

## APPENDIX X

### SAGE GROUSE MANAGEMENT

#### INTRODUCTION

Conservation measures delineated in the Montana Sage Grouse Conservation Strategy developed by a joint working group will be considered and used as the basis for conserving sage grouse populations through implementation of the Dillon RMP. Conservation measures would guide habitat management recommendations during watershed assessments and project level analysis under Alternative A, B and D. The measures would be applied as standards under Alternative C, along with the Western Association of Fish and Wildlife Agencies (WAFWA) guidelines which are summarized in this appendix. Only habitat-related conservation measures from the plan and guidelines are utilized in RMP alternatives. The Montana Conservation Strategy is in conformance with the draft National BLM sage grouse habitat conservation strategy.

#### RISKS TO SAGE GROUSE AND THEIR HABITAT

The Montana Sage Grouse Working Group identified risks to sage grouse and their habitat during the conservation planning effort. Conservation actions proposed in the strategy would address the 12 major issues presented in the plan and reduce the identified risks. The conservation actions are related to:

- *Fire Management*
- *Grazing Management*
- *Harvest Management*
- *Noxious Weed Management*
- *Managing Other Wildlife in Sage Grouse Habitats*
- *Mining and Energy Development*
- *Outreach and Education*
- *Power Lines and Generation Facilities*
- *Predation*
- *Recreational Disturbance*
- *Roads and Motorized Vehicles*
- *Vegetation*

#### CONSERVATION ACTIONS

The following conservation actions delineated in the Montana Sage Grouse Conservation Strategy by issue would be used in the watershed assessment process and in project level analysis for actions on BLM lands.

#### Fire Management

*Issue: Reduction of sagebrush by prescribed fire.*

1. Sites should not be burned unless:
  - a) biological and physical limitations of the site and impact on sage grouse are identified and considered,
  - b) management objectives for the site, including those for wildlife, are clearly defined,
  - c) potential for weed invasion and successional trends are well understood, and
  - d) capability exists to manage the post-burn site properly, including a funded monitoring schedule, to achieve a healthy sagebrush community.
2. Develop local or regional guidelines, such as the Beaverhead-Deer Lodge Forest/FWP guidelines in the intermountain valleys, or consider the following guidelines if fire is used as a tool elsewhere:
  - a) analyze cumulative effects of sagebrush treatment by considering ecological units, evaluate the degree of fragmentation, and maintain a good representation of mature sagebrush,
  - b) predict effects for the length of time necessary for sagebrush to return to desired condition for determine treatment types and intervals,
  - c) 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,
  - d) use available literature to research the effects of fire on sagebrush communities,
  - e) use caution in reducing sagebrush cover in and following drought periods,
  - f) work cooperatively with public agencies, academia, and private landowners to establish conservation objectives for the project area, and
  - g) map all burns within one year of treatment, monitor vegetative response, and develop a GIS layer of burn history.
3. 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.
4. 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.
5. 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.

6. Protect sagebrush along riparian zones, meadows, lakebeds, and farmlands that include important sage grouse habitat:
  - a) winter habitat,
  - b) breeding habitat, and
  - c) nesting habitat.
7. Wash vehicles and heavy equipment for fires prior to arrival at a new location to avoid introduction for noxious weeds.

*Issue: Reduction of sagebrush by wildfire.*

1. Schedule annual coordination meetings – with appropriate resource staff including fire specialists, wildlife biologists, and range ecologists – to incorporate new sage grouse habitat and other wildlife habitat information needed to set wildfire suppression priorities related to resources. Distribute updates to fire dispatchers for initial attack planning.
2. Identify the location of known sage grouse habitat and other wildlife habitats of concern, such as latitude and longitude with a polygon and radius, to avoid disturbance or degradation by temporary facilities, such as fire camps, staging areas, and helibases.
3. Incorporate known sage grouse habitat information into each Wildfire Situation Analysis to help determine appropriate suppression plans and prioritize multiple fires.
4. Retain unburned areas of sage grouse habitat, such as interior islands and patches between roads and fire perimeter, unless compelling safety, resource protection, or control objectives are at risk.

*Issue: Rehabilitation and restoration of sagebrush grasslands.*

1. Assure that long-term wildfire rehabilitation objectives are consistent with the desired natural plant community.
2. 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.
3. Emphasize native plant species adapted to the site that are readily available and economically and biologically feasible.
4. Monitor the site and treat for noxious weeds.
5. Allow a minimum of two growing seasons of rest from grazing by domestic livestock unless there are specific restoration objectives using livestock.

*Issue: Proactive treatments that could reduce the risk of loss of habitat critical to sage grouse.*

1. Develop criteria for managing fuels and other risks to sage grouse habitat.
2. Identify critical sage grouse habitats and prioritize on the basis of risk of loss to wildfire.

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

## Grazing Management

*Issue: Conflicting priorities for land uses, species, and habitats.*

1. Use scientific data and historic information to establish baseline information when evaluating soil conditions and ecological processes and when monitoring seasonal sage grouse habitats.
2. Set specific habitat objectives and implement appropriate grazing management to achieve those objectives and maintain or improve vegetation condition and trends.
3. Offer private landowners incentives when and where appropriated to achieve sage grouse objectives.

*Issue: Some sagebrush communities may have been significantly altered by past grazing management practices.*

1. Implement appropriate grazing management strategies and range management practices where soil conditions and ecological processes will support sage grouse and desired commodities and societal values.
2. Establish suitable goals for sagebrush communities that have deteriorated to such an extent that livestock management alone may not contribute to habitat objectives.
3. Offer private landowners incentives when and where appropriate to achieve sage grouse objectives.

*Issue: Drought may result in the degradation of native plant communities, and reduces forage production and sage grouse habitat.*

1. Livestock managers should have drought management strategies or plans, e.g. water facilities; forage sources formulated for implementation during periods of drought.
2. Consider effects of livestock and wildlife distribution on sage grouse prior to developing additional water sources.
3. Offer private landowners incentives when and where appropriate to achieve sage grouse objectives.

*Issue: Improper grazing or lack of grazing can change the composition and/or structure of the native plant community and thereby reduce or eliminate food and cover for sage grouse.*

1. Monitor the response of forbs (kinds, vigor, and production), and the compositional diversity of native species with respect to livestock grazing, evaluate the data, and make necessary adjustments.
2. Identify reasons for lack of grass and forb cover in sagebrush communities and recommend practices to in-

crease the native herbaceous understory.

3. Identify critical sage grouse areas, and adjust grazing to minimize conflict among the production of commodities and protection of societal values.
4. use monitoring methods that are best suited to the type of grazing management being incorporated at a site.
5. Adjust stocking levels (up or down) within the carrying capacity of the pasture or range. Adjustments should be based on monitoring program evaluating plant and soil response with respect to actual livestock use, weather, wildlife use, insects, and other environmental factors.

*Issue: Riparian areas (wet meadows, seeps, streams) are important resources for sage grouse and livestock.*

1. Design and implement livestock grazing management practices (riparian pastures, seasonal grazing, development of off-stream water facilities, etc.) to achieve riparian management objectives.
2. Modify or adapt pipelines and natural springs, where practical, to create small wet meadows as brood habitat.
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.

*Issue: Potential for sage grouse to be disturbed or displaced by concentrations of livestock near leks or winter habitat.*

1. 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.

*Issue: Sage grouse seasonal ranges often encompass private, tribal, state, and federal land. Habitat values across the respective ownership are important to sage grouse.*

1. Encourage land management practices that provide for maintaining or enhancing sage grouse habitat on private, tribal, state, and federal land.
2. Encourage the coordination of management activities on both properties to provide yearlong benefits to sage grouse. This may require reasonable compromise in establishing management practices to achieve specific goals.

3. Offer private landowners incentives when and where appropriate to achieve sage grouse objectives.

*Issue: Existing fences near breeding, brood-rearing, or winter habitats can increase the risk of collision mortalities and /or predation on sage grouse by hawks, eagles, and ravens by providing perches.*

1. 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.
2. Offer private landowners incentives when and where appropriate to achieve sage grouse objectives.

*Issue: Pesticides and herbicides may adversely impact the kinds and number of foods available in the form of insects and forbs and can directly affect chick survival.*

1. Evaluate ecological consequences of using pesticides to control grasshoppers or other insects.
2. Evaluate ecological consequences of broadcast herbicide use on forbs and other important sage grouse foods.
3. Minimize use of pesticides and herbicides within 1 mile of known grouse nests, leks, or brood-rearing areas.
4. Develop educational materials detailing the effects of pesticides and herbicides that can be used to evaluate their effects on sage grouse.

## Harvest Management

*Issue: There is a single harvest structure for the entire state, but regionally sage grouse may have different population characteristics and status.*

1. Divide sage grouse habitat into ecoregions based on clearly defined differences in ecological and/or population characteristics, which would allow for different season structures.
2. Develop an adaptive harvest management strategy including closed, conservative, and standard season structures. Clearly define “triggers” for each season structure based on population trend.
3. Establish sage grouse seasons on an annual basis using the current year’s lek data and other appropriate survey data. This would include the development of a statistically reliable trend monitoring protocol for inventorying lek attendance of male sage grouse.

*Issue: There strongly opposed viewpoints on the influences of hunting on sage grouse populations.*

1. Develop graduate level studies to evaluate the influence of hunting on sage grouse in Montana and what would constitute a maximum harvest rate.

2. Establish standardized wing collection protocol to evaluate the influence of environmental conditions on sage grouse productivity and population trends.
3. Identify small populations of sage grouse that are genetically isolated from other populations that could be at risk of overharvest.
4. Expand public information efforts designed to increase public awareness of the role of sage grouse hunting.

### **Managing Other Wildlife in Sage Grouse Habitats**

*Issue: High concentrations of wild herbivores in localized areas may reduce habitat effectiveness for sage grouse.*

1. Identify and map key sage grouse habitats where other wild herbivores are having significant impacts.
2. Establish an inventory and vegetative monitoring schedule to quantitatively determine the extent of the effects in key areas.
3. Determine seasons of expected use and assess the potential impact to sage grouse habitat.
4. Develop plans that keep ungulate population levels consistent with the sites capability to support them.

*Issue: Wetlands and other riparian habitats may be vulnerable to overuse by wild herbivores on some sites. This can sometimes be exacerbated seasonally, during droughts, and/or by other land use practices.*

1. Identify levels of use by wild herbivores in affected riparian areas.
2. Identify other land use practices occurring in riparian habitats.
3. Assess current management practices in respect to findings.
4. Determine whether management changes are needed.
5. Have drought management plans in place to allow for the rapid implementation of alternate management strategies.

### **Mining and Energy Development**

*Issue: Energy development may adversely affect sage grouse.*

1. Work cooperatively – agencies, utilities, and landowners – to identify and map important seasonal ranges for sage grouse.
2. Complete a broad scale assessment to identify important areas that require additional protection or conservation during land use planning and leasing of energy reserves.
3. Prioritize areas relative to their need for protection – ranging from complete protection to availability for moderate to high levels of energy development.

4. Encourage development in incremental stages to stagger disturbance (federal leases range from 3-10 years); design schedules that include long-term strategies to localize disturbance and recovery within established zones over a staggered time frame.
5. Provide technical assistance to private landowners who lease privately owned fee minerals.
6. Use off-site mitigation, such as the creation of sagebrush habitat, or purchase conservation easements with industry dollars to offset habitat losses.
7. Remove facilities and infrastructure when use is completed.
8. Enhance our understanding of the effects of energy development through:
  - a) pre-activity inventory,
  - b) monitoring over the life of the development, and
  - c) annual evaluations.

*Issue: Increased human disturbance.*

1. Allow no surface occupancy within 0.25 miles of an active lek. Use the best available information for siting structures near important breeding, brood-rearing, and winter habitat considering the following:
  - a) size of the structure(s),
  - b) life of the operation,
  - c) extent to which impacts would be minimized by topography, and
  - d) disturbance by noise and maintenance.
2. 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.
3. 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.
4. Allow no surface use activities within crucial sage grouse wintering areas during December 1 – March 15.
5. Remove structures and associated infrastructure when project is completed.

*Issue: Increased roads, pipelines, and power lines can fragment sagebrush habitats.*

1. Develop a comprehensive infrastructure plan prior to energy development activities to minimize road densities.
2. Avoid locating roads and power lines in crucial sage grouse breeding, nesting, and wintering areas.
3. See conservation actions for siting and constructing power lines.
4. Use minimal surface disturbance to install roads and pipelines and reclaim site of abandoned wells to natural communities.

*Issue: Energy-related facilities located within 2 miles of a sage grouse lek can degrade habitat quality within existing leases.*

1. Locate storage facilities, generators, and holding tanks outside the line of sight and sound of important breeding habitat.
2. Minimize ground disturbance in sagebrush stands with documented use by sage grouse:
  - a) breeding habitat – the lek and associated stands of sagebrush,
  - b) nesting habitat – stands of sagebrush within 2 miles of a lek, and
  - c) wintering habitat – sagebrush stands with documented winter use by sage grouse with portions that would remain above the snow even during years of deep-snow conditions.
3. Concentrate energy-related facilities when practicable.

*Issue: Energy-related activities can cause invasion of noxious weeds and other non-native plants.*

1. See conservation actions related to preventing the spread of weeds and controlling infestations of noxious weeds.
2. Engage industry as a partner to develop and establish new sources of seed of native plant species for restoration of sites disturbed by development.

*Issue: Noise can disrupt breeding rituals and cause abandonment of leks.*

1. Restrict noise levels from production facilities to 49 decibels (10 dba above background noise at the lek).
2. Restrict use of any heavy equipment that exceeds 49 decibels within 2 miles of a lek to hours from 8:00 a.m. to 7:00 p.m. and 10:00 p.m. to 4:00 a.m. March 15 to June 15.

*Issue: Water discharge and impoundments can degrade or inundate breeding, nesting, and winter habitat.*

1. Design impoundments and manage discharge so as not to degrade or inundate leks, nesting sites, and wintering sites.
2. Protect natural springs from any source of disturbance or degradation from energy-related activities.

*Issue: Siting requirements need to be re-examined as technological advances make development more compatible with sage grouse needs.*

1. Provide for long-term monitoring of siting requirements to examine effects of current and future development on sage grouse.
2. Set up a schedule for reviewing and revising siting and use criteria with industry.

## Noxious Weed Management

*Issue: Current information on existing weed infestations is insufficient for successful weed management.*

- Inventory and map existing noxious weed populations within and adjacent to occupied sage grouse habitat or suspected range.

*Issue: Appropriate weed management can't be performed without habitat-specific information.*

- Develop habitat-specific weed management plans for known sage grouse ranges, using the inventory and map information developed in the action described above.

*Issue: Weed infestations result in loss of native grass, forb, and sagebrush abundance and diversity.*

- Promote measures that prevent the introduction and spread of weed seeds and other reproducing plant parts.

*Issue: Noxious weeds spread quickly and without regard to ownership or management boundaries. Without immediate treatment, noxious weeds become a problem to all surrounding landowners. Effective weed management cannot occur in isolation or to the exclusion of any land managers within an area.*

1. Develop and implement management techniques that minimized the risk of infestation.
2. Use weed seed-free livestock forage and mulch.
3. Thoroughly clean personal clothing, pets, all vehicles and machinery before moving into non-infested areas.
4. Where feasible, isolate livestock from known infestations and avoid vehicle movement through infested areas.
5. Delay movement of livestock for a time period necessary to prevent viable weed seeds from passing through animals' digestive tracts or remaining physically attached when moving from infested to non-infested areas.
6. Use weed-free seed for re-establishment of vegetation.
7. Eliminate unnecessary soil disturbance and vehicle access/movement into occupied sage grouse habitat. Limit vehicle use to established roads only.
8. Regularly monitor access points and roads for weed establishment.

*Issue: Cooperative integrated weed management efforts are essential in order to have successful sage grouse habitat.*

1. Develop partnerships with regional public and private land management units. Solicit involvement of local weed management specialists, private landowners, wildlife biologists, and range ecologists to share knowledge and responsibilities on noxious weed issues.

2. Establish goals and set priorities that encompass the needs of both livestock and wildlife managers so all parties are working under a similar plan.
3. Provide training to appropriate staff on the proper selection and use of herbicides, including effects that climatic conditions and soils types have on applications of herbicides.
4. Maintain proper operating herbicide application equipment as well as proper herbicide application records, according to Montana pesticide laws.
5. Conduct monitoring and develop follow-up procedures for treated areas.
6. Participate in integrated weed management training conducted by state and federal agencies, local experiment stations, and local (county) weed districts.
7. Educate all field personnel on weed identification, manner in which weeds spread, and methods of treating weed infestations.

*Issue: It is important to maintain viable sagebrush habitat and populations of sage grouse while eradicating infestations of noxious weeds.*

1. 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.
2. Use the most selective herbicides where chemical treatment is appropriate, to minimize loss of non-target plant species.
3. 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.

*Issue: New weed infestations are often undetected.*

- Establish a monitoring protocol to detect new infestations.

*Issue: Weed management may not be identified budget item in sage grouse management plans.*

- Weed management costs should be an identified budget item in sage grouse management plans. Money should be dedicated for monitoring and education as well as direct treatment expenses.

*Issue: Funding and/or human resources may not be available when new infestations are discovered.*

- Establish partnerships or formal agreements with local (county) weed districts if appropriate to utilize their equipment and/or personnel.

## Outreach, Education, and Implementation

*Issue: The general public and agency staffs have not been exposed to current information on ecological needs and methods for conserving sage grouse and sagebrush habitats. Materials are needed to present this information.*

1. Develop educational materials (brochure, Power Point presentation, camera-ready ads, press releases, public service announcements, event invitations and surveys, websites, newsletters, and research information).
2. Present materials in a series of community meetings that bring statewide technical groups participants and regional agency staff together with local people.
3. consider Resource Advisory Committees and other regional and local opportunities for education and outreach.
4. Encourage public participation in censusing leks and other volunteer projects, including the general public on public lands and private landowners on their own properties.

*Issue: The general public and agency staff may not initially understand, and therefore support, the plan.*

1. Distribute the plan via hard copy and website.
2. Develop and implement a communications plan that identifies the audience and the message.
3. Prepare an executive summary of the plan.
4. Review and reconcile public concerns.

*Issue: Implementing a statewide plan in light of diverse geographical, cultural, and socio-economic challenges poses a challenge.*

1. Implement the local work group concept.
2. Coordinate efforts among work groups.

*Issue: Educational materials are needed for the sage grouse conservation effort in Montana.*

1. Develop a list of incentive programs presently offered that could be used to prevent the loss of sage grouse habitat.
2. Develop and distribute information on best management practices and is and agencies to designate a sage grouse contact person in interface with county planning authorities.
3. Request counties and agencies to designate a sage grouse contact person to interface with county planning authorities.
4. Provide sage grouse habitat maps and recommendations to county planners, public land agencies, and other interest groups and land managers.
5. Encourage county governments to offer incentives to developers who protect and enhance sage grouse habitat.

## Powerlines and Generation Facilities

*Issue: Existing power lines near a lek, brood-rearing habitat, or winter habitat increases the risk of predation on sage grouse by raptors.*

1. Document the segment(s) of line causing problems.
2. 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.
3. Emphasize the following if perch prevention modifications do not work to protect sage grouse and sagebrush habitat:
  - a) reroute the line using distance, topography, or vegetative cover; or
  - b) bury the line.
4. Explore opportunities for technical assistance and funding.
5. Remove power line when use is completed.

*Issue: New power lines proposed in areas that provide sage grouse habitat can pose threats to sage grouse.*

1. Minimize the number of new lines in sage grouse habitat.
2. Site new lines in existing corridors wherever practicable.
3. Encourage the use of off-grid systems such as solar, natural gas micro-turbines, and wind power where feasible in sage grouse habitats.
4. 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.
5. Develop a route – with agencies, utilities, and landowners cooperating – that uses topography, vegetative cover, site distance, etc. to effectively protect identified sage grouse habitat in a cost efficient manner.
6. Restrict timing for construction to prevent disturbance during critical periods:
  - a) breeding – March 15 – May 15
  - b) winter – December 1 – March 15.
7. Take appropriate measures to prevent introduction or dispersal of noxious weeds during construction and planned maintenance.
8. Remove power line when use is completed.

*Issue: Existing power line is causing consistent or significant collision mortality on sage grouse.*

1. Document the segment(s) of line causing consistent or biologically significant mortality- with agencies, utilities, and landowners cooperating in the effort.
2. Initiate collision prevention measures using guidelines (Avian Power Line Action Committee 1994) on identi-

fied segments. Measures are subject to restriction or modification for wind and ice loading or other engineering concerns, or updated collision prevention information.

3. Remove power lines that traverse important sage grouse habitats when facilities being serviced are no longer in use or when projects are completed.

*Issue: Fossil fuel generation may impact sage grouse and sage grouse habitat.*

1. Use the best available information to :
  - a) identify important sage grouse breeding, brood-rearing, and winter habitat in an appropriate vicinity of a proposed facility and associated infrastructure; and
  - b) site fossil fuel generation facilities and associated infrastructure – with developers, agencies, utilities, and landowners cooperating – using topography, vegetative cover, site distance, etc., to effectively protect identified sage grouse habitat.

*Issue: Wind generation may impact sage grouse and sage grouse habitat.*

1. Consult with USFWS Ecological Services for site selection evaluation information.
2. Use the best available information to:
  - a) identify important sage grouse breeding, brood-rearing , and winter habitat in an appropriate vicinity of a proposed facility and associated infrastructure; and
  - b) site wind generation facilities – with agencies, utilities, and landowners cooperating – using topography, vegetative cover, site distance, etc. to effectively protect identified sage grouse habitat.
3. Identify and avoid both local (daily)and seasonal migration routes.
4. Restrict timing of construction to minimize disturbance during critical periods:
  - a) breeding – March 15 – May 15
  - b) winter – December 1 – March 15
5. Take appropriate measures to prevent introduction or dispersal of noxious weeds during construction, maintenance, and operation as required by federal and state laws.
6. Develop offsite mitigation strategies in situations in which fragmentation or degradation of sage grouse habitat is unavoidable.

## Predation

*Issue: Predator numbers and species composition have changed, and the predator-prey relationship for sage grouse in Montana needs further investigation.*

1. Initiate studies to better understand sage grouse mortality rates, the factors that influence these rates and the effectiveness of management actions to change them.
2. Assess population status and trends of important predator species (both native and invasive).
3. Expand public information efforts designed to increase public awareness on the role of habitat predation, and weather on sage grouse population trends.

*Issue: Habitat fragmentation and poor quality habitat may be affecting mortality rates by allowing increased predation.*

1. Initiate studies to determine the relationships between predation, habitat fragmentation, and habitat condition.
2. Implement actions to improve the structure and composition of sagebrush communities to meet desired conditions for sage grouse seasonal habitats.
3. Maintain and restore sagebrush communities where appropriate for sage grouse populations.
4. Protect existing habitats through conservation easements, incentives, or other practices such as long-term leases.

*Issue: Man-caused alterations on the landscape have modified conditions and may directly facilitate increased predation.*

1. Reduce man-made perches and conifer encroachment in sage grouse breeding, nesting, and wintering habitats.
  - a) Placement of power poles should follow prescription detailed in the discussion transmission lines.
  - b) Placement of fences should follow prescriptions detailed in the discussion of grazing management, and
  - c) Treatment of conifer encroachment should be implemented in ways to minimize loss of sagebrush habitats.
2. 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.
3. If predation is shown to be depressing sage grouse populations, consider predator management actions specific to the predator species, site, and situation.
4. Consider expanded opportunities to take non-protected, invasive species where appropriate.

## Recreational Disturbance of Sage Grouse

*Issue: Citizens should be able to view and photograph sage grouse breeding displays. However, viewing may disturb breeding activities, displace leks, and reduce reproductive success.*

1. Agencies should document leks where recreational viewing is occurring.
2. Working together, the agency(ies) and interested public should determine whether or not management of viewing is needed to reduce disturbance of leks.
3. Educational materials should be developed and provided to the public indicating the effects of concentrated recreational activities and the importance of seasonal ranges to sage grouse.

*Issue: Management of lek viewing may be necessary.*

1. Establish viewing guidelines, i.e., distance, timing, approach methods, signage, parking areas, and area closures.
2. Consider sage grouse needs when developing roads and OHV management plans.
3. Develop and provide educational materials to the public describing effects of concentrated recreational activities and the importance of seasonal ranges to sage grouse.
4. Encourage recreationists to avoid continuous or concentrated use within 1.5 miles of leks from March 15 to May 15.
5. Issue special use permits for certain activities with distance and timing restrictions to maintain the integrity of breeding habitat.
6. Discourage concentration of hunters on critical seasonal habitats, such as during late big game seasons, when sage grouse are present.

## Roads and Motorized Vehicles

*Issue: Roads may increase sage grouse mortality through collisions with vehicles, displacement because of human disturbance, or other factors.*

1. Identify, map, quantify, and evaluate impacts of existing roads, including 2-tracks, in relation to known lek locations and sage grouse winter ranges.
2. Consider impacts to sage grouse when designing new roads and modifying existing roads.
3. Consider seasonal use restrictions or signing to avoid disturbance of critical times, such as winter and nesting periods.
4. Consider the use of speed bumps where appropriate to reduce vehicle speeds near leks, such as during oil and gas development.
5. Manage on-road travel and OHV use in key grouse areas to avoid disturbance during critical times such as winter and nesting periods.
6. Plan or permit organized events to avoid increased traffic and impacts to sage grouse.
7. 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.



8. Manage motorized and mechanized travel to minimize impacts to sage grouse by increasing enforcement of existing OHV and travel management plans.
9. Provide educational opportunities for users of OHVs dealing with the possible effects they may have on sage grouse.

*Issue: Roads and their associated disturbances and cumulative effects contribute to the loss of habitat and declining sage grouse populations.*

1. Develop a transportation management plan across ownership boundaries in critical sage grouse habitats.
2. Participate in travel planning efforts and educate the general public about the impacts of roads on sage grouse and critical habitat.
3. Consider buffers, removal, realignment, or seasonal closures where appropriate to avoid degradation of habitat.
4. Re-vegetate closed roads with plant species beneficial to sage grouse.
5. Close and re-vegetate travel ways in sage grouse habitats where appropriate.
6. Provide sage grouse habitat information during the planning phases of transportation development, working with MDOT, FHWA, industry, counties, etc.

## Vegetation

*Issue: Conifer encroachment reduces sagebrush habitat.*

1. Map and inventory areas believed to be impacted by conifer expansion.
2. If conifer encroachment is a concern, options for treatment include:
  - a) prescribed fires when and where feasible,
  - b) remove trees mechanically when feasible, and
  - c) apply herbicides when and where feasible.
3. Reclaim and/or re-seed areas disturbed by treatments when necessary. Include native forbs and grasses in all reclamation and seeding activities.

*Issue: Information regarding sagebrush distribution is incomplete.*

1. Identify the remaining breeding and winter areas for sage grouse.
2. Improve the classification of sagebrush cover to distinguish density and species.
3. Complete a mid to broad scale assessment to identify conservation priorities across the state.

*Issue: The age distribution of sagebrush may have been altered by management, such as a young stand recovering from disturbance or a mature stand with poor regeneration.*

1. Map and inventory areas believed to be deficient in quality of habitat or exhibiting poor health.
2. Evaluate the site potential and desired condition, and develop specific objectives accordingly within specific landscapes.
3. If sagebrush is lacking:
  - a) develop and implement grazing practices that influence sagebrush growth,
  - b) inter-seed historical breeding and winter habitats with the appropriate sagebrush species,
  - c) identify and promote seed sources for habitat restoration efforts,
  - d) encourage the voluntary use of sagebrush in habitat incentive programs, such as the Conservation Reserve Program, and work to develop additional funding sources for such programs,
  - e) reclaim and/or re-seed areas disturbed by treatments when necessary, and
  - f) promote sage plantings, where appropriate, on project areas occurring within sage grouse habitats.
4. If mature sagebrush dominates with suppressed herbaceous understory:
  - a) 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,
  - b) design sagebrush treatments to be compatible with sage grouse needs,
  - c) develop specific objectives for sage grouse in breeding or winter habitats, and
  - d) if treatment is deemed appropriated, interrupt several 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.

*Issue: The plant community has been altered and lack a diverse herbaceous understory.*

1. Map and inventory areas believed to be important sage grouse breeding habitats.
2. Evaluate the site potential and desired condition within the context of a larger landscape.
3. Develop and implement techniques to increase herbaceous diversity and density in sagebrush-steppe within ecological limits.
4. Ensure that grazing practices allow plants to grow to seed ripe on a rotational basis.
5. Adjust livestock grazing management when necessary, such as the season of use/projects, to promote forb establishment and recruitment.
6. Identify large areas of introduced plant species, such as crested wheat, and determine if restoration efforts are deemed appropriate.
7. Interseed appropriate breeding habitats with forbs as identified by the specialists and affected interests.

8. If mature sagebrush dominates with suppressed herbaceous understory:
  - a) 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,
  - b) design sagebrush treatments to be compatible with sage grouse need,
  - c) develop specific objectives for sage grouse in breeding or winter habitats, and
  - d) if treatment is deemed appropriate, interrupt seral stages within the appropriate patch size using the appropriate method, such as brush beating, chaining, chemical means, prescribed fire, etc. compatible with local conditions.
9. Identify and promote seed sources for habitat restoration efforts.
10. Identify landowner incentives and additional funding sources to enhance existing programs, such as to enhance the CRP.

*Issue: Residual understory is lacking in sagebrush stands, mainly in breeding habitats.*

1. Develop incentives to promote desired habitat conditions on private lands.
2. 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.
3. Ensure that grazing allotment plans include objectives for sage grouse in sage grouse habitats.
4. Monitor USFS/BLM/State allotment plans and regulations, and make changes where necessary.
5. Include native grasses in all reclamation and restoration activities.

## SAGE GROUSE GUIDELINES (WAFWA)

Sage grouse populations occupy relatively large areas on a year-round basis (Berry and Eng 1985, Connelly et al. 1988, Wakkinen 1990, Leonard et al. 2000), invariably involving a mix of ownerships and jurisdictions. Thus, state and federal natural resource agencies and private landowners must coordinate efforts over at least an entire seasonal range to successfully implement these guidelines. Based on current knowledge of sage grouse population and habitat trends, these guidelines have been developed to help agencies and landowners effectively assess and manage populations, protect and manage remaining habitats, and restore damaged habitat. Because of gaps in knowledge and regional variation in habitat characteristics (Tisdale and Hironaka 1981), the judgment of local biologists and quantitative data from population and habitat monitoring are necessary to implement the guidelines correctly. Further, agencies are urged

to use an adaptive management approach (Macnab 1983, Gratson et al. 1993), using monitoring and evaluation to assess the success of implementing these guidelines to manage sage grouse populations. These are the guidelines that will be used as standards in Alternative C management along with the Montana Sage Grouse Conservation Strategy conservation measures.

Activities responsible for the loss or degradation of sagebrush habitats also may be used to restore habitat. These activities include prescribed fire, grazing, herbicides, and mechanical treatments. Decisions on land treatments using these tools should be based on quantitative knowledge of vegetative conditions over an entire population's seasonal range.

Generally, the treatment selected should be that which is least disruptive to the vegetation community and has the most rapid recovery time. This selection should not solely be based on economic cost.

### Definitions

For the purpose of these guidelines, an occupied lek is defined as a traditional display area in or adjacent to sagebrush-dominated habitats that has been attended by  $\geq 2$  male sage grouse in  $\geq 2$  of the previous 5 years. A breeding population is defined as a group of birds associated with one or more occupied leks in the same geographic area separated from other leks by  $\geq 20$  km. This definition is somewhat arbitrary but generally based on maximum distances females move to nest.

### General Habitat Management

The following guidelines pertain to all seasonal habitats used by sage grouse.

1. Monitor habitat conditions and only propose treatments if warranted by range condition (i.e., the area no longer supports habitat conditions described in the following guidelines under habitat protection). Do not base land treatments on schedules, targets, or quotas.
2. Use appropriate vegetation treatment techniques (e.g., mechanical methods, fire) to remove junipers and other conifers that have invaded sage grouse habitat (Commons et al. 1999). Whenever possible, use vegetation control techniques that are least disruptive to the stand of sagebrush, if this stand meets the needs of sage grouse (Table 3).
3. Increase the visibility of fences and other structures occurring within one km of seasonal ranges by flagging or similar means if these structures appear hazardous to flying grouse (e.g., birds have been observed hitting

or narrowly missing these structures or grouse remains have been found next to these structures).

4. Avoid building powerlines and other tall structures providing perch sites for raptors within 3 km of seasonal habitats. If these structures must be built, or presently exist, the lines should be buried or poles modified to prevent their use as raptor perch sites.

## Breeding Habitat Management

For both migratory and non-migratory populations, lek attendance, nesting, and early brood rearing occur in breeding habitats. These habitats are sagebrush-dominated rangelands with a healthy herbaceous understory and are critical for survival of sage grouse populations. Mechanical disturbance, prescribed fire, and herbicides can be used to restore sage grouse habitats to those conditions identified as appropriate in the following sections on habitat protection. Local biologists and range ecologists should select the appropriate technique on a case-by-case basis. Generally, fire should not be used in breeding habitats dominated by Wyoming big sagebrush if these areas support sage grouse. Fire can be difficult to control and tends to burn the best remaining nesting and early brood rearing habitats (i.e., those areas with the best remaining understory), while leaving areas with poor understory. Further, using fire in habitats dominated by xeric mountain big sagebrush (*A. t. xericensis*) is not recommended because annual grasses commonly invade these habitats and much of the original habitat has been altered by fire (Bunting et al. 1987).

Although mining and energy development are common activities throughout the range of sage grouse, quantitative data on the long-term effects of these activities on sage grouse are limited. However, some negative impacts have been documented (Braun 1998, Lyon 2000). Thus, these activities should be discouraged in breeding habitats, but, when unavoidable, restoration efforts should follow procedures outlined in these guidelines.

### Habitat Protection

1. Manage breeding habitats to support 15-25% canopy cover of sagebrush, perennial herbaceous cover averaging  $\geq 18$  cm in height with  $\geq 15\%$  canopy cover for grasses and  $\geq 10\%$  for forbs and a diversity of forbs (Barnett and Crawford 1994, Drut et al. 1994a, Apa 1998) during spring (Table 3). Habitats meeting these conditions should have a high priority for wildfire suppression and should not be considered for sagebrush control programs. Sagebrush and herbaceous cover should provide overhead and lateral concealment from predators. If average sagebrush height is  $\geq 75$  cm, herbaceous cover may need to be substantially greater than 18 cm to provide this protection. There is much vari-

ability among sagebrush-dominated habitats (Tisdale and Hironaka 1981, Hironaka et al. 1983) and some Wyoming sagebrush and low sagebrush breeding habitats may not support 25% herbaceous cover. In these areas, total herbaceous cover should be  $\geq 15\%$ . Further, the herbaceous height requirement may not be possible in habitats dominated by grasses that are relatively short when mature. In all of these cases, local biologists and range ecologists should develop height and cover requirements that are reasonable and ecologically defensible. Leks tend to be relatively open, thus cover on leks should not meet these requirements.

2. For non-migratory grouse occupying habitats that are distributed uniformly (i.e., habitats have the characteristics described in guideline 1 and are generally distributed around the leks), protect (i.e., do not manipulate) sagebrush and herbaceous understory within 3.2 km of all occupied leks. For non-migratory populations, consider leks the center of year-round activity and use them as focal points for management efforts (Braun et al. 1977).
3. For non-migratory populations where sagebrush is not distributed uniformly (i.e., habitats have the characteristics described in guideline 1 but distributed irregularly with respect to leks), protect suitable habitats for  $\leq 5$  km from all occupied leks. Use radiotelemetry, repeated surveys for grouse use, or habitat mapping to identify nesting and early brood rearing habitats.
4. For migratory populations, identify and protect breeding habitats within 18 km of leks in a manner similar to that described for non-migratory sage grouse. For migratory sage grouse, leks generally are associated with nesting habitats but migratory birds may move  $> 18$  km from leks to nest sites. Thus, protection of habitat within 3.2 km of leks may not protect most of the important nesting areas (Wakkinen et al. 1992, Lyon 2000).
5. In areas of large-scale habitat loss ( $\geq 40\%$  of original breeding habitat), protect all remaining habitats from additional loss or degradation. If remaining habitats are degraded, follow guidelines for habitat restoration listed below.
6. During drought periods ( $\geq 2$  consecutive years), reduce stocking rates or change management practices for livestock, wild horses and wild ungulates if cover requirements during the nesting and brood rearing periods are not met. Grazing pressure from domestic livestock and wild ungulates should be managed in a manner that, at all times, addresses the possibility of drought.
7. Suppress wildfires in all breeding habitats. In the event of multiple fires, land management agencies should

have all breeding habitats identified and prioritized for suppression, giving the greatest priority to breeding habitats that have become fragmented or reduced by  $\geq 40\%$  in the last 30 years.

8. Adjust timing of energy exploration, development, and construction activity to minimize disturbance of sage grouse breeding activities. Energy-related facilities should be located  $\geq 3.2$  km from active leks whenever possible. Human activities within view of or  $\leq 0.5$  km from leks should be minimized during the early morning and late evening when birds are near or on leks.

### Habitat Restoration

1. Before initiating vegetation treatments, quantitatively evaluate the area proposed for treatment to ensure that it does not have sagebrush and herbaceous cover suitable for breeding habitat. Treatments should not be undertaken within sage grouse habitats until the limiting vegetation factor(s) has been identified, the proposed treatment is known to provide the desired vegetation response, and land use activities can be managed after treatment to ensure that vegetation objectives are met.
2. Restore degraded rangelands to a condition that again provides suitable breeding habitat for sage grouse by including sagebrush, native forbs (especially legumes), and native grasses in reseeding efforts (Apa 1998). If native forbs and grasses are unavailable, use species that are functional equivalents and provide habitat characteristics similar to those of native species.
3. Where the sagebrush overstory is intact but the understory has been degraded severely and quality of nesting habitat has declined, use appropriate techniques (e.g., brush beating in strips or patches and interseed with native grasses and forbs) that retain some sagebrush but open shrub canopy to encourage forb and grass growth.
4. Do not use fire in sage grouse habitats prone to invasion by cheatgrass and other invasive weed species unless adequate measures are included in restoration plans to replace the cheatgrass understory with perennial species using approved reseeding strategies. These strategies could include, but are not limited to, use of pre-emergent herbicides (e.g., Oust®, Plateau®) to retard cheatgrass germination until perennial herbaceous species become established.
5. When restoring habitats dominated by Wyoming big sagebrush, regardless of the techniques used (e.g., prescribed fire, herbicides), do not treat  $>20\%$  of the breeding habitat (including areas burned by wildfire) within a 30-year period (Bunting et al. 1987). The 30-year period represents the approximate recovery time for a stand of Wyoming big sagebrush. Additional treatments should be deferred until the previously treated area again provides suitable breeding habitat. In some cases, this may take  $<30$  years and in other cases  $>30$  years. If 2,4-D or similar herbicides are used, they should be applied in strips such that their effect on forbs is minimized. Because fire generally burns the best remaining sage grouse habitats (i.e., those with the best understory) and leaves areas with sparse understory, use fire for habitat restoration only when it can be convincingly demonstrated to be in the best interest of sage grouse.
6. When restoring habitats dominated by mountain big sagebrush, regardless of the techniques used (e.g., fire, herbicides), treat  $<20\%$  of the breeding habitat (including areas burned by wildfire) within a 20-year period (Bunting et al. 1987). The 20-year period represents the approximate recovery time for a stand of mountain big sagebrush. Additional treatments should be deferred until the previously treated area again provides suitable breeding habitat. In some cases, this may take  $<20$  years and in other cases  $>20$  years. If 2,4-D or similar herbicides are used, they should be applied in strips such that their effect on forbs is minimized.
7. All wildfires and prescribed burns should be evaluated as soon as possible to determine if reseeding is necessary to achieve habitat management objectives. If needed, reseed with sagebrush, native bunchgrasses, and forbs whenever possible.
8. Until research unequivocally demonstrates that using tebuthiuron and similar acting herbicides to control sagebrush have no long-lasting negative impacts on sage grouse habitat, use these herbicides only on an experimental basis and over a sufficiently small area that any long-term negative impacts are negligible. Because these herbicides have the potential of reducing but not eliminating sagebrush cover within grouse breeding habitats, thus stimulating herbaceous development, their use as sage grouse habitat management tools should be examined closely.

### Summer-Late Brood Rearing Habitat Management

Sage grouse may use a variety of habitats, including meadows, farmland, dry lakebeds, sagebrush, and riparian zones from late June to early November (Patterson 1952, Wallestad 1975, Connelly 1982, Hanf et al. 1994). Generally, these habitats are characterized by relatively moist conditions and many succulent forbs in or adjacent to sagebrush cover.

### Habitat Protection

1. Avoid land use practices that reduce soil moisture effectiveness, increase erosion, cause invasion of exotic plants, and reduce abundance and diversity of forbs.
2. Avoid removing sagebrush within 300 m of sage grouse foraging areas along riparian zones, meadows, lakebeds, and farmland, unless such removal is necessary to achieve habitat management objectives (e.g., meadow restoration, treatment of conifer encroachment).
3. Discourage use of very toxic organophosphorus and carbamate insecticides in sage grouse brood rearing habitats. Sage grouse using agricultural areas may be affected adversely by pesticide applications (Blus et al. 1989). Less toxic agri-chemicals or biological control may provide suitable alternatives in these areas.
4. Avoid developing springs for livestock water, but if water from a spring will be used in a pipeline or trough, design the project to maintain free water and wet meadows at the spring. Capturing water from springs using pipelines and troughs may affect adversely wet meadows used by grouse for foraging.

### Habitat Restoration

1. Use brush beating or other mechanical treatments in strips 4-8 m wide in areas with relatively high shrub canopy cover (>35% total shrub cover) to improve late brood rearing habitats. Brush beating can be used to effectively create different age classes of sagebrush in large areas with little age diversity.
2. If brush beating is impractical, use fire or herbicides to create a mosaic of openings in mountain big sagebrush and mixed shrub communities used as late brood rearing habitats where total shrub cover is >35%. Generally, 10-20% canopy cover of sagebrush and <25% total shrub cover will provide adequate habitat for sage grouse during summer.
3. Only construct water developments for sage grouse in or adjacent to known summer use areas and provide escape ramps suitable for all avian species and other small animals. Water developments and "guzzlers" may improve sage grouse summer habitats (Autenrieth et al. 1982, Hanf et al. 1994). However, sage grouse used these developments infrequently in southeastern Idaho because most were constructed in sage grouse winter and breeding habitat, rather than summer range (Connelly and Doughty 1989).

4. Whenever possible, modify developed springs and other water sources to restore natural free-flowing water and wet meadow habitats.

### Winter Habitat Management

Sagebrush is the essential component of winter habitat. Sage grouse select winter use sites based on snow depth and topography and snowfall can affect the amount and height of sagebrush available to grouse (Connelly 1982, Hupp and Braun 1989, Robertson 1991). Thus, on a landscape scale, sage grouse winter habitats should allow grouse access to sagebrush under all snow conditions.

### Habitat Protection

1. Maintain sagebrush communities on a landscape scale, allowing sage grouse access to sagebrush stands with canopy cover of 10-30% and heights of at least 25-35 cm regardless of snow cover. These areas should be high priority for wildfire suppression and sagebrush control should be avoided.
2. Protect patches of sagebrush within burned areas from disturbance and manipulation. These areas may provide the only winter habitat for sage grouse and their loss could result in the extirpation of the grouse population. They also are important seed sources for sagebrush reestablishment in the burned areas. During fire suppression activities do not remove or burn any remaining patches of sagebrush within the fire perimeter.
3. In areas of large-scale habitat loss ( $\geq 40\%$  of original winter habitat), protect all remaining sagebrush habitats.

### Habitat Restoration

1. Reseed former winter range with the appropriate subspecies of sagebrush and herbaceous species unless the species are re-colonizing the area in a density that would allow recovery within 15 years.
2. Discourage prescribed burns >50 ha and do not burn >20% of an area used by sage grouse during winter within any 20-30 year interval (depending on estimated recovery time for the sagebrush habitat).

