Bureau of Land Management

National Sage-Grouse Habitat Conservation Strategy

1.4.1 Guidance for the Management of Sagebrush Plant Communities for Sage-Grouse Conservation

U.S. Department of the Interior

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GUIDANCE FOR THE MANAGEMENT OF SAGEBRUSH PLANT COMMUNITIES FOR SAGE-GROUSE CONSERVATION

1) Introduction

a) Purpose

This document serves as guidance on managing, restoring and enhancing sagebrush habitat on public lands administered by the Bureau of Land Management (BLM). This guidance only applies until BLM State or local-level guidance is developed, or until specific sage-grouse conservation measures are incorporated into BLM land use plans. In July 2000, the Western Association of Fish and Wildlife Agencies (WAFWA) entered into a Memorandum of Understanding (MOU) with the U.S. Forest Service (FS), U.S. Fish and Wildlife Service (FWS) and BLM. This MOU established state wildlife agencies as the lead for state and local conservation planning efforts for sage-grouse. In July 2002, WAFWA approved a proposal to develop a Conservation Assessment (CA) for sage-grouse and sage-grouse habitat to be completed in two distinct phases. Phase 1 is an assessment of sage-grouse populations and habitat status throughout their range across eleven western states. It was completed in June 2004. Phase 2, a range-wide plan for the conservation of sage-grouse and sage-grouse habitats, is scheduled for completion in 2005. BLM will consider guidance in these documents when developing strategies and plans in accordance with the MOU.

This guidance is designed to support and promote the range-wide conservation of sagebrush habitats for sage-grouse and other sagebrush-obligate wildlife species on public lands administered by the BLM. BLM States and associated Field Offices will utilize this guidance until the Bureau and its partners (1) finalize and adopt the BLM State-Level Strategies and/or state wildlife agency-led Sage-grouse Conservation Plans, and/or (2) incorporate sage-grouse habitat objectives and conservation measures into appropriate planning documents. This guidance may be modified through collaborative processes in each state in order to better fit local and regional conditions and to reflect ongoing efforts to complete state-level strategies. This guidance may not apply where locally-specific guidance has already been developed by BLM using the best available science.

Land management decisions on public lands managed by BLM will continue to be made at the state or local planning levels in accordance with the National Environmental Policy Act and other applicable laws and regulations. BLM designed this guidance to focus on conserving the habitat of sage-grouse (and by extension other wildlife species requiring sagebrush habitat) since wildlife populations, predator control, and hunting are primarily regulated by state or other Federal agencies. This guidance complements the Standards for Rangeland Health that were developed by the BLM Resource Advisory Councils in most western states.

It summarizes the current sage-grouse situation and describes the development of the guidance, the guidance itself, and the application of the guidance. This guidance only

applies to land management decisions and use authorizations over which BLM has administrative authorities and responsibilities.

b) Development of Guidance

The following BLM documents were referred to during the development of this guidance:

- **2000 Memorandum of Understanding (MOU) with:** 1) WAFWA, 2) FS, 3) FWS and 4) BLM.

- **BLM Manual 6840 - Special Status Species Management.** The 6840 manual provides for BLM to implement management plans that conserve candidate and Bureau-sensitive species and their habitats, and to ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for the species to become listed under the provisions of the Endangered Species Act.

- **BLM Standards for Rangeland Health.** The regulations at 43 CFR 4180 require the management of rangelands so that "habitats are, or are making significant progress toward being restored or maintained for Federal threatened and endangered species, Federal Proposed … and other special status species." BLM's 4180 Handbook (Standards for Rangeland Health) and 1601 Handbook (Land Use Planning) expand upon the 4180 regulations to state policy that standards apply to all ecosystems falling under BLM management (not just rangelands) and all activities managed by BLM (not just livestock grazing). BLM adopted Standards for Rangeland Health in each state to promote the maintenance or attainment of rangeland health as defined in the four fundamentals of rangeland health in 43 CFR 4180.1.

- **Fluid Minerals Best Management Practices.** The Fluid Minerals Group in the BLM WO has developed new program direction and a menu of Best Management Practices for this program. The Best Management Practices have been incorporated into this guidance and can be found at *http://www.blm.gov/bmp/*.

This guidance will be amended or periodically updated to reflect either new information or new policies, such as the development and issuance of program-specific Best Management Practices. For example, BMPs for wind energy are currently being developed in the Wind Energy Programmatic Environmental Impact Statement. These BMPs will be adopted by reference when completed.

Many of the management actions described in this document (see "Suggested Management Practices" section) were derived from initial efforts by an interagency, interdisciplinary team in Oregon in 2000 to address the decline of sage-grouse habitat and populations. Since 2000, a number of resource specialists have revised the Oregon guidance to incorporate suggested management practices for application to all

BLM States with sage-grouse habitat where state conservation plans have not yet been approved and adopted by BLM, or where specific sage-grouse conservation measures have not been incorporated into BLM land use plans. This national-level guidance incorporates the best available science on landscape processes, sage-grouse seasonal habitats and sage-grouse life history into guidance to manage, restore and enhance sagebrush habitat.

c) Application of Guidance

This guidance applies only to BLM-administered public lands until either BLM State or local-level guidance is issued or locally-specific conservation measures are incorporated into BLM land use plans. In accordance with the 2000 MOU between BLM, Forest Service, Fish and Wildlife Service and WAFWA, BLM will consider the WAFWA Guidelines, state and local conservation plans, and other appropriate information in the development of plans and guidelines. During this interim period, this guidance provides a mechanism for Field Offices, in cooperation with other partners and cooperators, to proactively maintain, enhance and/or restore sagebrush habitats that are important to sage-grouse and other sagebrush-dependent wildlife species.

This guidance encourages the application of scientific knowledge, anecdotal information, and professional judgment of local BLM personnel, state wildlife agency biologists and local sage-grouse working groups to manage and restore sagebrush habitats. Available state, regional and local information about the condition and distribution of sage-grouse and their habitats will help managers select appropriate management practices to solve local habitat problems. This guidance should be adapted to local situations and site-specific conditions, and management decisions should be made in full consideration of social, environmental and economic consequences, consistent with the BLM mission.

2) Current Sagebrush and Sage-Grouse Situation

This section is intended to give the reader a general understanding of the current situation concerning sage-grouse and the sagebrush ecosystems upon which they depend. For a more complete treatment of the subject, the reader should consult the *Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats* (Connelly et al. 2004) which was recently completed by WAFWA and is available at *http://sagemap.wr.usgs.gov/*. This document contains a thorough discussion of population status and trends, population ecology and characteristics, habitat characteristics, sagebrush ecosystem dynamics, sagebrush ecosystem status and trends, and other information concerning impacts to the species.

a) Sagebrush Plant Communities

i) General characteristics

The entire sagebrush region in the western United States was estimated to historically cover 155.5 million acres (Kuchler 1970). Today, the sagebrush biome that supports

sage-grouse is estimated to cover 119 million acres (Connelly et al. 2004). Sagebrush covers much of the Great Basin and Wyoming Basin and reaches into the Snake River Plain, Columbia Basin, the Colorado Plateau, the state of Montana, southwestern Colorado, northern Arizona and New Mexico. Though sage-grouse are the most widely distributed species of conservation concern in the sagebrush biome, not all sagebrush is sage-grouse habitat.

Many species and subspecies of sagebrush grow in the Western United States from semi-desert lowlands to subalpine meadows. The species big sagebrush (*Artemisia tridentata*) predominates, and has five known subspecies (West 1988; Kartesz 1994). It is important to differentiate between sagebrush species and subspecies in order to classify and understand ecological sites, palatability to livestock and wildlife, response to fire, and management responses. Although our management requires this type of information, for many birds the subspecies of sagebrush is less important than its height, density, cover, and patchiness.

There are a wide variety of plant communities within the sagebrush biome due to spatial variability associated with soil, climate, topography, and other physical processes (Tisdale and Hironaka 1981; West 1988). Natural and human-induced disturbances (fire, drought, etc.) also play a role. There is also a large variation in plant community dynamics through time. The spatial and temporal variability associated with sagebrush community dynamics complicates the management and monitoring of this resource. Grassy openings, springs, seeps, moist meadows, riparian stream sides, pinyon and/or juniper woodlands, aspen stands, and rock outcrops also add to the sagebrush mosaic, and these habitats support a broad diversity of wildlife species.

Usually a single species of sagebrush is dominant or co-dominant in a community, but understory plant diversity and composition differ greatly depending on soils, climatic conditions, and past management. Canopy cover of sagebrush communities is extremely variable depending on the sagebrush species or subspecies, elapsed time since a disturbance such as wildfire, age of the stand, and management treatments. In big sagebrush types, cover may range from 5 to 30 percent on some sites (Dealy et al. 1981). Localized sites within mountain big sagebrush communities may exceed 30 percent canopy cover.

Biological soil crust is an integral and usually overlooked component of some sagebrush communities. Biological soil crust (also known as “cryptogamic crust,” “microbiotic crust,” or “cryptogamic soil”) is a microfloral community composed of blue-green algae, bacteria, fungi, mosses, and lichens. The diversity and function of biological crust communities are not well understood (St. Clair et al. 1993).

ii) Historic plant communities/conditions

A basic understanding of historical sagebrush ecosystems provides insight into the evolution of the connection between habitat and wildlife such as sage-grouse. Early explorers of the Intermountain West encountered a landscape dominated by shrubs and

found grasslands chiefly limited to hillsides and moist valley bottoms (Vale 1975). Big sagebrush was widespread and dominant and the range of sagebrush plant communities was about the same as it is today. With the introduction of domestic livestock in the late 1800s, the palatable understory species were greatly reduced, increasing the dominance of the less palatable sagebrush (Tisdale and Hironaka 1981, West 1988). Other studies also suggest that fire suppression and heavy grazing contributed to the invasion of junipers and other conifers in some sagebrush areas (Miller and Eddleman 2000, Tisdale and Hironaka 1981).

Jackrabbits, cottontails, and rodents were the major herbivores in the region. The cyclic population explosions of jackrabbits may have had a periodic and significant impact on local plant communities (Yensen 1980, Young 1994). Sage-grouse also had an effect on sagebrush and understory plants as did the periodic infestations of grasshoppers and crickets (Yensen 1980). Miller and others (1994) suggest that large herbivores were present in the sagebrush ecosystems, but their influence on vegetation was not significant because of low population densities.

Fires in pre-settlement times were probably patchy and smaller than recent fires creating a patchwork of young and old sagebrush stands across the landscape, interspersed with grassland openings, wet meadows, and other shrub communities. Pre-settlement fire intervals have been estimated at 15 to 25 years in wetter regions (mountain big sagebrush areas), and 60 to 110 years in the more arid sagebrush steppe where Wyoming big sagebrush dominates (Miller and Eddleman 2000, Tisdale and Hironaka 1981, Whisenant 1990). On more productive mountain big sagebrush and Wyoming big sagebrush plant communities, fires were frequent enough to limit establishment of conifers (Tisdale and Hironaka 1981).

Big sagebrush does not resprout after a fire; big sagebrush stands are replenished by wind-dispersed seed from adjacent unburned stands or seeds in the soil. Most sagebrush seeds fall within 3 feet of the shrub canopy, although wind can disperse seeds up to 90 feet (Meyer 1994), so the rate of big sagebrush recolonization in a burn depends on the distance from a seed source and the amount and viability of seed in the soil. Depending on the species and the size of a burn, sagebrush can reestablish itself within five years of a burn, but a return to a full pre-burn community (density and cover of sagebrush) cover can take 15 to 30 years (Bunting 1984, Miller and Rose 1999).

b) General Overview of Existing Conditions and Threats to Sagebrush Habitats

The sources and magnitude of impacts to sagebrush habitats have increased over time on public lands. The *Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats* (CA) produced by WAFWA addresses questions about the magnitude of these impacts (Connelly et al. 2004). The CA provides a more detailed and up-to-date assessment than what is provided in this document. However, the CA should not be used as a substitute for more specific local or regional analysis.

Greater sage-grouse populations have declined throughout North America by 33 percent over the past 30 to 40 years and have been extirpated in four states and one Canadian province. Since settlement of the West began, numerous activities have adversely affected the number of birds and the amount, distribution, and quality of sagebrush habitats. Historically sagebrush-dominated vegetation was one of the most widespread habitats in the country. However, the majority of sagebrush ecosystems have been lost or altered in some way by human activities and naturally-occurring events. No single factor can be identified as the cause of declines in sage-grouse populations.

Altered fire regimes are believed to be the single, most important, negative influence on sage-grouse habitat in the western portion of the species' ranges. Repeated wildfires, fueled by the invasive annual cheatgrass (*Bromus tectorum*) and other exotic species, alter vast acres of sage-grouse habitat in the Great Basin, Columbia Plateau, and other ecoregions of the West. Cheatgrass alters fire frequency from historic intervals of 30 to 110 years to shorter cycles of five years or less (Whisenant 1990). Sagebrush does not re-establish under frequent fire cycles. This situation increases the potential for large fires, carrying a threat for additional cheatgrass invasion onto adjacent areas not yet dominated by cheatgrass. Native sagebrush communities may not reestablish under this fire regime and conditions favorable to sage-grouse may not be available in the future in these areas.

On more mesic sagebrush sites where cheatgrass is not a threat, fire return intervals have been lengthened resulting in increased conifer expansion into sagebrush habitats. As conifers expand into sagebrush communities, contiguous sagebrush stands are reduced in size and diverse grasses and forbs used by sage-grouse are diminished. Increased livestock grazing in the late 1800s and early 1900s contributed to a reduction in fuels that could carry fire, thereby decreasing fire frequency and contributing to accelerated conifer woodland invasion into sagebrush associations. Fire suppression policies generally lengthen fire-return intervals in conifer-dominated habitats allowing for increased cover densities. Subtle climatic shifts toward warmer and drier conditions have also been identified as a potential causal factor to the encroachment of pinyon-juniper woodlands into the sagebrush plant communities (Crawford et al. 2004).

Although cheatgrass proliferation is widespread, increases in other invasive plants and noxious weeds pose a significant threat to sagebrush habitats. In 1996, the spread of invasive species and noxious weeds was estimated to be at least 2,300 acres per day on BLM public land alone (BLM 1996).

Within the Interior Columbia River Basin, sagebrush and bunchgrass cover types experienced greater losses than any other habitat and will probably continue to decline with the cumulative impacts of present land uses (Saab and Rich 1997, citing Hann et al. 1997). Some activities, such as large-scale conversion of sagebrush to cultivated croplands or pastures, are still of concern but less common today than in the past. Disposal of BLM public land has also removed sagebrush habitat from Federal

ownership, which has resulted in loss or fragmentation if that land was converted to other purposes, such as row-crops agriculture or landfills.

Seeding of introduced wheatgrass monocultures has been reduced and seed mixtures now include more native species. Past seedings of nonnative species have reduced the value of areas as sage-grouse habitat and slowed the natural recovery process of sagebrush. Livestock grazing impacts on habitat have been reduced as management of public lands has improved. However, livestock impacts on the composition and diversity of habitat and the impacts of management structures (fences, water developments, salt placement, etc.) and present livestock management or grazing practices may continue to be a source of concern in some locations.

In some areas, issuance of rights-of-way, energy development, and recreational activities have caused a reduction in suitable habitat and increased habitat fragmentation. The extent of fragmentation or total area lost rarely has been linked to specific land uses (Dobler et al. 1996, Hann et al. 1997, Knick and Rotenberry 1997) and cumulative effects have not been estimated over the large geographic extent of sagebrush. The wide geographic distribution of sagebrush in maps depicting only a dominant cover type cannot fully illustrate the presence or condition of available habitats across the range of sagebrush communities. With the reduction in sagebrush habitats, periodic drought may intensify impacts to the integrity of sagebrush plant communities particularly if changes in land use activities are not adjusted accordingly.

In summary, the changes in and threats to sagebrush habitat described above all contribute to the decline of sage-grouse and other wildlife species dependent on sagebrush ecosystems.

3) Sage-Grouse Biology and Habitat Requirements

The greater sage-grouse is the largest North American grouse species. They are relatively long-lived birds, typically living for four to five years. Because they lack a gizzard sage-grouse can only eat soft foods. Sage-grouse depend on a variety of sagebrush habitats throughout their life cycle. Sage-grouse are particularly dependent on subspecies of sagebrush: 1) Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), 2) mountain big sagebrush (*A. t. vaseyana*), and 3) basin big sagebrush (*A. t. tridentata*). Other sagebrush species such as low sagebrush (A. *arbuscula*), fringed sagebrush (*A. frigida*) and silver sagebrush (*A. cana*) are also used, but to a lesser degree. The type and condition of sagebrush communities affects habitat use by sage-grouse populations (Connelly et al. 2000), although sage-grouse generally show strong site loyalty to historically used areas. (Fisher et al. 1993).

Connelly et al. (2000) provides a good overview of the different habitat needs of sage-grouse at different seasons of the year. This publication also provides guidelines for habitat management including information on protective buffer distances for leks, sagebrush and herbaceous cover and structure specifications, and seeding recommendations. These quantitative specifications are not included in this guidance in

order to promote development of local, site-specific prescriptions; however, the Connelly and colleagues (2000) publication may serve as a good starting point in developing local management, enhancement and restoration guidelines. Another good reference document for this type of information is "Birds in a Sagebrush Sea" (1999) published by the Partners in Flight, Western Working Group.

There are four major seasonal habitats: breeding, summer-late brood rearing, fall, and winter (Connelly et al. 2000).

a) Breeding (includes leks, nesting and early-brood rearing activities)

i) Leks

Leks are sites where sage-grouse engage in courtship displays and mating and are often referred to as "strutting grounds." Leks are generally open areas with short vegetation, exposed knolls, or rocky and windswept ridges. They range in size from less than one acre to over 100 acres and can support from several to hundreds of males. Some leks are used for many years. Leks can be formed opportunistically at sites within or adjacent to nesting habitat, or females may travel more than 13 miles after mating to nest (Connelly et al. 2000). Therefore, the availability of lek sites is usually not considered to be a limiting factor for sage-grouse.

Breeding usually occurs March through mid-May during early morning hours. However, the lekking and breeding period varies based upon, latitude, geographic location and climatic conditions. Leks are often surrounded by sagebrush stands with good shrub cover where sage-grouse nesting occurs.

ii) Nesting

Most sage-grouse nests are located under sagebrush plants that provide overhead cover. Females nesting under plants other than sagebrush are less successful in hatching their clutch. Sagebrush canopy cover in the preferred nesting areas ranges from 15 to 30 percent (Connelly et al. 2000). Grass and forb cover at nest sites provide a combination of visual, physical, and scent barriers to predators. Sage-grouse nests are simple ground scrapes that are sometimes lined with feathers and vegetation. Clutch size ranges from 6 to 13 eggs. Nest success can range from 12 to 86 percent and is relatively low compared to other prairie grouse species.

iii) Early Brood-rearing

The first few weeks after hatch are considered an early brood-rearing period. Hens with chicks often spend time relatively close to the nest site, but movements of up to one mile are documented. An abundance of insects, especially ants and beetles, and native forbs enhances chick survival during early brood rearing. Chicks begin to fly at two to three weeks of age. Broods remain together for up to 12 weeks. Most juvenile mortality occurs during nesting and the juvenile's flightless stage, and is due primarily to

predation or severe weather conditions (Schroeder et al. 1999). Predation mortality can increase as concealment cover is diminished. Additionally juvenile survival is tied to the availability of insects. Insects provide the chicks with the necessary protein they need to develop (Drut 1994).

iv) Summer-Late Brood-Rearing and Fall

Late brood rearing habitats, used from summer into fall, usually have less dense sagebrush canopy than nesting habitats and generally a higher proportion of grasses and forbs in the understory. The diet of chicks consists of forbs and insects, and therefore diverse plant communities with abundant insects are especially important for nutritional purposes. As vegetation becomes desiccated in summer and fall, especially in dry years, sage-grouse move to areas that provide more palatable vegetation. They may migrate to higher elevations that receive additional summer moisture, concentrate along riparian habitats or, where available, utilize hay fields adjacent to sagebrush habitats to feed on green vegetation.

Sage-grouse may migrate only a short distance, not at all, or as much as 100 miles between seasonal uses (Schroeder et al. 1999). Their movements from late brood-rearing areas to winter habitat are dependent on weather conditions and snow cover and may involve travel across areas of unsuitable habitat during their migrations (Connelly et al. 2000). However, due to their dependence on sagebrush, they are rarely found outside of this habitat type.

v) Winter

During winter, sage-grouse feed almost exclusively on sagebrush leaves and buds. Sagebrush density can be highly variable on winter habitats, but typically sage-grouse select big sagebrush stands with plants at least 10 to 12 inches above snow. They tend to use the same wintering areas year after year.

4) Sagebrush Conservation Goal

BLM's goal is to:

> ***Sustain or reestablish the integrity of the sagebrush biome to provide the amount, continuity, and quality of habitat that is necessary to maintain sustainable populations of sage-grouse and other sagebrush-dependent wildlife species.***

5) Sagebrush and Sage-Grouse Issues

An estimated 50 percent of the sagebrush biome is still dominated by sagebrush. An unknown amount of this area still supports adequate vegetation structure and diversity to meet sage-grouse habitat needs. Some of this sagebrush habitat is contiguous over

large parts of the landscape with minimal fragmentation and with a healthy understory of native species that support viable sage-grouse populations. Some of these sagebrush communities also meet BLM's Standards for Rangeland Health and support multiple uses including recreation, livestock grazing, wild horses and burros, wilderness values, etc. The priority in these areas is to continue the existing good management that has maintained these habitats over the years. Management may need to be fine-tuned to accomplish this goal. Natural disturbance regimes (e.g., fires) may need to be periodically applied at the appropriate scale to maintain these current good conditions. This guidance provides practices that managers can apply in these healthy sagebrush communities to maintain or enhance these areas as good sage-grouse and other wildlife habitat.

In other parts of the sagebrush biome, habitat for sage-grouse and other wildlife species has been impacted by a variety of factors (human impacts, altered disturbance regimes, invasive species, etc.) resulting in loss, fragmentation and/or a reduction in the quality of habitat. These three habitat issues provide the framework for the Suggested Management Practices (SMPs) that follow, which have been developed to maintain, enhance or restore sagebrush habitat where BLM State or local strategies have not been developed, or specific sage-grouse conservation measures have not been incorporated into BLM land use plans.

The distinction is not immediately clear between: habitat loss, habitat fragmentation, and reduced habitat quality. It is a continuum that sometimes defies definition as it relates to some of the SMPs in this guidance. For example, habitat loss is distinguished from habitat fragmentation by the scope of the loss and shape of the loss (fragmentation is more linear or patchy), and from reduced habitat quality which is focused on the relative proportion of vegetation components within existing habitat. The relationships, interactions and significance related to habitat loss, habitat fragmentation and changes in habitat quality will vary by region, locality and site. Therefore, users of this guidance should not focus on the issue categories as much as on the local and regional application of the SMPs.

a) Habitat Loss

Habitat loss occurs in areas where both structure (vertical height and horizontal cover) of sagebrush and the diversity of plant species in the understory have been greatly reduced in a relatively large area, resulting in poor sage-grouse habitat, or where the habitat in its entirety has been eliminated. Examples of habitat loss include, but are not limited to, areas where wildfires burn in plant communities and invasive species significantly increase in the post-fire environment (e.g., cheatgrass), historic sagebrush habitat that has been converted to agricultural or human habitation uses, or disturbances resulting from large, open pit mining operations. Wildfires in healthy sagebrush communities temporarily change plant composition, but do not result in a permanent loss of habitat. Other smaller habitat loss areas (e.g., drill pads, roads, recreation facilities, powerlines, etc.) are considered under habitat fragmentation.

b) Habitat Fragmentation

On a broader scale, intact, functioning sagebrush communities may exist (e.g., good habitat continuity) but are interrupted or fragmented by structures, small disturbances, and transportation systems (and the noise associated with them at certain times of the year). These disturbances are generally linear or patchy when compared to larger areas of habitat loss caused by wildfires or agricultural conversion. Sometimes the fragmentation is not caused by the structure but by the use of, or potentially the presence of, the structure. For example, powerlines often fragment sagebrush landscapes because raptor predation of sage-grouse is increased due to the perches provided by the power poles. While large, spatially-extensive areas of lost habitat are easily identified as being a problem for sage-grouse, levels of acceptable fragmentation of sage-grouse habitat are not as easily established.

The consequences of fragmentation to sage-grouse vary, but can include the competition for fewer suitable nesting sites, reduced food supplies, the isolation of breeding habitat from brood-rearing areas and leks from nesting habitat. Such outcomes may lead to lower reproduction rates for sage-grouse and other wildlife species that use this habitat for all or part of their life cycle. At this time there are no minimum or optimum sizes of habitat patches known to be “best” for sage-grouse and other sagebrush associated species, however, larger patches are more desirable than small isolated patches.

c) Reduced Habitat Quality

Quality habitat for sage-grouse includes a diverse plant community (relative to the potential of the site) with appropriate vegetation heights and structure. Appropriate quality habitat for sage-grouse also varies by season. For example, on winter range, sagebrush is the key species upon which to focus management or restoration. Conversely, in spring brood-rearing habitat, understory diversity (with the associated insects) as well as sagebrush overstory are both required. An example of reduced habitat quality is an area that burned and recovered to a mixed stand of invasive and native herbaceous species with minimal sagebrush cover, or an area that has not burned but shows a decline in herbaceous understory.

It is important that the seasonal habitat requirements of sage-grouse (see sage-grouse biology section) be evaluated before instituting management changes or restoration treatments. Changes in current management or implementation of less intensive treatments (thinning sagebrush, changing herbivore use period or intensity to improve understory species vigor, etc.) are examples of SMPs that may be used to improve habitat quality relative to sage-grouse seasonal habitat needs.

6) Suggested Management Practices (SMPs)

SMPs are management or restoration activities, restrictions or treatments that are designed to maintain, enhance or restore sagebrush habitats. SMPs are intended to

stimulate creative and appropriate solutions for local issues surrounding the management and restoration of sagebrush habitat. Although SMPs focus on sage-grouse, they also apply more generically to other sagebrush-dependent wildlife species.

Applications of SMPs should always be considered at a larger spatial scale than the management action being considered. The context of the project relative to administrative boundaries and surrounding habitat condition should be included in the prioritization and implementation process for management or restoration activities. The potential for the local site to produce distinctive types, amounts and composition of vegetation is another important factor that influences treatment design and prioritization.

SMPs are divided into two categories; those that will **maintain** and those that will **restore or enhance** sagebrush habitats. Maintenance of habitat includes practices or treatments that minimize unwanted disturbances while maintaining the integrity of sagebrush communities and the values associated with them. These sagebrush stands have not crossed a threshold that requires expensive restoration of plant species. Reestablishment of sagebrush habitat may include restoration and enhancement treatments to reestablish habitat components that have been lost, reduced or suppressed. Generally some type of vegetation treatment followed by reseeding is required to move sagebrush plant communities that have lost important vegetation components back across a threshold to a functioning condition.

The differences in maintenance and restoration/enhancement approaches can be illustrated using a sagebrush plant community with juniper encroachment. Maintenance activities that may be used to slow juniper encroachment may include changing livestock grazing management to minimize impacts on herbaceous species that compete with the juniper. Another maintenance approach is to eliminate the juniper by mechanical removal, chemical control or prescribed burning. Besides implementing appropriate post treatment management, no further treatments would be necessary as understory species would recover. If juniper encroachment was not controlled and understory species (sagebrush and herbaceous species) were lost, restoration or enhancement would be required. The first step would be to remove or reduce the juniper followed by reseeding of desirable plants. In this case, an ecological threshold has been crossed necessitating more extensive and expensive treatments than in the maintenance example.

a) SMPs Common to all Issues

i) Maintain Habitat

- Base management decisions on monitoring and/or other appropriate information that provides plant and soil response with respect to land uses, development impacts, weather, wildlife use, insects and other environmental factors. Monitoring should be implemented and results should be applied in an adaptive management process to adjust maintenance strategies or treatments on similar projects conducted in the future. Appropriate spatial scales should be considered when developing monitoring strategies.

- Aggressively pursue the control of invasive species, especially noxious plants, in a timely manner. Small islands of invasive species can be treated more cost effectively than extensive acreages. Maintain the vigor of native species and minimize soil disturbance in areas where invasive species are a threat.

- Encourage vehicle use on established roads and trails or confine use to areas established specifically for off-road use to minimize impacts to sage-grouse habitat. Off-road vehicle use can cause significant disturbance to sagebrush habitat and sage-grouse, particularly when use extends into key areas where there are known leks, brood-rearing or winter sage-grouse habitat.

- Consider sage-grouse seasonal habitat needs in developing strategies and implementing treatments to maintain sagebrush habitat. Evaluate direct impacts from vegetation, dust, noise, human contact in the assessment process. Not all activities or the impacts of these activities are detrimental to sage-grouse or their seasonal habitats.

- Explore the use of conservation easements and the acquisition (through purchase, donation or exchange) of valuable sagebrush habitat, to maintain, replace or increase habitat. Any BLM program can purchase conservation easements. Federal Land Transition Facilitation Act (Baca II) and Land and Water Conservation Funds can be used to acquire both fee-title and conservation easements.

ii) Restore and Enhance Habitat

- Base management decisions on monitoring and/or other appropriate information that provides plant and soil response with respect to land uses, development impacts, weather, wildlife use, insects and other environmental factors. Monitoring should be implemented and results should be applied in an adaptive management process to adjust maintenance strategies or treatments on similar projects conducted in the future. Appropriate spatial scales should be considered when developing monitoring strategies.

- Control invasive species with herbicides, biological control agents, burning and/or mechanical techniques. Reseed native plant species, when available and/or appropriate, to restore desired plant communities. Native perennial plant communities are generally the desired goal although desirable non-native species may be used in some degraded situations.

- Encourage vehicle use of established roads and trails or confine use to areas established specifically for off-road use to minimize impacts to areas restored to sagebrush habitat. Implement appropriate exclusion periods until restoration goals are met. Many land uses (off-road vehicle, livestock, wild

horse and burros, etc.) can cause significant impacts to areas restored to native or other desirable plants.

- Consider sage-grouse seasonal habitat needs in developing strategies and implementing treatments to restore sagebrush habitat. Evaluate direct impacts from vegetation, dust, noise, human contact in the assessment process. Not all activities nor the impacts of these activities are detrimental to sage-grouse or their seasonal habitats.

- Focus project design and approval on avoiding or minimizing habitat degradation, or restoring areas that have been degraded (on-site mitigation). Measures to mitigate impacts at off-site locations could be considered to offset unavoidable sage-grouse habitat alteration and losses. Mitigation could also be used to offset sage-grouse habitat loss that is not a result of human activities. The effects of fragmentation and habitat loss should be weighed against the value of mitigation. Mitigation cannot always replace the quality or location of crucial habitat. BLM's authority to require off-site mitigation is limited. However, mitigation on a case-by-case basis may be implemented or negotiated with willing project proponents. Mitigation actions should be considered in the following priority: 1) replacing habitats with similar habitats (in-kind/off-site mitigation), and 2) replacing habitats with other appropriate habitats, when similar habitats are not available (out-of-kind/off-site mitigation). Mitigation should occur within or adjacent to occupied or restored habitats. Off-site mitigation should eliminate, reduce, or directly alleviate impacts to sage-grouse habitat.

The SMPs for Habitat Loss, Habitat Fragmentation, and Habitat Quality are numbered consecutively to facilitate use of Attachment 1. Attachment 1 contains a crosswalk between the SMPs and the BLM programs relevant to the conservation of sage-grouse.

b) Habitat Loss SMPs

i) Maintain Habitat

1. Develop cooperative agreements with other land owners to maintain sagebrush patches within developed lands (housing developments, croplands, business developments etc.).

2. Avoid the impact of construction and operations by not placing mines, oil and gas and geothermal drilling sites and facilities, roads, and mineral material disposal sites in or next to sensitive habitats such as sage-grouse leks, nesting, early brood-rearing, breeding, and wintering habitat. When habitat loss cannot be avoided, stipulations, conditions of approval, or mitigating measures should be developed to reduce impacts on sage-grouse habitats.

3. Whenever feasible and environmentally preferred, avoid surface occupancy by roads, livestock management facilities, well pads, powerlines, fences, or other structures adjacent to occupied leks, i.e., those leks attended by 2 or more males in at least 2 of the previous 5 years (Connelly et al. 2000). Protection of sage-grouse leks from disturbance during mating season is important for successful reproduction. Reproductive success is increased by minimizing disturbances to habitat when constructing, improving or maintaining roads. Signage, including OHV designations, identifying and/or protecting sensitive areas should be considered. Dust abatement measures should be employed.

4. Locate or construct facilities such as oil and gas compressor stations so that the noise from the station does not disturb grouse activities at the lek. Installing mufflers and baffle panels, berm the station (where invasive weeds are not an issue), or placing restrictions on how close these facilities can be located to leks, nesting and early brood-rearing habitat should be considered. New recreational facilities such as campgrounds should also be located so that the noise does not disturb grouse activities at the lek. Construction and/or maintenance should be scheduled to minimize conflicts with any known leks. Sage-grouse are sensitive to noise levels from all activities during early evening and morning hours when strutting occurs during March and April, so actions to reduce noise levels during these periods should be taken.

5. Reduce habitat loss associated with mineral exploration and development by consolidating facilities as much as possible. The possibility of burying utility and flow lines beneath or along roads, centralizing tank batteries, and drilling multiple wells from a single location should be considered.

6. Design and construct mineral exploration and development operations so as to disturb the smallest footprint practical on the landscape while meeting all safety requirements. Where feasible, consider mowing of parking and storage areas on portions of oil and gas well drilling locations rather than stripping the topsoil and vegetation from the entire location, and the use of two-track trails to conduct exploration activities. Minimize traffic by limiting public vehicular access in new development areas, use remote monitoring of production facilities, encourage car-pooling and the use of buses, and encourage operator-enforced speed limits to reduce dust, noise, and potential collisions with sage-grouse so as to reduce habitat impacts. Consider using stakeless geophysical exploration activities to reduce vehicle traffic in sagebrush habitat.

7. Plan and construct mining and mineral development activities, to the degree possible given State water rights, to minimize disturbances that would result in alterations to springs and riparian habitat. Sage-grouse can be impacted by the loss of surface water. Alternative water sources should be developed to replace natural sources that have been negatively affected or destroyed during these development activities. Water storage impoundments should be designed to avoid or minimize loss or degradation of sage-grouse habitat. Water storage impoundments should be

monitored and treated to prevent mosquito breeding (and the associated spread of West Nile Virus). Evaporation, reserve, work over, and production pits should also be designed with adequate fencing/netting or other protective features to reduce mortality of sage-grouse due to drowning or entrapment.

8. Carefully consider impacts to sage-grouse and their habitats when reviewing requests for exceptions, waivers, or modifications to lease stipulations or evaluating requests for waivers of Conditions of Approval. These requests occur from time to time in approved mining, oil and gas, geothermal exploration and development plans, mineral material disposal operations, and other realty actions.

9. Evaluate land exchanges, acquisitions and disposals to determine if important sage-grouse habitat would be impacted or whether the BLM would be acquiring important sage-grouse habitat.

10. Evaluate proposed agricultural leases, range improvements, recreational special use permits and habitat improvement projects to determine if sage-grouse and their habitats would be impacted.

11. Conduct fire management activities to minimize overall wildfire size and frequency in sagebrush plant communities where sage-grouse habitat objectives will not be met if a fire occurs. Wildfire suppression in sagebrush habitat with an understory of invasive, annual species is crucial. Prioritization of suppression actions should take into account the value and rarity of sagebrush habitat and sage-grouse. Retain unburned areas, including interior islands and patches, of sagebrush unless there are compelling safety, private property, resource protection, or control objectives at risk. Burnout operations in areas where there are no threats to human life, private property or other important resources identified in land management plans should be minimized in crucial sage-grouse habitats as identified in land and fire management plans.

12. Annually update Fire Management Plans to incorporate new sagebrush habitat information as well as fire suppression priorities in sagebrush habitats. Objectives for the management of sagebrush ecosystems should be incorporated into Fire Management Plans and provided to initial attack personnel at the beginning of each fire season.

13. Provide Fire Management Plans to the Incident Management Team. The Field Office should provide Resource Advisors to assist the Incident Commander or Incident Management Teams in developing timely fire suppression priorities in crucial sage-grouse habitat.

14. Evaluate impacts on sage-grouse habitat in areas where wildland fire use for resource benefits may be implemented. Also consider the interval since last fire, fire size and past plant community response to burning during this process.

15. Establish fuels treatment projects at strategic locations to minimize size of wildfires and limit further loss of sagebrush. Fuels treatment may include the use of greenstrips (strips of fire resistant vegetation) to help reduce the spread of wildfires into sagebrush communities.

16. Use prescriptive livestock grazing, where appropriate, to reduce annual grass production and the spread of wildfire into sagebrush communities. Timing of grazing and effects on residual native plants need to be carefully evaluated.

ii) Habitat Restoration and Enhancement

17. Consider removal of conifers (e.g., cutting, burning, chaining, etc.) where they have encroached upon sage-grouse habitat. Areas of dense conifers (pinyon pine, juniper, ponderosa pine, Douglas fir) may require cutting or chaining to reestablish sagebrush plant communities (prescribed fire may not be feasible given the lack of understory and high woody fuel loads). Sites selected for cutting or chaining should have conifers that have established after the early to mid-1800s. Sites should also have evidence of past sagebrush plant communities as evidenced by residual native plants or soils that support a rangeland not a woodland ecological site. Cutting and chaining may occur as a single treatment or a preparatory treatment for prescribed burning. Post-treatment seeding will probably be required in areas where residual, herbaceous vegetation is inadequate to recover once the conifer competition is removed.

18. Impacts to sage-grouse habitat can be minimized by quickly initiating restoration practices after surface disturbance activities such as mining and oil and gas production. Steps such as recontouring, respreading topsoil, revegetating all disturbed areas not needed for well or mine production, including cuts, fills, borrow ditches, and well pads up to the production facilities are suggested. Additionally, allowing room for the setup of workover rigs, and allowing future setup and parking on the top of new vegetation will minimize the need for future disturbances. The use of native species of shrubs, forbs, and grasses in seed mixes appropriate for each ecological site will also enhance habitat value or sage-grouse.

19. Evaluate (e.g., monitor) burned areas for up to three years post-fire and continue management restrictions until the recovering or seeded plant community reflects the desired condition. Length of time required will be dependent on inherent site productivity and local climatic patterns. Drier sagebrush plant communities may take longer than three years to reach desired condition. Periodic drought cycles may also increase the time necessary to reach the desired condition.

20. Reclaim unnecessary or redundant roads and facilities by removing surfacing material, reestablishing the original contour, spreading topsoil, and seeding to restore habitat.

21. Utilize the Emergency Stabilization and Rehabilitation program to apply appropriate post-wildfire treatments (livestock and/or recreation exclusion, reseeding, erosion control structures, etc.) within sage-grouse habitat. Use of native species is encouraged dependent on cost, availability and chance for success. Seed mixtures should be designed to reestablish important seasonal habitat components for sage-grouse. For example, forbs should be emphasized for early and late brood-rearing areas, leks should not be reseeded with plants that change the vegetation height previously found on the lek.

c) Habitat Fragmentation SMPs

i) Maintain Habitat Connectivity

22. Install anti-perching devices on existing or new powerlines in occupied sage-grouse habitat, or habitat identified for restoration, to minimize raptor use of these poles. When monitoring indicates that existing powerlines are contributing to sage-grouse decline, managers are encouraged to work with right-of-way holders to install anti-perching devices on existing lines in these situations. Some initial monitoring studies suggest that sage-grouse will avoid suitable habitat adjacent to overhead power lines if predators use the power poles for perching. Predation of sage-grouse would be reduced if it is feasible to bury powerlines in sage-grouse habitat.

23. Encourage placement of new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors to minimize fragmentation of sage-grouse habitat. If corridors do not exist, consider consolidating utility lines, pipelines, and other structures along the same new route (e.g., at one location) that least impacts sagebrush habitat.

24. Place new roads where construction activity and use is concentrated and does not impact critical areas such as leks, nesting, early brood-rearing, and winter habitat riparian areas, springs and wetlands. Predesigning a road system (and pipeline collection system) for the entire area will ensure the minimum impact to resource values. An increase in the number of roads increases habitat fragmentation, stress and sage-grouse displacement to less suitable habitats. Roads can create barriers to movement/dispersal, increased levels of disturbance (adjacent to suitable habitat), increased mortality (road kills), and reduced habitat suitability (within patch microclimate effects), and may increase susceptibility to predation. The type, intensity and volume of traffic, the road surface, and the type and structure of adjacent vegetation are all factors that contribute to impacts imposed by roads on sage-grouse and their habitat.

25. Manage existing road use to decrease the level of disturbance during critical periods such as breeding (lek use) by implementing seasonal or daily use schedules, by limiting traffic volume, and/or by posting speed limits.

26. Locate new structures associated with recreation (picnic areas, campgrounds, wildlife viewing sites, dispersed recreation sites, kiosks and parking lots) and livestock management facilities (corrals, water pipelines and tanks/troughs, exclosures, etc.) away from crucial breeding, brood-rearing and winter areas; or manage disturbance with seasonal or daily timing restrictions. Construction of recreational-related facilities (kiosks, toilets, signs, etc.) that provide avian perches should be avoided unless they include mitigating features such as perch guards. Manage use at established structures/developments to reduce impacts to sage-grouse during critical periods of their life cycle.

27. Design and locate the placement of fences for livestock, wildlife, wild horse and burro, recreation and developed site protection so as not to disturb important sage-grouse habitat areas. Poorly placed or improperly designed fences can provide perches for raptors and cause mortality of birds that fly into wires. Increasing the visibility of new fences can reduce hazards to flying sage-grouse. Impacts of livestock congregation against fences and its effect on sage-grouse habitat near leks, nesting, and wintering areas should be considered.

28. Design wind energy facilities to reduce habitat fragmentation and mortality to sage-grouse. Tubular tower designs to reduce raptor perches and noise reduction to minimize disturbance to nesting birds are encouraged. Design criteria for these projects should include minimizing the facility footprint (including the road network required to service the generators) in sage-grouse habitat. Best Management Practices (BMP) for wind energy are currently being developed in the Wind Energy Programmatic Environmental Impact Statement. The BMPs that address the conservation of sage-grouse and their habitat are adopted by reference.

29. Manage dispersed recreation activities like hiking, mountain biking, and horseback riding to minimize impacts to vegetation and sage-grouse in sensitive sage-grouse habitat areas. Keeping these users on established trails will minimize impacts to sage-grouse habitat and activities.

30. Consider seasonal closures to protect priority sage-grouse habitat if other alternatives will not achieve desired objectives.

ii) Restore Habitat Connectivity

31. Reclaim unused roads and facilities by reseeding sagebrush, shrubs, and native grasses and forbs to help improve sage-grouse habitat and reduce weed invasion.

32. Encourage vegetative restoration along roads, rights-of-way, on well pads, and at existing facilities where habitat needs for sage-grouse are not currently met.

33. Require successful seeding of appropriate vegetation on any new disturbance associated with mineral and energy facility developments, livestock management

facilities, and recreation facilities.

34. Restore small areas dominated by invasive species with desirable vegetation to minimize fragmentation of habitat.

d) Habitat Quality SMPs

i) Maintain Habitat Quality

35. Where good habitat quality exists, maintain current management practices considering plant composition and soil type.

36. Use grazing practices that promote the growth and persistence of native shrubs, grasses and forbs needed by sage-grouse for seasonal food and concealment. Grazing practices include changing season of use, numbers of livestock, grazing intensity, distribution of livestock use, and type of livestock (sheep, cattle or horses). Altering season of grazing may help to favor perennial plants in areas where native perennials and cheatgrass occur together in the plant community. Vegetation structure (height) should be managed so as to provide adequate cover for sage-grouse during the nesting period.

37. Change mineral supplement and/or watering locations to move domestic livestock to desired areas. However, any change in location of supplement or watering location should consider potential effects to sage-grouse habitat.

38. Maintain an appropriate management level (AML) of wild horse and burro numbers to minimize detrimental effects on sage-grouse habitat. Where wild horse grazing detrimentally affects sage-grouse habitat, reassess wild horse numbers and reduce them, if necessary.

39. Coordinate with state wildlife agencies where wildlife use detrimentally affects sage-grouse habitat quality. This coordination is especially important after large-scale disturbances such as wildfires.

40. Construct and maintain water developments at key locations in sage-grouse habitat. Install or retrofit water developments with wildlife escape ramps. Water developments and “guzzlers” can improve sage-grouse summer habitats.

41. Maintain seeps, springs, wet meadows, and riparian vegetation in a functional and diverse condition for young sage-grouse and other species that depend on forbs and insects associated with these areas. Consider fencing if vegetation associated with these wet areas can not be maintained with current livestock, wildlife or wild horse and burro use and the impacts of the fence are outweighed by the improved habitat quality.

42. Maintain sagebrush and understory diversity (relative to site potential) adjacent to crucial seasonal sage-grouse habitats unless such removal is necessary to achieve sage-grouse habitat management objectives. For example, thinning small patches of dense sagebrush may increase desirable forbs in early brood-rearing habitat.

43. Encourage the use of insecticide baits and natural pathogens instead of broad-spectrum insecticides where insect control is required. Improper use of pesticides to control insect outbreaks can result in a reduction of food resources for sage-grouse, particularly nesting females and chicks. While the Animal and Plant Inspection Service (APHIS) is responsible for controlling these insects on public lands, the BLM should recommend avoidance areas as well as the type of treatment. Target pest control toward key problem areas, and schedule applications to be effective in minimum doses. Broadcast spraying should generally be avoided in favor of ground applications to minimize drift into non-target areas. Avoid applying pesticides to sage-grouse breeding habitat during the brood-rearing season (mid-May through mid-July) to reduce the loss of food supply to chicks and avoid the chance of secondary poisoning.

44. Grazing use should be adjusted during extended drought periods. Consider transitioning back to pre-drought use when drought conditions have ended. Vegetation composition and vigor is slow to recover when drought and herbivore use are not in balance.

ii) Restoration and Enhancement of Habitat Quality

45. Reduce the density of conifers that have encroached into but do not yet dominate sagebrush plant communities. Site selection should be based on proximity to occupied habitat, site potential, herbaceous invasive species, or other factors that affect the potential for sagebrush plant communities to be reestablished.

46. Where other grazing management options are not achieving, or cannot achieve, the desired objectives, a short-term option may be livestock exclusion. Temporary exclusion can provide the plant community the opportunity to progress toward a point where grazing can again be reintroduced once desired conditions are reached. Removing livestock may not reverse the condition of severely altered habitats and often must be combined with reseeding and other rehabilitation methods to restore appropriate sagebrush habitat.

47. Restore lost riparian and wetland plant species diversity and structure by replanting appropriate species near crucial sage-grouse habitat.

48. Create small openings in continuous or dense sagebrush to create a mosaic of multiple age classes and associated understory diversity across the landscape to benefit many sagebrush-dependent species. Factors that will help to determine the mosaic are soil types, topography, aspect, climate and local weather patterns, and current and potential plant communities. Care should be exercised to ensure that

the understory does not contain invasive species that will become dominant with the removal of the sagebrush overstory.
Without careful consideration and knowledge of the species for which the treatment is designed, habitats can be fragmented and generalist species that compete with sagebrush-dependant species could be increased. Treatments should be designed to improve a deficient condition within the community (e.g. poor cover of herbaceous understory).

49. Reintroduction of appropriate fire regimes will help to limit conifer encroachment into the sagebrush plant communities. Prioritization of areas to be burned or mechanically treated should take into account invasive herbaceous species, fire regime and condition class (measure of departure from historic fire regime). A balance should be achieved between treating areas that have significantly departed from historic fire regime (condition class 3) and areas that are functioning within an appropriate fire regime (condition class 1).

50. Seeding may be required in areas where residual perennial vegetation is insufficient to respond following prescribed burning. Minimize seeding with non-native species that may create a continuous perennial grass cover and restrict reestablishment of native vegetation. However, non-native seed may be appropriate on severely degraded sites if native species would not be successful or are not available.

51. Evaluate all wildfires in known sage-grouse habitat to ensure that the appropriate plant species are reseeded relative to site potential and seasonal sage-grouse habitat requirements. Emphasize the use of native species in these seed mixtures and minimize the use of introduced grasses. Make burned sage-grouse habitats a high priority for restoration if funds are limited in the Emergency Stabilization and Rehabilitation Program. If native plant seed is scarce, assign a priority that this seed be reallocated to Emergency Stabilization and Rehabilitation projects in critical sage-grouse habitat areas. Seeding of non-native species may be necessary in areas where invasive plants dominate or have the potential to dominate the post-fire plant community.

7) Steps to Achieve Sagebrush and Sage-grouse Conservation

Where statewide sage-grouse conservation plans are not yet developed and adopted by BLM, or sage-grouse conservation measures are not incorporated into BLM land use plans, the following five steps should be followed to conserve sagebrush and sage-grouse. The five steps are: map populations and habitat, establish goals for sage-grouse habitat conservation at the local level, select, prioritize, and implement management activities, monitor progress towards goals and objectives, adjust activities to improve progress towards reaching goals and objectives.

Each step is important, and completing all steps will promote conservation of sage-grouse habitat. The implementation of SMPs is where “the rubber meets the road” –

where conservation will actually occur. Therefore, Field Offices should design and implement well conceived treatments on priority areas.

The inventory and mapping of sage-grouse populations and habitats may take several years. In the interim, Field Offices should implement **priority** management practices and restoration treatments while mapping populations and habitat and formulating broader objectives; other practices will require site-specific information. Completing steps 1 and 2 will ultimately influence the selection and implementation of all management practices. The remainder of this section describes each step in detail.

a) Map Populations and Habitats

Field Offices should work cooperatively with state agencies and other partners to survey and map known sage-grouse population and habitat locations at the local level. Partners may have already completed work that BLM can use in its mapping efforts, and BLM should share knowledge with partners as well.

Mapping populations and habitat is crucial to conserving and protecting habitat. The more that is known about the location and quality of sage-grouse populations and habitat, the easier it will be to evaluate, select and prioritize management actions, and the more cost-effective it will be to implement them. In addition, maintaining and updating knowledge of known habitat and potential habitat will establish a baseline for determining habitat loss and restoration over time, and for evaluating the effectiveness of management actions and mitigation measures. Mapping should be accomplished in GIS and used in coordination with mapping efforts performed by state wildlife agencies.

Most management activities require knowledge of populations and habitat. For example, one action for livestock grazing could be coordinating the timing and location of livestock turnout and trailing to avoid concentrations of livestock on leks during the sage-grouse breeding season. This would require knowledge of locations of lek sites. Another action could be installing new power lines within existing power line corridors. This would not require knowledge of populations or habitat because it is in an existing corridor.

Field Office staff can map sage-grouse populations and habitat in a variety of ways. If the staff has already started mapping at the local level and believes their method is effective, they do not necessarily need to adopt the following suggestions.

Listed below are recommended features to map.

- **Seasonal Habitats**

  - Breeding: breeding display sites (leks), nesting areas, and early brood-rearing areas
  - Summer-late brood-rearing
  - Fall habitats

- Wintering habitats

First, map known habitat, which includes areas that sage-grouse definitely occupy and use at various times of the year. Time permitting, map potential habitat, which refers to the kind of lands, land forms, and plant communities that could, but are not known to, support sage-grouse during breeding, summer and late brood-rearing, fall, or wintering. BLM should consider all documented historical habitats as potential habitat until better information is acquired through state and regional conservation planning efforts.

➢ **Populations**

- Migratory or Non-migratory – Determine whether the population is migratory, non-migratory or a combination.
- Source – Populations in which the output of offspring results in a population that exceeds the carrying capacity of the local habitat promoting dispersal.
- Isolated– Relatively small populations, which may be stable or declining, that are isolated by farmlands, forests, grasslands and/or development.

First, map source populations. Second, concentrate on mapping isolated populations. Note, however, that in some locations the isolated populations may be equally important as source populations, as they provide alternative genetic sources. This is true for the Gunnison sage-grouse, for example.

b) Establish Goals for Sage-Grouse Habitat Conservation at the Local Level

Establishing goals for the conservation of sage-grouse habitat will help Field Offices select and prioritize management actions. Field Offices should incorporate sage-grouse habitat related goals into land use plan revisions in progress, or into upcoming revisions (see the land use planning guidance for sage-grouse for more information). Field offices not currently undertaking land use plan revisions should amend land use plans to include goals. Recommended goals include the following:

i) Goals to Maintain Habitat

The first priority is to focus on currently occupied, high-priority habitat to maintain and enhance existing sage-grouse habitats (geographic extent and vegetative cover) used during each stage of the life cycle (breeding, summer/late brood rearing, and wintering). These goals should reflect land use plan decisions and consider human activities that disrupt sage-grouse habitats during their seasons of use, particularly during the breeding and winter seasons. In addition undesired habitat modifications such as land tenure adjustments, habitat conversions, road and facility construction, etc. need to be evaluated on a case-by-case basis. Finally, provide management appropriate for natural disturbances (wildland fire, insects, disease, etc.).

c) Goals to Restore and Enhance Habitat

Identify the initial amount and location of low quality or lost habitat that should undergo restoration during the life of the plan and initiate restoration using the following criteria for prioritization:

1. Reconnect occupied habitats.
2. Enlarge occupied habitats.
3. Reconnect stronghold populations with isolated populations.
4. Reconnect isolated populations.

d) Select, Prioritize, and Implement Management Activities

Field offices should apply SMPs to as many ongoing activities as possible. In addition, Field Offices should include appropriate SMPs in NEPA analyses on new land use or management proposals. Implementing SMPs will promote the conservation of sage-grouse habitat at the landscape level. Field Offices should prioritize activities based on local sage-grouse population and habitat needs, and on available resources.

In addition to prioritizing the activities themselves, Field Offices need to prioritize the locations for implementing SMPs. The following is a recommended prioritization process:

- First, implement activities to conserve ***known*** habitat, placing the highest priority on the best quality habitats that support the most populations (source populations first, then isolated populations).

- Second, implement activities to conserve ***potential*** habitat and populations, placing the highest priority on potential habitat that joins known habitat, serves as buffer to high quality known habitat and on the best quality habitats that could support viable populations.

When selecting activities and locations, Field Offices are encouraged to consider the relationship of key and potential habitat to ecological sites. It may be appropriate to group sage-grouse habitats by similar ecological sites and apply the same management activities. In all cases, appropriate monitoring studies are required to determine if project goals are being met.

e) Monitor Progress Towards Goals and Objectives

All offices should collect, evaluate and share monitoring results on all activities or treatments implemented to maintain or restore sagebrush habitat for sage-grouse. Annual reviews of monitoring are needed to determine progress toward mapping populations and habitat, developing habitat goals, and applying management and restoration actions in sage-grouse habitat.

f) Adjust Activities to Improve Progress Towards Reaching Goals and Objectives

Field Offices should adjust activities as needed and as quickly as possible to make significant progress in accomplishing sagebrush and sage-grouse habitat conservation goals (e.g., utilize an adaptive management approach). As previously mentioned, applying the SMPs is especially important, because they will promote the conservation of sage-grouse habitat. When activities conflict with habitat objectives, Field Managers should resolve the conflict as soon as possible.

8) Summary

The guidance to achieve sagebrush and sage-grouse habitat conservation is intended for use during the period until BLM State or local-level guidance is developed and adopted, or until specific sage-grouse conservation measures are incorporated into BLM land use plans. For conservation to be successful, BLM must communicate, consult and cooperate with state wildlife agencies, the public and a variety of stakeholders in implementing this guidance. Proper application of the guidance also requires managers to incorporate local expertise and knowledge, best available science and input from others in tailoring the SMPs in this document to site-specific activities or treatments. In all cases, management should consider local site conditions in context within a broader landscape that has extremely high temporal and spatial variability.

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Attachment 1. Matrix to crosswalk SMP's with BLM programs or activities. SMP's on pages 13-15 (SMPs Common to All Issues) apply to all programs and activities in this table.

SMPs Pages 15-23	BLM Program or Activity						
	Range Mgmt.	Mining	Recreation	Energy	Realty	Wildlife	Fire Mgmt.
1.					X		
2.		X		X			
3.	X	X		X	X		
4.		X	X	X	X		
5.		X		X			
6.		X		X			
7.		X		X			
8.		X		X	X		
9.					X		
10.					X		
11.							X
12.							X
13.							X
14.							X
15.							X
16.	X						X
17.	X						X
18.	X	X	X	X	X	X	X
19.							X
20.	X	X	X	X	X	X	X
21.							X
22.				X	X		
23.		X		X	X		
24.	X	X	X	X	X	X	X
25.	X	X	X	X	X	X	X
26.	X		X				
27.	X		X				
28.				X			
29.			X				
30.	X	X	X	X	X		
31.	X	X	X	X	X		X
32.	X	X	X	X	X		X
33.	X	X	X	X	X		
34.	X						X
35.	X						
36.	X						
37.	X						
38.	X						

SMPs Pages 15-23	BLM Program or Activity						
	Range Mgmt.	Mining	Recreation	Energy	Realty	Wildlife	Fire Mgmt.
39.						X	
40.	X					X	
41.	X	X	X	X	X	X	
42.	X						X
43.	X					X	
44.	X						
45.	X						X
46.	X						
47.	X	X	X	X	X	X	X
48.	X					X	X
49.							X
50.							X
51.						X	X