and reseeded with a native seed mix, as needed.

- Treatment areas will be monitored for the establishment and spread of noxious and invasive weeds pre- and post-treatment and treated if needed.

In addition, the Agencies would develop and implement additional conservation measures, as necessary, during project-level planning.

III. DESCRIPTION OF THE AFFECTED AREA AND LOCATION:

Across all land ownerships, there are an estimated 500,909 acres of occupied and 119,707 acres of unoccupied sage-grouse critical habitat in the Gunnison Basin (U.S. Fish and Wildlife Service 2014, Table 4). Elevation within critical habitat ranges from 7,500 to over 9,500 feet. Precipitation levels range from 7 to 16 inches depending on geographic area and elevation. The majority of sage-grouse habitat within the basin receives less than 12 inches of precipitation annually. The majority of occupied critical habitat is sagebrush, but the area also includes cottonwood and herbaceous riparian, juniper, aspen, and coniferous forest vegetative communities. Typical sagebrush types include mountain big sagebrush, Wyoming big sagebrush and black sage. Mountain big sagebrush occurs at higher elevations and at lower elevations containing moist sites. Wyoming big sagebrush is typically found at lower elevations and on drier sites. There is a hybrid of Wyoming and mountain in transition areas between the two. Black sage is also found on the dry gravel soils in lower elevations. Aspect is also an important factor influencing soil moisture content and the distribution of big sagebrush, with mountain big sagebrush often occurring on more northerly slopes and Wyoming big sagebrush occurring on more southerly slopes. There are many perennial and ephemeral streams within the sagebrush-steppe habitat that provide important brood rearing habitat throughout the Basin. Many of these streams have sagebrush encroachment as a result of down-cutting and entrenchment of the stream channel, leading to contraction of the riparian zone (RCP 2005).

The action area for this biological assessment includes all federally managed lands within the Gunnison Basin critical habitat unit (described as Unit 6 in U.S. Fish and Wildlife Service 2014). The Gunnison Basin critical habitat unit occurs in portions of Gunnison, Saguache, Hinsdale, and Montrose Counties. The small portion of this critical habitat unit in Montrose County is unoccupied. We estimate the action area to be 480,977.4 acres (Figure 1). We determined this area estimate for the action area based on tables 4 and 5 in the Final Rule for the designation of critical habitat for Gunnison sage-grouse (U.S. Fish and Wildlife Service 2014). Table 3 below provides area estimates per federal agency.

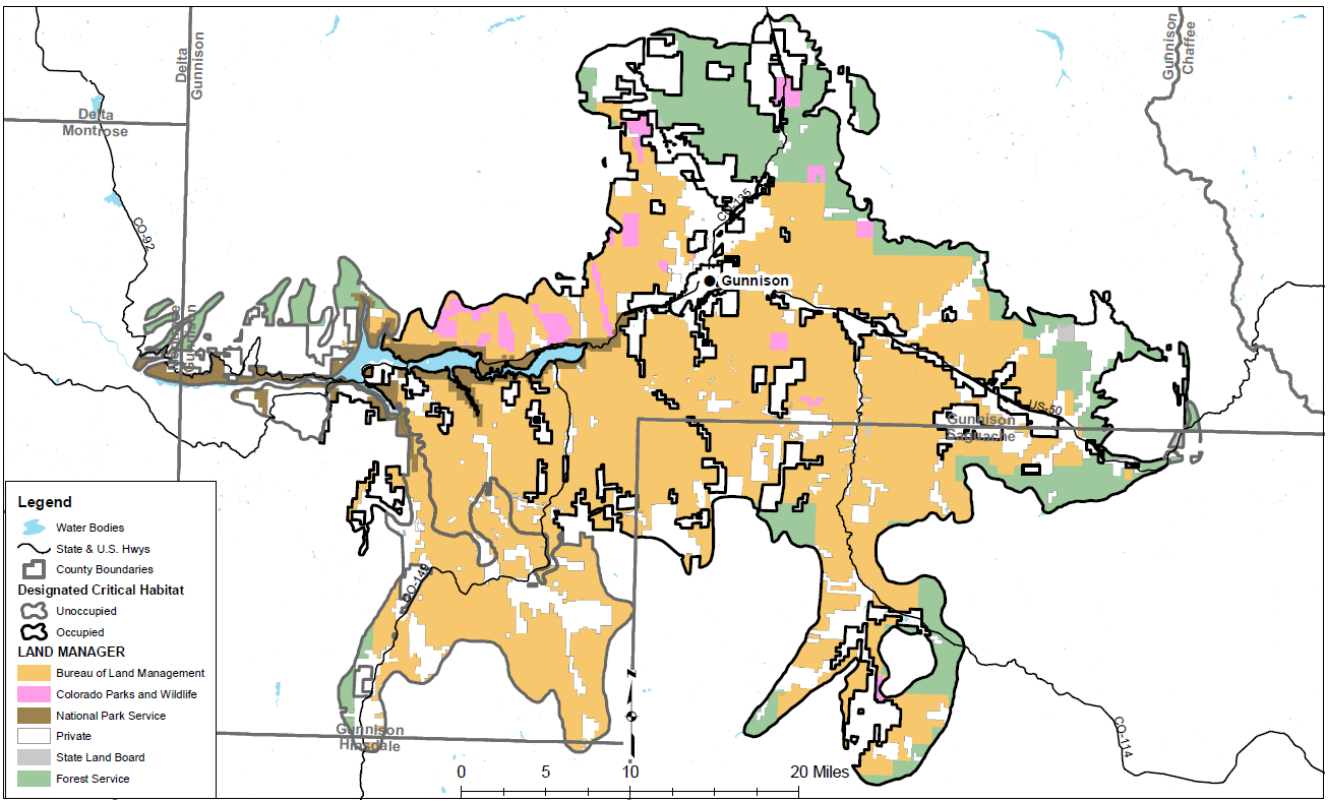

Figure 1. Action Area – All BLM, USFS, and NPS managed lands within the Gunnison Basin critical habitat unit.

Table 3. Gunnison Basin Critical Habitat Unit: Area Estimates by Federal Land Manager (acres)

	Land Manager		
Status	***BLM***	***USFS***	***NPS***
Occupied	300,476	83,650	12,172
Unoccupied	63,497	11,861	8,832

Existing Conditions

While the project area includes all federally managed Gunnison sage-grouse critical habitat in the Gunnison Basin, only localized areas within the project area will be affected. Weed treatments will occur in all vegetative communities within the project area. Since most weed infestations occur in disturbed areas (soil disturbance or fire-impacted) and along roads and trails, most treatments, by definition, will occur in fragmented habitat. However, protecting large patches of intact sagebrush and riparian habitat is a priority for all federal agencies and patches of weeds occurring in these intact communities will also be treated.

This analysis represents the initial baseline data in which the agencies will use to determine how future actions affect the species and its habitat across the Gunnison Basin. The following is a summary of existing conditions related to the threats to the species identified by the U.S. Fish and Wildlife Service that are relevant to this programmatic project.

Historic Modification of Habitat

Sagebrush communities in the Gunnison Basin have remained relatively intact compared to many of the large expansive sagebrush communities in the West that have been chained, chemically treated,

burned, converted due to invasive weeds, changing fire regimes, and converted to agricultural land. Fragmentation due to expansion of residential development, creation of Blue Mesa Reservoir which flooded a large area of sage grouse habitat, and expansion of hay meadows has resulted in the loss of some habitat in the Gunnison Basin. With Federal lands in the Gunnison Basin, removal of sagebrush habitat has been minimal. Contour plowing was done extensively across the sagebrush habitat during the 1940's to attempt to preserve soil in response to the dust bowl. Although total acreages of plowing are unknown, vegetation has returned to a natural sagebrush ecosystem, however, the alteration of contouring can still be seen. Some conversion of native vegetation to non-native grasses on Federal lands has occurred during the 1960's and 1970's. Crested wheat and Russian wild rye were planted to provide more robust forage for cattle. These species cause a monoculture with few natives able to grow within these stands. Most of these plantings are on BLM lands and total approximately 2,000 acres. Approximately 2,000 acres of sagebrush was treated using Tebuthiuron (Spike), a granular chemical that causes mortality to sagebrush. This was done using test strips within the sagebrush at varying levels of treatment dosage. Sagebrush was set back in these areas but many of these sites had cover above the maximum recommended cover for sagebrush so habitat was not reduced. Both prescribed and wildfire has occurred in the Gunnison Basin. Most prescribed fires were small patch burns within sagebrush as habitat improvement projects for wildlife species such as sage grouse and big game. Between wildfire and prescribed burns, approximately 1,010 acres has been burned within sage grouse habitat in the Gunnison Basin on Federal Lands. The largest wildfire in sage grouse habitat, the Wiley Burn (2004), has returned to fairly high quality sagebrush habitat.

Despite these modifications to habitat, Boyle and Reeder (2005) note the rate of sagebrush loss in the Gunnison Basin was lower than other areas of sagebrush distribution in Colorado (U.S. Fish and Wildlife Service 2010; page 59813). It appears that 60-70% of potential historic habitat remains occupied in the Gunnison Basin, considerably more than USFWS' estimated 7% of potential historic habitat currently occupied rangewide (U.S. Fish and Wildlife Service 2010, page 59813).

Roads and Trails

Within occupied Gunnison Basin Gunnison Sage-Grouse critical habitat, there are currently 1,349 miles of roads accessible to 2-wheel-drive vehicles and 4-wheel-drive accessible roads, and trails used by motorcycles, bicycles, horses and hikers are heavily distributed throughout the area. There are currently 1,274 miles of unpaved roads within 4 miles of sage-grouse leks on BLM and USFS lands in the Gunnison Basin.

These roads and trails not only fragment sagebrush habitat, they serve as a conduit for weed transmission. Currently, weed infestations are common along all classes of roadways and are spread by vehicles. Weeds occurring along roads fragmenting sage-grouse habitat have allowed for the incursion of invasive plants to native sagebrush habitat and negatively affects Gunnison sage-grouse habitat. Similarly, weeds are common along the margins of many trails and are often spread by recreationalists, pets, wildlife and domestic ungulates using those trails. Where these trails bisect sagebrush habitat, weeds have spread and negatively impacted sage-grouse habitat.

Existing roads and trails that are built in or adjacent to mesic sites and drainages have altered hydrologic regimes. In many instances, improper water flow in, around and off of road surfaces has led to soil erosion or water channelization. Where run off erodes soil, head cutting has occurred, resulting in deep channels and significant soil loss. Many roads and trails that were not properly designed to cross mesic areas work to concentrate water flow on the downstream side, resulting in constrained water flow, and, ultimately, reduced herbaceous riparian habitat.

Livestock Grazing and Wild Ungulate Herbivory

Domestic livestock grazing occurs throughout most of the occupied habitat in the Gunnison Basin and is expected to continue in the future. USFWS acknowledges that not all livestock grazing results in habitat degradation, and noted that "no studies have documented (positively or negatively) the actual impacts of grazing at the population level" (U.S. Fish and Wildlife Service 2010; page 59823). They conclude that "habitat degradation that can result from improper grazing is a significant threat to GUSG now and in the foreseeable future" (U.S. Fish and Wildlife Service 2010; page 59827).

Currently, 65% of occupied habitat in the Gunnison Basin is actively grazed with federal grazing permits. All public land agencies manage for sage-grouse habitat and conservation, yet these efforts are monitored inconsistently across jurisdictional boundaries. Although the BLM maintains Land health data for its allotments, most Land Health data in the Gunnison Basin is several years old and therefore doesn't represent current habitat condition, and this older data did not capture information specific to sage-grouse habitat guidelines. Therefore, little data is available that characterizes the overall current condition of the habitat in specific relation to sage-grouse habitat guidelines in the RCP.

Although sage-grouse guidelines from the RCP, BLM RMP, and Forest Service Forest Plan have been incorporated into grazing permits within occupied habitat, existing monitoring plans produce insufficient quantitative data to document habitat status relative to the sage-grouse guidelines.

Many ephemeral streams and drainages in sagebrush habitat have become incised due to livestock and wild ungulate trailing. Low-lying mesic areas and herbaceous riparian areas can also become incised by cattle and wild ungulates that concentrate near water sources. Cattle and wild ungulates cause erosion by concentrating water run off along trails and by trampling banks (hoof shearing).

Additionally, cattle and wild ungulates may help spread weeds often found in disturbed riparian areas and near other disturbed or trampled water sources. Seed can be caught in fur and transported and also may be eaten and excreted elsewhere throughout the range. Weeds are common in highly disturbed areas where cattle concentrate and along two track roads within grazing allotments.

Invasive Plants

Cheatgrasss (*Bromus tectorum)* and other noxious and invasive weeds are anticipated to increase in the Gunnison Basin in the future due to potential exacerbation from climate change and the limited success of broad-scale control efforts. USFWS anticipates that impacts will likely be in the form of habitat degradation via the loss of native plants and altered fire regime. The National Invasive Species Management System (http://www.blm.gov/wo/st/en/prog/more/weeds/nisims.html) identifies an independent weed population as one or more noxious or invasive weed plants in an area 40 feet or more from another population. Currently, it is estimated that greater than 2,300 weed populations exist on public lands within rangewide Gunnison Sage-grouse habitat. Most of these weed populations recorded were outside the Gunnison Basin. Since 2009, 723 of those populations have been recorded as treated. Of those treatments, 648 involved cheatgrass as the primary weed species. BLM monitoring records indicates that these treatments are 95-99% effective for controlling cheatgrass. Currently, cheatgrass is present but not dominant in grazing allotments in occupied habitat.

This project will address all non-native plants as weeds, although federal agencies focus treatment efforts on noxious and invasive weeds. The USFWS also identifies a number of weed species that are known to affect sagebrush habitats (U.S. Fish and Wildlife Service 2014b; page 69250). Due to differences in sampling methodologies, incomplete sampling and inconsistencies in species sampled, there are no quantifiable estimates of acres of sage-grouse habitat affected by weed infestations.

Climate Change

Changes in the amount and timing of precipitation and seasonal temperature changes are expected with climate change. However, there is a great deal of uncertainty regarding the magnitude of these changes and the effects of climate change on sagebrush plant community dynamics. This uncertainty also makes it difficult to predict to what extent climate change will affect Gunnison Sage-grouse. However, USFWS has found that climate change is a substantial future threat to sage-grouse due to the potential of climate change to alter important seasonal habitats and food resources, the distribution of resources and the distribution and extent of sagebrush.

Annual average temperature in west-central Colorado increased about 1.11^{o}C (2 ^{o}F) in the last 30 years (Ray et al. 2008). The timing and amount of precipitation has also likely significantly changed over the last 30 years, but no documentation of these trends has been found. While it is likely that climate change has significantly altered seasonal temperatures and precipitation, most of the concern of this analysis is addressing habitat function in order to adapt to future climate changes and enhance the resiliency of sagebrush habitat.

The U.S. Fish and Wildlife Service identified several threats to sage-grouse within the Gunnison Basin, many of which are relevant to this programmatic project. These include historic modification of habitat leading to habitat loss and fragmentation, roads and trails, domestic grazing and wild ungulate herbivory, invasive plants and climate change. This programmatic project addresses these threats throughout the Gunnison Basin by controlling noxious and invasive weeds and restoring proper hydrologic function.

Description of the Species in the Affected Area

A review of species and critical habitat protected or proposed for protection under the Endangered Species Act that may occur in the action area or be affected by the proposed action was conducted. Available information was reviewed on occurrence records and species habitat needs to conduct this analysis. Sources of information include Forest Service records (Gunnison Ranger District wildlife observation database; NRM- Wildlife – USFS corporate wildlife database), the State Natural Heritage Program database, state wildlife agency information (Colorado Parks and Wildlife), and the U.S. Fish and Wildlife Service Information for Planning and Conservation (IPaC) website (http://ecos.fws.gov/ipac/). Based on our review, Gunnison sage-grouse is the only species carried forward in our analysis.

On November 20, 2014, the U.S. Fish and Wildlife Service determined that protection under the Endangered Species Act (ESA) is warranted for the Gunnison sage-grouse, and finalized a rule to list the species as threatened (U.S. Fish and Wildlife Service 2014b). Critical habitat was designated on 1,429,551 acres in southwestern Colorado and southeastern Utah (U.S. Fish and Wildlife Service 2014). Following is a summary of the current distribution of the species' rangewide and an assessment of the Gunnison Basin population and trends. More detail on the species status is provided in aforementioned Federal Register notices. A detailed discussion of Gunnison sage-grouse taxonomy, the species description, historical distribution, habitat, and life-history characteristics can be found in the Service's 12-month finding for Gunnison sage-grouse, published September 28, 2010 (75 FR 59804).

Gunnison sage-grouse currently occur in seven isolated populations in southwest Colorado and eastern Utah. The seven populations are; Gunnison Basin, San Miguel Basin, Monticello–Dove Creek, Pınon Mesa, Crawford, Cerro Summit–Cimarron–Sims Mesa, and Poncha Pass. This biological assessment is

focused on the Gunnison Basin population, which comprises 87% of the Rangewide population. In 2014, the Gunnison Basin sage-grouse population was estimated at 3,978 birds and 23 active lek areas with a high male count of 811 (Jackson and Seward 2014). Preliminary population estimates for 2015 estimate a population increase from 2014 with a high male count of 974 (Colorado Parks and Wildlife 2015) but the official 2015 population estimate was not available at the time of preparing this biological assessment.

Several of the conservation measures described above relate to timing restrictions coinciding with several of the Gunnison Sage-Grouse life history periods. The following table details life history stages for the Gunnison Sage-Grouse. As part of the habitat restoration and weed treatment activities described above, we want to ensure that our activities avoid or minimize effects that would negatively affect population recruitment. As such, we consider the lek, nesting, and early-brood rearing life history stages the most critical time periods to avoid impacts.

Gunnison Sage-Grouse Sensitive Life History Chart

Life History		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Breeding (lek attendance)				–		–							
Nesting				–				–					
Brood-rearing[1]					–		–				–		
Molt	Female					–					–		
	Male					–				–			
Winter[2]				–							–		

Grey denotes peak activity.

– Dashes indicate range of activity.

[1]During the first two to three weeks after hatching, chicks primarily eat a protein diet of insects; afterwards they begin to eat plant material consisting of succulent forbs. Habitat quality, food availability, and predation are key factors influencing chick survival.

Grey crosshatch denotes early brood-rearing period for the majority of hens with broods.

[2]During this time period, sagebrush is used exclusively for food and cover.

IV. Effects of the Action

The effects of the action include the direct and indirect impacts of the proposed Federal action on the species and critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02).

Description of the Effects of the Proposed Action on Gunnison Sage-Grouse

Direct and Indirect Effects of Noxious and Invasive Plant Species Treatments

The ground-disturbing activity associated with weed treatment may flush individuals within the vicinity and temporarily expose them to increased risk of predation although the majority of invasive plants are located in already disturbed areas, with many infestations associated with roadside corridors. These treatments are done fairly quickly with only one trip into the site so no repeated flushing will occur.

Risks from direct spray and spills, indirect contact with foliage after direct spray, and ingestion of food items contaminated by direct spray are generally low or non-existent for terrestrial fauna such as sage grouse. Since most treatments currently done are spot and broadcast of less than a few acres, the probability of direct exposure is extremely low. For aerial treatments, these risks are elevated because of the broad area being sprayed. In Gunnison, aerial sprays would focus on the treatment of cheatgrass. The main chemical used to treat cheatgrass is Imazapic (Plateau). Calculated risk quotients for terrestrial wildlife were all below the most conservative Toxic Levels of Concern of less

than 0.1, therefore not likely to pose a risk to Gunnison Sage-grouse. In some cases during treatment of cheatgrass in the fall, Glyphosate is applied in order to target the newly growing cheatgrass when other species are dormant. Direct risks of Glyphosate on Gunnison Sage-grouse are low through ingestion of food items such as grasses and insects that have been treated and no risk to direct contact with spray (assuming a100% absorption of the chemical). By late fall, sage grouse have transitioned their diets to primarily sagebrush since most forbs and grasses are senesced. Glyphosate absorbs quickly into grasses and withers the plant within days, therefore the timing of application to when the plant will not be a desirable food source is very short so risks to sage grouse from infrequent fall exposures will be minimal.

Direct and Indirect Effects of Erosion Control Habitat Restoration Activities

Human presence and activities within seasonal habitats could have short-term impacts to sage-grouse (Gunnison Sage-Grouse Rangewide Steering Committee 2005, Appendix I). Human-caused disturbances that induce stress on individuals or populations may cause potential loss or reduction of individual or species fitness (survival, reproduction and recruitment) within seasonally important habitats or areas during specific time periods. With design features and timing restrictions implemented for this project, human presence and activity is restricted to late-summer to early-fall time frames when sage-grouse and chicks of the year are highly mobile, and likely to not be in the vicinity of the activities. However, physical disturbances and noise-related effects due to human activity and equipment have the potential to cause incidental disruption of Gunnison Sage-Grouse, resulting in birds temporarily avoiding project areas. We estimate human presence and activity at individual project areas to be:

- A maximum of 20 days during a 3.5 month period (July 15 to October 30) when implementing habitat restoration activities. We expect that the number of days will more commonly be 14 days during a 2-month period from July 15 to September 15.
- A maximum of 10 days per year for monitoring activities, some of which are likely to overlap the time period described above.
- A maximum of 10 days per year for maintenance of restoration structures. After they are built, structures may need to be maintained annually until sites meet restoration objectives.

While the net effect of the physical disturbance may cause a temporary avoidance of otherwise suitable habitat, this effect will be localized to small project sites at a time (up to 20 acres in size along linear channels). Affected individuals would likely be displaced to areas immediately adjacent or near project sites with suitable habitat that meets their needs. Since our habitat manipulation activities will be focused within small areas at a time, outside of sage-grouse critical time periods (breeding, nesting, early brood-rearing or wintering), the likelihood of impacts to recruitment and individual grouse fitness is insignificant. Brood-rearing habitat restoration activities are likely to result in a positive population response by Gunnison Sage-Grouse over the long-term, despite the potential for some level of temporary disturbance to the bird when habitat restoration activities are implemented. We believe that the conservation measures described as part of the proposed action will result in avoiding adverse effects that would cause take.

Long-term indirect effects of erosion restoration activities should be positive for Gunnison sage-grouse in terms of improvements to brood-rearing habitat. Restoration structures should function to build sediments back up within incised gullies, retain water for a longer period of time during the spring and early summer, and spread water across meadows. We anticipate that over time, this will increase herbaceous plant species diversity and quality, resulting in increased insect abundance and forbs in

these areas. The Gunnison sage-grouse early brood-rearing period occurs during the spring and early summer. Chicks need to feed entirely on insects for protein during the first 2 - 3 weeks of their lives, after which their diet is a combination of insects and forbs. The early brood-rearing period is a time critical for their survival and recruitment for the population. After water flows through these streams following spring snowmelt, if the restoration structures succeed in maintaining wet meadows for an additional two weeks during this time period that coincides with the early brood-rearing period, this project can have significant benefits to Gunnison sage-grouse population recruitment.

Description of the Effects of the Proposed Action on Gunnison Sage-Grouse Designated Critical Habitat

This analysis describes restoration and weed treatment effects based on how treatment methods affect the critical habitat primary constituent elements.

Primary Constituent Elements for Gunnison Sage-Grouse

As described in the Final Rule for the critical habitat designation (U.S. Fish and Wildlife Service 2014), primary constituent elements (PCEs) are those specific elements of physical and biological features that provide for a species' life-history processes and are essential to the conservation of the species. The U.S. Fish and Wildlife Service identified the following PCEs:

PCE 1 – Extensive sagebrush landscapes capable of supporting a population of Gunnison sage-grouse. In general, this includes areas with vegetation composed primarily of sagebrush plant communities (at least 25 percent of the land is dominated by sagebrush cover within a 0.9-mi (1.5-km) radius of any given location), of sufficient size and configuration to encompass all seasonal habitats for a given population of Gunnison sage-grouse, and facilitate movements within and among populations.

PCE 2 – Breeding habitat composed of sagebrush plant communities that, in general, have the structural characteristics within the ranges described in Table 2 from the Final Rule (U.S. Fish and Wildlife Service 2014). Habitat structure values are average values over a project area. Breeding habitat includes lek, nesting, and early brood-rearing habitats used typically March 15 through July 15 (GSRSC 2005, p. H–3). Early brood-rearing habitat may include agricultural fields.

Table 2 from 79 FR 69312 – Breeding Habitat Structural Guidelines

Vegetation variable	Amount in habitat
Sagebrush Canopy Cover	10–25 percent.
Non-sagebrush Canopy Cover [b].	5–15 percent.
Total Shrub Canopy Cover	15–40 percent.
Sagebrush Height	9.8–19.7 in (25–50 cm).
Grass Cover	10–40 percent.
Forb Cover	5–40 percent.
Grass Height	3.9–5.9 in (10–15 cm).
Forb Height	2.0–5.9 in (5–15 cm).

[a] Derived from GSRSC 2005, p. H–6, which depicts structural values for both arid and mesic areas in Gunnison sage-grouse habitat. Here we provide the full range of these structural values to account for this variation.

[b] Includes shrubs such as horsebrush (*Tetradymia* spp.), rabbitbrush (*Chrysothamnus* spp.), bitterbrush (*Purshia* spp.), snakeweed (*Gutierrezia sarothrae*), greasewood (*Sarcobatus* spp.), winterfat (*Eurotia lanata*), Gambel's oak (*Quercus gambelii*), snowberry (*Symphoricarpos oreophilus*), serviceberry (*Amelanchier* spp.), and chokecherry (*Prunus virginiana*).

PCE 3 – Summer-late fall habitat composed of sagebrush plant communities that, in general, have the structural characteristics within the ranges described in Table 3 from the Final Rule (U.S. Fish and Wildlife Service 2014). Habitat structure values are average values over a project area. Summer-fall habitat includes sagebrush communities having the referenced habitat structure values, as well as agricultural fields and wet meadow or riparian habitat types. Wet meadows and riparian habitats are also included qualitatively under PCE 5.

Table 3 from 79 FR 69312 – Summer-Late Fall Habitat Structural Guidelines

Vegetation variable	Amount in habitat
Sagebrush Canopy Cover	5–20 percent.
Non-sagebrush Canopy Cover[c].	5–15 percent.
Total Shrub Canopy Cover	10–35 percent.
Sagebrush Height	9.8–19.7 in (25–50 cm).
Grass Cover	10–35 percent.
Forb Cover	5–35 percent.
Grass Height	3.9–5.9 in (10–15 cm).
Forb Height	1.2–3.9 in (3–10 cm).

[a] Structural habitat values provided in this table do not include wet meadow or riparian habitats. Therefore, we address these habitat types under Primary Constituent Element 5 below.

[b] Derived from GSRSC 2005, p. H–7, which depicts structural values for both arid and mesic areas in Gunnison sage-grouse habitat. Here we provide the full range of these structural values to account for this variation.

[c] Includes shrubs such as horsebrush (*Tetradymia* spp.), rabbitbrush (*Chrysothamnus* spp.), bitterbrush (*Purshia* spp.), snakeweed (*Gutierrezia sarothrae*), greasewood (*Sarcobatus* spp.), winterfat (*Eurotia lanata*), Gambel's oak (*Quercus gambelii*), snowberry (*Symphoricarpos oreophilus*), serviceberry (*Amelanchier* spp.), and chokecherry (*Prunus virginiana*).

PCE 4 – Winter habitat composed of sagebrush plant communities that, in general, have sagebrush canopy cover between 30 to 40 percent and sagebrush height of 15.8 to 21.7 in (40 to 55 cm). These habitat structure values are average values over a project area. Winter habitat includes sagebrush areas within currently occupied habitat that are available (i.e., not covered by snow) to Gunnison sage-grouse during average winters (GSRSC 2005, p. H–3).

PCE 5 – Alternate, mesic habitats used primarily in the summer-late fall season, such as riparian communities, springs, seeps and mesic meadows (GSRSC 2005, pp. 30, H–7; Schroeder *et al.* 1999, p. 4; Connelly *et al.* 2000a, p. 980).

Direct and Indirect Effects of Noxious and Invasive Plant Species Treatments

Herbicide treatments are not expected to have substantial direct or indirect effects on the Gunnison sage-grouse because healthy sagebrush and mountain shrub communities, either occupied or unoccupied, would not be broadly sprayed with herbicides. When looking at the Landscape Level PCE 1, none of our invasive plant treatments will eliminate or reduce sagebrush cover and treatment of invasive plants within the sagebrush ecosystem will lead to an increased natural vegetation cover indicative of healthy sagebrush plant communities. When looking at site-scale primary constituent elements 2-5, removal of undesirable invasive vegetation could temporarily reduce hiding cover for grouse and temporarily expose birds potentially utilizing such habitats to higher levels of predation depending on the size of the treatment area. For spot and broadcast spraying, areas are small in treatment size and it would not be expected to increase the probability of predation. With aerial spraying of cheatgrass, the herbicides (glyphosate and imazapic) that would be used for such restoration treatments at low rates are very effective at removing invasive annuals without impacting desirable herbaceous perennials, sagebrush, or deciduous mountain shrub species so areas still offer

hiding cover. Such treatments coupled with effective interseeding (where determined needed) of perennial grasses and forbs are expected have long term beneficial effects on habitat suitability for Gunnison sage-grouse. Removing the composition of invasive annuals would provide the opportunity for disturbed sage cover types to develop the basic perennial vegetation requirements necessary to allow successional processes which are expected to have long term beneficial effects on habitat suitability for Gunnison Sage-grouse.

Direct and Indirect Effects of Erosion Control Restoration Activities

Direct effects include vegetation trampling, minor soil disturbances associated with rock placement, plug and spread construction, worm ditch construction, and water drainage work that could occur slightly outside of existing road prisms. Disturbances at each restoration site will be negligible and confined to small, narrow channels. Over the long-term the proposed action is expected to reduce the effects of fragmentation by facilitating the creation and restoration of habitat and the associated vegetative structure conducive to persistence of the species and its habitat needs (PCE 1).

Restoration structures are designed to restore eroded channels and prevent future erosion. Over the long-term we expect beneficial effects in terms of restoring degraded intermittent, ephemeral, and perennial stream channels, and increasing grasses, forbs, and riparian plant species. There will be negligible amounts of sagebrush mortality where sagebrush has encroached into areas that were once wetter sites not capable of supporting big sagebrush prior to the eroded conditions that exist today. However, the restoration methods are designed to maintain and improve mesic sites that are important for Gunnison Sage-Grouse brood-rearing habitat. The restoration activities will be beneficial to PCE 5, and to the grass and forb structural components from PCEs 2 and 3.

The proposed action will not destroy or adversely modify Gunnison Sage-Grouse critical habitat. Any anticipated habitat impacts within critical habitat are not expected to permanently degrade or alter its conservation role for the Gunnison sage-grouse in any substantial way. In fact, the proposed action is designed to improve the species' Primary Constituent Elements (as defined by the Service in its final rule) over the long term.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this letter (50 CFR § 402.02). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

The action area is confined to federal lands administered by the BLM, USFS, and NPS. These lands occur in a large, relatively contiguous pattern mixed with a mosaic of private and State lands. The area of analysis for cumulative effects is therefore federal and non-federal lands within the Gunnison Basin critical habitat unit of the Gunnison sage-grouse. There are no tribal lands designated as critical habitat within the action area. Approximately 20% (of critical habitat for the Gunnison Basin population is on private land, with 18% considered occupied and 29.3% considered unoccupied; and approximately 2.3% is on state land, with 2.8% considered occupied and 0.3% considered unoccupied (U.S. Fish and Wildlife Service 2014, Tables 4 and 5).

Activities that occur on private and State lands within the Gunnison Basin population include: agriculture, including hay production and livestock ranching; residential and commercial development;

utility lines; roads; fences and recreation, including OHV use, hiking, and horseback riding. The human population within the action area has grown substantially from 1985 to 2012. Between 1985 and 2012, within the occupied habitat portion of the Gunnison Basin Gunnison sage-grouse population the human population in Gunnison County has grown by 48.9%; Saguache County by 43.3%; and Hinsdale County by 71.6 (U.S. Fish and Wildlife Service 2014b; Table 2).

As described in the Final Rule (U.S. Fish and Wildlife Service 2014b, Table 4), these trends are anticipated into the foreseeable future. As human populations increase, residential and other associated infrastructure development (roads, trails, utility corridors, fences) in Gunnison sage-grouse range is expected to increase to meet the demand of growing human populations (U.S. Fish and Wildlife Service 2014b). This will result in increased pressure from residential development on private lands and recreation on both private and State lands. While the large amount of federal land ownership of occupied habitat in the Gunnison Basin reduces the potential impact of private land development, incrementally these activities will continue to affect the Gunnison Basin population of Gunnison sage-grouse through direct loss of habitat, through habitat modification, and through direct and indirect disturbances to birds due to increased use of public lands by recreationists.

As described in the Existing Conditions section, there have been numerous modifications to Gunnison Sage-Grouse habitat across all land ownerships in the Gunnison Basin, particularly private lands. The habitat improvement treatments described in this document are implemented holistically across public and private land ownerships and address the threat of noxious and invasive non-native plants and habitat degradation. Thus, this action, when added to all past, present and future foreseeable non-federal actions in the action area, is likely to reduce the cumulative effects of these specific threats for the Gunnison Basin Gunnison Sage-Grouse population.

V. Effect Determinations

Effect Determination on Gunnison Sage-Grouse

The proposed action ***may affect*** the Gunnison Sage-Grouse due to:

Noxious and Invasive Weed Treatments:

- Human disturbance associated with invasive weed spraying may temporarily displace individuals
- Aerial spraying may cause direct spray of birds with chemical
- Birds may ingest chemical through contaminated grass and insects
- Temporary reduction of non-native vegetation may reduce hiding cover and expose birds to increased predation

Erosion Control Restoration Activities:

- Physical disturbance associated with habitat restoration activities may temporarily displace individuals.

The proposed action is ***not likely to adversely affect*** the Gunnison Sage-Grouse because weed treatment and erosion control restoration actions are for the purpose of improving habitat; and the conservation measures in place avoid or minimize negative direct and indirect effects to Gunnison sage-grouse, except incidental disruptive impacts, by:

Noxious and Invasive Weed Treatments:

- Aerial spraying will only occur during the fall to ensure minimal impact on native grasses and forbs
- Spraying will not be conducted during lek season
- Chemicals will be used at or lower than label standards ensuring treatments are low risk to grouse through direct spray and ingestion of contaminated food sources

Erosion Control Restoration Activities:

- Restricting wet meadow and riparian restoration activities to outside of critical time periods (lek, nesting, early brood-rearing, and wintering time periods)
- Monitoring for and treating any weed development in treatment areas
- Restricting amount of native rock collected on site to no more than 10%
- Reseeding/planting with local native plant species
- Following existing Gunnison Basin Gunnison Sage-Grouse Candidate Conservation Agreement conservation measures for drift fence installations, consistent with requirements in the Biological Opinion issued by U.S. Fish and Wildlife Service on the Candidate Conservation Agreement Biological Assessment

The action agencies conclude that the proposed habitat improvement – noxious and invasive weed treatments and erosion control restoration activities **"*may affect, but is not likely to adversely affect*"** the Gunnison Sage-Grouse.

Effect Determination on Gunnison Sage-Grouse Designated Critical Habitat

The proposed action ***may affect*** Gunnison Sage-Grouse designated critical habitat due to:

Noxious and Invasive Weed Treatments:

- Temporary reduction of non-native vegetation cover

Erosion Control Restoration Activities:

- Direct effects from temporary vegetation trampling associated with restoration structure construction and material transport of rocks, logs, or fencing for drift fences
- Indirect effects from long-term changes to vegetation species composition and structure, including anticipated changed conditions from drier, eroded sites currently having more upland plant species to wetter, restored sites shifting to more riparian plant species and increased herbaceous production. We anticipate a negligible loss of sagebrush at restoration sites as sites become wetter and encroaching sagebrush dies and are replaced by species adapted for wetter conditions.

The proposed action ***will not destroy or adversely modify*** designated critical habitat because:

Noxious and Invasive Weed Treatments:

- Spot and broadcast treatments are small in size and target invasive populations. Components of PCE's are native vegetation which isn't targeted.
- Aerial sprays target cheatgrass and native grasses and forbs are dormant during spray operations allowing improvement of the PCE's.

Erosion Control Restoration Activities:

- Habitat restoration is designed to improve wet meadow, riparian, and other mesic habitats, which comprise PCE 5.
- One of the purposes and goals of the restoration work is to improve grass cover, forb cover, grass heights, and forb heights, which are all components of PCEs 2 and 3.
- We anticipate habitat restoration to restore sites to conditions that may have existed prior to the eroded conditions that exist today, and to build resiliency into wet meadow and riparian habitats within the sagebrush ecosystem such that these sites persist during drought conditions and during predicted climate changes that may occur in the foreseeable future.

The action agencies conclude that the proposed habitat improvement – erosion control restoration activities and noxious and invasive weed treatments "***may affect, but is not likely to adversely affect***" Gunnison Sage-Grouse designated critical habitat.

VI. Reporting

Each year, the Agencies will report the following items to USFWS to ensure compliance with this consultation:

Invasive Weed Treatments:
-Mapped Spray Locations
-Acres of Weeds Sprayed
-Chemical Use
-Weed Infestations Mapped
-Monitoring Associated with Spray Efforts (photo plots, transect data, Success Estimations)

Erosion Control Restoration:
-Type of Restoration Activity
-Locations of New Structures
-Repair of Existing Structures
-Monitoring Reports

VII. CONTACTS

If you require any additional information please contact Theresa Childers, Wildlife Biologist at (970) 641-2337 ext. 250 (Existing Conditions); Russ Japuntich, Wildlife Biologist at (970) 642-4949 (Noxious and Invasive Plant Species); or Matt Vasquez, Wildlife Biologist at (970) 642-4401 (Erosion Control Habitat Restoration).

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