Working to Protect Native Species and Their Habitats

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Public Comments Processing
Attn: FWS–R6–ES–2008–0022
Division of Policy and Directives Management
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Comments of Biodiversity Conservation Alliance, Center for Native Ecosystems, and Wild Earth Guardians on the Proposed Listing of the Greater Sage-Grouse as Threatened or Endangered

Dear Fish and Wildlife Service Sage Grouse Team:

The following are the comments of Biodiversity Conservation Alliance, Center for Native Ecosystems, and Wild Earth Guardians on the proposed listing of the greater sage-grouse as Threatened or Endangered under the Endangered Species Act. These comments focus most particularly on sage grouse conservation prospects in Wyoming, which is BCA's area of greatest expertise. Please consider these comments and the scientific literature that accompanies them during your listing review process.

The sage grouse decline to date is very serious. According to WAFWA (2006b:42), "Schroeder et. al. (2004) determined that the pre-settlement distribution of Greater sage-grouse encompassed 1.2 million square kilometers in western North America. The current occupied range of the Greater sage-grouse covers 668,412 square kilometers. This represents approximately 56% of the historically occupied range of the species. The loss of 44% of Greater sage-grouse range and the fragmentation/habitat degradation of remaining range poses great challenges for the perpetuation of the species."

The downward trend in grouse population has appeared to level off very recently; the USFWS will need to determine to what extent this is actually due to stabilizing or increasing grouse populations, and to what extent this is due to increased effort to identify and monitor grouse populations on leks. There has been a marked recent increase in counting effort over the past several years (see, e.g., Attachment 1), and counting birds on newly identified leks could mask an overall downward population trend. The most accurate method of assessing population trend over time is to compare comparable data from individual leks that have been monitored over time. We encourage the USFWS to undertake such an analysis.

Wyoming is the last remaining stronghold for the greater sage grouse, and clearly the Wyoming population, having become the core of the rangewide sage grouse population, offers the last best hope of preventing sage grouse extinction. GIS analysis shows that Wyoming has the largest expanse of least fragmented sagebrush habitat remaining in North America (Knick et al. 2003). According to Rowland et al. (2006:v), "Concomitant with the amount of sagebrush habitat, the Wyoming Basins area harbors some of the largest extant populations of sagebrush-obligate species, such as greater sagegrouse and pronghorn. Future persistence of these sagebrush-obligate species therefore is closely linked to effective management of sagebrush habitats in the Wyoming Basins." These researchers mapped sagebrush habitats versus fragmentation in relation to sage grouse in the Wyoming Basins Ecoregion (*see* p. 5-31), and found that the Red Desert is one of the remaining major hotspots. But sage grouse populations in the state have been on a long-term downward trend, still cycling upward and downward but both the peaks and the troughs in population are steadily being reduced over the past 50 years.

Climate is an important factor affecting sage grouse populations (South-Central Local Working Group 2007:15). Climate change scenarios in the sagebrush ecosystem predict that the largest area of sagebrush that will persist in the future is in southern and southwest Wyoming, between the northern and central Rocky Mountains (Neilson et al. 2005, Attachment 2) According to Rowland et al. (2006:vi, Attachment 3), this is the very area of greatest ecological diversity and high risk for future habitat degradation in the Wyoming Basins Ecoregion:

> "Species richness of sagebrush-associated vertebrates of concern was greatest in southwestern Wyoming, where as many as 36 of the 40 vertebrate species of concern cooccur. Moreover, some of the areas identified as most affected by anthropogenic disturbance, as estimated by our human footprint model, are also those that have the greatest species richness. Human activities occurring in southwestern Wyoming are expected to have disproportionately and substantially greater effects on a larger number of species of concern compared to other portions of the WBEA area."

Public lands, and BLM-managed lands in particular, are key to sage grouse conservation and recovery. The BLM and Forest Service manage 58% of sage grouse habitat in Wyoming, while private landowners manage 38% (Connelly et al. 2004). Rowland et al (2006:2-9) observed, "The BLM has management authority for nearly 47% of the sagebrush in the [Wyoming Basins Ecoregion] study area (12.1 million acres), comparable to the 52% of sagebrush managed by BLM nationwide (Knick et al. 2003; Table 2.6; Fig. 2.7)." Indeed, according to Knick et al. (2003:627), "Responsibility for maintaining sagebrush habitats and bird populations rests squarely on public land management agencies because most species' summer ranges are owned publicly and managed by state or federal agencies." Rowland et al (2006:1-2) echoed this conclusion: "Due to the preponderance of sagebrush on public lands, the future of this ecosystem will be shaped in large part by public lands management." Yet it has been the BLM that has been among the most recalcitrant opponents of changing land-use strategies.

The Endangered Species Act is specifically intended to protect ecosystems as well as Endangered and Threatened species. Sage grouse are a fairly good umbrella species, the protection of which would assist in the conservation of many other sagebrush obligate species that are currently declining (Rowland et al. 2006b). We strongly urge the USFWS to promptly grant Endangered or Threatened Species status to the sage grouse to prevent the extirpation of the species across significant portions of its range and, potentially, its rangewide extinction. In doing so, the USFWS will assist in protecting sagebrush ecosystems upon which many other species of rare and declining wildlife depend.

Threats to the Sage Grouse are Increasing at a Rapid Rate

In Wyoming, threats to remaining populations of sage grouse are currently increasing at a rapid and unprecedented rate due to the unprecedented acceleration in oil and gas development in sagebrush steppe habitats. According to Knick et al. (2003:625), "The continued threats to sagebrush ecosystems are numerous, and their consequences either will require long and expensive recovery or are largely irreversible." Internal citations omitted.

In its list of Problem Statements, WAFWA (2006) outlined a daunting list of threats to sage grouse persistence:

-Invasive plants, especially cheatgrass, are having major impacts on ecosystem function in sagebrush habitats
- Landscapes managed for livestock grazing may fail to provide optimum habitat for sage grouse.
- Management of agricultural lands can adversely affect sage-grouse (e.g. pesticides and crop harvesting)
-Fences cause direct mortality for sage grouse and serve as perches for their predators
-Human-caused impediments to natural water drainage can reduce the input of water, nutrients and sediments, which help to sustain and recruit sagebrush.
- The placement of energy corridors and associated facilities may lead to negative impacts to Greater sage-grouse and their habitats.
- Placement, use, construction, and maintenance of roads and railroads in Greater sage-grouse habitat may lead to negative impacts
- Tall structures and associated activities in Greater sage-grouse habitat may lead to negative impacts on Greater sage-grouse.
- the effects of fencing, power lines, road fragmentation, and disturbance from human dwellings and activities associated with exurban development render much of it inhospitable to sage-grouse
- Greater sage-grouse and habitat used by the species can be negatively impacted by dispersed recreational activities.
-Potential impacts to Greater Sage-grouse and sagebrush habitats from minerals recovery include direct habitat loss, habitat fragmentation, noise, air quality degradation, changes in water availability and quality, and increased human presence.
- The loss of 44% of Greater sage-grouse range to date and the fragmentation/ habitat degradation of remaining range poses great challenges for the perpetuation of the species.

- The increase in the distribution and density of conifer woodlands is a significant threat to the sagebrush ecosystem.
- Site-adapted species of native plants are not available in the quantities needed to meet desired restoration program goals.
- knowledge and capacity to achieve habitat restoration are inadequate to meet rangewide restoration goals
- Vegetation structure and composition in the sagebrush ecosystem have undergone major changes since European settlement in part due to human-induced changes in fire regime
- Lack of a clearinghouse for information related to sage grouse and sagebrush ecosystems
- Lack of a definition and metrics for success or failure of conservation actions for sage grouse
- There is a lack of understanding of social and economic effects (both positive and negative) of human activities on sage grouse and habitat persistence
- Lack of analytical tools to model effects of habitat treatments (succession, disturbance, bird response)
- Lack of coordination for funding, research, monitoring and management
- Greater Sage-grouse may be negatively impacted by inconsistent and inadequate application of regulations within and among agencies.
- Some regulations are antiquated resulting in negative impacts on Greater Sage-grouse and their habitat, sometimes disincentivizing solutions
- Current approaches do not facilitate coordinated planning and implementation and evaluation of plans that integrate the issues and address cumulative effects
- No standardized infrastructure has been developed to facilitate exchange of scientific and management information and learning among local working groups
- Lack of coordination of agency policies, programs and regulations at national, regional, state and local levels to address issues has adversely affected sage-grouse conservation.

While a few of these challenges, particularly those related to setting up information clearinghouses and communicating between various agencies, are presently being addressed to some extent, most of the threats that relate directly to sage grouse habitat quality and population trends not only still remain but are in many cases getting worse.

Sage Grouse Populations are Threatened with Extirpation Across Significant Portions of Their Range

Six of seven regions have shown statistically significant declines with an overall rangewide decline of 50% over the past 40 years (Garton et al. 2004). Sage grouse populations are likely to disappear in the near future from the Powder River Basin (and perhaps the entire Northern Plains ecosystem), and a number of key populations along the periphery of the current sage grouse range (e.g., central Colorado, Mono/Lyon, Washington state) are threatened with disappearance. Wisdom et al. (2005) rated the probability of extirpation of sage grouse from the interior Columbia Basin as moderate to high under both proposed management schemes and several "restoration alternatives." Given that these populations are under imminent threat of extirpation if the USFWS does not take action by listing the species, a listing of at least Threatened if not Endangered is mandated by federal law.

Aldridge et al. (in press, Attachment 33) found that 29% of the remaining occupied range of sage grouse is threatened with extirpation of sage grouse. It is notable that these researchers, in constructing their model, did not test the impact of energy development (even though GIS data is available for well sites), and the roads data used (which might otherwise have been a dummy variable for oil and gas) was the TIGER dataset, which excludes most oil and gas field access roads (Cameron Aldridge, USGS, pers. comm.). Thus, the actual area where extirpation is imminent when oil and gas impacts are accounted for would be expected to be significantly greater.

Survey efforts of lek populations have grown significantly over the past years (see, e.g., South-Central Local Working Group 2007:8-9, and see BHSBLWG 2006: 14), which complicates efforts to track population trend because apparent increases in aggregated lek counts may overestimate increases and underestimate decreases because increased survey effort can turn up more grouse counted, even during a population decline.

Central Colorado sage grouse populations are isolated by unsuitable montane habitats and are simultaneously under increasing pressure from human developments. Male high count lek data from 6 isolated populations in the central Colorado Rockies have declined from a high of 250 to 300 in the 1960s and early 1970s to below 100 as of 2004 (Northern Eagle/Southern Routt Greater Sage-grouse Work Group 2004). According to this LWG, "Eagle County sage-grouse numbers have declined and remained relatively low, while as of spring 2000, Southern Routt numbers were higher than they had been in the previous 15 years (based on counts of males on leks)." Id at 22. The goal of this study was to increase the population to minimum viable population size of 500 birds from 2004 estimate of 304 to 489 birds; the fact that minimum genetic population viability is not met for these populations is cause for concluding that these populations are at imminent risk for extirpation.

Many reports of population dynamics of sage grouse are tied to population indicators that may not provide an accurate picture of true population trends. For instance, in Wyoming, "wing barrel" counts have been used for years by the Wyoming Game and Fish Department as an index of hunting mortality, but these metrics may have more to do with season length and hunter effort levels than actual sage grouse population trends. Additionally, the high count of strutting males at lek sites are frequently used as population indices. These can be useful metrics, particularly when individual leks can be compared from year to year. However, in order to get a real picture of population size, the number of active leks must also be counted. A population may have a similar mean high count of males per lek from year to year, but if the number of active leks is declining, the population still shows a population decrease. For instance, based on a study of sage grouse populations in the Farson area, between 1949 and 2003 mean lek counts declined by 55%, yet active leks declined from 42 to 9 and the overall population of breeding males dropped by 90% (SW LWG 2007, Attachment 41).

The Wyoming population as a whole faces grave threats. WGFD (2000) reported that since 1952, there has been a 20% decline in the overall Wyoming sage grouse population, with some fragmented populations declining more than 80%; Christiansen (2000) reported a 40% statewide

decline over the last 20 years. These declines can be attributed to habitat loss (due to agriculture, mining and energy development, reservoirs, roads, and buildings), habitat fragmentation (due to fences, powerlines, roads, and reservoirs), habitat degradation (due to overgrazing, changes in fire regime, and mechanical and chemical sagebrush control efforts), drought, predation (the importance of which is controlled by the amount and quality of sage grouse habitat), and hunting (Braun 1998). The long-term decline of sage grouse populations in Wyoming tracks increasing fragmentation of sagebrush habitats over time. According to Rowland et al. (2006:vi), "mean patch size of shrublands in developed fields of the [Wyoming] Basin has decreased from 1,280 acres prior to 1964 to 360 acres in 2004." But even in parts of Wyoming unaffected by energy development, sage grouse populations are dwindling away. See Attachment 35.

At the same time, very little sage grouse habitat in Wyoming is currently protected. Rowland et al. (2006) reached the following conclusions in the context of the Wyoming Basins Ecoregion:

> "Almost all of the sagebrush habitats within the Wyoming Basins Ecoregional Assessment area are managed for multiple use and resource extraction; less than 2% of the sagebrush habitats is within national parks or receives permanent legal protection (Status Class 1) in which only natural processes in the absence of human activities are allowed to influence the system (Chapter 2)." P. ix. Furthermore,
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> "Compared to all landcover types within the study area, a disproportionately smaller percentage of sagebrush is protected, i.e., in status categories 1 and 2 (Fig. 2.8). …. Therefore, we can expect that landcover conversion and resource extraction will continue to dominate the management policies of sagebrush habitats." P. 2-11.

This state of affairs is unlikely to change in ways significant to sage grouse conservation and recovery in the foreseeable future.

Red Desert

Oil and gas development is accelerating rapidly in the Red Desert, resulting in increasing impacts to sage grouse populations found there. There is a heavy overlap between the location of moderate and high potential oil and gas deposits and active sage grouse leks in the region (see, e.g., South-Central Local Working Group 2007: 23). A major increase in oil and gas development in this area is taking place; project areas are both very large (1.2 million acres for Continental Divide – Creston, 250,000 acres for Desolation Flats, 270,000 acres for Atlantic Rim) and dense, with large numbers of new wells projected (e.g., 4,207 well in the Hiawatha Project, 8,950 wells in Continental Divide – Creston, and 2,000 wells in Atlantic Rim). See Attachment 42. At present, a threefold increase in the number of oil and gas wells is projected over the current total of about 5,000. Virtually all of the BLM lands in the Red Desert are currently leased for oil and gas development, which means that industry possesses a limited property right to explore and develop these leases for oil and gas. The Rawlins Reasource Management Plan is currently being revised, and the current Preferred Alternative would make

97% of the 4.5 million acres of the BLM lands and minerals in the planning area available for oil and gas leasing and development under varying stipulations.

Bighorn Basin

Populations in the Bighorn Basin, though experiencing a recent uptick, also are showing a longer-term downward trend. In the Bighorn Basin, an area isolated from other sage grouse populations, overall lek count trends are down from an average of just over 25 males per counted lek in 1970 to approximately 18 males per lek as of 2006 (Big Horn Basin LWG 2007, Attachment 52). According to the Forest Service, "As mentioned previously, populations are not currently thought to be at risk in the area surrounding and including the Forest, though trends are somewhat down compared to historical observations." (Bighorn NF n.d.: 3).

This area has been subject to a major increase in oil and gas leasing over the past two years, with millions of acres newly leased. Seismic projects (including Sellars Draw and Red Point) and wildcat drilling is beginning to crop up in parts of the Basin not previously developed for oil and gas, portending a major expansion of oil and gas drilling in this area in the near and middle terms. BLM has offered over 680,000 acres of public lands and minerals for oil and gas leasing since April 2006, and to date almost 450,000 acres have been sold. Most of this acreage is outside the existing oil and gas fields in the Basin (Attachments 47, 51). In addition, the Bighorn Basin has experienced major outbreaks of cheatgrass infestations in conjunction with livestock overgrazing: "Approximately 100,000 acres of sagebrush communities southeast of Worland that burned by wildfire have been infested with cheatgrass, thus replacing native forbs and grasses, and drastically accelerating the natural fire interval." (Big Horn Basin LWG 2007:39).

In the Upper Green River Basin, the proportion of sage grouse leks remaining active shrank from 88% in 2001 to 70% in 2006, in association with increases in oil and gas development in this area (Upper Green River Basin Sage-Grouse Working Group 2007, Attachment 43). Of the handful of leks with long-term trend data availability, 55.5% showed a decreasing lek trend (average decrease 85% with 4 of 5 leks decreasing more than 90%) while 33.3% showed an increasing population trend (average decrease of 83%, id.). Estimates of population trends were concluded to be "not possible" due to the absence of long-term lek data.

Powder River Basin

The sage grouse population in the Powder River Basin, the largest remaining occupied area in the Northern Plains ecosystem, is in especially dire straits. The Powder River Basin constitutes a significant portion of the range of the sage grouse, and its extirpation here would have important consequences for the persistence of the grouse on the High Plains as a whole. According to Naugle et al (2006:5), "An analysis of the current distribution and pace of development shows that the PRB is likely to be drilled at 32.4 ha (80 ac) spacing in less than 20 years (D. E. Naugle, unpublished data), leaving sage-grouse no place else to go." Coalbed methane development (and, to a lesser extent, conventional oil and gas development) is driving the present population crash. According to Walker et al. (2007:2644), in the Powder River Basin, "Of leks active in 1997 or later, only 38% of 26 leks in CBNG [coalbed methane] fields remained active by 2004–2005, compared to 84% of 250 leks outside CBNG fields." This study found an 82% decline in sage grouse lek counts between 2001 and 2005, while Powder River Basin leks unaffected by

development declined by only 12% over the same period. As of this study, 28,000 wells had been drilled on the Wyoming side of the Basin, but 50,000 additional wells had been authorized by the BLM. *Id*.

The problems that sage grouse are having in the Powder River Basin have been compounded by the proliferation of CBM wastewater impoundments, which serve as habitat for mosquito larvae and increase the incidence of West Nile Virus (WNv). Naugle et al. (2004) reported that WNv was a dominant cause of mortality for certain sage grouse populations between 1998 and 2002.

Availability of winter habitat is also a major concern for this population. According to Naugle et al. (2006:2, Attachment 4),

> "Expansion of CBNG development threatens to extirpate birds from otherwise suitable habitats and further isolate remaining populations. Risk of complete loss of this population is high if plans proceed to develop the entire northern study area because their non-migratory status and behavioral avoidance of CBNG will leave these birds with no other options."

Doherty et al. (2008) found that sage grouse in the Powder River Basin selected sagebrush stands that were large and unfragmented by development, on gentle topography. Additionally, sage grouse use stands of taller sagebrush, as sagebrush that protrudes above the snow is the key winter food source. Such stands of taller sagebrush are often viewed as "decadent" by range managers and targeted for sagebrush "control" projects. Doherty et al. (2008) concluded, "As remaining winter habitats are developed, and sage-grouse can no longer avoid CBNG, it is unclear whether birds will be able to adapt to a disturbance of this magnitude."

It is important to note that while populations of sage grouse rebounded somewhat in areas not developed for coalbed methane between 2004 and 2005 (presumably due to more favorable weather patterns), this rebound failed to occur in coalbed methane fields (*see* Walker et al. 2007, Figure 2).

Threats posed by oil and gas development on private lands are, if anything, even more severe than those on public land. In the Powder River Basin, Walker et al (2007:2645) observed, "Most state and private minerals have been developed with few or no requirements to mitigate impacts on wildlife." Thus, while the plight of sage grouse on federal lands is dire in the Powder River Basin, their prognosis on non-federal lands is even worse.

The extent of the destruction of sage grouse habitat in the Powder River Basin is best illustrated by comparing two maps. The Northeast Wyoming LWG (2006:38, Attachment 44) shows the distribution of sage grouse habitat by land cover as well as the distribution of sage grouse leks. Note that sage grouse distribution and habitat are clustered most heavily in the center of the basin. In preparation of a sage grouse plan amendment and interim management policy, the BLM modeled sage grouse habitat parameters using models that excluded habitats where drilling activity had reached sufficient density to impair habitat function; the remaining functional sage grouse habitat is shown on Slide 11 of Attachment 45. It is important to note that the bulk of the

sage grouse habitat shown in the LWG report throughout the center of the basin has become so impaired by oil, gas, and coalbed methane activity that the BLM itself no longer considers it sage grouse habitat eligible for conservation protection on an interim basis. These maps illustrate that habitats in the center of the basin, comprising the western half of Campbell County and the eastern portions of Johnson and Sheridan Counties have essentially been sacrificed to expedite energy production, leaving fragmented remnants of sage grouse habitats along the margins of the Basin. Id. Northeast Wyoming LWG (2006:28) provides a map of coalbed methane drilling as of 2005; this map accounts for the loss of habitat function in the center of the Basin; two years of additional drilling have rendered impacts even more severe and moved CBM impacts westward. According to a BLM official, "The Big George play – this is where development is going." Chris Hanson, Buffalo FO Manager, Sage Grouse Plan Amendment Land User Information Meeting, Buffalo, WY, May 28, 2008. This is also where many of the remaining strongholds for sage grouse in the Powder River Basin are located.

Given the massive number of wells that are forecast by the BLM's Powder River Basin EIS and the widespread nature of oil and gas leasing, the impacts to sage grouse in the Powder River Basin are likely to get worse rather than better. According to BLM Buffalo Field Manager Chris Hanson, "We are about 96-97% leased in the Powder River Basin at this point." Chris Hanson, Buffalo Field Office Manager, Sage Grouse Plan Amendment Land User Information Meeting, Buffalo, WY, May 28, 2008. Clearly, this is a population hanging on by a thread and likely to be extirpated in the absence of serious corrective action.

The BLM recently released interim management guidelines in order to maintain the decision space while it promulgates an amendment to its land-use plan. These interim management guidelines also do not constitute the serious corrective action needed. The interim management guidelines were developed in collaboration with the Petroleum Association of Wyoming (an industry lobbying group) at a closed meeting in Laramie on May 8, 2008 and presented to the public at a meeting in Buffalo on May 28, 2008. The interim management direction as presented at the meeting would halt the approval of pending and future APDs, but only in areas designated as high-quality sage grouse habitat. High-quality sage grouse habitat was defined spatially in a way which, among other criteria, excludes any area with well densities greater than 1 well per 500 acres. Thus, all areas previously affected by coalbed methane development, regardless of their previous quality as sage grouse habitat, were excluded. The only areas considered for protection were thus two strips of habitat along the eastern and western edges of the basin; sage grouse habitats in the center of the basin have essentially been written off by BLM.

In addition, loopholes were provided that would permit CBM drilling in high-quality habitats if one of the following conditions is present:

1. There is existing infrastructure already in the area. It is unclear at this point whether "existing infrastructure" includes agriculture-related roads, ranch buildings, and plugged and abandoned oil and gas wells.
2. If there are existing or approved (and not yet drilled) coalbed methane wells in the area.
3. If the possibility exists that there will be drainage of coalbed methane from beneath federal lands or minerals to wells on neighboring private minerals.

4. If the land/minerals ownership pattern is fragmented with isolated parcels of federal ownership.

See Attachment 45. Given the large number of loopholes, it appears that CBM development will be halted only in places not likely to be targeted for development in any case. All in all, it appears that the Powder River Basin sage grouse population is headed for extirpation without the intervention of Endangered Species listing.

Oil and Gas Leasing and Project Approvals

Oil and gas development poses perhaps the greatest single threat to sage grouse persistence in Wyoming. Walker et al. (2007) found that sage grouse habitat within 4 miles of a lek site was important to the persistence of the lek. Coversely, Walker et al. (2007) concluded that leks heavily impacted by oil and gas development "typically became inactive within 3-4 years." The USFWS should be able to predict, on the basis of the location of oil and gas projects both major and minor that are currently underway or are presently being approved, which sage grouse leks are likely to become inactive over the short term once development begins, and this is a key analysis that needs to be performed in order to properly evaluate the prognosis of sage grouse populations in Wyoming and other states being adversely impacted by energy development. The same is true for winter habitats. Indeed, Naugle et al. (2006) found that a model using habitat variables and coalbed methane development provided a near perfect fit for grouse distribution data. In the Powder River Basin, CBM well density within a 4 km^2 area provided the best fit for modeling sage grouse habitat use (Doherty et al. 2008).

Walker et al. (2007) found that coalbed methane development within 2 miles of a sage grouse lek had negative effects on lek attendance. Holloran (2005) found that active drilling within 3.1 miles of a lek reduced breeding populations, while wells already constructed and drilled within 1.9 miles of the lek reduced breeding populations. Both Holloran (2005) and Walker et al. (2007) documented the extirpation of breeding populations at active leks as a result of oil and gas development in the Upper Green River Valley and Powder River Basin, respectively. Rowland et al. (2006: A4-3 through A4-7) provide a useful literature review of the distance that impacts spread beyond the edge of disturbed areas into adjacent habitats.

Holloran found that when wellfields reached densities greater than one well per 699 acres reduced the breeding populations of males at lek sites. The following major projects are proposed or recently approved that exceed this density threshold (more moderate projects excluded from this list):

- Atlantic Rim (2,000 wells) – one well per 80 acres
- Jonah Infill (3,100 wells) – One well per 5 to 10 acres
- Pinedale Anticline (4,399 wells) – Currently at approximately 1 wellpad per 200 acres, based on current density trends (assuming directional drilling and well clustering continues) would go to approximately 1 wellpad per 80 acres.
- Seminoe Road (1,240 wells) – One well per 160 acres
- Powder River Basin (roughly 32,000 wells remaining) – One well per 40-80 acres

- Continental Divide – Creston (8,950 wells) – currently averages one well per 160 acres, likely to go to 1 well per 40 acres
- Hiawatha (4,207 wells) – likely at least 1 well per 40 acres

These are impacts that are prospective, meaning that the current decline in sage grouse populations do not reflect these impacts, but rather these projects will wholly or in large part, be additive and exacerbate the current decline into the future, making it more difficult to maintain populations even at their current low ebb.

These intensive oil and gas drilling projects are likely to cause local population exirpations throughout their project areas over time. For example, in for the Atlantic Rim project, covering over 270,000 acres and encompassing 88 active sage grouse leks (one of the largest lek concentration areas remaining in the world), BLM conceded to a litany of impacts to habitats and populations and concluded, "All of these impacts lead to lower productivity and long-term decline in the population of this species" (BLM 2006c: 4-76). Today's grim situation for sage grouse and their habitat is projected to get much worse in the foreseeable future, as a rash of large new oil and gas projects are currently in the approval stages, portending major increases in drilling activity, density, and intensity in the next 50 years. See Attachment 46.

Rowland et al. (2006:1-6, Attachment 3) encapsulated the level of threat to sage grouse habitats from oil and gas development as follows:

> A recently compiled inventory of onshore oil and natural gas reserves on federal lands focused on 5 geologic basins that contain the vast majority of these reserves in the 48 contiguous United States (U.S. Departments of the Interior, Agriculture, and Energy 2003). Four of the basins are centered in the Rocky Mountain region and extend across much of Wyoming, as well as parts of Colorado, Montana, and Utah (Fig. 1.3). These 4 basins also encompass 5 of the 7 "focus areas" that were given highest national priority for inventory related to the Energy Policy and Conservation Act, due to the exceptional concentrations of oil and gas reserves found there (U.S. Departments of the Interior, Agriculture, and Energy 2003).
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> Overlying these basins is one of the largest remaining expanses of sagebrush in western North America; the Wyoming Basins Ecoregion alone contains 18.3 million acres of sagebrush (Fig. 1.2), or 17% of all sagebrush in the United States (Knick et al. 2003). The extensive landscapes dominated by sagebrush in this area in turn support some of the largest extant populations of sagebrush obligates, such as greater sage-grouse and pronghorn (*Antilocapra americana*), in the United States (Clark and Stromberg 1987, Connelly et al. 2004)." P. 1-6.

In effect, displacement of sage grouse from preferred habitats due to energy development is virtually as bad as outright direct mortality. According to Naugle et al. (2006:11), "Avoidance is typically detrimental to populations because individuals are forced into sub-optimal habitats where vital rates decline (i.e., survival and reproduction), which in turn negatively influences

population growth rate, size, and persistence, and generally leaves populations with little capacity to respond to new stressors (e.g., West Nile virus)."

Road construction related to energy development is a primary impact on sage grouse habitat from habitat fragmentation and direct disturbance perspectives. Rowland et al. (2006) modeled sage grouse distribution, and reached the following conclusions:

> "The secondary road network is a highly significant factor influencing processes in this landscape and is being developed and expanded rapidly across much of the WBEA (Thomson et al. 2005). Secondary roads are being built as part of the infrastructure to support non-renewable energy extraction (Chapters 2, 4). For example, within the Jonah Field in the Upper Green River Valley, >95% of the area had road densities >2 mi/mi² (Thomson et al. 2005)." p. 5-10. Furthermore,
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> "The dominant feature affecting output of the sage-grouse disturbance model was secondary roads, which occupy nearly 8% of the study area (Table 5.2) and are presumed to negatively influence an even larger extent."

Pp. 6-15 through 16. Holloran (2005) found significant impacts of road traffic on sage grouse habitat use, concluding that habitat effectiveness declined in areas adjacent to roads with increasing vehicle traffic, documenting the secondary effect referenced by Rowland et al.

Holloran (2005) projected extirpation of the sage grouse in the Jonah and Pinedale Anticline fields in western Wyoming within 19 years of his study <u>if current population trends continue</u>. However, Holloran's research was completed before the approval of 3,100 additional wells in the Jonah Field (bringing well spacing to 5- to 10-acre spacing, or 64 to 128 wells per square mile – see photo Attachment 5) and a projected 4,399 additional wells on the Pinedale Anticline (*see* BLM 2006a and 2006b). Drilling of these infill wells is ramping up, with more than 160 wells drilled so far, placing greater stresses on sage grouse populations there, and hastening their extirpation.

In addition, BLM is proposing to waive timing stipulations on the Pinedale Anticline which currently (in cases where exceptions are not granted) preclude construction and drilling activities within 2 miles of sage grouse leks. These measures will make conditions much worse for sage grouse habitat effectiveness (and thus population trends), likely hastening the extirpation of grouse from these fields well before the predicted 19 years outlined in the Holloran study. Such waivers of timing stipulations are likely to be granted on a statewide basis for all sage grouse habitats located outside established "Core Areas" identified by the state Sage Grouse Implementation Team if their recommendations are adopted into state policy. See Attachments 6 and 7.

West Nile Virus

A collateral impact of coalbed methane development is increased threat of West Nile virus, which is deadly to sage grouse (Naugle et al. 2004, Attachment 8). Coalbed methane wastewater ponds are known to provide ideal habitat for the *Culex* spp. mosquitoes which carry the WNv

and infect sage grouse. Attachment 9. Mosquito infection with WNv associated with Powder River Basin CBM wastewater ponds was demonstrated by Naugle et al. (2004). While West Nile virus has been a lesser cause of mortality for sage grouse over the last two years, this does not guarantee that a major outbreak will not sweep across the sage grouse range at some time in the near future, as illustrated by the repeated outbreaks of similarly non-native *Yersinia pestis* in black-tailed prairie dogs.

The unpredictability of WNv outbreaks rangewide in the sage grouse population provides a stochastic mortality factor that will vary in magnitude, meaning that any population that becomes isolated or depleted is a candidate for extirpation due to WNv. Naugle et al. (2004) observed,

> "In small, fragmented populations, stochastic events such as disease exacerbate risk of extinction due to the combined effect of demographic stochasticity, deterministic stressors, and inbreeding depression. Moreover, because small or isolated populations generally show reduced genetic variation, they are less likely to contain individuals resistant to emerging infectious disease."

Internal citations omitted. This study also showed no evidence that sage grouse could develop immunity to WNv and survive once infected. A subsequent study (Walker 2008, Attachment 48) showed that the development of immunity in sage grouse populations was unlikely given current demographic parameters and labeled the disease "a persistent new source of mortality" for sage grouse in the Powder River Basin. Moreover,

> Without monitoring radio-marked individuals, impacts of WNv mortality, even severe outbreaks, may go undetected and lead to the misperception among managers and policy-makers that WNv is no longer an issue for greater sage-grouse in the Powder River Basin. Moreover, in the absence of radio-marked birds, population declines due to severe or persistent WNv mortality may be incorrectly attributed to other potential stressors (e.g., weather, range management) and lead to inappropriate policy and management decisions.

(Walker 2008:181). At present, radio-marking of sage grouse is not widespread in the Powder River Basin, and even the current level of radio-marking bird may not continue as current studies are reaching (or have reached) their conclusions. Given the cyclical nature of sage grouse population trends, West Nile presents the archetypal example of a stochastic event that could spell extirpation for fragmented populations: "The impact of WNv during a string of low-survival or low-productivity years may be severe" (Walker 2008:182).

Wind Power Projects

Two major wind projects have been installed in Wyoming (near Evanston and near Medicine Bow), and a third project is currently under construction near Fort Bridger. In addition, there are a great many wind energy projects slated for Wyoming BLM lands, with right-of-way applications totaling 1,018,627 acres. Attachment 10. Virtually all of these projects will occur within 5 miles of sage grouse habitat. This represents a new and growing threat to sage grouse which must be factored in to the USFWS' listing decision. The federal government has recently

completed a nationwide wind energy Programmatic EIS (available online at http://windeis.anl.gov/). The USFWS should consider the impacts that the wind projects that will be approved pursuant to this EIS will have on grouse populations in the near and medium term. In addition, wind power projects on private lands are advancing at an even faster rate. For example, Phil Anschutz is planning an approximately 1,000-turbine wind power project on their ranch holdings in the Miller Hill area south of Rawlins, Wyoming. The high wind potential in this area, also home to sage grouse lek concentrations, projects strong threats from wind energy development to sage grouse persistence in the future (see South-Central Local Working Group 2007: 25). In the Bates Hole – Shirley Basin area, wind power potential is not as closely correlated with sage grouse distribution but still poses a significant concern for certain clusters of leks (see BHSB LWG 2006: 37).

The impacts of wind energy projects on sage grouse have not been well studied to this point. To the extent that wind energy facilities have similar (if not greater) physical footprint when compared to oil and gas field, it would be logical to assume that the impacts of wind farms are therefore at least as great as those of oil and gas facilities at full-field development densities. In addition, the USFWS itself recommends siting wind turbine facilities at least 5 miles away from the leks of prairie grouse (Attachment 11); the sage grouse behaviorally avoid areas near tall structures. The extent to which wind energy developments are being planned for areas within 5 miles of active sage grouse leks must therefore be evaluated by USFWS in the context of the greater sage grouse ESA listing decision.

Even the erection of anemometer towers to test for wind energy potential can cause abandonment of key sage grouse habitats. Windland, Inc., a wind power company, was granted rights-of-way by BLM to construct 7 meteorological towers, 30 to 150 feet in height and topped with anemometers to measure wind velocity for a commercial wind power feasibility study, along the length of Cotterel Mountain, Idaho in July of 2001 (BLM 2001). Anemometers went into operation the same year (Windland, Inc. 2005). In October of 2003, permission to construct an eighth tower was granted (BLM 2003). As of 2003, there were 9 known sage grouse leks on Cotterel Mountain, five of which were newly identified that year (Reynolds 2004). On average, 21.5 birds were observed on the leks as a whole, and five leks were used consistently by breeding birds, with a population estimated at less than 50 breeding males (Id.). Overall population estimates were 64 to 72 individuals in 2004 and 59 to 66 individuals in 2005 (Reynolds and Hinckley 2005). In spring 2006, the population of sage grouse on Cotterel Mountain had declined to and estimated 16 individuals and seven of nine leks were unoccupied, while sage grouse populations elsewhere in the county exhibited steady population trends in 2004 and 2005 and only a very slight dip in 2006 (Collins and Reynolds 2006). It is instructive that the Cotterel Mountain sage grouse population crashed following installation of anemometer towers across the crest of Cotterel Mountain while populations elsewhere in Cassia County held relatively steady. As of 2006, the full-scale wind power project was not slated to begin operation prior to 2008 due to lack of purchasers for the produced power (Sandmann 2006). Shell is still interested in pursuing the Cotterel Mountain wind power project as a partner, which awaits only a purchaser to allow the project to move forward (Tim O'Leary, Shell Exploration and Production, pers. comm. 4/22/08).

A complete survey of proposed wind power projects is warranted in the context of determining the magnitude of the threat that wind turbine facilities pose to sage grouse in Wyoming and rangewide, and we encourage the USFWS to undertake such a survey.

Oil Shale and Tar Sands Development

Oil shale and tar sands development is a principal threat to sage grouse persistence. The BLM's preferred leasing alternative would offer almost 2 million acre area of the sage grouse range for leasing for these types of development (BLM 2007:ES-4). Regardless of whether oil shale or tar sands are produced using in situ methods or are mined for surface retorting or refining, oil shale and tar sands development represents a 100% land use conversion, leaving no room for other land uses, even other types of oil and gas development (see BLM 2007: 6-36 through 6-42). Where oil shale and tar sands development occurs, these activities represent a 100% destruction of sage grouse habitat with no potential for mitigation of impacts. There is a major overlap between proposed oil shale leasing areas and key sage grouse habitats. See BLM (2007:6-49), *and see* Attachment 12.

Electrical Transmission Corridors

The Department of Energy is currently designating energy corridors which will include major overhead electrical transmission lines stretching across thousands of miles of sage grouse habitat. The Programmatic EIS has already been released in Draft form (available online at http://corridoreis.anl.gov/), and will serve as the primary NEPA analysis for a large number of transmission projects in the future. In addition, the Gateway West project constitutes the largest project-level electrical transmission project in recent history, and it is planned to cross sage grouse habitats en route from the Douglas, Wyoming area to end south for Boise, Idaho. Maps and scoping materials available online at http://www.wy.blm.gov/nepa/cfodocs/gateway_west/; site last visited 1/25/08. Walker et al. (2007) documented a negative correlation between the density of powerlines within 4 miles of a sage grouse lek and breeding populations in the Powder River Basin. Powerline collisions accounted for 33% of the mortality of subadult sage grouse on one Idaho population (Beck et al. 2006), indicating that powerlines themselves can be a major factor in sage grouse mortality. The USFWS must consider the impact of these energy transmission corridors in assessing the viability of sage grouse at both the rangewide and local/regional scale.

The Inadequacy of Current Sage Grouse Mitigation Measures

Oil and gas development poses perhaps the greatest threat to sage grouse viability in the region. Under the Endangered Species Act, the inadequacy of existing regulatory mechanisms is clearly grounds for Threatened or Endangered Species listing; in the context of oil and gas development, the BLM's standard mitigation measures, which continue to be applied today despite having proven themselves ineffectual, are a prime example of this. On state and private lands, regulatory mechanisms are completely absent to protect grouse from oil and gas impacts.

In a study near Pinedale, sage grouse from disturbed leks where gas development occurred within 3 km of the lek site showed lower nesting rates (and hence lower reproduction), traveled farther to nest, and selected greater shrub cover than grouse from undisturbed leks (Lyon 2000). According to this study, impacts of oil and gas development to sage grouse include (1) direct

habitat loss from new construction, (2) increased human activity and pumping noise causing displacement, (3) increased legal and illegal harvest, (4) direct mortality associated with reserve pits, and (5) lowered water tables resulting in herbaceous vegetation loss. Pump noise from oil and gas development may reduce the effective range of grouse vocalizations (Klott 1987). Thus, lek buffers are needed to ensure that booming sage grouse are audible to conspecifics during the breeding season. A consortium of eminent sage grouse biologists recommended, "Energy-related facilities should be located >3.2 km form active leks" (Connelly et al. 2000:978). Walker et al. (2007:2644) examined the impacts of coalbed methane drilling on sage grouse in the Powder River Basin and concluded, "Current lease stipulations that prohibit development within 0.4 km of sage-grouse leks on federal lands are inadequate to ensure lek persistence and may result in impacts to breeding populations over larger areas. Seasonal restrictions on drilling and construction do not address impacts caused by loss of sagebrush and incursion of infrastructure that can affect populations over long periods of time. Regulatory agencies may need to increase spatial restrictions on development, industry may need to rapidly implement more effective mitigation measures, or both, to reduce impacts of CBNG development on sage-grouse populations in the PRB." And Dr. Clait Braun, the world's most eminent expert on sage grouse, has recommended even larger NSO buffers of 3 miles from lek sites, based on the uncertainty of protecting sage grouse nesting habitat with smaller buffers. Attachment 13.

The area within 2 or 3 miles of a sage grouse lek is crucial to both the breeding activities and nesting success of local sage grouse populations. One scientist described the lek site as "the hub from which nesting occurs"(Autenreith 1985). Grouse exhibit strong fidelity to individual lek sites from year to year (Dunn and Braun 1986). During the spring period, male habitat use is concentrated within 2 km of lek site (Benson et al. 1991). A Montana study found that no male sage grouse traveled farther than 1.8 km from a lek during the breeding season (Wallestad and Schladweiler 1974). Other researchers found that 10 of 13 hens nested within 1.9 miles of the lek site during the first year of their southern Idaho study, with an average distance of 1.7 miles from the lek site; 100% of hens nested within 2 miles of the lek site during the second year of this study, with an average distance from lek of 0.5 mile (Hulet et al. 1986). In Montana, Wallestad and Pyrah (1974) found that 73% of nests were built within 2 miles of the lek, but only one nest occurred within 0.5 mile of the lek site. Because leks sites are used traditionally year after year and represent selection for optimal breeding and nesting habitat, it is crucially important to protect the area surrounding lek sites from impacts.

The sage grouse is a BLM Sensitive Species in Wyoming, yet the agency does precious little to protect them. Wyoming sage grouse populations are some of the largest left in the nation and are more stable than in peripheral parts of the range (showing a 17% decline from 1985-1994); nonetheless, sage grouse populations have experienced major declines rangewide in recent decades (Connelly and Braun 1997). The Wyoming Game and Fish Department (WGFD 2000) reported that since 1952, there has been a 20% decline in the overall Wyoming sage grouse population, with some fragmented populations declining more than 80%; one of WGFD's biologists reported a 40% statewide decline over the last 20 years (Christiansen 2000). These declines are attributable at least in part to habitat loss due to mining and energy development and associated roads, and habitat fragmentation due to roads and well fields (Braun 1998).

Sage grouse mitigation measures have been demonstrated to be ineffective at maintaining this species at pre-development levels in the face of oil and gas development by Holloran (2005) and Naugle et al. (2006). See Attachments 14 and 15. In both of these studies, comparable levels of development led to significant declines in sage grouse populations. Holloran found that, for the Pinedale Anticline and Jonah Fields of western Wyoming, current population trends predicted extirpation of sage grouse in developed areas within 19 years of the date of the study. In the Powder River Basin, even NSO lek buffers of 2 miles were estimated to result in a lek perisistence of only 28%, versus 85% for unimpacted leks. Attachment 16 at 5. Walker et al. (2008) found an 85% decline of sage grouse populations in the Powder River Basin of northeastern Wyoming since the onset of coalbed methane development there, under well densities and mitigation measures approved under the Atlantic Rim project. Under both studies, the BLM had implemented and required mitigation measures identical to those that would apply under the action alternatives proposed for the Rawlins RMP. Walker et al. (2008) concluded:

> Seasonal restrictions on drilling and construction do not address impacts caused by loss of sagebrush and incursion of infrastructure that can affect populations over long periods of time. Regulatory agencies may need to increase spatial restrictions on development, industry may need to rapidly implement more effective mitigation measures, or both, to reduce impacts of CBNG development on sage-grouse populations in the PRB.

Attachment 14 at 2. Furthermore,

> Strong support for models with negative effects of CBNG at both the 0.8-km and 3.2-km scales indicate that the current restriction on surface infrastructure within 0.4 km is insufficient to protect breeding populations.

Id. at 18. In the end,

> Our analysis indicates that maintaining extensive stands of sagebrush habitat over large areas (6.4 km or more) around leks is required for sage-grouse breeding populations to persist. This recommendation matches those of all major reviews of sage-grouse habitat requirements (Schroeder et al. 1999, Connelly et al. 2000*b*, Connelly et al. 2004, Crawford et al. 2004, Rowland 2004). Our findings also refute the idea that prohibiting surface infrastructure within 0.4 km of the lek is sufficient to protect breeding populations and indicate that increasing the size of no-development zones around leks would increase the probability of lek persistence…. Timing restrictions on construction and drilling during the breeding season do not prevent impacts of infrastructure (e.g., avoidance, collisions, raptor predation) at other times of the year, during the production phase (which may last a decade or more), or in other seasonal habitats that may be crucial for population persistence (e.g., winter).

Id. at 21. Similar issues exist regarding the inability of BLM stuipulations to protect winter habitats. According to Doherty et al. (2008: 194),

> Timing stipulations that restrict CBNG development within 3.2 km of a lek during the breeding season (15 Mar–15 Jun) are insufficient because they do not prevent infrastructure from displacing sage-grouse in winter.

For sage grouse, Holloran (2005) demonstrated that wells sited within 1.9 miles **during the post-drilling, post-construction production phase** caused negative impacts on sage grouse. Attachment 15 at 50. Walker et al. (2008) demonstrated negative effects on sage grouse lek populations when wells were sited between 0.5 and 2 miles of the lek. Attachment 14 at 2. In the context of oil and gas project NEPA documents, it is typical for BLM to allow wells to be sited as near as 0.25 mile from a lek site under all action alternatives. *See, e.g.,* BLM (2006c) at Table 2-6. In the context of the Atlantic Rim CBM project, the U.S. Fish and Wildlife Service voiced its disapproval for the proposed mitigation measures:

> The Service is very concerned that authorization of this project, as proposed, will significantly affect the population of greater sage-grouse that occurs in this area of Wyoming. Adverse affects to sage-grouse may occur through the long-term loss of sagebrush habitat, fragmentation of habitat, and noise associated with project activities. The Service does not support a 0.25-mile protective buffer around sage-grouse leks as a mitigation measure, nor do we support a 2-mile buffer to protect nesting habitat…. Additionally, recent information from a doctoral dissertation on the impacts of oil and gas development to greater sage-grouse in the Pinedale Anticline found that as development increased, lek activity declined up to 100 percent (Holloran 2005)…Additionally, Holloran concluded that stipulations placed on oil and gas development in the Pinedale Anticline, which are identical to those proposed for the Atlantic Rim development, were insufficient to maintain sage-grouse breeding populations in natural gas fields.

Attachment 17 at 3. Holloran also found that well densities exceeding 1 well per 699 acres had a negative impact on grouse. Attachment 15. State agencies recommend that well densities not exceed one site per square mile in cases where sensitive habitats cannot be avoided altogether. Attachment 16 at 2. Thus, in the absence of mitigation measures capping well density at this figure, oil and gas development would be expected to have deleterious effects on nesting sage grouse despite the mitigation measures put in place.

The adequacy of the current small NSO buffers for sage grouse leks has been repeatedly refuted in the scientific literature. Beck (2006:4) stated, "Results suggest that no surface occupancy within 0.4 km is not adequate to avoid lek abandonment or other negative influences on prairie grouse populations, and also indicates that surface occupancy may need to be at least 1.6 km from leks to avoid declines or abandonment" (internal ref. omitted). Attachment 18.

The 2004 WGFD Sage Grouse Recovery Strategy adopts the standard BLM practice of preventing oil and gas development only within ¼ mile or less of sage grouse leks and applying timing stipulations to a 2-mile buffer around the lek site (WGFD 2003:34). Local working group plans typically adopt the same current BLM policy (*see, e.g.,* SWLWG 2007), or have no

specific standards or guidelines at all beyond very vague language urging that impacts be reduced or minimized (see, e.g., WDARM 2006:63).

Sage grouse local working groups likewise have adopted the standard BLM management practices for oil and gas into their plans. The Upper Green River Basin Sage-Grouse Working Group (2007:30) recommended, "Avoid habitat alteration on or within ¼ mile of the perimeter of lek sites (although local research data suggests this perimeter should be larger);" furthermore, specific to oil and gas development,

> 1. As a general rule, do not drill or permit new or expand existing sand and gravel activities within two miles of active leks between March 15 and July 15. As seasonal habitat mapping efforts are completed, re-direct efforts towards protecting nesting habitat.
>
> 2. Avoid surface disturbance or occupancy on or within 1/4 mile of known active lek sites. (Note: This is the current BLM stipulation, but existing information suggests this may not be adequate and may need to be expanded.)

(Id., p. 56). Similar measures are included in the plans of the South-Central Local Working Group (South-Central Local Working Group 2007: 49). Some local working groups recommended even more permissive measures, limiting recommendations to avoiding (rather than prohibiting) surface occupancy within ¼ mile of leks and providing not even seasonal relief from construction and drilling activities (e.g., WRSR LWG 2007, Attachment 37), or declining to recommend any No Surface Occupancy or timing limitation buffers around leks at all (see, e.g., Attachment 38, BHSB LWG 2006: 78-79; SW LWG 2007).

There are a number of Best Management Practices for oil and gas development that could be required by BLM and other agencies, but are not. The sad truth is that listing Best Management Practices does nothing to improve conditions on the ground for wildlife if these BMPs remain voluntary. The Washington Office produced a fairly comprehensive set of Best Management Practices for oil and gas development,[1] along with some language that they should be employed. In no projects of which we are aware has BLM ever required implementation of these Best Management Practices, leaving their adoption up to operators on a voluntary basis. As a result, the vast majority of projects employ few if any of these Best Management Practices, and the sage grouse populations affected by these projects have suffered accordingly.

The scientific literature is also replete with recommendations for improving the lot of sage grouse, which to date have been ignored by the agencies. For example, Walker et al. (2007:2653) recommended, "at minimum, burying power lines; minimizing road and well pad construction, vehicle traffic, and industrial noise; and managing water produced by CBNG to prevent the spread of mosquitoes that vector WNv in sage-grouse habitat." Internal citations omitted. These measures are seldom employed in practice.

[1] See BMP slide show, esp. Wildlife BMPs, at http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/technical_information.html.

A west-wide panel of state fish and wildlife agency personnel examined the state of the science on sage grouse conservation, and had this to say about the current suite of oil and gas lease stipulations:

> Much of the greater sage-grouse habitat in MZ-1 and 2 has already been leased for oil and gas development. These leases carry stipulations **that have been shown to be inadequate** for protecting breeding and wintering sage-grouse populations during full field development. New leases continue to be issued utilizing these same stipulations.

Attachment 16 at 2, emphasis added, internal citations omitted.

The Rawlins RMP: A Case Study

There are a large number of BLM land-use plans that have been placed on the "fast track" for energy development by the Bush administration, and which have major implications for sage grouse survival. Some examples of land-use plans recently completed or under revision now include the Price RMP (Vernal), Vernal RMP (Utah), Little Snake RMP (Colorado), White River RMP (Colorado), Piceance RMP (Colorado), Kemmerer RMP (Wyoming), Pinedale RMP (Wyoming), Casper RMP (Wyoming), Lander RMP (Wyoming), and Rawlins RMP (Wyoming). BLM is in the final stages of approving the Rawlins Resource Management Plan (RMP) as a revision of its former Great Divide RMP in the Rawlins Field Office, which manages 4.5 million acres of federal land surface and mineral rights; the Final EIS for the plan was released in January of 2008. This plan is typical of the problematic approach of BLM toward sage grouse conservation.

The proposed Rawlins RMP requires the standard ¼ mile NSO buffer around sage grouse leks with an additional 2-mile buffer subjected to timing stipulations that limit drilling and construction activities (but not production-related activities) to times outside the breeding and nesting season (BLM 2008: 3-157). In the end result, surface-disturbing activities, including the drilling of oil, gas and coalbed methane wells and the construction of roads, compressor stations, and other facilities are allowed to occur within the timing limitation buffer as long as the construction and drilling activities do not take place during the breeding and nesting season.

Under the Rawlins RMP FEIS, each alternative would apply mitigation measures of no surface occupancy within ¼ mile of sage grouse leks, with an additional measure presenting human activity during certain hours of the day within this buffer. FEIS at 3-157. This is supplemented with the standard seasonal restriction of drilling and construction activities within 2 miles of the lek site for sage grouse or within 1 mile of the lek site for sharp-tailed grouse (and even these provisions are subject to waiver). *Id.* This identical suite of mitigation measures was applied to all alternatives. FEIS at 3-157. While these measures provide protection from drilling and construction activities, they do not prevent the industrialization of key sage grouse nesting habitats within 3 miles of the lek site, nor to they prevent human disturbance related to industrial activity during the post-construction, production phase of operations, often slated to last 30 to 50 years. *See* BLM (2006) at ES-1.

For the Cow Butte/Wild Cow Wildlife Habitat Management Area (WHMA), BLM conceded that stipulations for sage grouse are inadequate to maintain viable populations:

> The development of oil and gas wells surrounding the ¼-mile buffer around grouse leks would reduce the amount of habitat available for nest site selection. The birds would be required to either nest in less optimal locations or space their nests more closely. Increased noise resulting from CBNG [coalbed methane]-related traffic would possibly affect the ability of female grouse (both greater-sage and Columbian sharp-tailed) to locate leks, potentially reducing the reproductive viability of the species. CBNG development within the Cow Butte/Wild Cow area would reduce the number of male grouse inhabiting leks within or adjacent to coalbed natural gas development. It would also increase fragmentation of plant communities used by grouse, degrading both nesting and brood-rearing habitat. The ability of these birds to move to adjacent, less disturbed habitat is extremely limited because of oil and gas development to the west and increasing elevation and snowpack to the east. Thus probable development would threaten sustained use of the area by sage grouse.

(BLM 2008: 4-332). For sage grouse leks and nesting habitat, "35 percent of the currently-identified sage-grouse nesting habitat within the RFO [Rawlins Field Office] would be potentially affected by oil and gas development." (BLM 2008: 4-456). Thus, according to the limited analysis presented in the FEIS, application of mitigation measures as proposed combined with oil and gas development projected for the planning area will result in major declines in sage grouse populations across more than a third of the planning area. This level of impact would clearly contribute to the need to list both BLM Sensitive birds under the Endangered Species Act, in violation of the BLM's Sensitive Species Policy.

In comments submitted to the Rawlins BLM, the EPA stated, "the DEIS presents a strategy to allow future use of areas that contain "unsuitable" nesting habitats, but that are within the two-mile lek-center buffers, but to off-set these impacts by identifying suitable nesting habitats outside of the two-mile lek-center buffers. This will cause severely fragmented habitats, and EPA believes this would not result in a healthy or stable habitat for maintenance of the species." EPA Comments on Atlantic Rim Draft EIS. Allowing oil and gas development in areas not deemed to be sage grouse habitat within the two-mile buffer of lek sites would provide even less protection than current timing stipulations do. It is notable that impacts from roads and wells, during both the construction/drilling and production phases of development, extend far beyond the area actually subjected to surface disturbance and into adjacent habitats. Attachment 15 at 50.

Thus, the sage grouse mitigation measures considered for all alternatives under the Rawlins RMP FEIS have already been proven ineffective by two BLM-funded studies in similar habitats, studies which had been presented to BLM prior to the issuance of the FEIS. Holloran (2005) concluded, "current development stipulations are inadequate to maintain greater sage-grouse breeding populations in natural gas fields." 15 at 57. State wildlife agencies have come to a similar conclusion. Attachment 16. Yet in the face of overwhelming evidence that its standard

mitigation measures were a failure, BLM declined even to consider alternative mitigation for sage grouse.

A Blueprint for Sage Grouse Conservation and Recovery by Dr. Clait Braun, arguably the world's leading expert on sage grouse conservation provides recommendations for sage grouse conservation, was submitted to the BLM during the planning process but was ignored by BLM. *See* Attachment 13. Dr. Braun's recommendations constituted a reasonable alternative based on the best available science that would place a moratorium on the constructions of well, roads, and other infrastructure for the important nesting habitat that occurs within 3 miles of a sage grouse lek. Conservation groups requested similar measures throughout the NEPA process under The Western Heritage Alternative. *See* Attachment 19. State agencies concurred that lek persistence increases with large NSO buffers. Attachment 16 at 4, 5. Yet BLM never considered the implementation of Dr. Braun's recommendations (or the Western Heritage Alternative's) in any of its own alternatives.

Additionally, in the context of the Atlantic Rim project, the U.S. Fish and Wildlife Service stated,

> The Service strongly recommends minimum protection measures as described by Connelly et al. (2000). The Service also encourages the Bureau to use its authority and not grant exceptions to protection measures for sage-grouse.

Attachment 17 at 3. These recommendations state that energy-related facilities should be placed at least 3.2 kilometers (2 miles) from a lek site. *See* Attachment 20 at 978. The BLM repeatedly failed to consider these alternatives throughout the NEPA process.

A number of experts criticized BLM's sage grouse mitigation measures in the context of the Great Divide RMP revision. In an interview, Pat Deibert of the U.S. Fish and Wildlife Service stated that the current quarter-mile buffer "is just not adequate," stating "One-quarter mile is just not going to protect these birds." Attachment 21 at 1. She also stated that a two-mile buffer where surface occupancy is prohibited "would be an absolutely huge improvement, not 100 percent, but huge." *Id*. According to Dr. Clait Braun, an eminent sage grouse scientist, "The BLM's present quarter-mile buffer around active leks is scientifically unsound, and the available data indicate that such a weak measure is a prescription for local population extinction," and added, "A three-mile buffer from surface disturbance is needed to protect sage grouse during breeding and nesting." *Id.* at 2.

BLM is aware that its standard mitigation measures, when applied in conjunction with an industrial project at 80-acre well spacing, "would result in habitat loss and disturbance and disturbance exceeding the significance criteria." (BLM 2006c:4-79) Indeed, BLM's proposed mitigation measures, when applied to full-field development projects, are pushing the sage grouse toward Endangered Species listing. Attachment 22. This outcome is proposed for adoption despite violating BLM Sensitive Species policy. This should have led BLM to examine a range of alternatives for sage grouse conservation in the context of the Rawlins RMP revision pursuant to the requirements of NEPA, including at least one alternative that adequately protects

these sensitive grouse. Instead, the BLm continued along the course of accelerated oil and gas development without strengthening its defective sage grouse protection measures.

In fact, BLM's own analysis in the Rawlins RMP analysis indicates that its proposed mitigation measures are inadequate to prevent significant impacts to sage grouse and their habitats. The BLM cites "long-term reduction of potential sage-grouse nesting habitat" as one of the effects of the Atlantic Rim project. BLM (2006c: 4-34). This statement is an admission that significant impacts to the human environment will occur as a result of this project's implementation, and that mitigation measures approved in the Atlantic Rim ROD are inadequate to prevent these significant impacts. The measures of this ROD are identical to those proposed under all alternatives for sage grouse management throughout the RMPPA.

BLM also adopted many standard conditions of approval and mitigation measures for the Rawlins RMP without taking a hard look at whether these measures are effective. Numerous oil and gas projects in this region have adopted many of the same mitigation measures over the past twenty years and BLM failed to inventory these sites to measure their effectiveness. There has been no disclosure or analysis of the effectiveness of mitigation measures proposed for sage grouse within the RMPPA.

Protestors repeatedly called into question the effectiveness of protective measures proposed by BLM for sage grouse lek sites (the traditional breeding and strutting grounds for this bird) and nesting habitats. The availability and quality of these habitats are key to preventing the collapse of sage grouse populations. Yet the BLM repeatedly failed to provide any analysis, whether field experiments or literature reviews, that examine the effectiveness of the proposed quarter-mile buffers where disturbance would be "avoided" that are required under the Atlantic Rim project as mitigation measures to protect sage grouse leks and nesting habitat. These quarter-mile buffers (encompassing 5.47 million square feet) would provide year-round protection for only 1.56% of the land area around the lek site that would be protected by the minimum two-mile buffers (encompassing 350.33 million square feet) recommended by experts[2] and 0.69% of the land area around the lek site that would be protected by the three-mile lek buffers (encompassing 788.24 million square feet) recommended by Dr. Braun. *See* Attachment 13. Furthermore, the proposed plan would allow roads and wells to be built within 2 miles of sage grouse leks (within sensitive nesting habitat) as long as construction occurred outside the breeding/nesting season. BLM (2008) at Table 2-6. This is the very area for which experts have recommended that no oil and gas facilities or infrastructure be built.[3] BLM also has failed to analyze the setting aside of core areas in the RMPPA, as recommended by Holloran and state agencies. *See* Attachments 15, 16 (at 2).

The BLM also failed to examine a range of alternative mitigation measures for grouse wintering habitat in the FEIS. A recent BLM-funded study found that sage grouse avoided coalbed methane development in selecting winter habitats, which is detrimental "because individuals are

[2] Connelly, J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. Wildl. Soc. Bull. 28:967-985, p. 978.
[3] *Id.*

forced into sub-optimal habitats where vital rates decline (i.e., survival and reproduction), which in turn negatively influences growth rate, size, and persistence, and generally leaves populations with little capacity to respond to new stressors." Attachment 23 at 10, 12. For both species of grouse in the context of the Atlantic Rim project, BLM concludes, "The timing stipulation prevents winter disturbance to greater sage-grouse, but does not prevent the direct loss of wintering areas outside this time period. Loss of this habitat would lead to lower productivity and long-term decline in the population of these species." BLM (2006) at 4-79.

Thus, the proposed path for the most recent BLM Resource Management Plan, one that has enormous implications for sage grouse, is to allow business as usual, at a great accelerated rate and expanded scale, with the same puny mitigation measures that are known by the agency and scientific experts alike to be ineffective. It appears that only a listing of the sage grouse under the ESA will be sufficient trigger to cause the BLM to change course and improve its sage grouse conservation actions.

Hunting

While hunting and falconry are not major threats to sage grouse populations in Wyoming, they do exert (relatively minor) downward effects on population trends and should be considered together with the larger and more pervasive threats in the context of the listing decision. Sage grouse hunting can retard the population recovery of sage grouse populations (Connelly et al. 2003), and conservative seasons and bag limits are recommended. In one Idaho population, hunting accounted for 17% of subadult sage grouse mortality, while powerline collisions accounted for 33% (Beck et al. 2007).

Subdivision and Rural Housing Developments

Suburban sprawl into sage grouse habitats is a locally significant impacts, although not a primary one across most of the state. On private lands surrounding Pinedale, Buffalo, and Sheridan, a significant increase in subdivision of land and construction of residential developments is edging out sage grouse on a local basis. These effects can be significant, as sage grouse may behaviorally avoid developed areas, and domestic dogs and cats could be a locally important predator of sage grouse nests and adults.

Predators

The sage grouse is faced with much the same suite of predators that have existed for eons. The construction of structures in oil and gas fields and around towns may increase the availability of suitable nesting and perching habitat for corvids, an important nest predator. In addition, foxes, skunks, and even ground squirrels can be sage grouse nest predators of some importance; coyote control programs, where successful, could release mesopredator populations otherwise depressed by coyote activity, potentially resulting in greater levels of predation on sage grouse.

Vegetation Enhancement Projects – Mitigation or Threat?

A great many vegetation manipulation projects are being undertaken in the name of sage grouse habitat improvement. In Wyoming, some of the more widespread programs are being undertaken by sage grouse Local Working Groups, the Wyoming Landscape Conservation Initiative(a federal project), the Sagebrush Conservation Initiative (an industry initiative), the Jonah

Interagency Office (a joint industry/government operation), and the Wyoming Wildlife and Natural Resource Trust Fund (funded through the state legislature). These projects are being pursued in the name of maximizing the number of acres treated for sage grouse (and often more primarily, livestock) benefit, without regard to whether the vegetation manipulations undertaken improve sage grouse habitat in the short or long term, result in short-and/or long-term impacts to sage grouse habitats and populations, or have no effect at all.

Haufler et al. (2007) created a framework for offsite mitigation that would actually require the immediate impacts of projects to be offset in real time, rather than having a system of tangible known impacts today with speculative promises of offsetting improvements to habitat in the future, which is the present model of offisite mitigation:

> "The fundamental concept underlying credit trading programs (indeed, underlying any mitigation effort) is that it is possible to compensate for lost "services" (or "values") at one site (the impact site) by replacing or increasing the same services at another site (the mitigation site) through purposeful management at the latter site. The challenge is to develop a consistent framework for quantifying the services lost or gained at each site, so that all parties can have confidence that the losses and gains are in fact commensurate…. It is recommended that credits accrue only when beneficial change is actually documented, rather than when a commitment to undertake conservation action is made. This recommendation addressed the risk component discussed above. More risky mitigation measures can be encouraged, but would not generate credits until they are shown to produce desired conditions…. To ensure that a temporary shortage of ecosystem services (i.e., habitat) is not created, credit units should not be released and exchanged for debit units before the actual improvements in the ecological integrity have occurred elsewhere on the landscape."

Such a system is diametrically opposed to today's model of offsite mitigation, in which impacts are immediate but offsetting habitat improvement projects offer benefits that are deferred, if they occur at all.

We are concerned that many, if not most, of these projects are actually harming sage grouse habitat in the long term and that the remainder will cause short-term impacts to sage grouse populations that contribute to the multiple serious threats to their existence. The scientific basis for many such projects (which include prescribed burns and mechanical or herbicidal thinning or removal of sagebrush) is extremely shaky, and given the lack of familiarity of the project proponents with basic sage grouse habitat requirements, such projects may unintentionally cause additional damage to sage grouse habitats. The impacts (positive and/or negative) of such projects have not been rigorously tested, and thus their results for improving (or harming) sagebrush habitats remain open to speculation.

During its listing review process, the USFWS should rigorously evaluate all sagebrush habitat treatment projects to determine how exactly they will impact sage grouse populations prior to counting such projects as assets toward sage grouse recovery or threats to sage grouse

persistence. The parameters of these projects should be compared to scientifically established habitat requirements for the grouse: for example, is thinning being implemented in sagebrush stands that exceed the canopy cover preferences of grouse for that type of habitat, or is canopy cover already optimal or too sparse for sage grouse habitat needs? According to one WAFWA commentor, "Some of these proposals are of questionable value, and may actually be detrimental, in terms of impact on sage-grouse conservation" (WAFWA 2006b:13). BCA received a funding proposal from the Bighorn Basin LWG for sage grouse thinning and removal, which proposed to remove sagebrush from stands already at 15% canopy cover, the lower edge of sage grouse habitat preference. Attachment 24. An independent expert evaluated the proposal and found it to be counterproductive for the needs of sage grouse. Attachment 25. We suspect that many (if not most) such habitat enhancement projects are also prescribing treatments which will harm rather than help sage grouse habitat quality, but instead of being vetted by review from independent scientists, they are proceeding forward in the absence of any critical evaluation of their end effects. Braun et al. (2005, Attachment 26) and Rowland (2004, Attachment 34) provide basic reviews of sage grouse habitat requirements from a vegetative perspective. The USFWS should provide such an independent scientific review of habitat projects to determine the level to which these projects are helping or impeding the recovery of sage grouse rangewide.

The most frequently cited "study" used to justify such projects is an unpublished report prepared for the Deseret Land and Cattle Company, which notes positive results for sage grouse but which lacks either spatial or temporal controls to determine whether sage grouse population response was the result of the treatment applied or a happy circumstance of climactic conditions that would have produced sage grouse population growth in the absence of habitat manipulation. In any case, the Deseret Ranch example is part of a very costly and intensive combination of mechanical and grazing treatments; this ranch (unlike most rangelands in the sage grouse range) is not being managed to maximize livestock production, but instead trophy elk hunting is the primary management priority (Clait Braun, pers. comm.). Sagebrush "enhancement" projects being implemented across the range if the sage grouse are not replicating all aspects of the Deseret program.

Prescribed fire is commonly employed putatively to improve sage grouse habitat (such projects are often supported by livestock operators, who typically are primarily concerned with eliminating sagebrush with the misguided belief that this will result in a net increase in forage for livestock). For instance, the Upper Snake LWG reported that the 1,100-acre prescribed burn in the Cherry Creek watershed would benefit sage grouse by improving brood rearing habitat. Sagebrush recovery following such fires takes decades, and can take more than 100 years, causing an immediate reduction in habitat effectiveness for sage grouse in pursuit of some eventual increase in habitat effectiveness at some point in the (distant) future.

The net result is that immediate welfare of the sage grouse today is being mortgaged for eventual habitat improvements that are speculative at best. However, unlike pheasants, sage grouse are known to respond poorly if at all to habitat enhancement projects. Attachment 27. In the WAFWA forum participants noted,

> "It's important for people to understand that if we are doing habitat projects, it often takes a matter of 10, 20, even 30 years to restore shrub habitat. Habitat treatments that put money on the ground today are speculating on the long-term success of the treatment, and of the sage-grouse response to those treatments. So we'll have to find a way to figure this much longer time frame into our calculations" (WAFWA 2006b: 13).

In the absence of rigorous scientific evidence supporting the translation of habitat enhancement projects into increased sage grouse population numbers, the USFWS may not consider such projects as offsetting sage grouse losses.

The role of fire in the sagebrush ecosystem, and how (or if) it drives the patch dynamics of the system, is poorly understood at present. A landscape mosaic of burns may not meet the nesting habitat needs of sage grouse (Nelle et al. 2000), and may also fail to meet grouse habitat requirements during other seasons (Wamboldt et al 2002). Large fires of high frequency can extirpate sage grouse populations (Pedersen et al. 2003). In Idaho, reduction of 57% of sagebrush canopy cover resulted in sage grouse population reductions (Connelly et al. 2000b). Thus, it is far from clear that projects which reduce sagebrush density or extent actually benefit sage grouse in the short or long term.

In Wyoming, Wyoming big sagebrush dominates the vast majority of sage grouse habitat throughout the state, both in the Wyoming Basins Ecoregion and on the Great Plains. Natural fire return intervals in Wyoming big sagebrush average 100-240 years (Baker 2007). Wyoming big sagebrush recovers slowly after fires, which typically result in 100% sagebrush mortality; recovery to pre-fire canopy cover takes over 100 years (Cooper et al. 2007, Attachment 28). Baker (2007, Attachment 29) examined the same issue and projected that Wyoming big sagebrush recovery following fire ranges from 50 – 120 years; for mountain big sagebrush, the recovery period was estimated at 35 – 100 years. Prescribed fire can result in a loss of sagebrush dominance for 25-45 years, and may also result in increased erosion (Sedgwick 2004). Cooper et al. (2007) projected the full recovery of Wyoming big sagebrush canopy cover would take 625 years based on their observed recovery rates following prescribed fire (a biologically improbable outcome), and no recovery at all was recorded following prescribed fire on 17 of 24 sites. Close proximity to seed sources and moister conditions did not accelerate recovery in this study. These researchers concluded, "Wyoming big sagebrush recovery takes so long that managers considering prescriptive burns need to have a long-term view of the landscape before eliminating a sagebrush habitat that will not return for at least a century" (Cooper et al. 2007:12).

The spread of cheatgrass, which thrives in the wake of fire (both natural and human-caused) further complicates post-fire sagebrush recovery. Once cheatgrass invasion begins, fires result in pure stands of cheatgrass, which tends to burn on a 2-5 year cycle, preventing the re-establishment of native vegetation. Biologists have observed, "Under current, altered fire regimes, natural re-establishment of sagebrush after burning (especially basin big sagebrush and Wyoming big sagebrush) is unlikely" (WAFWA 2006b: 66). Fires and subsequent cheatgrass invasion were a cause of major habitat loss in many of the sage grouse units in northern Nevada, and risk of large-scale habitat loss was high even in areas that had not experienced major

problems in the past. *See* Attachment 30. In the particular case of the Casper area, overuse of sagebrush by big game and livestock is an important issue (BHSBLWG 2006:13).

Many sagebrush "control" projects are undertaken based on the perception that sagebrush stands that are dense or tall produce less forage for livestock and also are poor sage grouse habitat; these habitats are based on entrenched myths that conflict with the scientific evidence at hand (Welch and Criddle 2003). Cooper et al. (2007) found no increase of desirable forbs for sage grouse following prescribed fire, but did find a significant increase in exotic forb and grass species following burns.

Once sagebrush is eliminated from the landscape through habitat projects, its recovery can be problematic. Re-establishment of big sagebrush is particularly problematic, as drought stress is particularly acute and seedlings may only become established in unusually wet years or microhabitats. (Lysne 2005, Shaw et al. 2005).

While Beck and Mitchell (1997) recommended against sagebrush control projects when canopy cover is less than 20 percent, and recommend against any sagebrush control within 2 miles of leks, projects have been put forward in the name of habitat improvement when canopy cover is less than this threshold, and where the proposed treatment is closer to lek sites.

The recovery of sagebrush "treatment" areas is further complicated by livestock grazing, which can hamper the establishment of native plants and spread the seeds of noxious weeds such as cheatgrass. Lambert (2005) recommended protecting re-seeded areas from livestock grazing for no less than 3 to 5 years. However, this standard is virtually never adhered to in practice in the West, where virtually every acre of public land falls within a grazing allotment.

The PECE Policy and Various Sage Grouse Conservation Strategies

The U.S Fish and Wildlife Service may consider the Policy for Evaluating Conservation Efforts ("PECE Policy") when considering whether listing is warranted. Implementation must be certain and the proposed plan in question must be known to be effective. While there have been a multitude of local and state sage grouse plans that have been promulgated by various working groups, very few of these contain conservation measures of known effectiveness and very few provide certitude that the conservation measures will be undertaken. Indeed, most rely on voluntary measures that may or may not be applied on a discretionary basis. Connelly and Braun (2007b, Attachment 53) provide a useful yardstick for measuring the effectiveness of sage grouse conservation plans; the plans that we have reviewed do not pass muster when measured by this yardstick.

Current State of Wyoming Sage Grouse Policy

At present, the state of Wyoming is implementing its 2003 Wyoming Greater Sage-grouse Conservation Plan through its newer 2007 Sage Grouse Habitat Management Guidelines for Wyoming. Attachment 39. These ability of these state policies to meet the requirements to qualify for consideration under the PECE policy are as follows:

<u>The certainty that the conservation effort will be implemented</u>

1. The conservation effort; the parties to the agreement or plan that will implement the effort; and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified.

No – Broad guidelines for vegetation treatment are provided. They are nonbinding suggestions only, and no assurances are provided that implementation will occur. 2003 plan is based on implementation by Local Working Groups, which by their charter can only advance nonbinding recommendations.

2. The legal authority of the parties to the agreement or plan to implement the formalized conservation effort, and the commitment to proceed with the conservation effort are described.

The guidelines provided are nonbinding recommendations, and implementation plans are not addressed in detail.

3. The legal procedural requirements necessary to implement the effort are described, and information is provided indicating that fulfillment of these requirements does not preclude commitment to the effort.

As nonbinding guidelines, there do not appear to be any binding requirements or authority to enforce same.

4. Authorizations (e.g. permits, landowner permission) necessary to implement the conservation effort are identified, and a high level of certainty is provided that the parties to the agreement or plan that will implement the effort will obtain these authorizations.

Specific details are not provided in either plan or guidelines.

5. The type and level of voluntary participation (e.g. by private landowners) necessary to implement the conservation effort is identified, and a high level of certainty is provided that the parties to the agreement or plan that will implement the conservation effort will obtain that level of voluntary participation.

Provisions for private landowner participation are not outlined in detail.

6. Regulatory mechanisms (e.g. laws, regulations, ordinances) necessary to implement the conservation effort are in place.

No regulatory mechanisms exist.

7. A high level of certainty is provided that the parties to the agreement or plan that will implement the conservation effort will obtain necessary funding**.**

Assurances of funding are not provided by these documents.

8. An implementation schedule (including completion dates) for the conservation effort is provided.

No schedule is provided.

9. The conservation agreement or plan that includes the conservation effort is approved by all parties to the agreement or plan.

Appears to be solely approved by the Wyoming Game and Fish Department, may be binding on other state agencies.

<u>The certainty that the conservation effort will be effective</u>

1. The nature and extent of threats being addressed by the conservation effort are described.

Yes – basic literature review of many (but not all) threats is provided. Although not comprehensive, these documents provide a credible literature review of the subjects that are covered.

2. Explicit incremental objectives for the conservation effort and dates for achieving them are stated.

No explicit objectives are provided; no timetable is in evidence.

3. The steps necessary to implement the conservation effort are identified in detail.

Due to a lack of specificity, a stepwise implementation plan cannot be inferred.

4. Quantifiable, scientifically valid parameters that will demonstrate achievement of objectives, and standards for these parameters by which progress will be measured, are identified.

Some parameters for vegetation monitoring and implementation success are provided. Grazing portions of these policies have yet to be identified and developed. In a general sense, monitoring of post-treatment populations is recommended.

5. Provision for monitoring and reporting progress in implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided.

Monitoring recommended for 10 years post-treatment using 3-year moving averages.

6. Principles of adaptive management are incorporated.

Adaptive management can be inferred based on recommendation to implement changes in management direction based on monitoring.

State of Wyoming Core Area conservation plan

The State of Wyoming is likely to advance a policy of Core Area identification as a means to sage grouse recovery, and recommendations have been advanced by a stakeholder Sage Grouse Implementation Team (SGIT). Attachments 6, 7. The Core Areas identified encompass parts of the 4-mile buffers around the sage grouse leks that make up 75% of the breeding male population for the state. See Attachment 36.

Portions of the largest (75% of population) leks are explicitly excluded from the Core Areas even though they contribute importantly to the overall statewide population; we are told that this is a political concession to the oil and gas industry to exclude key sage grouse areas that are presently leased for oil and gas development and/or are slated for energy projects over the near term. Notable exclusions of large lek habitats include the Powder River Basin, where less than half of the large lek habitats appear to fall within proposed Core Areas, parts of the Pinedale Anticline, and parts of the Continental-Divide – Creston field. However, it is equally clear that some Core Areas are presently slated for heavy oil and gas development, including the Atlantic Rim coalbed methane project area, and these areas will see major impacts. We understand that up to a third of core areas would be expected to see some industrial development in the future.

The wording of the SGIT recommendations is very ambiguous with regard to how exactly sage grouse management would occur both inside and outside the Core Areas.

Within the core areas, an activity could occur "only when it can be demonstrated that the activity would have no negative effects on sage grouse." Attachment 6 at 1. This would be a very stringent requirement <u>if</u> actually applied rigorously. Based on the results of Holloran (2005), this means that drilling in nesting habitat would need to be no denser than 699-acre spacing, and active drilling would not be allowed within 3.1 miles of a sage grouse lek during nesting season and no producing wells would be allowed to be drilled 1.9 miles or closer to a sage grouse lek. We suspect, based on conflicting language within the recommendations, that there may be no intention of fulfilling this rigorous recommendation. For instance, within Core Areas, management would rely on "non-regulatory measures;" it would not be possible to regulate well densities and distances from leks without regulatory measures. *See Id.* at 2. In addition, reliance on Controlled Surface Use Stipulations (which apply to rather negligible issues like what color to paint the tank batteries) rather than No Surface Occupancy stipulations (which would be needed

to enforce the distances of producing wells from the lek site). Thus, it appears that the aspirational language on p.1 of the recommendations is undermined by the nuts-and-bolts direction on page 2.

By protecting the lands within 4 miles of the most populous sage grouse leks, the core area recommendations fail to provide adequate habitat protection for migratory sage grouse populations, which may move farther than 4 miles miles from the lek site to nest. The problem is even more severe as regards winter range for migratory sage grouse populations. In a western Wyoming study, however, sage grouse were migratory and traveled at least 35 km to separate wintering grounds (Berry and Eng 1985). In Colorado's North Park, Beck (1977) found that grouse migrated 5-20 km away from breeding areas during winter. In a southeastern Idaho study, Connelly et al. (1988) found that some adult sage grouse moved more than 60 km to winter range, and some juveniles moved more than 80km, despite the availability of suitable wintering habitat nearby. In an Idaho study, subadult sage grouse from migratory populations had significantly greater mortality rates than subadults from nonmigratory populations (Beck et al. 2006). From this it can be inferred that migratory populations are even more vulnerable to human induced impacts.

The state's plan does not do anything to maintain connectivity between core areas, which means that populations in Core Areas could be subject to genetic isolation and extirpation from stochastic events such as drought or West Nile virus. If populations in Core Areas become extirpated, the ability of grouse to repopulate these areas is therefore hampered.

The Core Area policy also appears to write off sage grouse populations outside the Core Areas in favor of accelerated development permitting (and potentially the waiver of already weak sage grouse lease stipulations) there, which means that a third or more of the already-reduced Wyoming population is placed at greater risk. Rather than settling for additional sage grouse population reductions beyond those already suffered by the species, we would submit that the appropriate benchmark should be increases in populations and expansions in occupied range in Wyoming. The statement that "Development scenarios should attempt to maintain populations, habitats and essential migration routes outside Core Population Areas wherever possible" (Attachment 6 at 2) offers only the coldest of comforts. The loose wording allows token efforts known to be ineffective to be pursued here, and also permits decisionmakers to make the judgment call that maintaining populations and habitats is simply not possible, thereby obviating project proponents from taking any sage grouse conservation measures whatever. The approach of trading off sage grouse conservation in core areas for unbridled development outside them is not unique to Wyoming. According to WAFWA, the oil and gas industry is seeking waiver of stipulations in some areas in response to stricter requirements in other areas: "Colorado is willing to consider possibly "sacrificing" some areas to enable investment in other areas. And then we'd have the opportunity to go back to these sacrificed areas later to invest in improvement" (WAFWA 2006b:7).

For these reasons, the state Core Area model as currently articulated actually provides protection to oil and gas interests rather than sage grouse, and is likely to result in continued and additional population and habitat impacts that further depress sage grouse populations from their already

dangerously low levels. There is a lack of specificity in the plan as to what conservation measures will (or will not) apply both inside and outside Core Areas, without which the outcome of the policy, though it clearly portends continued declines for sage grouse, remains in doubt. Thus, from a PECE Policy standpoint, there is not enough information to evaluate the effectiveness of this proposal at this point.

Why the Collaborative Processes Have Failed to Provide Solutions

Many sage grouse conservation efforts are failing due to misplaced goals. State wildlife officials have acknowledged that the primary focus of Cooperative Sagebrush Initiative has been on listing avoidance (WAFWA 2006b), rather than sage grouse recovery. I attended one of the first South-Central Local Working Group meetings, where Tom Christiansen of the WGFD explicitly stated that the goal of the Local Working Groups was to undertake sage grouse projects with the end goal of providing a sufficient body of evidence to prevent the USFWS from listing the grouse. Such efforts to undermine the listing process, instead of focusing on addressing the well-known problems facing the sage grouse and promote their recovery, threaten to turn the PECE policy into a meaningless bureaucratic exercise while producing negligible positive outcomes for the bird.

Local Working Groups

The working-group approach, as employed by the Local Working Groups as well as the State of Wyoming's Sage Grouse Implementation Team, has a fatal flaw. By requiring a consensus to be reached before actions are adopted, each member of the working group has veto power that can be wielded against any proposal that would inconvenience their own interest. The oil and gas industry advertises (with misplaced pride) that it is represented on essentially all of the Local Working Groups where oil and gas development is a foreseeable issue. They have been using their participation in each of these venues to block proposals that would require changes or restrictions of oil and gas development. *See*, e.g., analysis of Local Working Group participants in Attachment 56 ("Management by concensus [sic] does not work if energy, mining, and agriculture interests are not willing to sacrifice production/economic potential to ensure habitat is maintained….I have low confidence that this effort (local working groups writing conservation plans) will result in substantive changes that will maintain sagebrush habitats.") and Attachment 57 ("The biggest problem is business as usual with the oil and gas development. I've seen no evidence they are willing to slow or scale back development."). Because the very interest groups that are causing the impacts to sage grouse are permitted to block conservation measures that might inconvenience them, the real problems go unaddressed while the measures that move toward approval are the small-scale or non-binding measures on which every interest group can agree. Thus, the end product is political compromise instead of a biological solution, and the output of these collaborative groups does more to protect entrenched interests than to protect the sage grouse.

Conservation interests have tended to be underrepresented and often marginalized in the Local Working Group setting, and Local Working groups are often heavily populated by representatives of consumptive user groups. *See* Attachments 54a, 54b, outlining problems with the Wind River – Sweetwater River LWG in Wyoming. For this reason, the agenda of

commercial users of the land have tended to weigh much more heavily in Local Working Group discussions than the agenda of individuals and groups dedicated to sage grouse conservation.

According to the statewide charter for Wyoming local working groups, plans and recommendations of these groups are advisory only and do not constitute decisionmaking processes (*see* Attachment 40). The concern that recommendations are advisory only, and that agencies that do have the authority to implement them will not, is echoed by Local Working Group participants. *See* Attachment 55. Detailed analysis of several of Wyoming's Local Working Group plans show that very few of the recommendations and/or commitments outlined in them even qualify for PECE consideration. *See* Attachments 49, 50.

Sage grouse working groups of all stripes have repeatedly placed the emphasis on "acres treated" and "putting more rocks in the box," a quantitative approach to sage grouse habitat management that ignores the qualitative issue of whether sage grouse habitat treatments are improving or degrading sagebrush habitats. According to Tony Apa of the Colorado Division of Wildlife,

> "When the decision is placed before a judge about listing, the question is going to be raised: 'How much acreage have you protected?' That's not to say that research isn't important, it's just that when we're asked about what we have done, what we're doing for sage-grouse, and how we've benefited the species or the habitat. We'll need to be pointing to something tangible"

(WAFWA 2006b: 12).

Similarly, some interest groups would like dollar amounts spent to substitute for real biological results on the ground. For example, EnCana is fond of touting the $26 million it is spending through its Jonah Interagency Office to compensate for the 33,000 acres of sage grouse habitat the company is destroying in its Jonah Field leaseholds. But one symposium speaker cautioned,

> "Tracking number of acres protected and dollars expended may index partner activity, but provides no direct evidence of a population response to those efforts and expenditures, leaving the Strategy open to criticism for how $431 million will be spent. Simply put, the Strategy must do more than assess lek trends across Management Zones in the next 5-10 years."

Attachment 31 at unnumbered 5. This encapsulates the reason why the Local Working Groups' efforts, to which virtually all state and federal agencies defer, have resulted in negligible conservation benefits for the sage grouse overall.

Federal Strategies

Yet another shortcoming that crops up in the federally-driven conservation strategies is the tendency to restrict conservation actions to commitments to coordinate and meet with other agencies, with no on-the-ground management standards in sight. The BLM Sage Grouse Conservation Stategy epitomizes this approach. WAFWA has observed, "One of [the] assumptions is 'The "Habitat Restoration Sub-team' is assuming that we are only to develop strategies, not to

implement them" (WAFWA 2006b: 42). The BLM's national Sage Grouse Conservation Strategy fits this description to a T; indeed, it is not a strategy at all. It merely states vague intentions to collaborate with other stakeholders and perform some unspecified types of habitat manipulations (which may or may not benefit or harm the grouse).

Real Solutions are Needed

We support the three-tiered WAFWA approach to sage grouse conservation and recovery as the legitimate blueprint for sage grouse recovery: (1) protect the robust populations we have; (2) save the populations currently facing threats; and (3) recover populations that have been extirpated. Unfortunately, there are no current management frameworks that have been proposed in Wyoming that accomplish all three of these goals. The Governor's core area proposal as currently envisioned (Attachments 6 and 7) comes closest (demonstrating how weak competing conservation strategies are), but would only partially address the first goal and leave the other two goals completely unaddressed; by contrast, plans from the Local Working Groups, industry consortia, the Wyoming Landscape Conservation Initiative, and current and proposed BLM Resource Management Plans offer little or no hope of achieving even one of these goals.

However, there is plenty of scientific knowledge that would make these goals attainable; what is lacking is the political will to make fundamental changes in land-use policies to allow for sage grouse conservation in the context of other land uses. Essentially, the inflexibility of the energy industry, paired with the deference of state, local, and federal agencies to their whims, is currently an obstacle to sage grouse conservation and recovery. Due to the political impasse that presently blocks sage grouse recovery efforts, the listing of the sage grouse as Threatened or Endangered is needed to break the logjam and create the opportunity for real conservation progress.

Scientists have made a multitude of science-based recommendations to halt or slow the decline of sage grouse populations and/or reverse the trends and recover the species. These recommendations are systematically being ignored by the land and wildlife management agencies that have the authority to influence sage grouse population trends. According to WAFWA, two of the five "Primary issues" that have been identified were "Need for better Regulation of Public Land Use" and "Need to Implement better Habitat Conservation & Land Use Practices" Attachment 32 at slide 12. These priorities are likely the most important yardsticks for evaluating conservation efforts in Wyoming, where oil and gas development is the greatest current threat to sage grouse population persistence.

Setting aside large-scale reserves with strong protections for sage grouse is a recurring theme in the sage grouse scientific literature. Sage grouse are a species that require large expanses of unimpacted, continuous sagebrush habitat (Clait Braun, pers. comm.). According to Knick et al (2003: 623), "To develop this network of reserves, we need to prioritize the landscape by identifying and providing protection or other appropriate management to those relatively large areas of sagebrush in good condition. We then need to enlarge existing protected blocks, increase connectivity in the landscape, and employ basic principles of landscape management to ensure long-term survival of sagebrush habitats and birds." Holloran (2005) also recommended setting aside large reserves free of development to serve as population sources for recolonization of

areas where sage grouse had been extirpated by oil and gas development. The Heart of the West Conservation Plan was developed with sage grouse as a focal species, identifying core habitats and connections to maintain wildlife on a landscape scale (Jones et al. 2003, *and see* Jones et al. 2006). Paige and Ritter (1999:20) outlined ideas for how a reserve system might be made to function:

> "To benefit sage grouse and sharp-tailed grouse, maintain large expanses of sagebrush habitat. Summer sage grouse home ranges vary from 3 to 7 km2 (1 to 2.5 mi2) and may be larger in fragmented habitats. However, this area may be insufficient for year-long habitat use, and surveying the seasonal movements and winter habits of local sage grouse populations will better define a population's area requirements. Sage grouse winter home ranges may exceed 140 km2 (53 mi2). Large expanses of sagebrush across a landscape with stands of 10% to >20% canopy cover and tall shrubs (25 to 20 cm; 10 to 12 in) provide winter habitat."

However, as Rowland et al (2006:6-25) observed, "Despite decades of observational study and research on greater sage-grouse, some questions remain unanswered, such as how large a block of intact sagebrush habitat is required for population persistence" (internal citations omitted).

A second key point is prevent the loss of sage grouse populations currently at risk due to human induced activities. WAFWA Forum participants (WAFWA 2006b), in the context of mineral development, recommended: "Develop no 'net loss' criteria and methods to accurately assess current habitat/population status, potential impacts and mitigation needs (e.g. habitat equivalency, mitigation ratios, mitigation banking), and mechanisms for implementation." Final Forum Report, Appendix 2 at 38. The producible measure of success in this regard is listed as "Favorable trend in AREA of available habitat and ABUNDANCE of Greater Sage-grouse." Id at 39, emphasis in original. This is the right goal statement; unfortunately, current land-use policy rangewide and in Wyoming is not setting the standards needed to achieve these goals.

In the context of oil and gas development, a multitude of sound recommendations have been advanced by the scientific community to render full-field development more compatible with sage grouse conservation. The *Blueprint for Sage Grouse Conservation and Recovery* provides useful measures. Attachment 20. Connelly et al. (2000) recommended keeping energy facilities at least 3.2 km away from sage grouse lek sites. The problem is that state and federal agencies have been reluctant to impose such measures in the context of land-use decisionmaking, preferring to continue with outmoded protection measures rather than requiring Best Management Practices and new, scientifically supported protection measures.

Conclusion

Thank you for considering these comments in your greater sage grouse ESA listing process. We incorporate into our comments by reference all articles referenced or appended to these comments, and urge the USFWS to duly consider this scientific and technical information when rendering a listing decision for the greater sage grouse. There is an additional study regarding impacts to sage grouse in the Powder River Basin and throughout Wyoming which is slated to be

released in fall 2008 – the PhD Dissertation of Kevin Dougherty from the University of Montana – which was originally slated to be available prior to the end of the comment period but the release of which has been delayed. We will forward this study to the USFWS as soon as they become available, and would ask the USFWS to consider them in making their listing decision. Please keep us informed of any future decisions regarding this process.

Sincerely yours,

Erik Molvar
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Signing on behalf of

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List of Attachments

1. 2007 Local Working Group Survey, Biologist, Wind River – Sweetwater River LWG
2. Neilson et al. 2006. Global warming impacts on sage grouse habitat
3. Rowland et al. 2006. Wyoming Basins Ecoregional Assessment
4. Naugle et al. 2006. Sage grouse winter habitat report
5. Photo of Jonah Field, 5 to 10 acre well spacing
6. State of Wyoming Core Area recommendations, Sage Grouse Implementation Team
7. Maps accompanying Wyoming Core Area proposal
8. Naugle et al. 2004 West Nile Virus study
9. Press release, Montana State Univ. regarding Culex mosquitoes, WNv, CBM ponds, and sage grouse
10. Spreadsheet of BLM wind projects, Wyoming, as of May 2008.
11. USFWS recommendations on wind turbine siting
12. State of Wyoming map showing overlap of oil shale leasing areas and sage grouse leks.
13. Braun, C.E. 2006. Blueprint for sage grouse conservation and recovery
14. Walker et al. 2008. Greater sage-grouse population response to energy development and habitat loss, manuscript
15. Holloran. 2005. Greater sage-grouse response to natural gas development in western Wyoming, PhD Dissertation
16. WGFD "best science" report on oil and gas impacts to sage grouse
17. USFWS comments on Atlantic Rim CBM project
18. Beck 2006. Oil and gas impacts on prairie grouse.
19. The Western Heritage Alternative for the Rawlins RMP revision
20. Connelly, J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. Wildl. Soc. Bull. 28:967-985.
21. News article: Protections for grouse criticized, Rawlins Daily Times
22. Op-Ed from LWG member: Listing may be only way to save the grouse
23. Doherty et al. 2008. sage grouse winter habitat and energy development
24. Proposal from Bighorn Basin LWG for funding of sage grouse habitat manipulation project
25. Braun response to Bighorn Basin LWG funding proposal
26. Braun et al. 2005. Sage grouse habitat requirements
27. Minutes of Wyoming Sage Grouse Implementation Team, July 31, 2007
28. Cooper et al. 2007. sagebrush recovery from fire
29. Baker. 2007. Fire and Restoration of Sagebrush Ecosystems, manuscript
30. Elko County Sagebrush Ecosystem Conservation Strategy
31. Ecological Society of America Implementer Comments
32. WAFWA Sage grouse conservation strategy PowerPoint
33. Aldridge et al. 2008. Range-wide patterns of sage-grouse persistence
34. Rowland. 2004. Effects of management practices on sage grouse
35. Casper Star-Tribune: Sage grouse slipping away
36. Map of sage grouse lek populations, Kevin Doherty
37. Wind River – Sweetwater River LWG Sage Grouse Conservation Plan
38. Bates Hole – Shirley Basin LWG Sage Grouse Conservation Plan

39. WGFD Sage grouse habitat management guidelines, 2007
40. Wyoming Charter for Sage Grouse Local Working Groups
41. Southwest Wyoming LWG Conservation Assessment
42. Wyoming Oil and Gas Statistics fact sheet, Biodiversity Conservation Alliance
43. Upper Green River Basin LWG Sage Grouse Conservation Assessment
44. Northeast Wyoming LWG Sage Grouse Conservation Plan
45. PowerPoint, BLM Sage Grouse Plan Amendment Interim Management meeting, Buffalo Field Office, May 28, 2008
46. Energy development chart, Wyoming and neighboring states
47. Chart of Leasing activity in the Bighorn Basin, Wyoming
48. Walker. 2008. Greater sage-grouse response to coal-bed natural gas and West Nile virus in the Powder River Basin, PhD Dissertation
49. Northeast Wyoming LWG Plan PECE analysis chart
50. South Central Wyoming LWG Plan PECE analysis chart
51. Map of recent Bighorn Basin oil and gas leasing activity
52. Bighorn Basin LWG Conservation Plan
53. Connelly and Braun 2006. Measuring success of sage-grouse conservation plans
54. (a,b) Critique of Wind River Sweetwater River Local Working Group, David Leib, LWG member
55. Declaration of Barbara Parsons, South Central Wyoming LWG member
56. Survey response, anonymous Bighorn Basin LWG member
57. Survey response, South Central Wyoming LWG member