

**Appendix AB:
Mitigation Measures and Conservation Actions for
Greater Sage-Grouse Habitat**

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Mitigation Measures and Conservation Actions For Greater Sage-Grouse Habitat

Introduction

The Montana/Dakotas Bureau of Land Management (BLM) Greater Sage-Grouse Mitigation Measures and Conservation Actions are a compilation of measures employed by the BLM to mitigate impacts from surface disturbance in priority and general sage-grouse habitat in order to meet the Goals and Objectives set forward in the BLM National Sage-grouse Conservation Strategy and in individual land use plans. They apply to activities such as road or pipeline construction, range improvements, and permitted land uses or recreation activities. These guidelines are presented as an appendix for easy reference as they apply to many resources and were derived from many laws and other guidelines such as the Management Plan and Conservation Strategies for Sage-Grouse in Montana, the BLM National Technical Team Report, WAFWA Conservation Strategy for Greater Sage-Grouse and others.

The guidelines are primarily included to provide consistency within the Montana/Dakotas BLM in how management measures and requirements are identified and applied to avoid and mitigate environmental impacts and resource and land use conflicts in greater sage-grouse habitat. Consistency in this sense does not mean that identical requirements would be applied for all similar types of land use activities, nor does it mean that the requirements or guidelines for a single land use activity would be identical in all areas.

There are two ways the mitigation guidelines are used in the RMP and EIS process: (1) as part of the planning criteria in developing the RMP alternatives; and (2) in the analytical processes of both developing the alternatives and analyzing the impacts of the alternatives. In the first case, an assumption is made that any one or more of the mitigation measures or conservation actions will be appropriately included as conditions of relevant actions being proposed or considered in each alternative. In the second case, the mitigations are used (1) to develop a baseline for measuring and comparing impacts among the alternatives; (2) to identify other actions and alternatives that should be considered; and (3) to help determine whether more stringent or less stringent mitigations should be considered.

The EIS for the RMP does not decide or dictate the exact wording or inclusion of these guidelines. Rather, the guidelines are used in the RMP and EIS process as a tool to help develop the RMP alternatives and to provide a baseline for comparative impact analysis in arriving at RMP decisions. These guidelines will be used in the same manner in analyzing activity plans and other site-specific proposals. These guidelines and their wording are matters of policy. As such, specific wording is subject to change primarily through administrative review, not through the RMP and EIS process. Any further changes that may be made in the continuing refinement of these guidelines and any development of program-specific standard stipulations will be handled in another forum, including appropriate public involvement and input

Purpose

The purpose of these mitigation measures and conservation actions are to (1) reserve for the BLM the right to modify the operations of surface disturbing and/or disruptive activities as part of the statutory requirements for environmental protection, and (2) inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands and minerals. These measures have been written in a format that will allow for either their direct use as stipulations or operating standards and/or in addition to specific or specialized mitigation following the submission of a detailed development plan or other project proposal and an environmental analysis. These operating standards are given as acceptable methods for mitigating anticipated effects and achieving the desired plan outcomes but are not prescribed as the *only* method for achieving the outcomes.

Those resource activities or programs currently without a standardized set of permit or operation stipulations can use the mitigation measures and conservation actions for greater sage-grouse as stipulations or as conditions of approval, or as a baseline for developing specific stipulations for a given activity or program.

These mitigation measures and conservation actions are primarily written for priority sage-grouse habitats. Within general habitat the mitigation measures and conservation actions applied are determined at a project by project level and may be similar in many cases to the priority habitat measures. A selection of mitigation measures and conservation measures for general habitat is also included for some programs. At the project level, in order to prioritize certain general habitat areas over marginal or substandard sage-grouse habitat areas, consideration should be given to:

- The capability of the habitat to provide connectivity among priority areas
- Habitats occupied by sage-grouse where enhancing general sage-grouse habitat can offset losses to habitat and/or populations elsewhere within the habitat.
- The potential to replace lost priority habitat or needed changes in total priority habitat due to perturbations and/or disturbances, providing connectivity between priority areas, and restoring historical habitat functionality to support meeting objectives to maintain or enhance connectivity.

Threats to Greater Sage-Grouse and Their Habitat

A number of threats and risks to greater sage-grouse and their habitat have been identified during conservation planning efforts and assessments. Range wide issues were covered in listing decisions made by FWS in 2007 and 2010. In addition, the BLM National Technical Team Report (see Instruction Memorandum No. 2012-044: BLM National Greater Sage-Grouse Land Use Planning Strategy) covered BLM program areas with the potential to impact Greater Sage-grouse Populations. The 2005 Management Plan and Conservation Strategies for Sage-Grouse in Montana - Final identified twelve major issues:

- *Fire Management*
- *Grazing Management*
- *Harvest Management*
- *Noxious Weed Management*
- *Mining and Energy Development*

- *Outreach and Education*
- *Power Lines and Generation Facilities*
- *Predation*
- *Recreational Disturbance*
- *Roads and Motorized Vehicles*
- *Vegetation*
- *Managing Other Wildlife in Sage-Grouse Habitats*

Conservation Actions

These mitigation measures and conservation actions for greater sage-grouse would be implemented on a project specific basis in sage-grouse priority habitat, depending on the specific characteristics of the project area and the types of disturbance being proposed. They may not be appropriate to implement in all cases. The mitigation would be requirements, procedures, management measures or design features that the BLM, through issuance of the record of decision would adopt as operational requirements. The BLM may add additional site-specific restrictions as deemed necessary by further environmental analysis and as developed through coordination with other federal, state, and local regulatory and resource agencies. Because mitigation measures change or are modified, based on new information, the guidelines will be updated periodically.

In the very early stages of the development of siting and design plans, project developers shall coordinate with appropriate federal, state, and local agencies that regulate activities that affect sage-grouse and their habitats to determine what expected level of mitigation will be needed to ensure the RMP goals and objectives can be met within the proposed action. NEPA analysis shall demonstrate how the mitigation measures and conservation actions being applied to the project lead to impacts (direct, indirect, and cumulative) that do not cause the BLM to authorize actions that would exceed habitat level thresholds causing goals and objectives for the priority area to not be met. This will analyze at the project level at least two considerations to examine functionality of sage-steppe systems and thresholds where populations are known to be impacted:

- At the landscape scale, priority areas should be maintained with enough land cover composed of adequate sagebrush habitat to provide sage-grouse needs to meet priority habitat objectives. This is measured using broad scale habitat classification to determine the amount of potential habitat based on ecological sites against habitat lost to permanent to short term habitat loss from disturbances such as agricultural tillage, fire, etc. At a minimum priority areas should contain at least 70% of the total as functioning sage-grouse habitat. In many cases, as appropriate with site potential, restoring, enhancing, and maintaining habitat so that 90% of the priority area is classified as functioning sage-grouse habitat will provide a high quality and resilient priority area.
- At the local population scale discrete anthropogenic disturbances should be minimized to maintain the highest quality habitat. Two thresholds have been proposed to maintain populations within priority areas. The National Technical Team proposed a 3% cap for priority sage-grouse habitat while Wyoming issued an Executive Order utilizing a 5% cap. The actual impact from direct disturbances will depend on the level of activity

associated with the disturbance that leads to indirect of the activity and cumulative effects of habitat loss and degradation.

In analyzing the impact from a project, consideration should be given to the type of activity, the amount of anthropogenic disturbance to seasonal sage-grouse habitat utilized by the local population, and the landscape context. As an area moves from direct disturbance exceeding 3% and then 5%, put in context of the condition of the larger landscape, increased mitigation, habitat enhancement, and off-site considerations will be important to maintaining goals and objectives for sage-grouse and priority habitats. Specifically, at the site level the BLM will analyze and disclose how permitted actions, including included mitigation measures and conservation actions, affect the ability for priority area goals and objectives to be met and ensure permitted activities are in conformance with the RMP.

Priority Habitat

Travel Management

NEPA analysis would disclose the impact of the addition to the surface disturbance total for the local population within the priority sage-grouse habitat. If that analysis shows anthropogenic disturbance crossing or above 3% for that area, then the analysis will include expected level of activity, types of use, and if there are expected population impacts will make additional, effective mitigation necessary to offset the resulting loss of sage-grouse habitat and population.

Travel management should evaluate the need for permanent or seasonal road or area closures in protect Greater sage-grouse priority habitat areas, during site-specific travel planning.

Use existing roads, or realignments to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then any new roads would be constructed to the absolute minimum standard necessary.

Allow no upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless the upgrading would have minimal impact on sage-grouse habitat, is necessary for motorist safety, or eliminates the need to construct a new road.

Conduct restoration of roads, primitive roads and trails not designated in travel management plans. This also includes primitive route/roads that were not designated in Wilderness Study Areas and within lands with wilderness characteristics that have been selected for protection.

When reseeding roads, primitive roads and trails, use appropriate seed mixes and consider the use of transplanted sagebrush.

Identify, map, quantify, and evaluate impacts of existing roads, including 2-tracks, in relation to known lek locations and sage-grouse winter ranges.

Consider the use of speed bumps where appropriate to reduce vehicle speeds near leks, such during oil and gas development.

Manage on-road travel and OHV use in key grouse areas to avoid disturbance during critical times such as winter and nesting periods.

Plan or permit organized events to avoid increased traffic and impacts to sage-grouse.

Manage motorized and mechanized travel to minimize impacts to sage-grouse and their habitat by developing standards for future roads to give to BLM, FS, BIA, state, county, and private parties.

Manage motorized and mechanized travel to minimize impacts to sage-grouse by increasing enforcement of existing OHV and travel management plans.

Provide educational opportunities for users of OHVs dealing with the possible effects they may have on sage-grouse.

Develop a transportation management plan across ownership boundaries in critical sage-grouse habitats.

Participate in travel planning efforts and educate the general public about the impacts of roads on sage-grouse and critical habitat.

Consider buffers, removal, realignment, or seasonal closures where appropriate to avoid degradation of habitat.

Reclaim closed roads with plant species beneficial to sage-grouse.

Close and re-vegetate travel ways in sage-grouse habitats where appropriate.

Recreation

Document leks where recreational viewing is occurring.

Develop and provide educational materials to the public describing effects of concentrated recreational activities and the importance of seasonal ranges to sage-grouse.

Issue special use permits for certain activities with distance and timing restrictions to maintain the integrity of breeding habitat.

Discourage concentration of hunters on critical seasonal habitats, such as during late big game seasons, when sage-grouse are present.

Lands and Realty

NEPA analysis would disclose the impact of the addition to the surface disturbance total for the local population within the priority sage-grouse habitat. If that analysis shows anthropogenic disturbance crossing or above 3% for that area, then the analysis will include expected level of activity, types of use, and if there are expected population impacts will make additional, effective mitigation necessary to offset the resulting loss of sage-grouse habitat and population.

Within designated ROW corridors encumbered by existing ROW authorizations: new ROWs should be co-located to the extent practical and feasible with the entire footprint of the proposed project within the existing disturbance associated with the authorized ROWs.

Subject to valid, existing rights, where new ROWs associated with valid existing rights are required, co-locate new ROWs within existing ROWs or where it best minimizes sage-grouse impacts. Use existing roads, or realignments as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new road constructed to the absolute minimum standard necessary.

Upon project completion, roads used for commercial access on public lands would be reclaimed, unless, based on site-specific analysis, the route provides specific benefits for public access and does not contribute to resource conflicts.

For powerlines:

- Document the segment(s) of line causing problems.
- Determine by cooperative action- agencies, utilities, and landowners- whether or not modification of poles to limit perching will prevent electrocution of raptors and decrease predation on sage-grouse.
- Emphasize the following if perch prevention modifications do not work to protect sage-grouse and sage-brush habitat:
 - reroute the line using distance, topography, or vegetative cover; or
 - bury the line.
- Explore opportunities for technical assistance and funding.
- Remove power line when use is completed.
- Encourage the use of off-grid systems such as solar, natural gas micro-turbines, and wind power where feasible in sage-grouse habitats.
- Use the best available information for siting power lines on important breeding, brood-rearing, and winter habitat in an appropriate vicinity of the proposed line.
- Initiate collision prevention measures using guidelines (Avian Power Line Action Committee 1994) on identified segments. Measures are subject to restriction or modification for wind and ice loading or other engineering concerns, or updated collision prevention information.
- Remove power lines that traverse important sage-grouse habitats when facilities being serviced are no longer in use or when projects are completed.

Livestock Grazing

Conducting Land Health Assessments and Permit Renewals in Priority Sage-Grouse Habitat Land Health Assessments

I. When conducting land health assessments:

- Prioritize allotments that have the best opportunities for conserving, enhancing or restoring habitat for sage-grouse.
- Include (at a minimum) indicators and measurements of structure/condition/composition of vegetation specific to achieving sage-grouse habitat objectives (Doherty et al. 2011). If local/state seasonal habitat objectives are not available, use sage-grouse habitat recommendations from Connelly et al. 2000b and Hagen et al. 2007.

II. When conducting permit renewal:

- If an effective grazing system that meets sage-grouse habitat requirements is not already in place, analyze at least one alternative that conserves, restores, or enhances sage-grouse habitat in the NEPA document prepared for the permit renewal if the size of the allotment or and/or cooperative opportunities warrant it.
- Work cooperatively on integrated ranch planning within sage-grouse habitat so ranch operations with deeded/BLM allotments can be planned as single units.
- Analyze springs, seeps and associated pipelines to determine if modifications are necessary to maintain the continuity of the predevelopment riparian area within priority sage-grouse habitats. Make modifications where necessary, considering impacts to other water uses when such considerations are neutral or beneficial to sage-grouse. Only authorize new spring or seep developments where the impacts to sage-grouse would be beneficial.
- Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to priority sage-grouse habitats to determine if they should be restored to sagebrush or habitat of higher quality for sage-grouse. If these seedings are part of an AMP/Conservation Plan or if they provide value in conserving or enhancing the rest of the priority habitats, then no restoration would be necessary. Assess the compatibility of these seedings for sage-grouse habitat or as a component of a grazing system during the land health assessments (Davies et al. 2011).
- Evaluate existing structural range improvements and location of supplements (salt or protein blocks) to make sure they conserve, enhance or restore sage-grouse habitat.
 - This includes evaluating methods to reduce outright sage-grouse strikes and mortality, through removing, modifying or marking fences in high risk areas within priority sage-grouse habitat based on proximity to lek, lek size, and topography (Christiansen 2009, Stevens 2011).
- Monitor for, and treat invasive species associated with existing range improvements (Gelbard and Belnap 2003 and Bergquist et al. 2007).

III. Include terms and conditions on grazing permits and leases that assure plant growth requirement are met, and residual forage remains available for sage-grouse hiding cover. Utilize techniques appropriate for uplands vs. riparian/meadow areas and enhancement vs. reclamation/restoration. Across all these types of projects consider singly, or in combination, changes as necessary:

- 1) Season or timing of use;
- 2) Numbers of livestock (includes temporary non-use or livestock removal);
- 3) Distribution of livestock use;
- 4) Intensity of use (utilization or stubble height objectives)
- 5) Kind of livestock (e.g., cattle, sheep, horses, llamas, alpacas and goats)
- 6) Class of livestock (e.g., yearlings versus cow calf pairs)

Within riparian areas specifically, consider measures such as:

- 1) Manage hot season grazing on riparian and meadow complexes to promote recovery or maintenance of appropriate vegetation and water quality. Utilize fencing/herding techniques or seasonal use or livestock distribution changes to reduce pressure on riparian or wet meadow vegetation used by sage-grouse in the hot season (summer).
- 2) Within priority sage-grouse habitat, reduce hot season grazing on riparian and meadow complexes to promote recovery or maintenance of appropriate vegetation and water quality. Utilize fencing/herding techniques or seasonal use or livestock distribution changes to reduce pressure on riparian or wet meadow vegetation used by sage-grouse in the hot season.
- 3) Ensure the sustainability of desired soil conditions and ecological processes within upland plant communities following implementation of strategies to protect riparian areas. This can be achieved by:
 - protecting natural wet meadows and springs from over-use while developing water for livestock, and
 - plan the location, design, and construction of new fences to minimize impacts on sage-grouse.

Range Management Mitigation Measures and Conservation Actions

Discourage concentration of livestock on leks or other key sage-grouse habitats.

Avoid placement of salt or mineral supplements near leks during the breeding season (March-June), and avoid supplemental winter feeding of livestock, where practical, on sage-grouse winter habitat and around leks.

If portions of existing fences are found to pose a significant threat to sage-grouse as strike sties or raptor perches, mitigate through moving or modifying posts, implementation of predator control programs, etc. Actions may include increasing the visibility of the fences by flagging or by designing “take-down” fences.

In priority habitat, all proposed range improvements must be designed in a way that conserves, enhances, or restores sage-grouse habitat, where applicable.

Pesticides and herbicides use:

- Evaluate ecological consequences of using pesticides to control grasshoppers or other insects.
- Evaluate ecological consequences of broadcast herbicide use on forbs and other important sage-grouse foods.

- Minimize use of pesticides and herbicides within 1 mile of known grouse nests, leks, or brood-rearing areas.

Noxious Weed Management

- Promote measures that prevent the introduction and spread of weed seeds and other reproducing plant parts.
- Develop and implement management techniques that minimized the risk of infestation.
- Where feasible, isolate livestock from known infestations and avoid vehicle movement through infested areas.
- Use weed-free seed for reestablishment of vegetation.
- Eliminate unnecessary soil disturbance and vehicle access/movement into occupied sage-grouse habitat. Limit vehicle use to established roads only.
- Regularly monitor access points and roads for weed establishment.
- Develop partnerships with regional public and private land management units.
- Establish goals and set priorities that encompass the needs of both livestock and wildlife managers so all parties are working under a similar plan.
- Conduct monitoring and develop follow-up procedures for treated areas.
- Educate all field personnel on weed identification, manner in which weeds spread, and methods of treating weed infestations.
- Employ integrated weed management treatment methods such as a combination of biological and cultural, such as grazing, mowing, or seeding treatments in conjunction with herbicides to manage weeds in sage-grouse habitat.
- Use the most selective herbicides where chemical treatment is appropriate, to minimize loss of non-target plant species.
- Restore plant communities with desired species adapted to the site, using proven management techniques where biologically feasible. A restoration program may be necessary if conditions prevent natural plant species.

Fluid Minerals

In cases where Federal oil and gas leases have been issued without adequate stipulations for the protection of sage-grouse or their habitats being provided in the applicable RMP decision, as revised or amended, include mitigation measures and conservation actions as permit Conditions of Approval (COAs) when approving exploration and development activities through completion of the environmental record of review (43 CFR 3162.5), including appropriate documentation of compliance with NEPA. Prior to completing the environmental record of review, BLM should closely examine the applicability of categorical exclusions in priority habitat. If extraordinary circumstances review is applicable, BLM should determine whether those circumstances exist.

General or typical conditions of approval (COAs) are mitigation measures that may be considered when processing Applications for Permits to Drill (APDs), Sundry Notice Drilling Plans, and Surface Use Plans when they are: 1) not specifically addressed in those plans or existing lease stipulations; and 2) needed to mitigate impacts to resource values identified at the onsite inspection or during review of the plans. The use of COAs are intended to reduce, mitigate, or minimize impacts from development but they do not necessarily avoid or preclude resulting significant impacts from the project.

The COAs also allow the BLM to prescribe resource protection measures for lands that were previously leased with varying sets of lease stipulations. However, for lands that are already leased, BLM restrictions on development, not required to comply with existing laws, must be reasonable and consistent with existing lease rights. The COAs must not constrain or restrict development beyond the measures anticipated or authorized by the lease terms or regulations and/or interfere with the lessee's opportunity to economically recover the oil and gas resources, considering the lease as a whole.

Evaluation of these COAs will consider during the NEPA process:

- Whether the conservation measure is "reasonable" (43 CFR 3101.1-2) and consistent with valid existing rights;
- Whether the action is in conformance with the approved RMP; and
- The effectiveness of the mitigation measures proposed.

When incorporated into BLM's program in the Record of Decision (ROD), mitigation approaches and conservation measures detailed in the Surface Use Plan of Operations (see 43CFR 3162-1(f)) shall address, at a minimum the proposed project's anticipated noise, density and amount of disturbance, mechanical movement (e.g., pump jacks), permanent and temporary facilities, traffic, phases of development over time, offsite mitigation, and expected periods of use. Following larger scale considerations for minimizing impacts to sage-grouse this section contains BMPs that will be included, as applicable, as COAs to address to categories of concern. Due to site-specific circumstances, some categories may not apply to some projects and/or may require slight variations from the approach described. It is anticipated the applicability and/or variation in approach will be limited to project siting and configuration. Additional mitigation measures may be identified and required during individual planning. Applicants will be required to discuss any proposed variations with BLM staff. All variations will require appropriate analysis and disclosure as part of future project authorizations. Those design features that do not apply to a given project will need to be described as part of the project file along with an appropriate rationale.

The following hierarchical approach and guidelines should be followed during project development to address these and other areas of concern for sage-grouse:

1) Density and Amount of Disturbance

Do not allow new surface occupancy on Federal leases within priority habitat areas, including winter concentration areas during any time of the year (Doherty et al. 2008, Carpenter et al. 2010). Where this is not possible due to valid existing rights and development requirements for the specific geologic and fluid mineral resources, consider the following disturbance and surface occupancy limits to the extent practicable:

If the lease is partially or entirely within priority habitat areas:

- Subject to topographic and other environmental constraints, require any development within priority habitat to be placed in the area least harmful to sage-grouse based on vegetation, topography, or other habitat features.

- To the extent possible and consistent with valid existing rights, limit disturbances to an average of one site per 640 acres on average, with no more than 3% direct surface disturbance in the analysis area.
- NEPA analysis would disclose the impact of the addition to the surface disturbance total for the local population within the priority sage-grouse habitat. If that analysis shows anthropogenic disturbance crossing or above 3% for that area, then the analysis will include expected level of activity, types of use, and if there are expected population impacts will make demonstrate how additional, effective mitigation necessary will offset the resulting loss of sage-grouse habitat and population impacts.
- When additional mitigation is necessary, conduct it in the impacted priority sage-grouse habitat areas when possible or, if that is not possible, in general sage-grouse habitat with the ability to increase sage-grouse populations tied to the impacted priority area(s).

2) Breeding and Nesting Habitat

To limit impacts to breeding and nesting habitat, surface-disturbing and disruptive activities shall be prohibited or restricted within 4 miles of a lek to the extent possible and consistent with valid existing rights. If the entire lease is entirely within the 4-mile perimeter of a lek, require any development to be placed at the part of the lease farthest from the lek, or, based depending on topography and other habitat features, in an area demonstrably the least harmful to sage-grouse.

To ensure comprehensive planning relative to sage-grouse conflicts, complete Master Development Plans or PODS during planning and review of projects involving multiple proposed disturbances within a logical geographic area, with an exception for individual wildcat (exploratory) wells.

Encourage unitization when deemed necessary for proper development and operation of an area or to facilitate more orderly (e.g., phased and/or clustered) development as a means of minimizing adverse impacts to sage-grouse (see Federal Lease Form, 3100-11, Sections 4 and 6).

3) Brood Rearing Habitat

Apply a seasonal timing restriction on exploratory drilling that prohibits construction, drilling, completion, and reclamation surface-disturbing activities during the nesting and early brood-rearing seasons in all priority sage-grouse habitats areas for this period.

Best Management Measures for Fluid Mineral Development

Require a one-day notice prior to any planned activity during March 1 through June 15 so that the pad site and any undeveloped access route or pipeline can be nest-dragged to determine the presence or absence of active nests. Require a second nest-drag survey if drilling activity begins more than two days after completion of pad construction.

Prioritize pad development based on suitability of habitat; construct pads that are in less suitable habitat (i.e., along existing roadways or within degraded habitats) during the breeding season, and construct pads located in more suitable habitat prior to or after the critical breeding season.

Avoid sagebrush, but if disturbance is necessary, interim reclamation should include sage plantings/seedings and/or the use of minimum disturbance measures to protect sage on well pads and pipelines.

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Establish trip restrictions or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.)
- Use dust abatement measures on roads and pads.
- Close and rehabilitate duplicate roads.

Operations

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
- Apply a phased development approach with concurrent reclamation.
- Place liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority areas (minimizes perching and nesting opportunities for ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury distribution power lines.
- Corridor power, flow, and small pipelines under or immediately adjacent to roads.

- Design or site permanent structures which create movement (e.g. a pump jack) to minimize impacts to sage-grouse.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species. (E.g. by washing vehicles and equipment.)
- Use only closed-loop systems for drilling operations and no reserve pits.
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus.
- Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. *In preparation*).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Require sage-grouse-safe fences.
- Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.
- Clean up refuse.
- Locate man camps outside of priority habitats.

Reclamation

- Include objectives for ensuring habitat restoration to meet sage-grouse habitat needs in reclamation measures/sites. Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

Solid Minerals

Recommend minimization of surface-disturbing or disrupting activities (including operations and maintenance) where needed to reduce the impacts of human activities on important seasonal sage-grouse habitats. Apply these measures during activity level planning.

Encourage development in incremental stages to stager disturbance; design schedules that include long-term strategies to localize disturbance and recovery within established zones over a staggered time frame.

Use off-site mitigation, such as the creation of sage-brush habitat, or purchase conservation easements with industry dollars to offset habitat losses.

Remove facilities and infrastructure when use is completed.

Allow no surface use in nesting habitat within 2 miles of an active lek during a period of breeding and nesting – March 15 – June 15.

Restrict maintenance and related activities in sage grouse breeding/nesting complexes – March 15 – June 15 – between the hours of 4:00 – 8:00 a.m. and 7:00 – 10:00 p.m.

Allow no surface use activities within crucial sage grouse wintering areas during December 1 – March 15.

Use minimal surface disturbance to install roads and pipelines and reclaim site of abandoned wells to natural communities.

Locate storage facilities, generators, and holding tanks outside the line of sight and sound of important breeding habitat.

See conservation actions related to preventing the spread of weeds and controlling infestations of noxious weeds.

Engage industry as a partner to develop and establish new sources of seed of native plant species for restoration of sites disturbed by development.

Design impoundments and manage discharge so as not to degrade or inundate leks, nesting sites, and wintering sites.

Protect natural springs from any source of disturbance or degradation from energy-related activities.

Provide for long-term monitoring of siting requirements to examine effects of current and future development on sage grouse.

Set up a schedule for reviewing and revising siting and use criteria with industry.

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.

- Restrict vehicle traffic to only authorized users on newly constructed routes (e. g., use signing, gates, etc.)
- Use dust abatement measures on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, limit favorable mosquito habitat through reservoir design.
- Require sage-grouse-safe fences around sumps.
- Clean up refuse.
- Locate man camps outside of priority sage-grouse habitats.

Reclamation

- Include restoration objectives to meet sage-grouse habitat needs in reclamation measures/sites. Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
- Irrigate interim reclamation as necessary during dry periods.
- Utilize mulching techniques to expedite reclamation.

Wildfire Suppression, Fuels Management and Fire Rehabilitation

Fuels Management

Design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems.

- Do not reduce sagebrush canopy cover to less than 15% (Connelly et al. 2000, Hagen et al. 2007) unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection of priority sage-grouse habitat and conserve habitat quality for the species. Closely evaluate the benefits of the fuel break against the additional loss of sagebrush cover in the EA process.
- Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present in a priority area.
- Allow no treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk or enhance habitat around or in the winter range and will maintain habitat quality.
- Do not use fire to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species). However, if as a last resort and after all other treatment opportunities have been explored and site specific variables allow, the use of prescribed fire for fuel breaks that would disrupt the fuel continuity across the landscape could be considered, in stands where cheatgrass is a very minor component in the understory.
- Monitor and control invasive vegetation post-treatment.
- Require use of native seeds for fuels management treatment based on availability, adaptation (site potential), and probability of success. Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet sage-grouse habitat objectives.
- Design post fuels management projects to ensure long term persistence of seeded or pre-treatment native plants. This may require temporary or long-term changes in livestock grazing management, wild horse and burro management, travel management, or other activities to achieve and maintain the desired condition of the fuels management project.
- Design fuels management projects in priority sage-grouse habitat to strategically and effectively reduce wildfire threats in the greatest area. This may require fuels treatments implemented in a more linear versus block design.
- For the project to be approved the authorizing official should consider:
 - o biological and physical limitations of the site and the impact on sage-grouse
 - o management objectives for the site, including those for wildlife, are clearly defined,
 - o potential for weed invasion and successional trends are well understood
 - o capability exists to manage the post-burn site properly, including a funded monitoring schedule, to achieve a healthy sagebrush community.

Develop local or regional guidelines or consider the following guidelines if fire is used as a tool:

- Analyze cumulative effects of sagebrush treatment by considering ecological units, evaluate the degree of fragmentation, and maintain a good representation of mature sagebrush
- Predict effects for the length of time necessary for sagebrush to return to desired condition for determine treatment types and intervals,

- Identify suitable patch size based on site-specific characteristics of the natural community and treat patches in a mosaic pattern that provides sagebrush cover for snow capture, hiding cover, and a seed source
- Use available literature to research the effects of fire on sagebrush communities
- Use caution in reducing sagebrush cover in and following drought periods

During fuels management project design, consider the utility of using livestock to strategically reduce fine fuels, and implement grazing management that will accomplish this objective.

Consult with ecologists to minimize impacts to native perennial grasses.

Develop criteria for managing fuels and other risks to sage-grouse habitat.

Identify critical sage-grouse habitats and prioritize on the basis of risk of loss to wildfire.

Develop appropriate actions on a site by site basis, such as using existing roads as fire breaks.

Develop treatments to improve habitats over the long term if sagebrush stands do not meet objectives for sage-grouse, such as confining treatments to small patches.

Consider mechanical treatment as the primary method and prescribed fire as a secondary method to remove conifers that encroach on sage-grouse habitat, except where forested habitat is limited.

Avoid treatments to sage-grouse habitat in areas that are susceptible to invasion by cheatgrass or other invasive plant species. Treatment will be accompanied by restoration, and reseeded if necessary, to re-establish native vegetation.

Protect sagebrush along riparian zones, meadows, lakebeds, and farmlands that include important sage-grouse habitat.

Wash vehicles and heavy equipment for fires prior to arrival at a new location to avoid introduction for noxious weeds.

Fuels Management BMPs (WO IM 2011-138):

1. Where applicable, design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.
2. Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.
3. Use fire prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of hydrophobicity).

4. Ensure proposed sagebrush treatments are planned with interdisciplinary input from BLM and /or state wildlife agency biologist and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.
5. Where appropriate, ensure that treatments are configured in a manner (e.g., strips) that promotes use by sage-grouse (See Connelly et al., 2000*)
6. Where applicable, incorporate roads and natural fuel breaks into fuel break design.
7. Power-wash all vehicles and equipment involved in fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.
8. Design vegetation treatment in areas of high frequency to facilitate firefighting safety, reduce the risk of extreme fire behavior; and to reduce the risk and rate of fire spread to key and restoration habitats.
9. Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands first to sites which are adjacent to or surrounded by sage-grouse key habitats. Annual grasslands are second priority for restoration when the sites not adjacent to key habitat, but within 2 miles of key habitat. The third priority for annual grasslands habitat restoration projects are sites beyond 2 miles of key habitat. The intent is to focus restoration outward from existing, intact habitat.
10. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs.
11. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
12. Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks and other habitats (e.g., nesting, wintering, and brood rearing) to reduce the availability of perch sites for avian predators, as appropriate, and resources permit.
13. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
14. Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.
15. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to aid in controlling wildfire should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).

Fire operations

In priority sage-grouse habitat areas, prioritize suppression, immediately after firefighter and public safety, to conserve the habitat. In general sage-grouse habitat, prioritize suppression where wildfires threaten priority sage-grouse habitat.

Best Management Practices (WO IM 2011-138):

- Develop state-specific sage-grouse toolboxes containing maps, a list of resource advisors, contact information, local guidance, and other relevant information.
- Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
- Assign a sage-grouse resource advisor to all extended attack fires in or near key sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.
- On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.
- During periods of multiple fires, ensure line officers are involved in setting priorities.
- To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
- Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and ATVs prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.
- Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.
- Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.
- Utilize retardant and mechanized equipment to minimize burned acreage during initial attack.
- As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.

Emergency Stabilization and Rehabilitation (ES&R)

Prioritize native seed allocation for use in sage-grouse habitat in years when preferred native seed is in short supply. This may require reallocation of native seed from ES&R projects outside of priority sage-grouse habitat to those inside it. Use of native plant seeds for ES&R seedings is required based on availability, adaptation (site potential), and probability of success (Richards et al. 1998). Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet sage-grouse habitat conservation objectives (Pyke 2011). Re-establishment of appropriate sagebrush species/subspecies and important understory plants, relative to site potential, shall be the highest priority for rehabilitation efforts.

Design post ES&R management to ensure long term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing, wild horse and

burro, and travel management, etc., to achieve and maintain the desired condition of ES&R projects to benefit sage-grouse.

Consider potential changes in climate when proposing post-fire seedings using native plants. Consider seed collections from the warmer component within a species' current range for selection of native seed.

Assure that long-term wildfire rehabilitation objectives are consistent with the desired natural plant community.

Re-vegetate burned sites in sage-grouse habitat within one year unless natural recovery of the native plant community is expected. Areas disturbed by heavy equipment will be given priority consideration.

Emphasize native plant species adapted to the site that are readily available and economically and biologically feasible.

Monitor the site and treat for noxious weeds.

Restoration

Prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit sage-grouse.

Prioritize restoration in seasonal habitats that are thought to be limiting sage-grouse distribution and/or abundance.

Include sage-grouse habitat parameters as defined by Connelly et al. (2000), Hagen et al. (2007) or, if available, state Sage-Grouse Conservation plans and appropriate local information in habitat restoration objectives. Make meeting these objectives within priority sage-grouse habitat areas the highest restoration priority.

Require use of native seeds for restoration based on availability, adaptation (ecological site potential), and probability of success. Where probability of success or adapted seed availability is low, non-native seeds may be used as long as they support sage-grouse habitat objectives.

Design post restoration management to ensure long term persistence. This could include changes in livestock grazing management, wild horse and burro management and travel management, etc., to achieve and maintain the desired condition of the restoration effort that benefits sage-grouse.

Consider potential changes in climate when proposing restoration seedings when using native plants. Consider collection from the warmer component of the species current range when selecting native species.

Restore native plants and create landscape patterns which most benefit sage-grouse.

Make re-establishment of sagebrush cover and desirable understory plants (relative to ecological site potential) the highest priority for restoration efforts.

In fire prone areas where sagebrush seed is required for sage-grouse habitat restoration, consider establishing seed harvest areas that are managed for seed production and are a priority for protection from outside disturbances.

Map and inventory areas believed to be impacted by conifer expansion. If conifer encroachment is a concern, options for treatment include:

- Prescribed fires when and where feasible,
- Remove trees mechanically when feasible, and
- Apply herbicides when and where feasible.

Evaluate the site potential and desired condition, and develop specific objectives accordingly within specific landscapes.

If sagebrush is lacking:

- Develop and implement grazing practices that influence sagebrush growth,
- Inter-seed historical breeding and winter habitats with the appropriate sagebrush species,
- Identify and promote seed sources for habitat restoration efforts,
- Reclaim and/or re-seed areas disturbed by treatments when necessary, and
- Promote sage plantings, where appropriate, on project areas occurring within sage-grouse habitats.

If mature sagebrush dominates with suppressed herbaceous understory:

- Identify areas of dense mature cover that do not appear to be serving as quality habitat and analyze these areas within the context of a larger landscape,
- Design sagebrush treatments to be compatible with sage-grouse needs,
- Develop specific objectives for sage-grouse in breeding or winter habitats, and
- If treatment is deemed appropriated, interrupt seral stages within the appropriate patch size using the appropriate method, such as brush beating, chaining, chemical means, prescribed fire, etc. that are compatible with local conditions.

If residual understory is lacking in sagebrush stands:

- Manage grazing by domestic livestock and wild herbivores to retain and promote adequate residual cover in all breeding habitats with an emphasis on nesting areas.
- Ensure that grazing allotment plans include objectives for sage-grouse in sage-grouse habitats.
- Monitor allotment plans and regulations, and make changes where necessary.
- Include native grasses in all reclamation and restoration activities.

Other Wildlife

Initiate studies to better understand sage-grouse mortality rates, the factors that influence these rates and the effectiveness of management actions to change them. These studies should determine the relationships between predation, habitat fragmentation, and habitat condition.

Assess population status and trends of important predator species (both native and invasive).

Implement actions to improve the structure and composition of sagebrush communities to meet desired conditions for sage-grouse seasonal habitats.

Maintain and restore sagebrush communities where appropriate for sage-grouse populations.

Reduce man-made issues and conifer encroachment in sage-grouse breeding, nesting, and wintering habitats.

- Reduce the availability of predator ‘subsidies’ such as human-made den sites (nonfunctioning culverts, old foundations, wood piles) and supplemental food sources (garbage dumps, spilled grains, etc.) that contribute to increased predator numbers.
- Placement of power poles should follow prescription detailed in the discussion transmission lines.
- Placement of fences should follow prescriptions detailed in the discussion of grazing management, and
- Treatment of conifer encroachment should be implemented in ways to minimize loss of sagebrush habitats.

General Habitat

Within General Habitat mitigation measures and conservation actions will mirror management actions in the selected alternative. Mitigation measures would be applied during activity level planning if an evaluation of the project area indicates the presence of important wildlife species seasonal wildlife habitat or other resource concern. Exceptions may be granted by the authorized officer if an environmental review demonstrates that effects could be mitigated to an acceptable level, habitat for the species is not present, or portions of the area can be occupied without affecting a particular species. Exceptions may also be granted where the short-term effects are mitigated by the long-term benefits (e.g., prescribed fire or forest health treatments).

In addition to actions below and in Chapter 2, best management practices for all resources may be found in Appendix B, and will help form the COAs applied to specific projects. These measures would be implemented at the discretion of the Billings Field Office on a project specific basis in general habitat, depending on the specific characteristics of the project area and the types of disturbance being proposed. They may not be appropriate to implement in all cases and in many cases may mirror those for priority habitat. Mitigation of surface-disturbing or disruptive activities would be applied where needed to minimize impacts and could be applied consistent with the oil and gas stipulations outlined in the Fluid Minerals section of Chapter 2. The mitigation would be requirements, procedures, management measures or design features that the BLM, through issuance of the record of decision would adopt as operational requirements. The BLM may add additional site-specific restrictions as deemed necessary by further environmental analysis and as developed through consultation with other federal, state, and local regulatory and resource agencies.

Greater Sage-Grouse Leks

Surface-disturbing and disruptive activities would be avoided if possible within 1 mile of greater sage-grouse leks.

Greater Sage-Grouse Nesting Habitat

Surface-disturbing and disruptive activities would be avoided if possible from March 1 through June 15 within 1 mile of greater sage-grouse nesting habitat.

Require a one-day notice prior to any planned activity during March 1 through June 15 so that the impacted areas and any undeveloped areas can be nest-dragged to determine the presence or absence of active nests. Require a second nest-drag survey if activity begins more than two days after completion of pad construction.

Prioritize activities based on suitability of habitat; construct projects that are in less suitable habitat (i.e., along existing roadways or within degraded habitats) during the breeding season, and construct projects located in more suitable habitat prior to or after the critical breeding season.

Avoid sagebrush, but if disturbance is necessary, interim reclamation should include sage plantings/seedings and/or the use of minimum disturbance measures to protect sage on well pads pipelines, and other disturbances.

Manage produced water to reduce the spread of West Nile virus within sage-grouse habitat areas.

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Do not issue ROWs to counties on energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Establish speed limits to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Use dust abatement measures on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Clean up refuse.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.

- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.
- Control the spread and effects from non-native plant species. (e.g. by washing vehicles and equipment.)
- Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus.

Include restoration objectives to meet sage-grouse habitat needs in reclamation measures/sites. Address post reclamation management in reclamation plan such that goals and objectives are to enhance or restore sage-grouse habitat.

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