**National Headquarters**
1130 17th Street, N.W. | Washington, D.C. 20036-4604 | tel 202.682.9400 | fax 202.682.1331
**www.defenders.org**

Submitted via electronic mail to blm_co_nw_sage_grouse@blm.gov

December 2, 2013

NEPA Coordinator
Bureau of Land Management
Northwest Colorado District
2815 H Road
Grand Junction, Colorado 81506

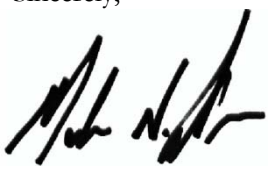
**RE: Comments on the Northwest Colorado Greater Sage-Grouse Draft Land Use Plan Amendment and Environmental Impact Statement**

Dear NEPA Coordinator:

Please find attached our comments on the Northwest Colorado Greater Sage-Grouse Draft Land Use Plan Amendment and Environmental Impact Statement. Defenders of Wildlife ("Defenders") is a national, non-profit, public interest conservation organization with more than one million members and supporters. Defenders has been substantively involved in wildlife management in Colorado, including conservation of greater sage-grouse and sagebrush habitat.

Thank you for this opportunity to submit comments on the draft plan and environmental impact statement.

Sincerely,



Mark N. Salvo
Federal Lands Policy Analyst

Greater sage-grouse (*Centrocercus urophasianus*) are a sagebrush obligate species whose range has been significantly reduced with the loss of sagebrush steppe. Greater sage-grouse distribution has decreased by 44 percent (Schroeder et al. 2004) and populations have experienced long-term declines (Connelly and Braun 1997; Connelly et al. 2004; Anonymous 2008). The U.S. Fish and Wildlife Service (FWS) determined that greater sage-grouse warranted listing under the Endangered Species Act (ESA) in March 2010 (although listing was precluded by other, higher priorities) (75 Fed. Reg. 13910). Greater sage-grouse are now a candidate species. The FWS will either propose to list sage-grouse under the ESA or determine the species is "not warranted" for protection by fiscal year 2015.

Sage-grouse are a landscape species that use a variety of sagebrush habitats throughout the year (Connelly et al. 2004; Connelly et al. 2011a). Large, interconnected areas of sagebrush steppe must be conserved if sage-grouse are to persist (Connelly et al. 2011b). Most remaining sage-grouse habitat is publicly owned, most of it managed by the federal government (Knick 2011). Historic patterns of land use, conflicting management policies and demand for resources on these lands have left little sagebrush steppe protected. Less than one percent of sage-grouse current range is within wilderness or other protected areas (Knick 2011).

Federal departments and agencies manage more than 70 percent of remaining sagebrush steppe. Although cooperation among many federal and state agencies and private land owners will be necessary to conserve sage-grouse and sagebrush habitat (Stiver et al. 2006), the federal government and federal public land are key to achieving these goals. Federal agencies must prioritize sagebrush conservation if sage-grouse are to persist (Connelly et al. 2011a).

Developing and implementing conservation strategies at regional or landscape scales will have the greatest benefit for sage-grouse and their habitat (*see* Doherty et al. 2011). Protecting large expanses of sagebrush steppe and current populations of greater sage-grouse are the highest priority (Connelly et al. 2011a; Wisdom et al. 2005b). Given the importance of public lands to sage-grouse conservation; the sensitivity of these lands to disturbance, longer recovery periods and variable response to restoration; and their susceptibility to invasion by exotic plants (Knick 2011), land uses that negatively affect these lands should be avoided or prohibited in key habitat areas to conserve sage-grouse habitat. Establishing a system of habitat reserves in sagebrush steppe will also help conserve essential habitat and ecological processes important to sage-grouse conservation.

The FWS described a lack of adequate regulatory mechanisms to conserve sage-grouse as a primary factor for determining the species warranted listing under the ESA. The FWS further identified Bureau of Land Management (BLM) resource management plans (RMPs) as the principle mechanism for the BLM to regulate land management to conserve sage-grouse. The BLM (and Forest Service) initiated a National Greater Sage-Grouse Planning Strategy (www.blm.gov/sagegrouse) to amend RMPs and Forest Service land use plans with sage-grouse conservation measures, and potentially preclude the need to list the species under the ESA. These plan amendments should strive to establish large, viable, well-distributed sage-grouse populations, and maintain and restore sufficient quality habitat to sustain the species.

Noting the need to address the "[i]nadequacy of regulatory mechanisms...as a significant threat...to sage-grouse," the stated purpose of and need for the Northwest Colorado Greater Sage-Grouse Draft Land Use Plan Amendment and Environmental Impact Statement (NW CO DLUP/EIS) is

> ...to ensure that the BLM and [Forest Service] have adequate regulatory mechanisms in its (sic) LUPs for consideration by [the Fish and Wildlife Service] a year in advance of its anticipated 2015 listing. USFWS identified the principal regulatory mechanisms for the BLM and the USFS as conservation measures embedded in LUPs. Changes in management of GRSG habitats are necessary to avoid the continued decline of populations that are anticipated across the species' range (6).

The proposed alternatives were formulated in response to issues and concerns identified through public scoping, and in an effort to maintain or increase sage-grouse abundance and distribution by conserving, enhancing, or restoring the sagebrush ecosystem upon which populations depend…" (33); the alternatives are intended to meet to purpose and need of the NW CO DLUP/EIS (34; 40).

Unfortunately, the preferred alternative would fail to implement conservation measures needed to conserve sage-grouse, according to the best available information on the species and its habitat. The preferred alternative would not prohibit new surface disturbance nor impose a density cap on development in sage-grouse priority habitat; would fail to specially protect sage-grouse winter habitat; proposes inadequate protections for sage-grouse from fluid minerals development (on both leased and unleased parcels); would fail to prescribe stricter standards for livestock grazing in sagebrush steppe; declines to adopt cohesive plans for combatting cheatgrass (*Bromus tectorum*) incursion or ameliorating the effects of climate change on sage-grouse; and would not prohibit wind energy development in sage-grouse priority habitat (*see* Table 1, "Sage-Grouse Conservation Issues in the Northwest Colorado Greater Sage-Grouse Draft Land Use Plan Amendment and Environmental Impact Statement").

Following are additional comments on the adequacy of sage-grouse conservation measures in the NW CO DLUP/EIS.

**Rights-of-Way**

The preferred alternative would "avoid" granting new rights-of-way in priority sage-grouse habitat, and otherwise exclude construction of large transmission lines in these areas, except for 68,000 acres (146, Table 2-4, NTT 10) that is apparently part of the preferred route for the TransWest Express 600-kV Direct Current Transmission Project (see Appendix 1, Map). This priority habitat may be essential for sage-grouse conservation. The distinction between transmission "avoidance" and "exclusion" areas should be based entirely on biological criteria and habitat value rather than on the perceived need to expedite development of the TransWest project. These habitat classifications are intended to safeguard sage-grouse populations and habitat; they should not be used as a means to prioritize development areas. Please see our comments on the TransWest project in Appendix 1.

**Livestock Grazing**

Livestock grazing is considered the single most important influence on sagebrush habitats and fire regimes throughout the Intermountain West in the past 140 years (Knick et al. 2005: 68). Grazing is the most widespread use of sagebrush steppe and almost all sagebrush habitat is managed for grazing (Connelly et al. 2004; Knick et al. 2003; Knick et al. 2011).[1] Livestock grazing disturbs the soil, removes native vegetation, and spreads invasive species in sagebrush steppe (Knick et al. 2005). Cattle or sheep grazing in sage-grouse nesting and brood-rearing habitat can negatively affect habitat quality; nutrition for gravid hens; clutch size; nesting success; and/or chick survival (Connelly and Braun 1997; Beck and Mitchell 2000; Barnett and Crawford 1994; Coggins 1998; Aldridge and Brigham 2003). Livestock may directly compete with sage-grouse for grasses, forbs and shrub species; trample vegetation and sage-grouse nests; disturb individual birds and cause nest abandonment (Vallentine 1990; Pederson et al. 2003; Call and Maser 1985; Holloran and Anderson 2003; Coates 2007). The potential conflict between livestock grazing and sage-grouse intensifies near riparian and mesic habitats due to the importance of these areas to sage-grouse, particularly during brood-rearing and in summer. Heavy cattle grazing near springs, seeps, and riparian areas can remove grasses used for cover by grouse (Klebenow 1982). Connelly et al. (2007), citing Coggins (1998) and Beck and Mitchell (2000), stated that "[t]he large number of documented negative impacts of livestock grazing in sagebrush shrub steppe appears to neutralize or outweigh any positive effects." Manier et al. (2013) describe multiple effects of grazing on sagebrush steppe.

Current grazing management in the planning area may be deleterious to sage-grouse. Of the 581,000 acres of priority habitat on BLM-administered lands in the planning area for which spatial land health data are available, only 308,700 acres (53 percent) were found to meet land health standards (280). Of the 1,121,900 acres of all designated sage-grouse habitat on BLM-administered lands in the planning area for which spatial

[1] One expert contended that the "livestock industry has had [a] more negative impact on sage-grouse than any other single factor" and "[i]t's rare to find any place that hasn't been grazed" Hudak (2007: 28-29).

data are available, only 503,900 acres (45 percent) were found to meet land health standards (280). (These data do not include the Kremmling and White River field offices, 280).

Even where grazing is meeting rangeland standards and guidelines, habitat may be unsuitable to support sage-grouse. Current standards and guidelines are not based on ecological site potential, do not prescribe a maximum forage utilization level of 25 percent, do not specifically require grazing to maintain ≥18 cm grass height in sage-grouse nesting and brooding-rearing habitat, and do not proscribe grazing where cheatgrass occurs in sagebrush steppe (*see* Table 1). Given past grazing management, the lack of unambiguous and unequivocal grazing standards, and the multitude of negative effects on sage-grouse, the BLM (and Forest Service) should consider reducing or eliminating grazing in essential sage-grouse habitat to conserve the species.

Most grazing on BLM lands occurs within grazing districts established by the Taylor Grazing Act of 1934 (43 U.S.C. § 315). The act required the Secretary of Interior to determine that lands within grazing districts were "chiefly valuable" for livestock grazing (43 U.S.C. § 315). However, the Secretary can also separately conclude that any lands within grazing districts are "more valuable or suitable for any other use than for [grazing]" (43 U.S.C. § 315f). To meet the purpose and need of the NW CO DLUP/EIS, the Secretary should reconsider whether sage-grouse habitat, or a subset of extant habitat (e.g., priority habitat), in grazing districts is still "chiefly valuable" for grazing as opposed to other priorities, such as sage-grouse conservation. The Secretary can adjust boundaries of grazing districts to exclude grazing where it may continue to harm the species.

**Cheatgrass**

The NW CO DLUP/EIS acknowledged that sagebrush communities are "highly susceptible to cheatgrass...invasion" (275), cheatgrass is "commonly found" in sage-grouse habitat (279), and that many lower-elevation grasslands are dominated by cheatgrass (276). Drought has contributed to increased occurrence of cheatgrass within the planning area (282). Cheatgrass is of particular concern in lower elevation and degraded areas associated with "historic overgrazing" and other factors (279, 280). Cheatgrass is believed to have contributed to declines in a local sage-grouse population (256). Almost all sage-grouse habitat in the planning area has a high potential for cheatgrass invasion (279, Table 3-22) and lower elevation sagebrush communities are exhibiting a downward trend due, in part, to cheatgrass incursion (283).

Noxious weeds were identified as a planning issue raised in scoping comments (as part of vegetation management) (xxviii, Table ES.2) and invasive species are among the seven issues addressed in the NW CO plan amendments (24). However, the NW CO DLUP/EIS, citing the Fish and Wildlife Service, also claims that weed infestations are not considered a top threat to sage-grouse in northwest Colorado (189, Table 2-6) and the preferred alternative does not include a cohesive program for addressing cheatgrass incursion. This omission could be detrimental to sage-grouse, given the presence of cheatgrass and its and many harmful effects on sage-grouse and sagebrush habitat in the planning area as documented in the NW CO DLUP/EIS, Manier et al (2013) and Bryce et al. (2012: 96-98).

**Climate Change**

Climate change may increase the rate and intensity of impacts on ecosystems so that some species and habitats may not be capable of adapting at the same pace (386). Climate change may be contributing to the spread of cheatgrass in the planning area (291). Climate largely influences soil development processes; soil characteristics, in combination with climate, determine whether sagebrush can exist in a given location (364). Climate change may compound the effects of other factors on wildlife, including invasive species, pests, and diseases, and frequency and intensity of wildfires (386).

The cumulative impacts of these and other stressors could cause local species extirpation, including sage-grouse populations (386; 804). Increased temperatures predicted by the Colorado Plateau Rapid Ecological Assessment Report (Bryce et al. 2012) (the NW CO DLUP/EIS stated the REA's findings are applicable to the entire planning area, 386) could reduce sagebrush cover across northwest Colorado, affecting sage-grouse

(386; 805). Many of these effects will occur within the next 50 years (*see* 386), a timeline often used as the "foreseeable future" for listing decisions under the Endangered Species Act.

The NW CO DLUP/EIS identified climate change as a planning issue raised in scoping comments (xxviii, Table ES.2), but dropped climate change from further consideration in the land use plan amendments (23-24), contending that "there is no resource program in an RMP for addressing this threat to [sage-grouse] and its habitat" (38, Table 2-1; 190, Table 2.6). It is both inappropriate for the plan to disregard climate change—a major threat to sage-grouse—and contrary to Secretarial direction to agencies to consider climate change in management planning (Secretarial Order 3289, 02-22-2010).

The BLM does not need a specific resource program to address climate change. Basic conservation measures implemented across multiple, existing programs that increase habitat resiliency, protect soil resources, and prevent the spread of invasive plants would all ameliorate the effects of climate change on sage-grouse. For example, the NW CO DLUP/EIS reviews the effects of climate change on riparian areas that are important brood-rearing habitat for sage-grouse (805); the BLM could easily devise management prescriptions to address impacts based on that analysis within the existing management framework.

Finally, the BLM has initiated a major effort to assess the status of and threats to ecosystems it manages, including the potential effects of climate change (*see* Bryce et al. 2012; 386). Failing to incorporate these data into sage-grouse conservation plans is a waste of this important initiative. The NW CO DLUP/EIS should account for the predicted effects of climate change on sage-grouse in management alternatives, and then evaluate the potential effectiveness of each alternative to ameliorate this threat to sage-grouse.

**New Information**

Planning criteria for the NW CO DLUP/EIS assures that the planning process "will endeavor to use current scientific information" to develop management strategies (xxx; 24; 25). The following new information related to sage-grouse and sagebrush steppe was published during preparation of the NW CO DLUP/EIS and should be considered in the plan, as appropriate.

1. Beschta, R. L., D. L. Donahue, D. A. DellaSala, J. J. Rhodes, J. R. Karr, M. H. O'Brien, T. L. Fleischner, C. Deacon-Williams, Cindy. 2012. Adapting to climate change on western public lands: addressing the ecological effects of domestic, wild, and feral ungulates. Environmental Management, available at http://fes.forestry.oregonstate.edu/sites/fes.forestry.oregonstate.edu/files/PDFs/Beschta/Beschta_2012EnvMan.pdf.

    - Domestic livestock and other ungulates alter vegetation, soils, hydrology, and wildlife species composition and abundances that exacerbate the effects of climate change on western landscapes. Removing or reducing livestock grazing across large areas of public land would alleviate a widely recognized and long-term stressor and make ecosystems less susceptible to the effects of climate change.

2. Knick, S. T., S. E. Hanser, K. L. Preston. 2013. Modeling ecological minimum requirements for distribution of greater sage-grouse leks: implications for population connectivity across their western range, U.S.A. Ecology and Evolution, available at http://onlinelibrary.wiley.com/doi/10.1002/ece3.557/pdf.

    - Sage-grouse require sagebrush-dominated landscapes containing minimal levels of anthropogenic disturbance. Ninety-nine percent of remaining active sage-grouse leks were in landscapes with less than 3 percent disturbance within 5 km of the lek, and 79 percent of the area within 5 km was in sagebrush cover.

3. Patricelli, G. L., J. L. Blickley, S. L. Hooper. 2012. The impacts of noise on greater sage-grouse: a discussion of current management strategies in Wyoming with recommendations for further research

and interim protections. Unpublished report. Prepared for the Bureau of Land Management, Lander Field Office and Wyoming State Office, Cheyenne and Wyoming Game and Fish Department; available at http://www.wy.blm.gov/jio-papo/papo/wildlife/reports/sage-grouse/2012sgNoiseMon.pdf.

- Maximum noise levels from land use and development allowed under the Wyoming state sage-grouse core area policy near sage-grouse leks and other habitat are untested, may be difficult to measure, and may be too high to support sage-grouse conservation within and outside core areas.

4. Reisner, M. D., J. B. Grace, D. A. Pyke, P. S. Doescher. 2013. Conditions favouring *Bromus tectorum* dominance of endangered sagebrush steppe ecosystems. Journal of Applied Ecology, available at http://onlinelibrary.wiley.com/doi/10.1111/1365-2664.12097/pdf.

   - Cattle grazing exacerbates cheatgrass (*Bromus tectorum*) dominance in sagebrush steppe by decreasing bunchgrass abundance, shifting and limiting bunchgrass composition, increasing gaps between perennial plants, and trampling biological soil crusts. Grazing was also not found to reduce cheatgrass cover, even at the highest grazing intensities.

5. Copeland, H. E., A. Pocewicz, D. E. Naugle, T. Griffiths, D. Keinath, J. Evans, J. Platt. 2013. Measuring the effectiveness of conservation: a novel framework to quantify the benefits of sage-grouse conservation policy and easements in Wyoming. PLoS ONE 8(6): e67261. doi:10.1371/journal.pone.0067261. Available at www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0067261&representation=PDF.

   - Modeling indicates that the Wyoming sage-grouse core area conservation strategy, fully applied, plus $250 million invested in targeted conservation easements, would slow, but not stop projected sage-grouse population declines in the state. The Wyoming core area policy prohibits or restricts surface occupancy within 0.6 miles of sage-grouse leks, generally limits development to one site per 640 acres, and limits cumulative surface disturbance to 5 percent per 640 acres in core habitat.

6. Taylor, R. L., J. D. Tack, D. E. Naugle, L. S. Mills. 2013. Combined effects of energy development and disease on greater sage-grouse. PLoS ONE 8(8): e71256. doi:10.1371/journal.pone.0071256. Available at http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0071256.

   - The predicted cumulative impact of dense fluid minerals development (3.1 wells/km$^2$) and West Nile virus outbreaks on greater sage-grouse quadrupled inactivity at leks in northeast Wyoming compared to the individual impacts of development or disease. Noting the deleterious effects of cumulative impacts on sage-grouse, the researchers concluded that "conservation measures should maintain sagebrush landscapes large and intact enough so that leks are not chronically reduced in size due to energy development, and therefore vulnerable to becoming inactive due to additional stressors." They also advised "placing new developments outside of core [habitat] areas has the greatest likelihood of sustaining [sage-grouse] populations."

7. Blickley, J. L., K. R. Word, A. H. Krakauer, J. L. Phillips, S. N. Sells, C. C. Taff, J. C. Wingfield, G. L. Patricelli. 2012. Experimental chronic noise is related to elevated fecal corticosteroid metabolites in lekking male greater sage-grouse (*Centrocercus urophasianus*). PLoS ONE 7(11): e50462. doi:10.1371/journal.pone.0050462.

   - Anthropogenic noise from energy development and roads can cause greater sage-grouse to avoid otherwise suitable habitat and increase stress responses in birds that do remain, which could affect disease resistance, survival and reproductive success. The effects of noise from many common activities in the sagebrush biome significantly expands the human footprint on the landscape and impacts on sage-grouse.

| Table 1. Sage-Grouse Conservation Issues in the Northwest Colorado Greater Sage-Grouse Draft Land Use Plan Amendment and Environmental Impact Statement | |
|---|---|
| **Sage-Grouse Conservation Issue** | **NW CO DLUP/EIS (Preferred Alternative D)** |
| ***Priority Sage-Grouse Habitat*** | |
| Greater Sage-grouse are a landscape species (Connelly et al. 2011a). Migratory populations have large annual ranges that can encompass >2,700 km² (1,042 mi²/667,184 ac) (Knick and Connelly 2011, *citing* Dalke et al. 1963; Schroeder et al. 1999; Leonard et al. 2000) (the species may use up to 2,500 mi² per population (Rich and Altman 2001)). Large-bodied birds are generally more strongly affected by habitat loss and fragmentation (Winter et al. 2006). Although conclusive data on minimum patch size is unavailable (Connelly et al. 2011a), conserving large expanses of sagebrush steppe is the highest priority to conserve sage-grouse (Aldridge et al. 2008; Connelly et al. 2011b; *see* Manier et al. 2013: 25-26).<br><br>Sage-grouse conservation plans should designate and manage large areas of priority sage-grouse habitat to conserve the species. Priority habitat is generally defined as "having the highest conservation value to maintaining sustainable Greater Sage-grouse populations" (BLM Memo 2010-071) and should include all active sage-grouse leks, and brood-rearing, transitional and winter habitats. "Priority habitat will be areas of high quality habitat supporting important sage-grouse populations, including those populations that are vulnerable to localized extirpation but necessary to maintain range-wide connectivity and genetic diversity" (BLM Memo 2010-071). | The NW CO DLUP/EIS identifies the same amount of preliminary priority habitat (priority habitat) (1,576,900 acres/926,700 surface acres), preliminary general habitat (general habitat) (1,134,800 acres/742,000 surface acres) and linkage/connectivity habitat (181,900 acres/82,000 surface acres) on federal public lands (including subsurface estate) for all three action alternatives in the plan (42, Table 2-2; 7). Priority habitat is intended to protect 84 percent of sage-grouse on all land ownerships in northwest Colorado (Rocky Mountain Wild). |
| Prohibit new surface disturbance in priority sage-grouse habitat. Where new disturbance cannot be avoided (e.g., due to valid existing rights), **(A)** minimize impacts by limiting preexisting and permitted disturbance to one instance per section of sage-grouse habitat regardless of ownership, **(B)** with no more than three percent surface disturbance per section or priority area (SGNTT 2011: 8; Knick et al. 2013). Disturbances include but are not limited to highways, roads, transmission lines, substations, wind turbines, oil and gas wells, heavily grazed areas, range developments, severely burned areas, pipelines, landfills, mines, and vegetation treatments that reduce sagebrush cover. **(C)** Where possible, buffer active sage-grouse leks against surface disturbance or occupancy by 4 miles[2] (SGNTT 2011: 23). | No sage-grouse habitat is recommended for mineral withdrawal; only very small areas are closed to fluid mineral leasing, mineral materials sales, and nonenergy mineral leasing (43, Table 2-2). The preferred alternative does not include a density cap on development in sage-grouse habitat (*see* 163).<br><br>**Leased, undeveloped fluid minerals:** Seasonal restriction on development within 4 miles of lek (162, Table 2-4, NTT 47, GRSG PPH COA-47-51d); disturbance limited to 5 percent of surface within management zone (162, Table 2-4, NTT 47, re. PPH COA-47-51d) (although see 166, Table 2-4, NTT 55, GRST PPH COA-55d, "surface disturbance cannot exceed 5 percent for *ecological sites* that support sagebrush in [priority habitat] for that [management. zone]" (emphasis added)). These prescriptions also apply to uranium development (188).<br><br>**Leased, undeveloped solid minerals:** (coal) encourage lessees to voluntarily follow recommended development prescriptions (169, Table 2-4, NTT 62).<br><br>**Unleased, solid minerals:** (coal) find unsuitable (as opposed to unacceptable) all surface mining of coal in sage-grouse habitat; |

[2] Smaller sage-grouse lek buffers may be justified where research demonstrates that most sage-grouse nests (i.e., > 90 percent) would be protected by the smaller buffer (see, e.g., Conservation Plan for Greater Sage-Grouse in Utah, unpublished: 9), although the impacts from continued and future land use (pursuant to valid existing rights) in nesting habitat would still advise adopting larger 4-mile lek buffers to conserve the species.

| | |
|---|---|
| | manage development within 5 percent disturbance cap, although the disturbance standard may be waived (169, Table 2-4, NTT 63)[3, 4] Require that surface disturbance associated with new underground coal mining is placed outside priority habitat (169, Table 2-4, NTT 64) (although exceptions available, 169-170, Table 2-4, NTT 69);[5] manage development within 5 percent disturbance cap, although the disturbance standard may be waived (169, Table 2-4, NTT 64). Oil shale and tar sands development is excluded in priority habitat (188).<br><br>**Nonenergy leasable minerals:** Consider allowing expansion of existing leases; manage disturbance under 5 percent of surface, although the disturbance cap could be waived (175-176, Table 2-4, NTT 69). Prescriptions and recommendations applied to fluid mineral development also apply to existing nonenergy leasable mineral leases (176, Table 2-4, NTT 70).<br><br>**Locatable minerals:** The preferred alternative would not recommend any areas for mineral withdrawal (43, Table 2-2), including for locatable minerals (174. Table 2-4, NTT 65). Mitigation and seasonal restrictions may be applied in plans for operations to develop minerals (175, Table 2-4, NTT 67).<br><br>**Salable minerals:** Consider allowing expansion of existing leases; manage disturbance under 5 percent of surface, although the disturbance cap could be waived (176, Table 2-4, NTT 71).<br><br>**Renewable energy:** The preferred alternative would not prohibit wind energy development or industrial solar projects in priority habitat (149-150, Table 2-4, NTT 18b-18d).<br><br>**Rights-of-way:** Avoid granting new rights-of-way; exclude construction of large transmission lines in priority habitat, except for 68,000 acres (146, Table 2-4, NTT 10). Newly developed rights-of-way would be subject to 5 percent disturbance cap (146, Table 2-4, NTT 10), although an exception may be granted (147, Table 2-4, NTT 10).<br><br>**Travel management:** Limit motorized travel to existing roads, primitive roads and trails at a minimum (143, Table 2-4, NTT 1). |

[3] See 43, Table 2-2: why would more acres be found unsuitable for surface mining of coal under Alternative A (current management) than the preferred alternative? *See also* 189, Table 2-6.

[4] Why is the disturbance cap necessary if surface coal mining is to be found unsuitable in sage-grouse habitat?

[5] Why is the disturbance cap necessary if surface coal mining is to be found unsuitable in sage-grouse habitat?

| | |
|---|---|
| | Newly constructed roads may be excepted from 5 percent disturbance cap (144, Table 2-4, NTT 5). No prohibition on constructing new roads within 4 miles of active leks (145, Table 2-4). |
| Identify[6] and protect sage-grouse winter habitat (Braun et al. 2005, *citing* Connelly et al. 2000 and others; Moynahan et al. 2007). | "Winter concentration areas" is defined in the NW CO DLUP/EIS (1029-1030). Priority habitat generally includes sage-grouse winter concentration areas (xxii), and winter habitat is described (12-14) and mapped (B-29, Fig. 3-4) in the planning area. However, except for protections associated with priority habitat designation or seasonal restrictions, sage-grouse winter habitat is not specially protected in the plan. |
| Manage or restore sage-grouse habitat so that at least 70 percent of the land cover is sagebrush sufficient to meet sage-grouse needs[7] (SGNTT 2011: 7; Knick et al. 2013[8]).[9] | The preferred alternative would, as part of range management and fuels management, "[r]etain in sagebrush habitat, for each [management zone], a minimum of 70 percent of ecological sites capable of supporting 12 percent canopy cover of Wyoming sagebrush or 15 percent canopy cover of Mountain sagebrush. Manage for a total disturbance cap of less than 30 percent, to include all loss of sagebrush from all causes, including anthropogenic disturbance, wildfire, plowed field agriculture, and vegetation treatments" (155, Table 2-4, NTT 32; 178, Table 2-4, NTT 77; 185-186, Table 2-4, NTT 95). |
| ***Restoration Sage-Grouse Habitat*** | |
| Designate restoration sage-grouse habitat to focus habitat restoration efforts to extend sage-grouse habitat and mitigate for future loss of priority habitat (BLM Memo MT-2010-017). Restoration habitat may be degraded or fragmented habitat that is currently unoccupied by sage-grouse, but might be useful to the species if restored to its potential natural community. Restoration habitat should be identified in management planning based on its importance to sage-grouse and the likelihood of successfully restoring sagebrush communities (Meinke et al. 2009; Wisdom et al. 2005a). Effective restoration requires a regional approach (e.g., sub/regional EISs) that identifies appropriate options across the landscape (Pyke 2011). Passive restoration is preferred for restoring these areas over active restoration methods. | The preferred alternative does not designate restoration habitat. It does include a number of prescriptions for restoring habitat (184-186, Table 2-4, NTT 90-93, 95-97), although it fails to adopt ecological standards and management restrictions intended to ensure that restoration benefits sage-grouse (186-187, Table 2-4). |

[6] Failure to map sage-grouse winter habitat could be grounds for remanding an RMP/EIS back to BLM to address the omission. WWP v. Salazar, 4:08-CV-516BLW, Slip Op. at 3.
[7] While ≥ 70 percent of land cover is sagebrush, the remainder of the landscape should be naturally occurring habitat, including a mosaic of successional habitats progressing toward sagebrush steppe.
[8] Seventy-nine percent of the area within 5 km of active sage-grouse leks was in sagebrush cover.
[9] *See also* Karl and Sadowski (2005): 15.

| ***Specially Designated Sage-Grouse Habitat*** | |
|---|---|
| Designate a subset of sage-grouse priority habitat areas as sagebrush reserves (e.g., Areas of Critical Environmental Concern (Bureau of Land Management), Zoological Areas (Forest Service),[10] research natural areas (Bureau of Land Management, Forest Service), or national wildlife refuges (Fish and Wildlife Service), etc.) to be specially managed refugia for sage-grouse and other sagebrush-dependent species.[11] Sagebrush reserves should encompass centers of sage-grouse abundance on the landscape and protect a sufficiently large proportion of habitat in each planning area to sustain biological processes, recover species and mitigate for the systematic effects of climate change, invasion by nonnative plants and unnatural fire.[12] Sagebrush reserves should offer additional conservation benefits for sage-grouse and other sagebrush-dependent species over priority habitat. They may be withdrawn from locatable and leasable minerals development (43 U.S.C. § 1714); closed to new surface disturbance; and prioritized for grazing permit retirement and removal of infrastructure (unneeded oil and gas equipment, roads, range developments, fencing, etc.).o-= | Priority habitat areas (926,800 acres) were found to meet relevance and importance criteria for designation as ACECs (40; 187, Table 2-4),[13] but the preferred alternative would not designate new ACECs to conserve sage-grouse (43, Table 2-2). |

***Fluid Minerals Development*** **(unleased)**

| | State of Wyoming | Wyoming BLM | NTT Report Recommendations | Sage-Grouse Ecology | NW CO DLUP/EIS (Preferred Alternative D) |
|---|---|---|---|---|---|
| **Lek Buffers** | No surface occupancy within 0.6 miles of occupied sage-grouse leks in core areas, and "no more than" 0.25 miles from occupied leks outside core areas. | Surface occupancy is "prohibited" on or within 0.6 miles of occupied sage-grouse leks in core areas, and 0.25 miles from occupied leks outside core areas. | No surface occupancy throughout priority habitat; exceptions may be considered if a 4-mile no surface occupancy buffer is applied, and if an entire lease is within priority habitat, then a limitation of one well-pad per section might be applied. | Development negatively affects sage-grouse 1.9 miles from occupied leks (Holloran 2005). Most sage-grouse hens nest within 4 miles of leks (Moynahan 2004; Holloran and Anderson 2005). Effects of drilling on sage-grouse were noticeable out to 12.4 miles from leks (Taylor et al. 2012; Taylor et al. 2013). | Apply no surface occupancy stipulation to development of unleased fluid minerals development in priority habitat (161, Table 2-4, NTT 46, GRSG PPH NSO-46d) (0.6-mile protective lek buffer required for active leks in all designated habitat, 161, Table 2-4, NTT 46, GRSG ADH NSO-46d). These stipulations may be waived, modified, or excepted (E-5 – E-6).<br><br>Seasonal limitation on development within a minimum of 4 miles of active leks in all designated habitat (161, Table 2-4, NTT 46, GRSG ADH TL-46d). This stipulation may be waived, modified, or excepted (E-6). |

[10] The Sage-Grouse Recovery Alternative referred to specially designated areas on Forest Service lands as "Sagebrush Conservation Areas," p. 30 (www.sagebrushsea.org/pdf/Sage-Grouse_Recovery_Alternative.pdf).

[11] More than 350 species of conservation concern occur in sagebrush steppe (Wisdom et al. 2005a: 21 and App. 2). Conservation planning for a suite of sagebrush species now could avoid land use conflicts in the future.

[12] *See* Sage-Grouse Recovery Alternative for criteria for designating sagebrush reserves, p. 50 (www.sagebrushsea.org/pdf/Sage-Grouse_Recovery_Alternative.pdf).

[13] The Federal Register notice announcing the availability of the Northwest Colorado Draft LUP/EIS stated that the ACEC analyzed in the EIS was approximately 910,000 acres. 78 Fed. Reg. 50089.

| | | | | | |
|---|---|---|---|---|---|
| **Density** | Maximum development density of 1 well per an average of 640 acres. | Maximum development density of 1 well per 640 acres (with some exceptions). | Limit disturbance to 1 well per 640 acres. | Maximum development density of 1 well per 640 acres to 1 well per 699 acres (Holloran 2005; Doherty et al. 2010a; Doherty 2008). | The preferred alternative would not impose a density cap on fluid minerals development (*see* 163). |
| **Disturbance** | In core areas, surface disturbance limited to 5 percent of "suitable sage-grouse habitat" per an average of 640 acres. | Cumulative existing surface disturbance may not exceed 5 percent per 640 acres (with some exceptions). | Surface disturbance may not exceed 3 percent per 640 acres (exceptions may be considered in limited circumstances). | Ninety-nine percent of active sage-grouse leks are in landscapes with less than 3 percent disturbance within 5 km of leks (Knick et al. 2013). | Surface disturbance "within ecological sites that support sagebrush in [priority habitat]" would not exceed 5 percent" (161, Table 2-4, NTT 46, re. PPH CSU-46d). This stipulation may be waived, modified, or excepted (E-7). |
| **Winter Habitat** | Activities restricted in sage grouse winter habitat in core areas from December 2 – March 13; "seasonal restrictions should also be considered" in winter habitat outside core areas. | No surface disturbing or disruptive activities in sage-grouse winter habitat from November 30 – March 14. | No surface occupancy in winter habitat during any time of the year; exceptions may be considered if a 4-mile no surface occupancy buffer is applied, and if an entire lease is within priority habitat, then a limitation of one well site per section might be applied. | No surface disturbance in or adjacent to winter habitat any time of year (Walker 2008). | Except for protections associated with priority habitat designation, sage-grouse winter habitat is not specially protected from fluid minerals development. |

| ***Livestock Grazing*** | |
|---|---|
| For range management, sage-grouse habitat objectives should be based on, in priority order, potential natural community within the applicable Ecological Site Description, Connelly et al. (2000: 977, Table 3), or other objectives that have been demonstrated to be associated with increasing sage-grouse populations. Utilization levels should not exceed 25 percent annually on uplands, meadows, flood plains and riparian habitat (Holecheck et al. 2010; BLM & USFS 1994).[14] Habitat objectives should be applied to all sage-grouse habitat areas. Management plans should include three specific conservation measures:<br>1. Grazing should maintain ≥ 18 cm grass height in nesting and brooding-rearing habitat (Connelly et al. 2000; Braun et al. 2005).<br>2. Livestock grazing should be restricted where cheatgrass (*Bromus* tectorum) occurs in sagebrush steppe to avoid contributing further to its incursion on the landscape (Reisner et al. 2013).<br>3. Grazing permit retirement should be prioritized in sage-grouse habitat (*see* SGNTT 2011: 17). | Objectives for range management include "maintain[ing] residual herbaceous cover to reduce predation during nesting" and "avoid[ing] [sage-grouse] habitat changes due to herbivory" (150, Table 2-4).<br><br>The preferred alternative would incorporate sage-grouse "habitat objectives" in all designated sage-grouse habitat in grazing management planning (150, Table 2-4, NTT 19). Objectives based on "Ecological Site/Range Site Descriptions" would be developed in future planning (151, Table 2-4, NTT 23), although range management would be consistent with "ecological site potential and within the reference state subject to successional stage objectives" (151, Table 2-4, NTT 24). Terms and conditions would be included on grazing permits/leases that assure plant growth and residual vegetation remains for sage-grouse hiding cover" (152, Table 2-4, NTT 25). Various grazing "guidelines" generally support sage-grouse habitat objectives (K-6 - K-7).<br><br>The preferred alternative does not prescribe a forage utilization standard for livestock grazing and levels allowed in some current plans are too high to support vegetation recovery (*see* 85-86, Table 2-3). Notes associated with Standard 3 in Appendix K, BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado, suggest that the goal of maintaining "vigorous" plant community might provide needed cover for sage-grouse, although the same notes also admit Standard 3 "covers so many ecological process that proper interpretation is required" (K-5). Standard 3 may not be properly interpreted now, as a majority of grazed public lands for which data exists fails to meet rangeland standards and guidelines (*see* 280).<br><br>**[1]** The NW CO DLUP/EIS fails to include standards for grass height in sage-grouse seasonal habitats (including in riparian zones, 153, Table 2-4, NTT 28). Notes associated with Standard 4 in Appendix K, BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado, claim that land managers would consult Appendix A in the Colorado Greater Sage-grouse Conservation Plan (2008) (which is not included in the NW |

[14] "A community is considered to be at its natural potential when the existing vegetation is between 75-100 percent of the site's potential natural plant community." BLM & USFS 2004: 3-26.

| | |
|---|---|
| | CO DLUP/EIS) for habitat characteristics important to sage-grouse (K-5). These include a range of grass heights in sage-grouse habitats, some of which may be sufficient for sage-grouse, if they are in fact applied in grazing management (152, Table 2-4, NTT 25; *but see,* K-5, managers may substitute recommended grass heights with other standards).<br><br>**[2]** The NW CO DLUP/EIS does not limit or restrict livestock grazing in areas invaded by cheatgrass, even though inappropriate grazing has contributed to cheatgrass invasion in the planning area (280). In fact, the NW CO DLUP/EIS, citing the Fish and Wildlife Service, claims that weed infestations are not considered a top threat to sage-grouse in northwest Colorado (189, Table 2-6). Grazing guidelines even recommend using livestock as a tool to inhibit or stop the spread of noxious weeds, where feasible (K-7). (In contrast, the preferred alternative would manage free-roaming horses to avoid increasing incidence of cheatgrass, 159, Table 2-4).<br><br>**[3]** When a permittee or lessee voluntarily relinquishes their grazing preference in sage-grouse habitat, managers may consider converting the associated allotment to a reserve allotment (grass bank) that will remain available for use on a temporary, nonrenewable basis for the benefit of sage-grouse. Managers may authorize temporary nonrenewal permits in reserve allotments to meet resource objectives elsewhere such as rest or deferment due to fire (159, Table 2-4). The preferred alternative would close no areas to livestock grazing (42, Table 2-2). |
| ***Climate Change Effects*** | |
| Account for the effects of climate change in management planning (Secretarial Order 3289, 02-22-2010; CEQ Memo, 02-18-2010 (draft)). Climate change is a recognized threat to sage-grouse (Connelly et al. 2011b: 556, Table 24.2; Blomberg et al. 2012; van Kooten et al. 2007) that is also predicted to have deleterious impacts on sagebrush steppe (Schlaepfer et al. 2012; Neilson et al. 2005). Most climate change simulations predict sagebrush steppe will contract as mean temperatures increase and the frost line shifts northward (Blomberg et al. 2012; Neilson et al. 2005). In the worst case scenario, sagebrush species are simulated to contract to just 20 percent of current distribution (Wisdom et al. 2005b: 206, *citing* Neilson et al. 2005). The largest remaining areas will be in southern Wyoming and in the gap between the northern and central Rocky Mountains, followed by areas along the northern edge of the Snake River Plateau and small patches in Washington, Oregon and Nevada (*see* Miller et al. 2011: 181, Fig. 10.19). Sagebrush steppe may also shift northward in response to increased temperatures (Schlaepfer et al. 2012; Shafer et al. 2001).<br><br>Measures for ameliorating the effects of climate change on species and landscapes include increasing the size and number of protected areas, maintaining and enhancing connectivity between protected areas, and identifying and | The NW CO DLUP/EIS claims there is no resource program in an RMP for addressing effects of climate change to sage-grouse and its habitat (190, Table 2-6).<br><br>The preferred alternative would not implement a number of prescriptions for emergency stabilization and rehabilitation intended to restore habitat and support resiliency (183, Table 2-4). It also fails to include measures adopted in other alternatives that would consider potential effects of climate change in management (*see, e.g.,* 185, Table 2-4, NTT 94). |

| | |
|---|---|
| protecting areas likely to retain suitable climate/habitat conditions in the future (even if not currently occupied by the species of concern). Management should also repulse invasive species, sustain ecosystem processes and functions, and restore degraded habitat to enhance ecosystem resilience to climate change (Chester et al. 2012; NFWPCAS 2012). | |
| ***Wind Energy Development*** | |
| Do not site wind energy development in priority sage-grouse habitat (Jones 2012; SGNTT 2011: 12). Site wind energy development at least five miles from active sage-grouse leks (Manville 2004; Jones 2012). Site wind energy development at least four miles from the perimeter of sage-grouse winter habitat. | The preferred alternative would not prohibit wind energy development in priority habitat (149, Table 2-2, NTT 18b-18c). |

**References**

Aldridge, C. L. and R. M. Brigham. 2003. Distribution, status and abundance of Greater Sage-grouse, *Centrocercus urophasianus*, in Canada. Canadian Field-Natur. 117: 25-34.

Aldridge, C. L., S. E. Nielsen, H. L. Beyer, M. S. Boyce, J. W. Connelly, S. T. Knick, M. A. Schroeder. 2008. Range-wide patterns of Greater Sage-grouse persistence. Diversity and Distrib. 14(6): 983–994.

Anonymous. 2008. Greater Sage-grouse population trends: an analysis of lek count databases 1965–2007. Western Association of Fish and Wildlife Agencies, Sage- and Columbian Sharp-tailed Grouse Technical Committee. Cheyenne, WY.

Barnett, J. F. and J. A. Crawford. 1994. Pre-laying nutrition of sage-grouse hens in Oregon. J. Range Manage. 47: 114-118.

Beck, J. L. and D. L. Mitchell. 2000. Influences of livestock grazing on sage grouse habitat. Wildl. Soc. Bull. 28(4): 993-1002.

(BLM & USFS) Bureau of Land Management, U.S. Forest Service. 1994. Rangeland Reform '94 Draft Environmental Impact Statement. U.S. Department of Interior, Bureau of Land Management; U.S. Department of Agriculture, Forest Service. Washington, DC.

Blomberg, E. J., J. S. Sedinger, M. T. Atamian, D. V. Nonne. 2012. Characteristics of climate and landscape disturbance influence the dynamics of greater sage-grouse populations. Ecosphere 3(6): 1-20.

Braun, C. E., J. W. Connelly, M. A. Schroeder. 2005. Seasonal habitat requirements for sage-grouse: spring, summer, fall and winter. Pages 38-42 *in* N. L. Shaw, M. Pellant, S. B. Monsen (compilers). Sage-grouse Habitat Restoration Symposium Proceedings; June 4-7, 2001; Boise, ID. RMRS-P-38. U.S. Forest Service, Rocky Mountain Research Station. Fort Collins, CO.

Bryce, S. A., J. R. Strittholt, B. C. Ward, D. M. Bachelet. 2012. Colorado Plateau Rapid Ecoregional Assessment Report. Prepared for the U.S. Department of the Interior, Bureau of Land Management, Denver, Colorado.

Call, M. W. and C. Maser. 1985. Wildlife habitats in managed rangelands – the Great Basin of southeastern Oregon: sage grouse. Gen. Tech. Rep. PNW-187. U.S. Forest Service, Pacific Northwest Forest and Range Exp. Stn. Portland, OR.

Chester, C. C., J. A. Hilty, S. C. Trombulak. 2012. Climate change science, impacts and opportunities. Pages 3-15 *in* CLIMATE AND CONSERVATION: LANDSCAPE AND SEASCAPE SCIENCE, PLANNING, AND ACTION. J. A. Hilty, C. C. Chester, M. S. Cross (eds.). Island Press. Washington, DC.

Coates, P. S. 2007. Greater Sage-grouse (*Centrocercus urophasianus*) nest predation and incubation behavior. Ph.D. Diss. Idaho State Univ. Pocatello, ID.

Coggins, K. A. 1998. Relationship between habitat changes and productivity of sage grouse at Hart Mountain National Antelope Refuge, Oregon. M.S. thesis. Oregon State University. Corvallis, OR.

Connelly, J. W. and C. E. Braun. 1997. Long-term changes in sage-grouse *Centrocercus urophasianus* populations in western North America. Wildl. Biol. 3: 229-234.

Connelly, J. W., E. T. Rinkes, C. E. Braun. 2011a. Characteristics of Greater Sage-grouse habitats: a landscape species at micro and macro scales. Pages 69-83 *in* S. T. Knick and J. W. Connelly (eds). GREATER SAGE-

GROUSE: ECOLOGY AND CONSERVATION OF A LANDSCAPE SPECIES AND ITS HABITATS. Studies in Avian Biol. Series, vol. 38. Cooper Ornithological Society. Univ. Calif. Press. Berkeley, CA.

Connelly, J. W., C. E. Braun, M. A. Schroeder, C. A. Hagen. 2007. Setting the record straight: a response to "Sage-Grouse at the Crossroads." Rangelands 29(6): 35-39.

Connelly, J. W., M. A. Schroeder, A. R. Sands, C. E. Braun. 2000. Guidelines to manage sage-grouse populations and their habitats. Wildl. Soc'y Bull. 28(4): 967-985.

Connelly, J. W., S. T. Knick, C. E. Braun, W. L. Baker, E. A. Beever, T. J. Christiansen, K. E. Doherty, E. O. Garton, C. A. Hagen, S. E. Hanser, D. H. Johnson, M. Leu, R. F. Miller, D. E. Naugle, S. J. Oyler-McCance, D. A. Pyke, K. P. Reese, M. A. Schroeder, S. J. Stiver, B. L. Walker, M. J. Wisdom. 2011b. Conservation of Greater Sage-grouse: a synthesis of current trends and future management. Pages 549-563 *in* S. T. Knick and J. W. Connelly (eds). GREATER SAGE-GROUSE: ECOLOGY AND CONSERVATION OF A LANDSCAPE SPECIES AND ITS HABITATS. Studies in Avian Biol. Series, vol. 38. Cooper Ornithological Society. Univ. Calif. Press. Berkeley, CA.

Connelly, J. W., S. T. Knick, M. A. Schroeder, S. J. Stiver. 2004. Conservation assessment of Greater Sage-grouse and sagebrush habitats. Western Association of Fish and Wildlife Agencies. Cheyenne, WY. (July 22, 2004).

Conservation Plan for Greater Sage-grouse in Utah. Unpublished document. (Feb. 14, 2013). Available at http://wildlife.utah.gov/uplandgame/sage-grouse/pdf/greater_sage_grouse_plan.pdf.

Copeland, H. E., A. Pocewicz, D. E. Naugle, T. Griffiths, D. Keinath, J. Evans, J. Platt. 2013. Measuring the effectiveness of conservation: a novel framework to quantify the benefits of sage-grouse conservation policy and easements in Wyoming. PLoS ONE 8(6): e67261. doi:10.1371/journal.pone.0067261. Available at www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0067261&representation=PDF.

Dalke, P. D., D. B. Pyrah, D. C. Stanton, J. E. Crawford, E. F. Schlatterer. 1963. Ecology, productivity and management of sage grouse in Idaho. J. Wildl. Manage. 27: 811-841.

Doherty, K. E. 2008. Sage-grouse and energy development: integrating science with conservation planning to reduce impacts. Ph.D. dissertation. University of Montana. Missoula, MT.

Doherty, K. E., D. E. Naugle, B. L. Walker. 2010a. Greater Sage-grouse nesting habitat: the importance of managing at multiple scales. J. Wildl. Manage. 74(7): 1544-1553.

Doherty, K. E., D. E. Naugle, H. E. Copeland, A. Pocewicz, J. M. Kiesecker. 2011. Energy development and conservation tradeoffs: systematic planning for greater sage-grouse in their eastern range. Pages 505-529 *in* S. T. Knick and J. W. Connelly (eds). GREATER SAGE-GROUSE: ECOLOGY AND CONSERVATION OF A LANDSCAPE SPECIES AND ITS HABITATS. Studies in Avian Biol. Series, vol. 38. Cooper Ornithological Society. Univ. Calif. Press. Berkeley, CA.

Holechek, J. L., R. D. Pieper, C. H. Herbel. 2010. RANGE MANAGEMENT: PRINCIPLES AND PRACTICES. 6th ed. Prentice-Hall. Upper Saddle River, NJ.

Holloran, M. J. 2005. Greater sage-grouse (*Centrocercus urophaisianus*) population response to natural gas field development in western Wyoming. PhD Diss., Univ. of Wyoming. Laramie, WY.

Holloran, M. J. and S. H. Anderson. 2005. Spatial distribution of Greater Sage-grouse nests in relatively contiguous sagebrush habitats. Condor 107(4): 742-752.

Jones, A. L. (ed). 2012. Best Management Practices for siting, developing, operating and monitoring renewable energy in the intermountain West: a conservationist's guide. Special publication. Wild Utah Project. Salt Lake City, UT.

Karl, M. and J. Sadowski. 2005. Assesssing big sagebrush at multiple spatial scales: an example in southeast Oregon. Tech. Note 417. BLM/ST/ST-05/001+4400. Bureau of Land Management, National Science and Technology Center. Denver, CO.

Klebenow, D. A. 1982. Livestock grazing interactions with sage grouse. Proc. Wildlife-Livestock Relations Symp. 10: 113-123.

Knick, S. T. 2011. Historical development, principal federal legislation and current management of sagebrush habitats: implications for conservation. Pages 13-31 *in* S. T. Knick and J. W. Connelly (eds). GREATER SAGE-GROUSE: ECOLOGY AND CONSERVATION OF A LANDSCAPE SPECIES AND ITS HABITATS. Studies in Avian Biol. Series, vol. 38. Cooper Ornithological Society. Univ. Calif. Press. Berkeley, CA.

Knick, S. T. and J. W. Connelly. 2011. Greater Sage-grouse and sagebrush: an introduction to the landscape. Pages 1-9 *in* S. T. Knick and J. W. Connelly (eds). GREATER SAGE-GROUSE: ECOLOGY AND CONSERVATION OF A LANDSCAPE SPECIES AND ITS HABITATS. Studies in Avian Biol. Series, vol. 38. Cooper Ornithological Society. Univ. Calif. Press. Berkeley, CA.

Knick, S. T., A. L. Holmes, R. F. Miller. 2005. The role of fire in structuring sagebrush habitats and bird communities. Pages 63-75 *in* V. A. Saab and H. D. W. Powell (eds.). FIRE AND AVIAN ECOLOGY IN NORTH AMERICA. Studies in Avian Biology, no. 30. Cooper Ornithological Society. Boise, ID.

Knick, S. T., D. S. Dobkin, J. T. Rotenberry, M. A. Schroeder, W. M. Vander Haegen, C. van Riper. 2003. Teetering on the edge or too late? Conservation and research issues for avifauna of sagebrush habitats. Condor 105(4): 611-634.

Knick, S. T., S. E. Hanser, R. F. Miller, D. A. Pyke, M. J. Wisdom, S. P. Finn, E. T. Rinkes, C. J. Henny. 2011. Ecological influence and pathways of land use in sagebrush. Pages 203-251 *in* S. T. Knick and J. W. Connelly (eds). GREATER SAGE-GROUSE: ECOLOGY AND CONSERVATION OF A LANDSCAPE SPECIES AND ITS HABITATS. Studies in Avian Biol. Series, vol. 38. Cooper Ornithological Society. Univ. Calif. Press. Berkeley, CA.

Knick, S. T., S. E. Hanser, K. L. Preston. 2013. Modeling ecological minimum requirements for distribution of greater sage-grouse leks: implications for population connectivity across their western range, U.S.A. Ecology and Evolution, available at http://onlinelibrary.wiley.com/doi/10.1002/ece3.557/pdf.

Leonard, K. M., K. P. Reese, J. W. Connelly. 2000. Distribution, movements and habitats of sage grouse *Centrocercus urophasianus* on the Upper Snake River Plain of Idaho: changes from the 1950s to the 1990s. Wildl. Biol. 6: 265-270.

Manier, D. J., D. J. A. Wood, Z. H. Bowen, R. M. Donovan, M. J. Holloran, L. M. Juliusson, K. S. Mayne, S. J. Oyler-McCance, F. R. Quamen, D. J. Saher, A. J. Titolo. 2013. Summary of science, activities, programs, and policies that influence the rangewide conservation of greater sage-grouse (*Centrocercus urophasianus*). U.S. Geological Survey, Open-File Report 2013–1098; available at http://pubs.usgs.gov/of/2013/1098/.

Manville, A. M. 2004 Prairie Grouse Leks and Wind Turbines: U.S. Fish and Wildlife Service Justification for a 5-mile Buffer from Leks; Additional Grassland Songbird Recommendations (briefing paper). U.S. Fish and Wildlife Service, Division of Migratory Bird Management. Arlington, VA. Available at www.environment.ok.gov/documents/OKWindEnergy/PrairieGrouseLeksWindTurbines.pdf.

Miller, R. F., S. T. Knick, D. A. Pyke, C. W. Meinke, S. E. Hanser, M. J. Wisdom, A. L. Hild. 2011. Characteristics of sagebrush habitats and limitations to long-term conservation. Pages 145-184 *in* S. T. Knick and J. W. Connelly (eds). GREATER SAGE-GROUSE: ECOLOGY AND CONSERVATION OF A LANDSCAPE SPECIES AND ITS HABITATS. Studies in Avian Biol. Series, vol. 38. Cooper Ornithological Society. Univ. Calif. Press. Berkeley, CA.

Meinke, C. W., S. T. Knick, D. A. Pyke. 2009. A spatial model to prioritize sagebrush landscapes in the intermountain west (U.S.A.) for restoration. Restoration Ecol. 17(5): 652-659.

Moynahan, B. J. 2004. Landscape-scale factors affecting population dynamics of Greater Sage-grouse (*Centrocercus urophasianus*) in northcentral Montana, 2001-2004. PhD Diss. Univ. of Montana. Missoula, MT.

Moynahan, B. J., M. S. Lindberg, J. J. Rotella, J. W. Thomas. 2007. Factors affecting nest survival of Greater Sage-grouse in northcentral Montana. J. Wildl. Manage. 71(6): 1773-1783.

Neilson, R. P., J. M. Lenihan, D. Bachelet, R. J. Drapek. 2005. Climate change implications for sagebrush ecosystems. Trans. N. Amer. Wildl. & Nat. Res. Conf. 70: 145-159.

Pederson, E. K., J. W. Connelly, J. R. Hendrickson, W. E. Grant. 2003. Effect of sheep grazing and fire on sage grouse populations in southeastern Idaho. Ecol. Model. 165(1): 23-47.

Pyke, D. A. 2011. Restoring and rehabilitating sagebrush habitats. Pages 531-548 *in* S. T. Knick and J. W. Connelly (eds). GREATER SAGE-GROUSE: ECOLOGY AND CONSERVATION OF A LANDSCAPE SPECIES AND ITS HABITATS. Studies in Avian Biol. Series, vol. 38. Cooper Ornithological Society. Univ. Calif. Press. Berkeley, CA.

(NFWPCAS) National Fish, Wildlife and Plants Climate Adaption Partnership. 2012. National Fish, Wildlife and Plants Climate Adaption Strategy. Association of Fish and Wildlife Agencies, Council on Environmental Quality, Greate Lakes Indian Fish and Wildlife Commission, National Oceanic and Atmospheric Administration, and U.S. Fish and Wildlife Service. Washington, DC.

Reisner, M. D., J. B. Grace, D. A. Pyke, P. S. Doescher. 2013. Conditions favouring *Bromus tectorum* dominance of endangered sagebrush steppe ecosystems. J. Applied Ecol., available at http://onlinelibrary.wiley.com/doi/10.1111/1365-2664.12097/pdf.

Rich, T. D., and B. Altman. 2001. Under the sage grouse umbrella. Bird Cons. 14: 10.

Shafer, S. L., P. J. Bartlein, R. S. Thompson. 2001. Potential changes in the distributions of western North America tree and shrub taxa under future climate scenarios. Ecosystems 4: 200-215.

Schlaepfer, D. R., W. K. Lauenroth, J. B. Bradford. 2012. Effects of ecohydrological variables on current and future ranges, local suitability patterns, and model accuracy in big sagebrush. Ecography 35(4): 374–384.

Schroeder, M. A., C. L. Aldridge, A. D. Apa, J. R. Bohne, C. E. Braun, S. D. Bunnell, J. W. Connelly, P. A. Deibert, S. C. Gardner, M. A. Hilliard, G. D. Kobriger, S. M. McAdam, C. W. McCarthy, J. J. McCarthy, D. L. Mitchell, E. V. Rickerson, S. J. Stiver. 2004. Distribution of sage-grouse in North America. Condor 106: 363-376.

Schroeder, M. A., J. R. Young, C. E. Braun. 1999. Sage grouse (*Centrocercus urophasianus*). Pages 1-28 *in* A. Poole and F. Gill (eds.). The Birds of North America, No. 425. The Birds of North America. Philadelphia, PA.

(SGNTT) Sage-grouse National Technical Team. 2011. A Report on National Greater Sage-grouse Conservation Measures. Available at

www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_fs/2012.Par.52415.File.dat/IM%202012-044%20Att%201.pdf.

Stiver, S. J., A. D. Apa, J. R. Bohne, S. D. Bunnell, P. A. Deibert, S. C. Gardner, M. A. Hilliard, C. W. McCarthy, M. A. Schroeder. 2006. Greater Sage-grouse Comprehensive Conservation Strategy. Western Association of Fish and Wildlife Agencies. Cheyenne, WY.

Taylor, R. L., D. E. Naugle, L. S. Mills. 2012. Viability analysis for conservation of sage-grouse populations: Buffalo Field Office, Wyoming. BLM Contract 09-3225-0012; Number G09AC00013. Final Report. Prepared for Bureauf of Land Management, Buffalo Field Office. Buffalo, WY.

Taylor, R. L., J. D. Tack, D. E. Naugle, L. S. Mills. 2013. Combined effects of energy development and disease on greater sage-grouse. PLoS ONE 8(8): e71256. doi:10.1371/journal.pone.0071256. Available at http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0071256.

van Kooten, G. C., A. J. Eagle, M. E. Elsworth. 2007. Determinants of threatened sage grouse in northeastern Nevada. Human Dimensions of Wildl. 12(1): 53-70.

Vallentine, J. F. 1990. GRAZING MANAGEMENT. Academic Press. San Diego, CA.

Walker, B. L. 2008. Greater sage-grouse response to coal-bed natural gas development and West Nile virus in the Powder River Basin, Montana and Wyoming, USA. PhD dissertation. Univ. of Montana. Missoula, MT.

Winter, M., D. H. Johnson, J. A Shaffer. 2006. Does body size affect a bird's sensitivity to patch size and landscape structure? Condor 108(4): 808-816.

Wisdom, M. J, C. W. Meinke, S. T. Knick, M. A. Schroeder. 2011. Factors associated with extirpation of sage-grouse. Pages 451-472 *in* S. T. Knick and J. W. Connelly (eds). GREATER SAGE-GROUSE: ECOLOGY AND CONSERVATION OF A LANDSCAPE SPECIES AND ITS HABITATS. Studies in Avian Biol. Series, vol. 38. Cooper Ornithological Society. Univ. Calif. Press. Berkeley, CA.

Wisdom, M. J., M. M. Rowland, L. H. Suring, L. Schueck, C. W. Meinke, S. T. Knick, B. C. Wales. 2005a. Habitats for groups of species. Chap. 7 in part II: Regional assessment of habitats for species of conservation concern in the Great Basin. Pages 205-231 in M. J. Wisdom, M. M. Rowland, L. H. Suring (eds.). HABITAT THREATS IN THE SAGEBRUSH ECOSYSTEM: METHODS OF REGIONAL ASSESSMENT AND APPLICATIONS IN THE GREAT BASIN. Alliance Communications Group. Lawrence, KS.

Wisdom, M. J., M. M. Rowland, R. J. Tausch. 2005b. Effective management strategies for sage-grouse and sagebrush: a question of triage? Trans. N. Wildl. Nat. Res. Conf. 70: 206-227.

**National Headquarters**
1130 17th Street, N.W. | Washington, D.C. 20036-4604 | tel 202.682.9400 | fax 202.682.1331
**www.defenders.org**

September 30, 2013

*Delivered via electronic mail (TransWest_WYMail@blm.gov)*

Sharon Knowlton, BLM Project Manager
TransWest Express Project
Bureau of Land Management
P.O. Box 20678
Cheyenne, WY 82003

**Re: Comments on TransWest Express 600-kV Direct Current Transmission Project in Wyoming, Colorado, Utah, and Nevada, and Prospective Draft Land Use Plan Amendments Draft Environmental Impact Statement, 78 Fed. Reg. 40163 (July 3, 2013**)

Dear Ms. Knowlton:

Thank you for the opportunity to comment on the TransWest Express 600-kV Direct Current Transmission Project in Wyoming, Colorado, Utah, and Nevada and Prospective Draft Land Use Plan Amendments Draft Environmental Impact Statement (TWE DEIS). Defenders of Wildlife (Defenders) is a national, non-profit, public interest conservation organization with more than one million members and supporters.

These comments reflect our broad concerns from the conservation perspective, with a focus on Greater Sage-Grouse, Golden Eagles, Desert Tortoise, and Mitigation.

Sincerely,

Erin Lieberman
Western Policy Advisor
Renewable Energy & Wildlife
elieberman@defenders.org
916-313-5800x111

Jon Belak
Wildlife Biologist
Renewable Energy
jbelak@defenders.org
720-203-1964

The two joint lead federal agencies for this project are:

•The Bureau of Land Management (BLM, and agency of the U.S. Department of Interior), and

•Western Area Power Administration (Western, a Federal power marketing agency of the United States Department of Energy)

The project proponent is TransWest Express, LLC, a wholly owned affiliate of The Anschutz Corporation, a privately held company based in Denver, Colorado. As we continue to acquire and review relevant information, we hope to submit supplemental comments based on such information.

Defenders supports many of the comments, concerns and recommendations made in the comment letter, *TransWest Express DEIS Comments (TWS, Audubon Rockies and partners – 9-30-13)*, specifically recommendations related to avoidance, minimization and mitigation for resource impacts. We address those issues more broadly in this letter, with a focus on four core issues: (1) expected impacts to Greater Sage-Grouse from transmission and the BLMs National Greater Sage-Grouse Planning Strategy; (2) expected impacts to the federally listed Desert Tortoise; (3) expected impacts on Golden Eagles; and (4) mitigation. These comments do not address specific route segments presented in the TWE DEIS.

## 1. Sage Grouse

- Impacts to Greater-Sage Grouse from Transmission Lines

The BLM initiated a National Greater Sage-Grouse Planning Strategy to improve sage-grouse management on an estimated 47 million acres of sagebrush steppe under BLM control. That national effort includes amending dozens of Resource Management Plans (RMPs) to incorporate policies and provisions designed to restore the species and protect its diminishing sagebrush steppe habitat. This unprecedented planning process, properly executed, could finally reverse declining Greater Sage-grouse populations, while providing for sustainable use of public lands. However, we are very concerned that, despite the promise of the planning effort, the goals of the process have been compromised by a lack of coordination and miscommunication within and between agencies, as well as the unwillingness of agencies to propose the range of land use restrictions necessary to conserve sage-grouse.

Developing and implementing conservation strategies at regional or landscape scales will have the greatest benefit for sage-grouse and their habitat (see Doherty et al. 2011). Protecting large expanses of sagebrush steppe and current populations of greater sage-grouse are the highest priority (Connelly et al. 2011a; Wisdom et al. 2005b). Given the importance of public lands to sage-grouse conservation; the sensitivity of these lands to disturbance, their longer recovery periods and variable response to restoration; and their susceptibility to invasion by exotic plants (Knick 2011), land uses that negatively affect these lands should be avoided or prohibited in key habitat areas to conserve sage-grouse habitat. Establishing a system of habitat reserves in sagebrush steppe will also help conserve essential habitat and ecological processes important to sage-grouse conservation.

To address the conservation challenges, the National Technical Team (NTT), an ad hoc committee of 23 federal and state land managers and sage-grouse experts (including 14 BLM representatives), drafted guidelines for conserving sage-grouse and their habitat. The NTT report is a primary reference for the National Greater Sage-Grouse Planning Strategy. It recommends making priority

habitat "exclusion areas" for new ROWs, and general habitat "avoidance areas." Priority habitat is generally defined as "having the highest conservation value to maintaining sustainable Greater Sage-grouse populations" (BLM Memo 2010-071) and should include all active sage-grouse leks, and brood-rearing, transitional and winter habitats. "Priority habitat will be areas of high quality habitat supporting important sage-grouse populations, including those populations that are vulnerable to localized extirpation but necessary to maintain range-wide connectivity and genetic diversity" (BLM Memo 2010-071).

Unfortunately, the proposed route for the TWE line overlaps sage-grouse priority habitat and is likely to harm sage-grouse. In a 2009 report prepared for the Department of Energy, titled "Sage-Grouse and Wind Energy: Biology, Habits, and Potential Effects from Development," the authors summarized that "Braun et al. (2002) reported that sage-grouse were particularly susceptible to the placement of overhead power lines at within 0.8 km (0.5 mi) of nesting grounds. Significant impacts to sage-grouse have been documented from overhead power transmission and communication distribution lines out to 6 km (3.7 mi) (Manville 2004)." More recently, a study using positions collected from collared sage-grouse along with a rigorous statistical analysis concluded that sage-grouse avoid areas within 600 m of transmission lines (Gillan et al. 2013), a result also strongly supported by USGS research (Hanser et al. 2011) that modeled sage grouse habitat use through pellet counts, and found a significant negative effect on activity from transmission lines within a 500 m radius. Finally, the 2013 USGS synthesis of the status of the species and threats across the range states that sage-grouse may avoid habitats within 0.4–2.9 mi (0.6–4.7 km) of a transmission line, that erection of a transmission line close to a lek will negatively influence sage-grouse lek attendance and breeding-season behavior, that higher densities of power lines within 4 mi (6.4 km) of a lek may negatively influence lek persistence, and that foraging distances of avian sage-grouse predators have been estimated at 4.3 mi, suggesting that transmission and power lines may influence sage-grouse at large spatial scales (Manier et al. 2013).

The USFWS 2010 listing determination also identified power lines as directly affecting greater sage-grouse "by posing a collision and electrocution hazard" (Braun 1998, pp. 145-146; Connelly et al. 2000a, p. 974), having indirect effects by decreasing lek recruitment (Braun et al. 2002, p. 10), increasing predation (Connelly et al. 2004, p. 13-12), fragmenting habitat (Braun 1998, p. 146), and facilitating the invasion of exotic annual plants (Knick et al. 2003, p. 612; Connelly et al. 2004, p. 7-25) (page 18). Additionally, sage-grouse could be impacted through a direct loss of habitat and human activity (especially during construction periods) (USFWS 2010 at 44). The recently released Gateway West FEIS noted that recent research identified the best predictors between extirpated and occupied ranges to include distance to transmission lines (Wisdom et al 2011). FEIS at 3.11-74. Knick et al. 2013 further emphasized intolerance of grouse to human disturbance and development, reporting that 99 percent of active leks in the species' western range were in landscapes with less than three percent disturbance.

Therefore, we remain concerned that the TWE transmission line will cause significant adverse impacts to greater sage-grouse if improperly routed.

- Sage Grouse Planning

Given the known impacts on sage-grouse from transmission development, the BLM should be cautious of moving forward with development decisions prior to other decision-making affecting conservation of the species. The proposed routes for TWE cross through key sage-grouse habitats,

particularly in Moffat County, Colorado, southwestern Wyoming, and Utah's Uintah Basin, areas under review in the National Greater Sage-grouse Planning Strategy, and it is vital that route planning—specifically focused on avoidance—fully and adequately consider impacts on the species. The USFWS specifically noted in its 2010 determination that "Southwestern and central Wyoming and northwestern Colorado in MZ II has been considered a stronghold for sage-grouse with some of the highest estimated densities of males anywhere in the remaining range of the species (Connelly et al. 2004, pp. 6-62, A5-23). Wisdom et al. (in press, p. 23) identified this high-density sagebrush area as one of the highest priorities for conservation consideration as it comprises one of two remaining areas of contiguous range essential for the long-term persistence of the species" (page 35). It is imperative that conservation drive management decisions, and not the reverse.

Our concerns about the two processes were elevated after an initial review of the draft Northwest Colorado Greater Sage-grouse Resource Management Plan Amendment/Environmental Impact Statement (NW CO Draft GRSG RMP/EIS), covering 1.6 million acres in northwest Colorado that includes sage-grouse protections. Review of the NW CO Draft GRSG RMP/EIS identifies all three action alternatives as having different approaches to ROW management. Alternative C (Conservation Groups) excludes new BLM ROWs in all designated habitat (Preliminary Priority Habitat – PPH, Preliminary General Habitat – PGH, and Linkage/Connectivity Habitat). Alternative B (NTT report) and the Alternative D (Colorado Sub-regional/BLM referred) both only manage ROWs in regards to PPH. Alternative B would manage PPH as exclusion areas and Alternative D as avoidance areas. However, Alternative D stipulates that ROWs would be allowed in PPH if they don't adversely affect GRSG. Alternative D is also the only alternative that specifically addresses large transmission lines (greater than 230 kilovolts), which brings into question whether the BLM has presented a reasonable range of alternatives and the appearance of pre-decisional information in habitat that is of critical importance to the long-term management of greater sage-grouse. For large transmission lines, such as TWE, Alternative D (see figure 2-8, page B-14 in NW CO Draft GRSG RMP/EIS) has PPH as exclusion areas except for the 68,000 acres managed as an avoidance area. This avoidance area follows the same approximate route identified as the BLM-preferred alternative (D) for TWE, as shown by the yellow shaded areas in Map 1 (attached). We submit that the distinction between transmission avoidance and exclusion areas should be based completely on biological criteria and habitat value rather than on the perceived need to expedite development. These habitat classifications are intended to be a safeguard to conserve habitat and population viability for a candidate ESA species; they should not be used as a means to prioritize development areas. The BLM should not allow waiver, exemption or modification to restrictions on surface occupancy in priority habitat

In light of the aforementioned issue, a group of 12 conservation organizations, including Defenders, submitted a formal request on August 27, 2013, for a 60-day extension to the comment period for the TransWest DEIS. The primary reason for our request is that the NW CO Draft GRSG RMP/EIS is currently out for public review and similar plans are slated to be released in September for Utah and Wyoming. One of the most important issues raised by the proposed TWE project is potential impacts to sage-grouse populations and habitat – as referenced above the preferred route in the TWS DEIS directly impacts the planning area currently under review in the NW CO Draft GRSG RMP/EIS – and extending the comment period would have provided the public with an adequate time frame to participate in both planning processes in a substantive manner, and also allow for a more complementary and in-depth analysis of both documents and submission of constructive comments. The BLM denied the extension request.

The lack of public information available to reconcile these tandem and potentially conflicting planning processes represents a critical and unacceptable lack of transparency that strongly impairs the public's ability to provide constructive comments on TWE. It is also unclear how BLM can move forward given this planning bottleneck, not just for TWE but for other priority transmission projects such as Gateway South and Zephyr given that key information that is foundational for sage-grouse planning is missing. We recommend that these upcoming plans be used to make a full and meaningful range of alternatives before a decision is made.

***Recommendation:*** The tandem processes of sage-grouse and transmission line planning must be made consistent, and details regarding the integration of these efforts must be made fully available for public comment.

## 2. Desert Tortoise

The primary means to preserve desert tortoise is to avoid disturbing high-quality, occupied habitat and to ensure that areas with healthy populations are connected by relatively wide and intact habitat linkages. Unlike other species for which individuals migrate readily between populations, desert tortoise are "corridor dwellers." Maintaining landscape connectivity is essential to provide for the slow transfer of genetic information between populations of this species.

All TWE segments and alternatives in Nevada would intersect desert tortoise Critical Habitat, Desert Tortoise Recovery Office Priority 2 habitat, and areas predicted to have high habitat potential based on USGS models, as shown by Figure 2 (attached). Defenders believes that all but one of the three routes entering into Nevada from Utah have unacceptable desert tortoise impacts. Routes 510 and the combination of routes 520, 580, and 610 would create new transmission corridors through relatively undisturbed lands, passing through desert tortoise critical habitat, desert tortoise non-critical habitat that has burned but has recovery potential, two of the three known occurrences of the Desert Valley kangaroo mouse, and potentially impacting other BLM Special Status Species (Meadow Valley speckled dace, red-tailed blazing star bee, Meadow Valley sandwort, and the Needle Mountains milkvetch). Route 502.05, in contrast, appears to represent the least impactful of the three routes. Although our comments are limited to an analysis of the routes included in the DEIS, there may be alternate routes which do a better job of avoiding impacts to desert tortoise and other protected species, and we encourage the BLM, the Applicant and Western to analyze other routes with desert tortoise impacts in mind.

Impact on the federally listed species should be offset through mitigation measures including, but not limited to: on-the-ground conservation actions such as land acquisitions, installing protective fencing, retiring grazing allotments, withdrawal of locatable mineral entry, limiting off-highway vehicle access, and implementing restoration projects. With regards to impacts to designated desert tortoise critical habitat, we recommend habitat loss compensation at a 5:1 ratio. Furthermore, we strongly recommend against any new roads in designated desert tortoise critical habitat, but if it absolutely necessary to construct new roads we recommend they be closed to motorized vehicle use by the public and effectively fenced.

## 3. Golden Eagles

Golden eagles (GOEA) are protected under two major forms of federal legislation, the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA), and under

increasing federal scrutiny with uncertain population levels. Take is likely unavoidable with a transmission project of this magnitude and in this location. Use by GOEA is not surprising as the application area contains native shrubland and grassland communities, as well as natural landscape features, that provide foraging and nesting opportunities sought by this species. In concert with our conservation groups, Defenders recommended that the BLM develop a supplemental GOEA document for public review and comment. That has not yet occurred. Given the continued concern for these important raptors, especially related to mortalities associated with wind development and expanding transmission infrastructure, any development decisions must be consistent with the conservation requirements under BGEPA. In addition, GOEA impacts must be placed within the appropriate regional population context. Areas 10 miles from the application area should be evaluated. Adequate buffers for GOEA should be in place and monitored to evaluate effectiveness. For unavoidable impacts, compensatory mitigation for retrofitting of lethal power poles should be considered. We note that spatial buffers for GOEA nests, as is done for Bald Eagles in most field office planning areas, should be 1.0 miles.

## 4. Mitigation

Defenders is pleased to see the Department of the Interior and the BLM recognize the need for a more transparent and systematic approach to mitigation, based on sound science, that addresses clear conservation priorities. We believe that an effective approach to mitigation requires the establishment of a mitigation framework that is built into the initial planning for energy and associated infrastructure development and an integral part of the design and development of a specific project. To be effective, a mitigation framework must include efforts to avoid impacts to wildlife and natural resources first, seek ways to minimize any negative effects second, and finally compensate for any unavoidable impacts of a particular project.

For a transmission project, one of the first and most important steps to avoid impacts is to plan potential transmission corridors so that they are developed within existing corridors, ROWs, on brownfields and other degraded lands, and other areas with co-locating opportunities. Important wildlife movement corridors, landscape connections, and crucial wildlife habitats on lands identified for development are crucial to the current and long-term viability of game and nongame wildlife, especially for providing adaptation options in the face of a changing climate. Depending on the wildlife and landscape, transmission can contribute to loss, fragmentation, and diminished resiliency of these habitats. Consequently, planning and siting to avoid or minimize impacts to the wildlife corridors and landscape connections is very important.

In many states across the west, mitigation for species, including the greater sage-grouse, will need to occur on lands managed by the BLM. To help achieve effective mitigation on these lands, the BLM must specify an approach to mitigation that can be considered durable. To be durable, mitigation conducted outside the areas of impact must, at a minimum, be effective for as long as the land-use authorization affects the resources and values, which may include withdrawal or removal of other incompatible uses on those sites. The duration of actions taken to achieve durable protection must be established consistent with the biological and ecological needs of the resources impacted.

Defenders believes the overall goal of mitigation associated with development of any kind should be to enhance overall ecological values within a region, including, but not limited to the recovery of endangered species. If the project is approved, the BLM should establish through the EIS the mitigation goal of a net gain in conservation benefits for endangered, threatened or candidate plants

and animal species affected by transmission line development compared with their status before the line. This will help recover listed species and hopefully preclude the need to federally list candidate or sensitive species.

In these comments we focus on proposed mitigation measures for greater sage-grouse habitat loss through Habitat Equivalency Analysis, as well as mitigation for direct and indirect development impacts on a range of bird species through an Avian Protection Plan.

- Habitat Equivalency Analysis:

We support Habitat Equivalency Analysis (HEA) methods that precisely define mitigation needed to offset both short and long-term project impacts and benefit affected populations while still maximizing landscape-scale conservation. As presented in our comments on the Gateway West DEIS, Sage-grouse Supplement, and FEIS (attached), actual species habitat use data is the appropriate basis for estimating Habitat Services, the currency of an HEA. Our previous recommendation for the Gateway West Habitat Services Metric (HSM) model was that the predictions of this heuristic, expert opinion-based model be checked against the scientifically rigorous USGS Wyoming Basin Ecoregional Assessment (WBEA) sage-grouse models (Hanser et al. 2011). These models, based on sage-grouse pellet counts taken from surveys across the ecoregion, tested a far more comprehensive set of predictors, including disturbance from transmission lines, and incorporated the spatial scale at which predictors were influential.

The approach we recommend for Transwest Express is based on project-specific modeling efforts, similar to the WBEA. The TWE HEA should focus on (1) defining the best model for the purposes of valuing habitat proposed for development (vs. habitat proposed for preservation or mitigation) and on (2) the effects of transmission lines and structures themselves. Restoration methods might also be included in the HEA on an experimental, adaptive management basis, but at this time there is insufficient understanding of their equivalency to habitat loss and degradation to allow full use in HEAs. We oppose the use of an opinion-based approach like that used for Gateway West to assess the impacts of development on sage-grouse, habitat services lost, and resulting mitigation needed for the species; this approach could lead to significant negative impacts on this already compromised species.

***Recommendation:*** The BLM must adopt a HEA process that models actual sage grouse habitat use to identify the strongest habitat predictors. The attempt to define them a priori through an expert opinion process lacks sufficient biological realism and is inherently inaccurate. The HEA and all associated data should be available for public review prior to the release of the FEIS.

- Avian Protection Plan

The DEIS mentions the applicant's commitment to developing an Avian Protection Plan that includes a full listing of all minimization measures included in this EIS. This APP is a critical component of the applicant's proposal and must be made available to the public for comment.

The APP should include consideration of:

- Adequate conductor-to-conductor and conductor-to-ground space to prevent avian electrocution.

- Anti-perching devices, when appropriate, to reduce perching and nesting on transmission structures by avian predators and prevent avian electrocution (Lammers and Collopy 2007, Slater and Smith 2010).
- Marking of lines as well as structure guy wires (or use of non-guyed structures) in areas with high avian collision risk. This is particularly important since the default structure type would be a guyed v-string lattice with double overhead static wires, a design that presents multiple opportunities for collision.
- Use of single solid tubular pole structures to reduce perching, and relocation of development to less sensitive areas (foraging areas, nesting areas, flyways, etc).

The DEIS mentions identifying Important Bird Areas and Bird Habitat Conservation Areas in the vicinity of the project as well as FWS Birds of Conservation Concern and Partners in Flight Priority Bird Species. These are all important steps that we fully support. However, these datasets must be incorporated with other biologically relevant data into a prospective, comprehensive analysis that effectively identifies high-risk areas for collision and electrocution, defines approaches needed to reduce this risk, and proactively reduces perching opportunities for synanthropic predators that negatively impact sage-grouse and desert tortoise. The APP should be continually evaluated and refined as monitoring data and new innovations become available, and, like the initial APP, any changes should be subject to public review. The Eagle Conservation Plan should include a listing of risk factors, as noted in the USFWS' Draft Golden Eagle Conservation Plan Guidance, and a discussion of these factors for the this project.

**Recommendation:** The Avian Protection Plan mentioned in the EIS must be based on a thorough review of available biological data and conservation areas to target areas where mitigation and management is needed, effective measures to counteract impacts, and a public review and adaptive management process to ensure continued effectiveness.

**References**

Braun CE. 1998. Sage grouse declines in western North America: what are the problems? Proceedings of the Western Association of State Fish and Wildlife Agencies 78:139–156.

Braun, C. E., O. O. Oedekoven, and C. L. Aldridge, 2002. Oil and gas development in western North America: effects on sagebrush steppe avifauna with particular emphasis on sage grouse. Transactions of the North American Wildlife and Natural Resources Conference 67:337-349.

Connelly, J. W., S. T. Knick, M. A. Schroeder, and S. J. Stiver. 2004. Conservation assessment of greater sage-grouse and sagebrush habitats. Unpublished report, Western Association of Fish and Wildlife Agencies.

Doherty, K.E., D.E. Naugle, H.E. Copeland, A. Pocewicz, and J.M. Kiesecker. 2011a. Energy development and conservation tradeoffs: systematic planning for greater sage -grouse in their eastern range. Pages 505 -516 in S.T. Knick and J.W. Connelly, editors. Greater sage -grouse: ecology and conservation of a landscape species and its habitats. Studies in Avian Biology 38. University of California Press, Berkeley, California, USA.

Connelly, J.W., S.T. Knick, C.E. Braun, W.L. Baker, E.A. Beever, T. Christiansen, K.E. Doherty, E.O. Garton, S.E. Hanser, D.H. Johnson, M. Leu, R.F. Miller, D.E. Naugle, S.J. Oyler -McCance, D.A. Pyke, K.P. Reese, M.A. Schroeder, S.J. Stiver, B.L. Walker, and M.J. Wisdom. 2011. Conservation of Greater Sage -Grouse: a synthesis of current trends and future management. Pp. 549–563 in S. T. Knick and J. W. Connelly (editors). Greater Sage -Grouse: ecology and conservation of a landscape species and habitats. Studies in Avian Biology (vol. 38), University of California Press, Berkeley, CA.

Gillan, J. K., Strand, E. K., Karl, J. W., Reese, K. P. and Laninga, T. (2013), Using spatial statistics and point-pattern simulations to assess the spatial dependency between greater sage-grouse and anthropogenic features. Wildlife Society Bulletin, 37: 301–310. doi: 10.1002/wsb.272

Hanser, S.E., C.L. Aldridge, M. Leu, M.M. Rowland, S.E. Nielsen, and S.T. Knick. 2011. Greater Sage-Grouse: General Use and Roost Site Occurrence with Pellet Counts as a Measure of Relative Abundance Chapter 5 in S.E. Hanser, M. Leu, S.T. Knick, and C.L. Aldridge (editors). Sagebrush ecosystem conservation and management: ecoregional assessment tools and models for the Wyoming Basins. Allen Press, Lawrence, KS.

Knick S.T. and J.W. Connelly. 2011. Greate r s age -g rouse and sagebrush: an introduction to the landscape. Pp. 1 -9 in S.T. Knick and J.W. Connelly (editors). Greater Sage -Grouse: ecology and conservation of a landscape species and its habitats. Studies in Avian biology (vol. 38). University of California Press, Berkeley, CA.

Knick ST, Hanser SE, Preston KL. 2013. Modeling ecological minimum requirements for distribution of greater sage -grouse leks: implications for population connectivity across their western range, U.S.A. Ecology and Evolution: 3(6) 1539 -1551.

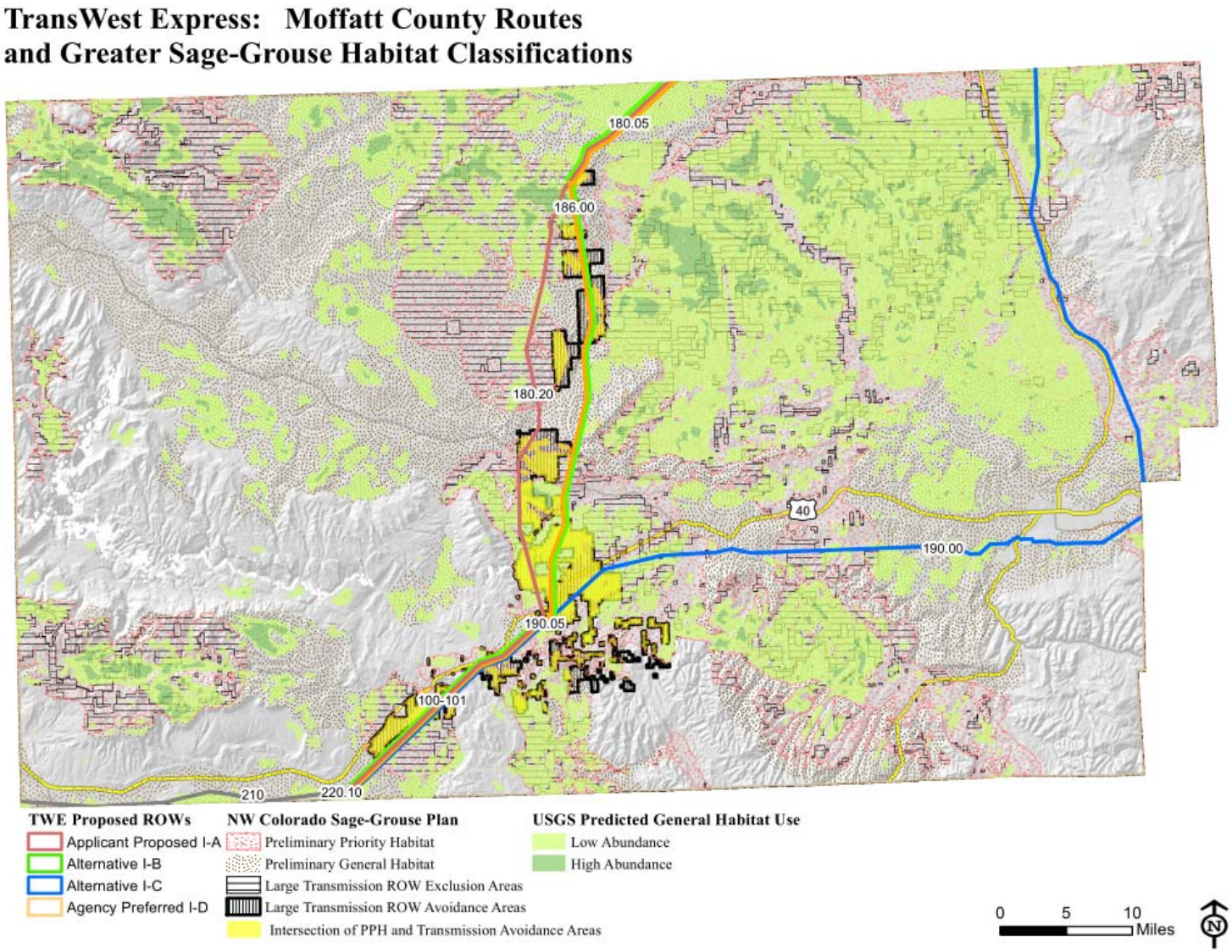
Manier, D.J., Wood, D.J.A., Bowen, Z.H., Donovan, R.M., Holloran, M.J., Juliusson, L.M., Mayne, K.S., Oyler-McCance, S.J., Quamen, F.R., Saher, D.J., and Titolo, A.J., 2013, Summary of science, activities, programs, and policies that influence the rangewide conservation of Greater Sage-Grouse (Centrocercus urophasianus): U.S. Geological Survey Open-File Report 2013–1098, 170 p., http://pubs.usgs.gov/of/2013/1098/.

Manville, A.M., II. 2004. Prairie grouse leks and wind turbines: U.S. Fish and Wildlife Service justification for a 5-mile buffer from leks; additional grassland songbird recommendations. Division of Migratory Bird Management, USFWS, Arlington, VA, peer-reviewed briefing paper. 17 pp.

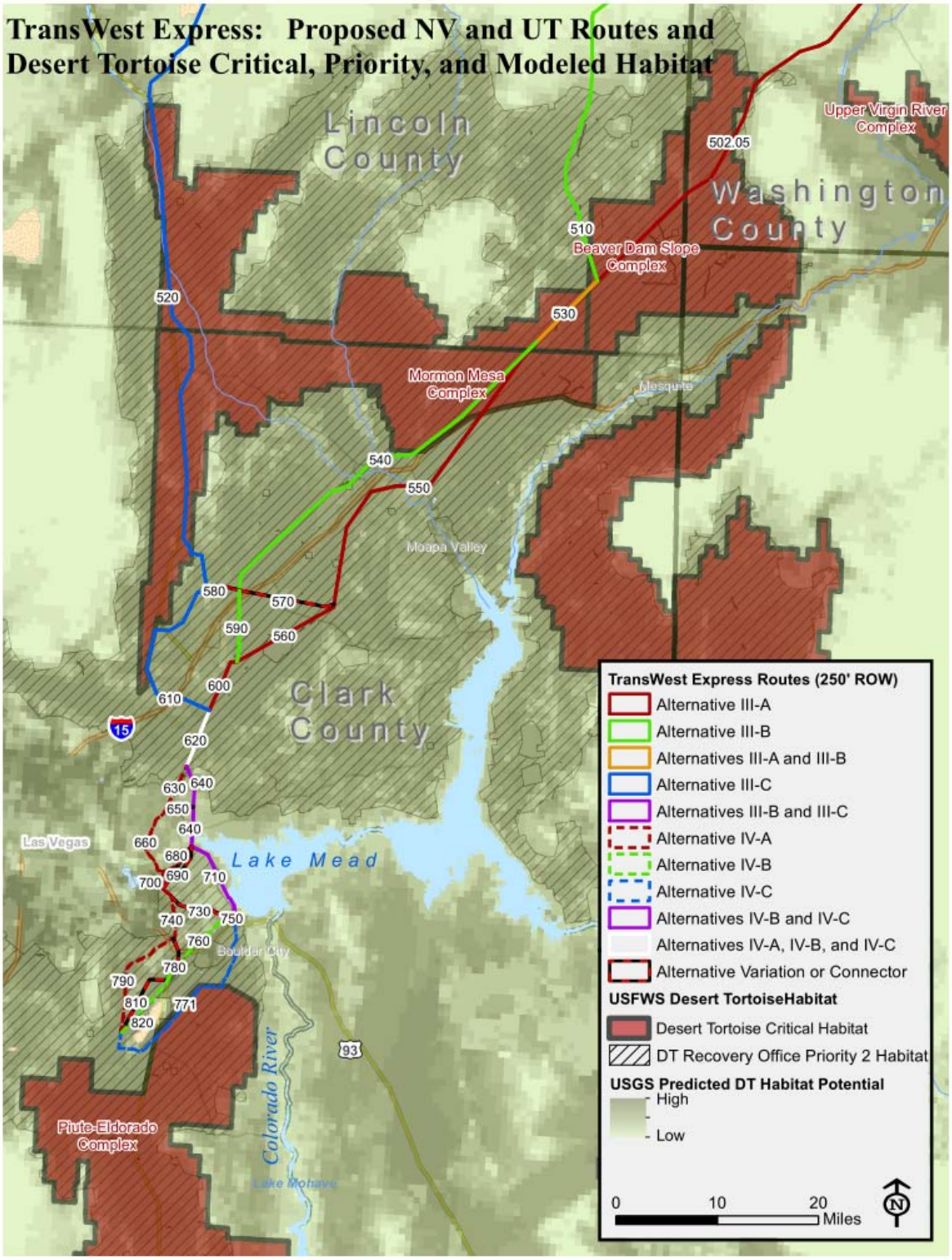
Wisdom, M.J., M.M Rowland, L.H. and Suring. 2005. Habitat Threats in the Sagebrush Ecosystem: Methods of Regional Assessment and Applications in the Great Basin. Alliance Communications Group, Lawrence, Kansas, USA.

Wisdom, M.J., C.W. Meinke, S.T. Knick, and M.A Schroeder. 2011. Factors associated with extirpation of sage -grouse. Page 451 -472 in S.T. Knick and J.W. Connelly (editors). Greater sage -grouse: ecology and conservation of a landscape species and its habitats. Studies in Avian Biology 38. University of California press, Berkeley, California, USA.

USFWS. 2010. Endangered and Threatened Wildlife and Plants; 12 -Month Findings for Petitions to List the Greater Sage -Grouse ( Centrocercus urophasianus ) as Threatened or Endangered. 75 Federal Register 55 (23 March 2010), pp. 13910 -14014




Map 1: PPH classified as transmission avoidance areas that coincide with proposed ROWs in Moffat County




Map 2: Most TWE proposed routes in Nevada intersect some desert tortoise Critical Habitat, Priority 2 Habitat, and areas with high habitat potential based on USGS models.

June 28, 2013

Walt George, Project Manager
Gateway West Transmission Project EIS
Bureau of Land Management
P.O. Box 20879
Cheyenne, Wyoming 82003
Via email: *Gateway_West_WYMail@blm.gov*

**Re: Comments on Proposed Gateway West Transmission Line Project Sage-Grouse Habitat Equivalency Analysis (HEA)**

Dear Mr. George:

Thank you for accepting these comments on the greater sage-grouse (sage-grouse) Habitat Equivalency Analysis (HEA) for the Gateway West project, as presented in the Final Environmental Impact Statement (EIS). As noted in comments submitted on both the draft EIS and Sage Grouse Addendum, we remain extremely concerned that the Bureau of Land Management (BLM) and U.S. Fish and Wildlife Service (FWS) are utilizing an opinion-based approach instead of a peer-reviewed,[1] data-driven approach to assess the impacts of development on sage-grouse, habitat services lost, and resulting mitigation needed for the species. Given the BLM's stated intent to use the Gateway West HEA as a template for assessing sage-grouse mitigation for future and ongoing projects, we believe the proposed approach could lead to significant negative impacts on this species.

Sage-grouse are an especially disturbance prone species, with 99% of active leks range-wide in landscapes which have less than 3 percent coverage of developed land types.[2] For this species, accurate assessment of habitat services requires assessment of direct, indirect, and cumulative effects, particularly the effect of tall structures on habitat services. Unfortunately, the Habitat Services Metric model (HSM model) used at Gateway West does not adequately incorporate and assess indirect and cumulative effects when evaluating habitat services—making it unclear how the agencies and developer will mitigate for those effects. In practical terms, this will likely lead to undisturbed habitat being undervalued, disturbed habitat being overvalued, and an overall underestimate of the amount of mitigation necessary and the area over which it is required.

This project comes at a critical time for the conservation of greater sage-grouse. This "warranted but precluded" candidate species requires management and protection focused on ensuring local

[1] A peer review is a documented, critical review performed by peers [defined in the USNRC report as "a person having technical expertise in the subject matter to be reviewed (or a subset of the subject matter to be reviewed) to a degree at least equivalent to that needed for the original work"] who are independent of the work being reviewed. The peer's independence from the work being reviewed means that the peer, a) was not involved as a participant, supervisor, technical reviewer, or advisor in the work being reviewed, and b) to the extent practical, has sufficient freedom from funding considerations to assure the work is impartially reviewed. *See* USNRC.

[2] Knick, S.T., S.E. Hanser, and K.L. Preston. 2013. Modeling ecological minimum requirements for distribution of greater sage-grouse leks- Implications for population connectivity across their western range, U.S.A. DOI-10.1002/ece3.557: Ecology and Evolution, p. online.

conservation success, in conjunction with an overall strategy to incorporate indirect and cumulative effects and to provide for rangewide persistence for the species. The adoption of objective methods based on the most complete and current science is the key component of such a strategy. We are optimistic that further refinement of HEA for sage-grouse can lead to sound development with lasting conservation benefits.

To address and remedy the flaws in the HSM used for Gateway West, we recommended in previous comments that the BLM objectively evaluate the HSM model results against the existing peer-reviewed, data-based greater sage-grouse habitat model created by USGS for the Wyoming Basins Ecoregional Assessment (WBEA).[3] This comprehensive analysis employed sage-grouse habitat use data gathered across the ecoregion to model relative sage-grouse habitat use vs. availability, selecting the best habitat predictors from a large set of candidates using objective methods, incorporating indirect and cumulative effects and scale when estimating habitat services, and making use of improved habitat predictors using readily available data. This model represents the most complete and current habitat suitability analysis for the species.

Our main recommendation in previous comments, that habitat services estimated by the HSM model be compared to the publicly available USGS Wyoming Basins Ecoregional Assessment (WBEA) sage-grouse habitat models by an independent group of experts, was not incorporated into the FEIS, leaving us no basis to conclusively evaluate the HSM model performance. Our prior evaluations of both models are still relevant, however, and are detailed below.

Additional recommendations are summarized in Table 1, below, along with a description of the methods used in the DEIS, Sage-Grouse Addendum, and FEIS. Most of these recommendations—build habitat models based on habitat use, statistically evaluate competing predictors and competing models, objectively test competing models, include all potentially relevant effects—are standard best practices enforced through peer review in the research community, and should be non-controversial.

> **The BLM must adopt a HEA process that models actual sage grouse habitat use to identify the strongest habitat predictors. The attempt to define them a priori through an expert opinion process lacks sufficient biological realism and is inherently inaccurate.**

Table 2, also below, compares the extensive set of predictors used in the WBEA models to those used in the Gateway West HSM model. This comparison highlights the strengths of a model like that used for the WBEA over one based on existing research filtered through expert opinion (e.g. the HSM model used for Gateway West). The WBEA models tested 28 predictors, 19 of these at multiple spatial scales, in order to determine objectively the scale at which both negative and positive impacts on sage grouse habitat influence sage-grouse habitat use. The only predictors

[3] Hanser, S.E., C.L. Aldridge, M. Leu, M.M. Rowland, S.E. Nielsen, and S.T. Knick. 2011. Greater Sage-Grouse: General Use and Roost Site Occurrence with Pellet Counts as a Measure of Relative Abundance Chapter 5 in S.E. Hanser, M. Leu, S.T. Knick, and C.L. Aldridge (editors). Sagebrush ecosystem conservation and management: ecoregional assessment tools and models for the Wyoming Basins. Allen Press, Lawrence, KS.

retained in the final models were those most effective at explaining the patterns in observed sage-grouse habitat use. Short-range, cumulative effects of disturbance were wrapped into evaluation of habitat services through predictors that quantify disturbance density within various spatial neighborhoods. Although this process of formulating and testing competing predictors and competing models to fit observed data represents the standard of modern ecological research, such testing is not even possible with the structure of the HSM model. This leaves no objective basis to evaluate how any given predictor, or the model overall, is performing and no basis to assess the adequacy of proposed mitigation. When uncertainty exists, the agencies need to make decisions based on sound science and proven methodologies that can be independently validated. The BLM and FWS could have done this at Gateway West by adopting the modeling process used to create the WBEA model. Instead, the proposed HEA has developed no data-based, objective assessment of sage-grouse habitat use against which to make this determination.

Two of the 11 predictors included in the HSM model were omitted from testing in some form within the WBEA model framework, and in both cases these omissions are well supported; these predictors should not have been included in the HSM model. First, distance to fences was excluded due to basic inadequacies in existing fence data; deficiencies that were also acknowledged in the Gateway West DEIS meeting notes (see Table 3). As discussed further below, the choice of distance from fences as a predictor of habitat services for the HSM model seems to have been driven primarily by the desire to pursue fence marking as mitigation. Although properly targeted fence marking has been shown to be effective to prevent sage-grouse collision mortality by a preliminary study, the authors caution that direct inferences to population-level benefits resulting from reduced sage-grouse collision risk cannot be made.[4] More fundamentally, fence marking does not provide habitat services; it just potentially removes one source of mortality from fences without affecting increased mortality risk due to providing predator perches or any disturbance effects of fences. Similarly, in the WBEA model distance to occupied leks was also excluded, and lek data were instead used as a means to independently validate the models. Areas with high predicted habitat value in the final WBEA brood and general habitat use models overlapped lek locations with greater than 75% accuracy. A strong argument can be made that it is far more useful to have a model that is predictive of leks than one which includes leks as a predictor; since lek locations are generally known, it is always possible to overlay lek data to modify habitat suitability predictions, and it is a very desirable trait of a model to be able to make accurate predictions about potential sage-grouse habitat services beyond some proximity of known leks.

Most of the predictors used in both the HSM and WBEA analyses were quantified in a more effective manner in the final WBEA models. Some of the predictors used in the HSM model, such as slope, were insignificant in the WBEA models in their raw form, but were significant when used in a composite index more predictive of habitat use (Topographic Ruggedness Index). Other HSM predictors, such as sagebrush canopy size, were implied in the more detailed vegetation layers used for the WBEA models, which split sagebrush vegetation into different classes (the HSM model considered all sagebrush types as suitable for sage-grouse, a

[4] Stevens, B. S., D.E. Naugle, B. Dennis, B., J.W. Connelly, T. Griffiths, and K.P. Reese. (2013), Mapping sage-grouse fence-collision risk: Spatially explicit models for targeting conservation implementation. Wildlife Society Bulletin. doi: 10.1002/wsb.273

biologically invalid assumption). Still other predictors used in the HSM model, such as distance to nearest sage or shrub-dominated area, were quantified using metrics more consistent with landscape ecology best practices (sage edge density, patch size, and contagion) but when tested still had little or no ability to predict observed habitat use. The key point again is that with the WBEA model this fine tuning to increase performance can be done, but with the HSM model there's no ability to objectively gauge the effectiveness of any model predictors since variables were chosen based on judgment, not data.

Table 3 summarizes predictors used in the Gateway HSM model itself, followed by comments from the meeting notes/FEIS that relate to the choice of each predictor and decisions on scoring, as well as our recommendations for improvement. The most obvious conclusion that can be drawn from reading the "BLM Comment" field in Table 3 is that there's actually little basis in the published literature to construct an opinion based model that would accurately estimate sage-grouse habitat services, reinforcing the need for a data-driven model and approach; Table 3 details multiple instances where decisions were made based on incomplete information and group consensus, often with the acknowledgement that scores were not supported by peer-reviewed literature and were being made on a heuristic basis. In these situations, multiple sources of bias can strongly influence outcomes, as detailed by Martin et al (2012):[5]

> Humans are susceptible to a range of subjective and psychological biases (overview in Supporting Information), often unknowingly (Slovic 1999; Kynn 2008; McBride & Burgman 2011). Motivational biases arise from the context of the expert, personal beliefs, and from the personal stake one might have in a decision. Accessibility biases arise when information that comes more easily to the mind of an expert exerts a disproportionate influence on an expert's judgments. Anchoring and adjustment biases occur when an expert anchors an estimate on a benchmark and then is unable to adjust this estimate much above or below the benchmark. Overconfidence bias arises when the confidence of experts in their judgments is higher than is warranted by the accuracy of their estimates (McKenzie et al. 2008). This bias sometimes results in systematic underestimation, in which experts fail to express the extent of uncertainty (O'Hagan et al. 2006).

In the context of evaluating habitat services, these sources of bias are best avoided by use of an objective modeling process driven by observed species use of habitat in relation to a broad set of predictors, including all relevant types of disturbance and quantified across a range of scales. When a full suite of predictors is tested against the data, predictors that are not useful and their associated biases drop out due to their negative impacts on predictive power. The HSM model, since it is entirely expert opinion-based and has not been objectively verified by any independent data, cannot be disentangled from these biases due to its basic structure. Previous comments detail the extreme influence that inaccuracy and bias can have in HEA model results when projected out over time[6], and how this can result in grossly inadequate mitigation.[7] With the

[5] Martin, T. G., M.A. Burgman, F. Fidler, F., P.M. Kuhnert, S. Low-Choy, M. Mcbride, and K. Mengersen, K. 2012. Eliciting Expert Knowledge in Conservation Science. Conservation Biology, 26: 29–38. doi: 10.1111/j.1523-1739.2011.01806.x

[6] Dunford, R.W., T.C. Ginn, and W.H. Desvousges. 2004. The use of habitat equivalency analysis in natural resource damage assessments. Ecological Economics 48: 49-70.

proposed HSM model, there are no analytical safeguards to prevent this from happening, and in fact, as noted in most detail in previous comments by The Nature Conservancy, the model scoring is structured so that restoration of poor quality habitat as mitigation for the loss or impairment of high quality habitat is likely. In other words, all information indicates the HSM model is biased, and that these biases in the model will lead to inadequate mitigation.

**The HEA fails to include any predictor of disturbance effects of tall structures, including transmission lines, on the species**

Overall, the WBEA models tested a wide range of thoughtfully constructed predictors against sage-grouse habitat use data. Of the variables tested and found to be highly effective in the WBEA models that were not used in the HSM model, the most important omission was any predictor to assess disturbance effects from power lines and tall structures themselves, . The meeting notes state that decay distance from power lines was not included in the HSM model due to the consensus of the interagency group that existing research is not sufficient to show power lines have an impact on the species. This conclusion is at odds with the findings of a recent, rigorously designed study that found greater sage-grouse avoid areas within 600 m of transmission lines,[8] and also conflicts with numerous studies that, although they were not able to completely control for other disturbance effects to isolate the effects of tall structures themselves, strongly associated negative impacts on greater sage-grouse with human disturbance and with transmission infrastructure[9,10]. The group's conclusion is also at odds with the FWS[11] assertion that avoidance impacts of transmission lines on prairie grouse species are essentially the same; if the FWS is correct, the multiple studies that have documented negative effects on lesser prairie chicken are also relevant. Finally, decay distance from power lines within a half kilometer was highly predictive as a negative influence on sage-grouse habitat use in the WBEA models. The fact that a key conclusion of the data-based WBEA approach, which as detailed above represents the best available analysis for over 50% of the project area, is directly at odds with assumptions made for the Gateway West HEA on the basis of expert opinion indicates that this assumption of the HSM model is not supported by the most current, peer-reviewed science.

The BLM's responses in Appendix L note that while the WBEA model is useful for characterizing habitat quality and quantifying habitat injury, it was not designed to specifically address power line impacts, particularly in terms of being able to quantify the benefit of

---

[7] Efroyemson, R.A., M.J. Peterson, C.J. Welsh, D.L. Druckenbrod, M.G. Ryon, J.G. Smith, W.R. Hargrove, N.R. Giffen, W. Kelley Roy, and H.D. Quarles. 2008. Investigating habitat value to inform contaminant remediation options: approach. Journal of Environmental Management 88: 1436-1451.

[8] Gillan, J. K., Strand, E. K., Karl, J. W., Reese, K. P. and Laninga, T. (2013), Using spatial statistics and point-pattern simulations to assess the spatial dependency between greater sage-grouse and anthropogenic features. Wildlife Society Bulletin, 37: 301–310. doi: 10.1002/wsb.272

[9] Ellis, K.L. 1985. Effects of a new transmission line on distribution and aerial predation of breeding male sage-grouse. Report for Deseret Generation and Transmission Cooperative, Sandy, Utah.

[10] Rodgers, R. 2003. Wind Power Generation: Biological Concerns. Wind Energy Symposium April 10, 2003. Ft. Hays State University, Hays, Kansas

[11] Manville, A.M., II. 2004. Prairie grouse leks and wind turb ines: U.S. Fish and Wildlife Service justification for a 5 -mile buffer from leks ; additional grassland songbird recommendations. Division of Migratory Bird Management, USFWS, Arlington, VA, peer -reviewed briefing paper. 17 pp.

proposed mitigation projects with respect to the habitat lost or degraded through development. This is a key point, and there are several valid counter-responses. The most obvious is that equivalency has not been established for most of the proposed mitigation methods, as discussed further below, and that is the exact reason why the current Habitat Equivalency Analysis for Gateway West, which is entirely based on assumptions, represents such an unacceptable risk at this time. Second, it was notable that the final WBEA models both contained the predictor "decay distance to transmission lines within 0.5 km" as a highly significant predictor. Although the models were not specifically designed for a transmission project, they are clearly sensitive enough to detect impacts of existing transmission on sage grouse habitat use, and as repeatedly stated, the approach of testing variables rather than excluding them based on inadequate support in the literature is the one that needs to be taken over the approach taken of modeling only those habitat service losses that could be defensively quantified using existing literature, literature which everybody agrees is not adequate. It's true that revisiting the WBEA model process for Gateway West and other potential projects that affect sage-grouse within the ecoregion would produce a more accurate result tailored to the specific development context. This is not a full re-invention of a process, however, but rather an iteration of an existing process with modified inputs and possibly a few new ones.

### Habitat Services Cannot be Defined for Experimental Restoration or Fence Marking

As mentioned above, some predictors in the HSM model either have no relationship with habitat services or a relationship that cannot be defined based on current research. We assert that such predictors fundamentally have no place in a model to evaluate habitat services for a HEA. In particular, fence marking, conifer removal, and bunchgrass/forb seeding were chosen because they mirror ongoing priority habitat restoration efforts, and they are chosen in the FEIS as the preferred mitigation approaches for the project. No relationship is explained between how many marked spans of fence, removed conifers, or seed applications equates to each acre of habitat developed. As a result, we see no basis to make these judgments, making these predictors unsuitable for use in determining habitat equivalency until such relationships are established. This would require linking this proposed mitigation to sage-grouse productivity and survivorship through well-designed research. Some of this is ongoing through the NRCS Sage-Grouse Initiative, but is still in initial stages.

The emphasis of a HEA, as typically formulated, is on establishing equivalency between impacts and mitigation used to compensate for those impacts. In the cold desert sagebrush ecosystem where this mitigation approach is currently being implemented, however, this equivalency of x units of effort producing x units of sage-grouse habitat services has not been established at all, or is at best very tenuous. In addition, restoration in these water-limited areas is inherently risky, and it's uncertain how successful restoration can be at the landscape scale given climate change and drought. Wisdom et al (2003)[12] assert that retaining and protecting high quality sagebrush habitat is more effective, efficient, and economical than attempting to restore habitats already

[12] Wisdom, M. J., M. M. Rowland, L. H. Suring, L. Schueck, C. Wolff Meinke, B. C. Wales, and S. T. Knick. 2003. Procedures for regional assessment of habitats for species of conservation concern in the sagebrush ecosystem. March 2003 Report, Version 1, Pacific Northwest Research Station, La Grande, Oregon.

degraded by cheatgrass invasion, fire, and juniper encroachment. Given this uncertainty in the equivalency and projected benefits, the emphasis in sage-grouse HEA analyses should be on identifying and protecting intact habitat and on evaluating habitat value in both development and mitigation areas with the highest level of accuracy possible, not on specifying restoration to offset impacts. The approaches above are promising and should be pursued, but until equivalency with respect to habitat loss and degradation can be firmly established for sage-grouse, these types of mitigation are inappropriate in the context of mitigation used to provide habitat services for a Habitat Equivalency Analysis. A HEA for this candidate species should focus on precise evaluation of habitat services to be developed with respect to habitat used for mitigation. We strongly support the full development of such an approach.

**Conclusion**

As previously stated, this project comes at a critical time for the conservation of greater sage-grouse. This "warranted but precluded" candidate species requires management and protection focused on ensuring local conservation success, in conjunction with an overall strategy to incorporate indirect and cumulative effects and to provide for rangewide persistence for the species. The adoption of objective methods based on the most complete and current science is the key component of such a strategy. We are optimistic that further refinement of HEA for sage-grouse can lead to sound development with lasting conservation benefits.

If the tools needed to implement sage-grouse HEA are not developed to their full potential, however, and the HEA approach used for Gateway West is allowed to become a template for future projects, agencies will be missing a huge opportunity to contribute to sage-grouse conservation. It is vital for the recovery of this candidate species to set a high bar in terms of scientific credibility and conservation effectiveness. Adaptive management with a focus on preserving high-quality habitat is the key to effective conservation of sage-grouse and other sagebrush obligate species. To accomplish the ambitious conservation goals required of this analysis, HEA must be finely honed tool with the level of precision and accuracy needed to be responsive to changes in habitat that are meaningful to the species itself.

We are available to clarify these comments and would be happy to meet with you to learn what steps the BLM and the proponents are taking to address our concerns. Thank you for the opportunity to comment on this precedent-setting analysis, which we believe must continue to evolve to make it an effective tool for both conservation and development.

Sincerely,

Jon Belak, Wildlife Biologist, Renewable Energy

Defenders of Wildlife

Erin Lieberman, National Renewable Energy Policy Analyst
Defenders of Wildlife

Daly Edmunds, Regional Policy Coordinator
Audubon Rockies

Alex Daue, Renewable Energy Associate
The Wilderness Society

## Table 1: Summary of Past Recommendations

| Recommendation | Gateway West DEIS Methods | Gateway West FEIS Methods |
|---|---|---|
| Incorporate all relevant indirect effects possible at the appropriate scale when estimating habitat quality of areas proposed for development. | Only noise, human presence, fences, and roads were incorporated in the impacts analysis, and only proxies for these effects as represented by distance from nearest feature were used in the HSM model. | No change. Baseline habitat service level does not account for all habitat service losses associated with existing environmental disturbances, and the FEIS states that omission of these disturbances is a conservative approach to the analysis of Project-related habitat service losses since the analysis assumes that the habitats affected by the Project are of higher-quality than they actually are, and so requires a greater amount of mitigation to offset Project-related habitat service losses. |
| When using distance-based predictors, instead of using distance to nearest feature as a predictor, use feature density within a set of spatial neighborhoods and test the predictive power of each to determine which is most predictive for sage grouse habitat use. | 5/11 predictors in the model were based upon distance to the nearest feature (highway, road/well pad/mine, fence, occupied lek, and sage/shrub dominant vegetation). Predictors that instead incorporated feature density per unit area were discussed but not used. | No change |
| Include all relevant indirect and cumulative effects when evaluating habitat services; Disturbance has a strong effect on sage-grouse habitat selection, and the indirect and cumulative effects of disturbance must be incorporated into evaluation of habitat services; the absence of published studies on disturbance effects does not justify excluding them from consideration, it means that these relationships must be modeled using the best available data. We recommend use or adaptation of the model developed for the USGS WBEA that used sage-grouse pellet counts as a proxy for habitat use and tested the influence of disturbance on habitat use over various spatial extents. | The DEIS Supplemental states HEA is a method to quantify loss of habitat services and define mitigation rather than an impacts analysis. The Framework for Sage-Grouse Impacts Analysis for Interstate Transmission developed limits disturbance to one per 640 acre section to justify not considering cumulative impacts, and includes only noise and human presence as potential indirect impacts to habitat services. Transmission structures, while present, are assumed to only affect habitat quality in terms of habitat removed by tower foundations; the ROW is assumed to return to 95.8% of the original habitat service value. Tertiary roads were not included by group consensus. Disturbance-based predictors do not express disturbance density and were assigned values through expert opinion. The meeting notes detail the group's explicit decision to exclude indirect impacts from the HEA (DEIS page F-15), and also note that this change allowed the study corridor width to be decreased from 18 km to 9 km (F-24). | No change |

## Table 2: Comparison of Wyoming Basins Ecoregional Assessment Sage-Grouse Model with Habitat Services Metric Model

| | Spatial Scale of Measurement (km) | | | | | | |
|---|---|---|---|---|---|---|---|
| **Predictor** | **Plot Center** | **0.25** | **0.5** | **1** | **3** | **5** | **18** |
| All big sagebrush | n/a | x | x | o | x | x | x |
| All sagebrush | n/a | x | x | o | x | x | x |
| Big sagebrush | n/a | x | x | x | x | x | x |
| Coniferous forest | n/a | x | x | x | o | x | x |
| Grassland | n/a | x | x | x | x | x | x |
| Mixed shrubland | n/a | x | x | x | o | x | x |
| Riparian | n/a | x | x | o | x | x | x |
| Salt-desert shrubland | n/a | x | x | x | x | x | x |
| Decay distance from intemittent water | n/a | x | x | x | n/a | n/a | n/a |
| Decay distance from permanent water | n/a | x | x | x | n/a | n/a | n/a |
| Decay distance from agricultural land | n/a | x | x | x | n/a | n/a | n/a |
| Decay distance from highways | n/a | x | x | o | n/a | n/a | n/a |
| Decay distance from pipelines | n/a | x | x | x | n/a | n/a | n/a |
| Decay distance from power lines | n/a | x | o | x | n/a | n/a | n/a |
| Decay distance from secondary roads | n/a | x | x | x | n/a | n/a | n/a |
| Decay distance from oil and gas wells | n/a | x | x | o | n/a | n/a | n/a |
| Density of all roads | n/a | x | x | x | n/a | n/a | n/a |
| Normalized Difference Veg. index | x | x | x | x | x | x | x |
| Topographic Ruggedness Index | x | o | x | x | x | x | x |
| Compound Topographic Index | x | n/a | n/a | n/a | n/a | n/a | n/a |
| Elevation | o | n/a | n/a | n/a | n/a | n/a | n/a |
| Slope | x | n/a | n/a | n/a | n/a | n/a | n/a |
| Solar radiation index | x | n/a | n/a | n/a | n/a | n/a | n/a |
| Mean annual maximum temperature | x | n/a | n/a | n/a | n/a | n/a | n/a |
| Mean annual minimum temperature | o | n/a | n/a | n/a | n/a | n/a | n/a |
| All sage species contagion | x | n/a | n/a | n/a | n/a | n/a | n/a |
| All sage species edge density | x | n/a | n/a | n/a | n/a | n/a | n/a |
| All sage species patch size | x | n/a | n/a | n/a | n/a | n/a | n/a |

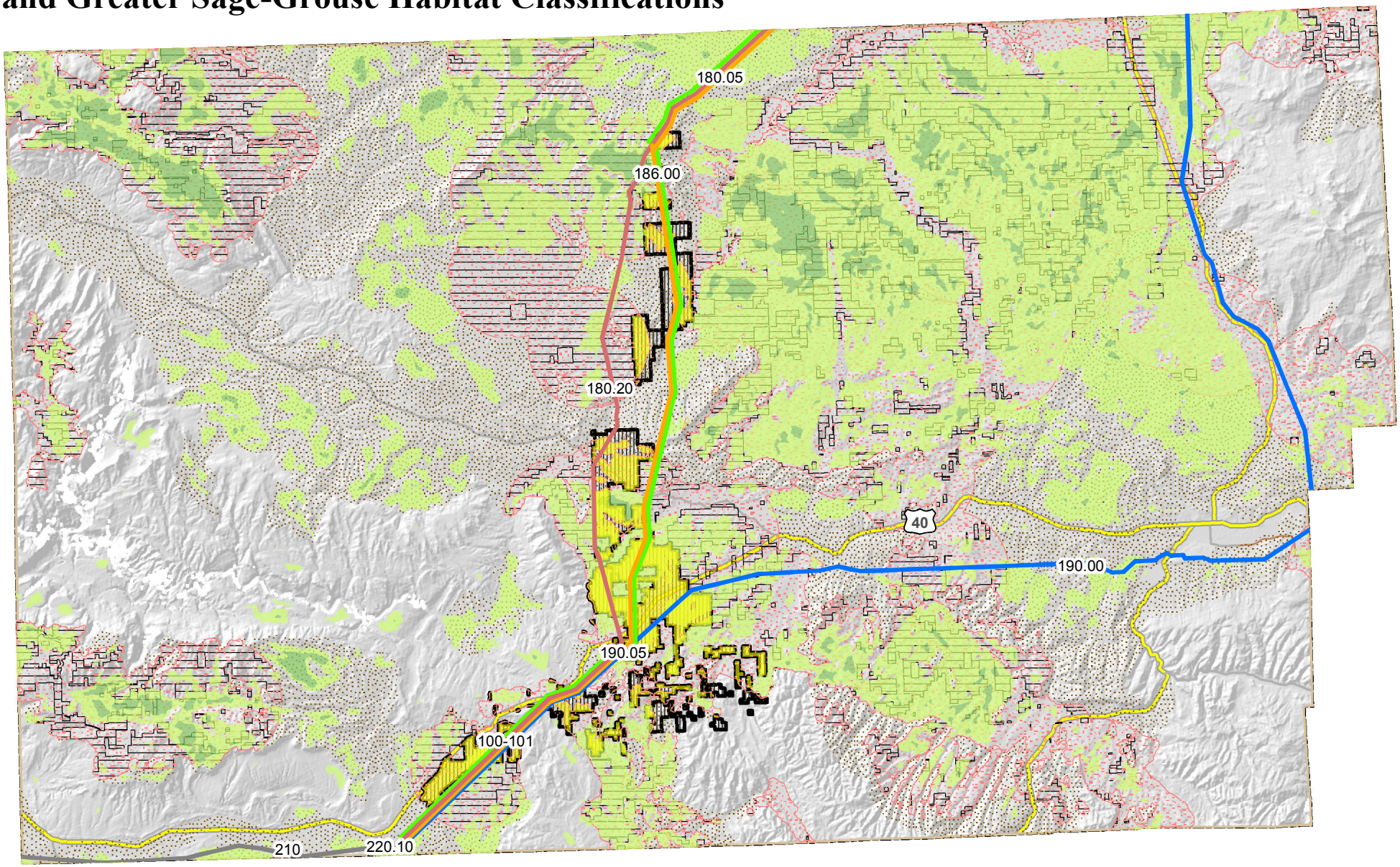
| Legend | |
|---|---|
| x | Tested but not significant |
| o | Tested and significant |
| | Positive relationship with sage-grouse general and roost habitat |
| | Positive relationship with sage-grouse roost habitat |
| | Positive relationship with sage-grouse general habitat |
| | Negative relationship with sage-grouse general and roost habitat |
| | Included in the HSM model only as a "nearest feature" predictor |
| | Included in both models |

## Table 3: Summary of HSM Model Predictors and Recommendations

| Predictor | Predictor Value | | | | BLM Comment | Recommendation |
|---|---|---|---|---|---|---|
| (blue=additive, yellow=multiplicative) | 3 | 2 | 1 | 0 | | |
| **Distance to interstate or US highway (m)** | > 5000 | 700-5000 | 100-700 | < 100 | Scoring "not perfectly supported in the peer-reviewed literature" (FEIS App J) | Retain distance to nearest roads, but also use road density and test this within various spatial neighborhoods |
| **Distance to county highway, surfaced high-use road, well pad, or mine footprint (m)** | > 200 | 50-200 | 25-50 | < 25 | Scoring "not perfectly supported in the peer-reviewed literature" (FEIS App J) | Retain distance to nearest roads, but also use road density and test this within various spatial neighborhoods |
| **Distance to fence (km)** | > 2 | 0.4-2 | < 0.4 | NA | The minimum value of 0.4 km was based on preliminary results of an ongoing fence marking study that did not examine strikes vs. distance to lek. The highest values in were based on guidelines from two general sage-grouse management papers. The middle value was assigned using a linear relationship. The meeting notes detail problems with this predictor (effects are site specific and close range, fence data are generally inaccurate and incomplete) and suggestions to use fence density in place of distance to nearest fence, but there were no changes. | This predictor reflects the relatively recent interest in using fence marking for mitigation, an approach that makes intuitive sense and has been shown to be effective in reducing collision mortality when properly targeted, but provides no sage-grouse habitat services and has an unknown equivalency with respect to habitat loss and/or degradation; determining the number of spans to mark to offset each unit area of habitat lost or degraded is not possible to address given current knowledge, as acknowledged in Stevens et al. (2013). Given that, this form of mitigation should be pursued in contexts other than HEA. |
| **Distance to occupied lek (km)** | 0-5 | 5-8.5 | .8.5 | NA | Current sage-grouse habitat management guidance uses occupied leks as focal points for nesting habitat management, so distance to lek was used as a variable in the Habitat Services Metric. | BLM uses recommended guidelines for lek protection along with three different radio collar studies to arrive at distance values for scoring. Instead, use observed grouse use data to test the ability of distance to the nearest lek and lek density within various neighborhoods to predict sage-grouse habitat use. |
| **Distance to sage or shrub dominant area (m)** | < 90 | 90-275 | > 275 | NA | This was included since sage-grouse use other shrub types for excape cover during brood rearing, and the values were derived from loosely applying guidelines and recommendations from two sources (Lincoln County s-g technical team and Stiver et al. 2010). | As above, generate multiple versions of the predictor and test their ability to predict observed grouse habitat use, as has been already done already in the WBEA sage-grouse model. |
| **% slope** | < 10 | 10-30 | 30-40 | > 40 | Areas less than 5% slope were assigned the high score, with those exceeding 10% intervals subjectively assigned after that and areas with greater than 40% unsuitable (0). | Slope was tested in the WBEA model and had no power to predict observed sage-grouse habitat use, but Topographic Ruggedness Index, a neighborhood-based index more typical of modern GIS-based predictors, was significant. |

| Predictor | Predictor Value | | | | BLM Comment | Recommendation |
|---|---|---|---|---|---|---|
| **% sagebrush cover** | 15-25 | 5-15 or > 25 | < 5 | NA | In general, the recommended sagebrush cover for nesting habitats was intermediate to and overlapped that of brood-rearing and winter habitats. Thus, favorable conditions for nesting were given the highest scores for percent sagebrush cover in the sage-grouse habitat services metric. The sagebrush cover scores assigned for nesting habitat in the sage-grouse habitat assessment framework by Stiver et al. (2010) to different sagebrush cover categories were assigned to this variable. | This metric has the strongest link to sage-grouse habitat services based on existing research, but nesting habitat requirements were subjectively prioritized in the scoring based on conjecture about seasonal habitat overlap. Variables should be tested for their power to predict different types of habitat use. |
| **% bunchgrass cover** | 5-15 | 2-5 or > 15 | < 2 | NA | Literature reviewed defined an optimum range of bunchgrass cover for nesting and brood rearing; above and below this ideal range, lower scores were assigned subjectively with no support. | The WBEA study methods define separate models for brood/nesting habitat and general habitat since brood pellets are easily differentiated from general habitat use pellets due to clustering. The brood/nesting habitat model would be ideal for exploring bunchgrass as a habitat predictor. |
| **Sagebrush patch size (ha)** | > 130 | 10-130 | < 10 | NA | A 130-hectare (ha) patch size for sagebrush was used as the recommended service condition (score of 3) based on professional judgment. Professional judgment was used because "conclusive data are unavailable on minimum patch sizes necessary to support viable populations of sage-grouse" (Connelly et al. 2011). | As above, generate multiple versions of the vegetation predictors and test their ability to predict observed grouse habitat use, as has been already done already in the WBEA sage-grouse model. |
| **Sagebrush canopy height (cm)** | 30-80 | 20- < 30 or > 80 | < 20 | NA | The sagebrush canopy heights that provided high quality nesting habitat generally also provided high quality winter habitat, thus favorable conditions for nesting were given the highest scores overall. | As with sagebrush cover, although values are based on research, nesting habitat requirements were subjectively prioritized in the scoring based on conjecture about seasonal habitat overlap. Variables should be tested for their power to predict different types of habitat use |
| **Vegetation** | NA | NA | All Other Veg Types | Forested<br>Open Water<br>Roads<br>Well pads<br>Mine Footprints | Habitats typically avoided by sage-grouse (roadways, urban, open water, forest) were scored zero to give them no habitat service value in the output. | This layer was included as a screen and basically contributes nothing to the scoring beyond eliminating areas known to be unsuitable. |

# TransWest Express: Moffatt County Routes and Greater Sage-Grouse Habitat Classifications




**TWE Proposed ROWs**
- Applicant Proposed I-A
- Alternative I-B
- Alternative I-C
- Agency Preferred I-D

**NW Colorado Sage-Grouse Plan**
- Preliminary Priority Habitat
- Preliminary General Habitat
- Large Transmission ROW Exclusion Areas
- Large Transmission ROW Avoidance Areas
- Intersection of PPH and Transmission Avoidance Areas

**USGS Predicted General Habitat Use**
- Low Abundance
- High Abundance

0 5 10 Miles

N