



Montana Fish, Wildlife & Parks

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Dear Plan Partner:

The Management Plan and Conservation Strategies for Sage Grouse in Montana (2005) describe relevant management issues that can impact both sage grouse populations and sagebrush habitat and lists suggested conservation actions to address and potentially mitigate those issues. Energy development is presented as one such issue in Section VI of this document. Since the completion of the Management Plan, various research investigations have been undertaken and results published that bring to light new considerations and a need to adaptively modify certain recommendations related to energy development. The need to develop energy resources is recognized and the efforts to do so in a responsible fashion are supported.

Montana Fish, Wildlife and Parks (FWP) by means of this document, is acknowledging that new information based on the most current science, will be used to help shape agency recommendations as they relate to development activities and the overall strategies designed to conserve sage grouse, other wildlife species and the sagebrush communities that support them. Recent efforts to lease both federal and state mineral resources for potential oil and gas development are occurring at a significant scale across the state. Existing conservation strategies as outlined in the plan appear insufficient to effectively mitigate intensive development.

To that end, FWP has summarized recent findings that assess oil and gas resource development and the documented impacts to sage grouse populations. The bulk of this information has come from work conducted in Wyoming, southern Alberta, Colorado and Montana. This position paper is attached for information purposes. Incorporating this information into more appropriately designed conservation measures will necessitate both fine and large-scale modifications to existing approaches. FWP looks forward to working with Plan partners to accomplish this task.

Sincerely,

M. Jeff Hagen
Director

Montana Fish, Wildlife and Parks
Agency Position – Sage-Grouse Conservation and Energy Development
May 2007

Background:

Greater Sage-grouse are widely considered in scientific and public arenas to be a species of significant conservation concern (Connelly and Braun 1997). In response to those concerns, states and provinces that are occupied by sage-grouse have implemented extensive conservation efforts. In 2000, the Western Association of Fish and Wildlife Agencies (WAFWA) committed to inter-jurisdictional coordination with the signing of the interagency sagebrush/sage-grouse conservation MOU with US Department of Agriculture, Forest Service (USFS), US Department of Interior, Fish and Wildlife Service (USFWS) and Department of Interior, Bureau Of Land Management (BLM).

This MOU established the Sage-grouse Conservation Planning Framework Team comprised of state and federal biologists. The Team produced the greater Sage-grouse Conservation Assessment in two Phases: a conservation assessment, *Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats* (Connelly et al. 2004) as Phase I and the *Greater Sage-grouse Comprehensive Conservation Strategy* (Stiver et al. 2006) as Phase II. The Assessment and the Conservation Strategy were accepted by WAFWA and transmitted to the US Fish and Wildlife Service in 2004 and 2007, respectively.

The Strategy establishes seven biologically based sage-grouse and sagebrush management zones which cross jurisdictional boundaries and require cooperation and collaboration in order to maintain the distribution and abundance of the species. Management Zone 1 (MZ1) represents a core population encompassing a majority of the bird's range in Montana with the exception of inter-mountain valleys in the southwestern portion of the state. Included within MZ1 is northeastern Wyoming and the upper portion of the Powder River Basin (PRB). The document also presents a series of conservation issues, concerns or risks that confront the species at various scales. In discussing energy development as one of those issues, the Strategy highlights new information regarding impacts of development on sage-grouse populations.

Within these same timeframes, a petition to list the greater sage-grouse on a range-wide basis under provisions of the Endangered Species Act was determined to be "not warranted" by the USFWS (2005). However, this "not warranted" finding for the majority of the range of greater sage-grouse (excluding the Columbia Basin in Washington), encouraged continued and enhanced conservation efforts for sage-grouse. The 2005 determination is currently under litigation and substantiates the need to conserve sage-grouse populations at a scale that avoids the need to list the species.

Montana sportsmen, resource managers, landowners, and other conservation interests have been concerned about the status of sage-grouse and sagebrush habitat since the 1950s. Concurrent with the above-noted work, a collaborative effort was initiated in Montana in 2000 to develop a state-based conservation strategy to address these resource

issues. The Montana Sage-Grouse Work Group (SGWG) was responsible for the development of the Management Plan and Conservation Strategies for Sage Grouse in Montana (2004). The SGWG adopted the following goal: "*Provide for the long-term conservation and enhancement of the sagebrush-steppe/mixed-grass prairie complex within Montana in a manner that supports sage-grouse, a healthy diversity and abundance of wildlife species, and human uses*". The Management Plan describes relevant management issues that can impact both sage-grouse populations and sagebrush habitat and lists suggested conservation actions to address and potentially mitigate those issues.

Impetus for Modifying FWP's Position:

Section IV of the Management Plan entitled Conservation Actions, sought to adapt WAFWA Guidelines (Connelly et al. 2000) to Montana sagebrush habitats. Mining and energy development were identified as an unresolved issue and conservation actions were outlined to minimize impacts of development on sage-grouse and sagebrush habitats. Since the completion of the Management Plan, results from various research investigations have been reported that bring to light new considerations and a need to adaptively modify certain recommendations related to energy development. The need to develop energy resources is recognized and efforts to do so in a responsible fashion are supported.

Montana Fish, Wildlife and Parks (FWP), by means of this Position Statement, acknowledges that new information based on the most current and credible science, will shape agency recommendations as they relate to energy development activities and the overall strategies to conserve sage-grouse, other wildlife species and the sagebrush communities that support them. Recent studies have shown that certain conservation actions as outlined in the plan are inadequate to effectively mitigate intensive oil and gas development at the level of intensity observed in Wyoming and Alberta.

To that end, FWP has summarized recent findings that assess oil and gas resource development and the documented impacts to sage-grouse populations. The bulk of this information has come from work conducted in Wyoming, southern Alberta, Colorado and Montana. Incorporating this information into more appropriately designed conservation measures will necessitate both fine and large-scale modifications. We look forward to cooperatively working with federal, state and the private sector to accomplish this task.

Significant Findings:

Sage-Grouse Breeding Activities:

Holloran (2005) – western WY

- Male lek attendance declined as distance from leks to drilling rigs, producing wells and haul roads decreased and as densities of those infrastructure facilities increased. Effects were detectable out to various distances (3 – 6.2 km) depending on the disturbance variable. These observations were similar to that reported for sage-grouse associated with energy development in Alberta (Aldridge and Brigham 2003) and Colorado (Remington and Braun 1991).

- Well densities exceeding 1 producing well every 283 ha (1 well/699 acres) appeared to negatively influence male lek attendance.
- Main haul roads within 3 km of leks negatively influenced male lek attendance largely through increased traffic volume.
- Male attendance decreased with traffic volume of < 12 vehicles per day and leks became inactive when volume exceeded 75 vehicles per day.

Naugle et al. (2006) - northeast WY and southeast MT

- Among leks of known status in 2004-2005, only 34% remained active within CBNG fields, compared to 83% of leks adjacent to or outside CBNG fields.
- From 2000-2005, leks in CBNG fields had 11-55% fewer males per active lek than leks outside CBNG development. All known remaining leks with ≥ 25 males occurred outside CBNG fields in 2005.
- Findings show that CBNG development is having negative effects on sage-grouse populations over and above those of habitat loss caused by wildfire, sagebrush control, or conversion of sagebrush to pasture or cropland. Moreover, the extent of CBNG development explained lek inactivity better than power lines, pre-existing roads, or West Nile virus mortality.
- Research findings show a lag effect, with leks predicted to disappear, on average, within 4 years of CBNG development. Regardless of other stressors, 22 of 24 lek complexes (92%) did not go inactive until after CBNG development came into the landscape.
- Leks typically remained active when well spacing was ≥ 500 acres (1.3 wells per section), whereas leks typically were lost when spacing exceeded 4.2 wells per section.

Summary: During the breeding season, male sage-grouse are sensitive to disturbance during both the exploratory and production phase of oil and gas development. Levels of sensitivity as measured by the distance at which no change in male attendance was detectable, vary by factor but are significant at distances of less than 3 km. In the Powder River Basin, impacts to lek activity included an observed 50% decrease in the number of active leks within developed gas fields as well as a 50% reduction in the average number of males present on remaining leks. There was a discernable time lag between development and observed declines. Changes in numbers were likely an artifact of both distribution shifts in attendance as well as changes in survival and recruitment rates. Existing stipulations that restrict surface occupancy within .4 km (.25 mile) of an active lek are insufficient to maintain populations within developed oil and gas fields. Current well-spacing of 32 – 64 ha (80 – 160 acres) appear to be several times greater than breeding sage grouse populations can tolerate.

FWP Recommendation: Utilize a minimum 1.6 km (1 mile) buffer and preferably, a 3 km (1.8 mile) buffer, of no surface occupancy around existing leks. Recognize that development activities within 3 km will have negative impacts on sage grouse populations.

Sage-Grouse Nesting and Brood Rearing

Holloran and Anderson (2005), Holloran (2005) - western WY:

- Sage-grouse nest locations are spatially related to lek locations and a 5 km buffer included 64% of known nests. Moynahan's (2004) work in north central MT supports this finding.
- The substantial number of females nesting > 5 km from a lek could be important for population viability.
- Observed lek to nest distances was not related to lek size.
- Successful nests were generally located further from leks than destroyed nests.
- Nests located ≤ 1 km from another known nest tended to have lower success probabilities.
- Nesting females strongly avoided areas with high well densities but adult females can exhibit strong nest site fidelity. Mean annual survival rates for females suggest that 5 to 9 years may be required to realize ultimate nesting population response to development activities.

Lyon and Anderson (2003) – western WY

- Female sage-grouse disturbed by natural gas development during the breeding season had lower nest initiation rates.

Schroeder and Robb (2003) – north central WA

- Nest distribution patterns may change as a result of habitat alteration and fragmentation and the 5 km buffer should be considered relevant only for contiguous sagebrush habitats.

Aldridge and Boyce (2007) - southeast AB

- Sage-grouse chick survival decreased as well densities increased within 1 km of brooding locations. These brood-rearing areas acted as habitat sinks where recruitment was poor.
- Low nest success (39%) and low brood survival (12%) characterized sage-grouse vital rates in habitat fragmented by energy development in southern Alberta.

Summary: Female sage-grouse are spatially grouped around a lek or lek complex during the nesting season. Females tend to move away from leks in selecting nest locations and to an extent, those movements appear to improve their rates of nest success. However, females in developed habitat moved twice as far as females in undisturbed habitat and exhibited lower rates of nest initiation. Females also select nest locations that segregate their nests from those of adjacent hens and the probability of successfully hatching those nests increases when that distance is ≥ 1 km. When females have suitable and contiguous nesting habitat to select from, slightly over 60% of nests occur within 5 km of the lek. This strategy of mutual avoidance reduces nest densities and therefore reduces probability of detection by nest predators. However, land use practices that fragment sagebrush habitat and reduce the amount of suitable nesting cover may lead to increased densities of nesting birds and lower rates of nest success. Even if 5 km buffers are employed around existing leks, increased development and production activity in the zone beyond that buffer will impact the remaining 40% of nesting hens and potentially compromise the success of those birds nesting within that 5 km buffer based on the density dependent factors noted above. Stipulations restricting seasonal surface use within 2 miles of an active lek during the breeding and nesting period (1 March – 15 June) are inadequate to maintain sage-grouse populations within developed habitat.

FWP Recommendation: Utilize a 6.9 km (4 mile) buffer around leks to protect nesting and brood rearing habitat for a minimum of 70% of the nesting hens associated with a lek from March 1 through June 30. This protection should apply to both initial development and subsequent production and maintenance operations.

Sage-Grouse Winter Habitat Use

Naugle et al (unpub report 2006)

- In NE WY, predictive winter habitat use models based on vegetation and topographic features were strongly correlated with observed sage-grouse locations ($R^2 = 0.985$).
- Sage-grouse select for large intact and relatively flat expanses of sagebrush as winter habitat and avoid more rugged terrain and conifer habitat. Given that severe winter conditions (deep snow, low temperatures) could force birds into more rugged terrain, topographic variables should be considered in regions outside the PRB.
- After controlling for vegetation and topography, the addition of a variable quantifying the extent of energy development showed that sage-grouse avoid energy development in otherwise suitable habitat. Probabilities of use decrease by ~40% at 80 acre spacing, an avoidance level that would negate use of all but the highest quality habitat once development has occurred.
- Avoidance of CBNG in winter and the high likelihood of lek loss in spring threaten to severely impact populations along the Montana/Wyoming border where models classify only 13% of area as high quality winter habitat.

Summary: Sage-grouse are sensitive to energy development associated with winter habitat. Recent advances in modeling efficiencies provide a tool to assess important winter habitat and the spatial relationship between known leks and potential winter habitat. Sage-grouse in this region can be nonmigratory when suitable seasonal habitats occur in reasonable juxtaposition while other population segments do migrate to more distant winter habitat. In some cases, these dissimilar distribution patterns may involve birds using the same lek complex or a shared winter range. Winter habitat should be conserved at an appropriate scale and with some knowledge of sage-grouse distribution patterns. Seasonal restrictions will not be effective at mitigating infrastructure development if the level of development is moderate to intense and overlays important winter habitat.

FWP Recommendation: Prior to field development, model potential winter habitat and once crucial areas have been identified, prohibit development in those areas.

West Nile Virus:

Naugle et al (2006)

- West Nile virus (WNV) mortalities in radio-marked sage-grouse each year since 2003 (2-25% per yr) show that disease is a new and likely permanent stressor to sage-grouse populations. Mortality from WNV may have population-level impacts because female survival plays a vital role in population growth. Mortality events from WNV in 8 of 11 states since 2003 support the need to

conserve the sage-grouse across their remaining range to reduce the risk of impacts from disease.

- Research shows that CBNG ponds pose a threat to sage-grouse because they provide habitat for mosquitoes that spread WNV. Landscapes with the highest mosquito densities also harbor the highest infection rates in *Cx. tarsalis*, the species of mosquito that spreads the disease. Larval *Cx. tarsalis* were produced at similar rates in CBNG and natural sites, whereas CBNG ponds produced *Cx. tarsalis* over a longer time period than agricultural irrigation.

Summary: West Nile Virus should be considered endemic across the northern Great Plains portion of the range of greater sage-grouse. The presence of this disease has added another stressor to sage-grouse population dynamics. The prevalence of the disease and associated level of mortality in sage-grouse appears to vary considerably from year to year based on environmental conditions. However, CBNG ponds do provide a much more consistent set of conditions favorable to the spread of WNV even in years of low natural precipitation. Conservation actions need to consider the relationship between CBNG and WNV and attempt to mitigate those conditions favorable to WNV.

FWP Recommendation: Reduce potential of CBNG ponds to produce late summer mosquito populations that vector WNV.

Management Approach: Recent research, coupled with previous investigations, has added measurably to our understanding of sage-grouse population response to oil and gas development. Knowledge that sage-grouse avoid energy development during both breeding and wintering seasons and do so at scales that render current protective stipulations ineffective, requires a new approach to conservation strategies and development plans. We believe the following approaches are warranted and need to be incorporated into all phases of lease, exploration and development activities on public and private lands. These measures should be implemented immediately or well in advance of full-scale coal bed methane production.

- Industry, agencies, landowners and concerned publics need to work cooperatively in the development of oil and gas resources and in the conservation of important fish and wildlife resources. State and federal land managers and industry should take the lead to voluntarily adopt measures that will adequately conserve sage-grouse in Montana.
- ✓ • This will be best accomplished using current distribution information and predictive models to prioritize areas relative to their need for protection and at scales necessary to effectively conserve populations. This should include conservation areas set aside with no energy development that are deemed crucial for population maintenance and range connectivity.
- ✗ • Significant fragmentation of habitat and associated loss of populations within the PRB, could serve to isolate important core populations in MZ1 and MZII with status implications to the species within the Great Plains portion of the species range.
- ✗ • Officially amend stipulations for sage-grouse outside of protected crucial areas to reflect current science. This includes extending the no surface

occupancy stipulation to a minimum of one mile and the seasonal no-surface occupancy to 4 miles for annual operations as well as initial development.

- Minimize the footprint of energy development (infrastructure present on the landscape) and the level of use during the production phase based on current information pertaining to observed population response to specific development activities. Specifically this should include requirements for consolidating powerline, pipeline and roads in order to reduce habitat disturbance, burying powerlines to reduce raptor predation, utilizing directional drilling where feasible, remotely monitoring wells to reduce vehicle traffic and human disturbance, employ noise abatement techniques on production equipment, and treating, removing or re-injecting CBNG waste water to prevent the spread of mosquitoes that vector WNV.
- Continue to reduce areas of uncertainty with population monitoring and assessment, especially as related to the effectiveness of new stipulations. Refine prescriptions as appropriate.
- Plan development in incremental stages and in consideration of time periods required to monitor sage-grouse population response and to recover sagebrush habitat functions.
- ✘ • Unify field development as a means of dealing effectively with mixed mineral and surface ownership.
- Assess potential impacts to other important wildlife species including mule deer, antelope, grassland birds and important Tier 1 Species as identified in the Montana Comprehensive Fish and Wildlife Strategy. Adopt appropriate conservation strategies so as to avoid the listing of Tier 1 Species of Concern under ESA.

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