Submitted online via https://eplanning.blm.gov/eplanning-ui/project/2016719/595/8002640/comment **and to** BLM_HQ_GRSG_Planning@blm.gov

February 8, 2022

Patricia Deibert
Acting National Sage-grouse Coordinator
Bureau of Land Management
440 W. 200 S., Suite 500
Salt Lake City, Utah 84101

Re: Notice of Intent to Amend Land Use Plans Regarding Greater Sage-Grouse Conservation and Prepare Associated Environmental Impact Statements

Dear Ms. Deibert:

Oregon Natural Desert Association ("ONDA"), and on behalf of more than 10,000 members and supporters, is pleased to submit these scoping comments on the Bureau of Land Management's ("Bureau" or "BLM") "Notice of Intent to Amend Land Use Plans Regarding Greater Sage-Grouse Conservation and Prepare Associated Environmental Impact Statements," 86 Fed. Reg. 66,331 (Nov. 22, 2021).

We appreciate and support the Bureau's attention to sage-grouse conservation, initiating its third range-wide planning process in a decade to strengthen management of the species and its habitat on public lands. ONDA, the Bureau, other federal and state agencies and stakeholders are all too familiar with the plight of the species and the importance of BLM lands to its conservation and recovery. In Oregon, this is especially the case, where BLM lands comprise the vast majority (more than 10 million acres) of remaining sage-grouse habitat in the state.

Similar to every other plan amendment produced in 2015, conservation prescriptions in the Bureau's Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment ("ARMPA") and Record of Decision for the Great Basin Region must be updated and strengthened to achieve the purpose of that unprecedented planning process. As described in the Oregon ARMPA, that purpose must remain "identify[ing] and incorporat[ing] appropriate conservation measures to conserve, enhance, and/or restore [sage-grouse] habitat by reducing, eliminating, or minimizing, threats to [sage-grouse] habitat" (Oregon 2015 ARMPA: 1-8). The Bureau also acknowledged that "changes in management of [sage-grouse] habitats are necessary to avoid the anticipated continued decline of populations across the species' range" (Oregon 2015 ARMPA: 1-7).

The past six years have brought continued and rapid change to sage-grouse habitats in Oregon and across the West. New and improved research, analysis and mapping have also helped to deepen and expand our understanding of sage-grouse, sagebrush steppe, and threats to these resources. The last administration also exposed weaknesses in current federal and state sage-grouse conservation strategies, authorizing new development and land use and implementing policies that further reduced the extent and quality of habitat remaining for the species. The Bureau and its partners now have less margin for error, and an even more urgent mandate to conserve and restore sagebrush habitats and reverse population declines.

Fortunately, the Bureau has a strong foundation to build upon in the 2015 Oregon ARMPA. While it contains many provisions that require updating, clarity and improvement, the agency's plan for Oregon also includes innovative and important management directives and habitat designations essential to sage-grouse conservation in the state. These measures must be retained, in a new record of decision for the state, or as part of a single range-wide record of decision produced from this new planning process. We have identified many of these existing measures throughout these comments; they must not be discarded as the Bureau updates its sage-grouse conservation strategies in Oregon and west-wide.

ONDA has also, based on more than three decades working to conserve sage-grouse in Oregon–including the last six years under the Oregon ARMPA–identified seven priorities for strengthening the Bureau's current plan in Oregon.

1. Identify and conserve greater sage-grouse late brood-rearing habitat

1.1. Identify and prescribe appropriate management direction to conserve late brood-rearing habitats, including mesic and riparian zones
1.2. Identify appropriate areas for restoration of riparian zones and associated mesic habitats through restoration of beaver

2. Identify and conserve greater sage-grouse winter habitat

3. Mitigate climate change impacts on greater sage-grouse and sagebrush habitats

3.1. Analyze direct, indirect and cumulative effects of climate change on greater sage-grouse and sagebrush habitats
3.2. Improve sagebrush habitat resistance and resilience to drought
3.3. Identify and conserve greater sage-grouse habitat connectivity
3.4. Identify and specially manage climate refugia for greater sage-grouse and other fish and wildlife

4. Manage domestic livestock grazing to support greater sage-grouse conservation and ecosystem resilience

4.1. Manage livestock grazing to maintain habitat objectives in greater sage-grouse nesting and brood-rearing habitat

4.2. Limit annual livestock grazing use to 25-30 percent of forage utilization in greater sage-grouse priority habitat
4.3. Manage grazing to limit annual grass to five percent of vegetative cover within 4 miles of active/pending greater sage-grouse leks
4.4. Inventory and assess need for current range infrastructure by BLM district; require no net additional range infrastructure in greater sage-grouse priority habitat
4.5. Close key research natural areas to livestock grazing to support research and management
4.6. Authorize voluntary grazing permit retirement in greater sage-grouse priority habitat, including as a part of departmental and BLM mitigation policies

5. Preserve greater sage-grouse priority habitat from new disturbance

5.1. Prohibit new rights-of-way in greater sage-grouse priority habitat, including for renewable energy development
5.2. Account for vegetation management in priority habitat disturbance cap

6. Plan and manage travel in greater sage-grouse habitat

7. Retain, designate and manage sagebrush reserves for greater sage-grouse and other fish and wildlife

7.1. Retain Sagebrush Focal Areas in Oregon
7.2. Retain and provide management direction for strategic areas
7.3. Designate a network of Areas of Critical Environmental Concern to conserve greater sage-grouse and other sagebrush-dependent species

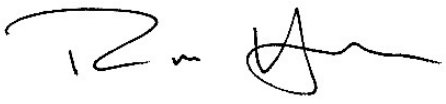
* * *

Adopting these priority measures, while retaining all of the important elements of the current ARMPA for Oregon, should finally provide the foundation needed to conserve and recover sage-grouse and hundreds of other species that depend on sagebrush steppe.

Following is further explanation of the seven priority measures, including whether and how they are incorporated in the current ARMPA, and our recommendations for adopting or strengthening these prescriptions in a revised conservation strategy for Oregon.

Thank you for initiating and providing opportunity to comment on this important planning process.

Sincerely,



Ryan Houston
Executive Director

1. Identify and conserve greater sage-grouse late brood rearing habitat

1.1. Identify and prescribe appropriate management direction to conserve late brood-rearing habitats, including mesic and riparian zones

High quality, late brooding-rearing habitats are key to maintaining viable sage-grouse populations. Late brood-rearing habitats include mesic and higher elevation areas that support sage-grouse broods in late summer and early autumn. The Bureau defines late brood-rearing habitat as a priority sage-grouse habitat "used from July through September…includ[ing] mesic sagebrush and mixed shrub communities, wet meadows, and riparian areas" (Oregon 2015 ARMPA: 5-12). Sage-grouse selection of these habitats corresponds with the desiccation of nesting and early brood-rearing habitats and upland habitats and a general decrease in water availability on the landscape (Coates et al. 2020; Casazza et al. 2011). The forbes and associated insect diversity at these sites are essential for the development and survival of juvenile sage-grouse (Gregg and Crawford 2009; Drut et al. 1994a).

Late brood-rearing habitats are often considered a population-limiting habitat type due to their strong influence on chick survival, and by extension, population growth (Taylor et al. 2012; Dahlgren et al. 2016; Street 2020). Within the Great Basin, researchers have estimated that late brood-rearing habitats comprise less than 2 percent of sage-grouse habitats (Atamian et al. 2010). Street (2020) found that less than 5 percent of habitats associated with 24 lek sites in southeastern Oregon and northern Nevada were considered high quality late brood-rearing habitat. Yet, little is known about the location and condition of many late brood-rearing habitats in Oregon, limiting the ability of land managers to prescribe and apply appropriate conservation measures to these finite resources. As Street (2020: 60) suggests, "[i]dentifying habitats associated with key life history stages is critical for the management of species of concern."

1.1.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment: identifying sage-grouse late brood-rearing habitat

The 2015 Oregon ARMPA failed to identify sage-grouse late brood-rearing habitat, limiting the ability of land managers to implement conservation prescriptions for these habitats.

1.1.2. Management prescription: identify sage-grouse brood-rearing habitat

The Bureau in Oregon has recently funded a project to map seasonal habitats for sage-grouse in the state. Utilizing numerous GPS collaring datasets, the final report linked a set of 22,546 known sage-grouse locations to different environmental variables, producing a series of maps for winter, summer, and spring sage-grouse habitats within the state (*see* Henderson 2019). The report's modeled habitat maps have since been incorporated into the Oregon Sage-Grouse Conservation Partnership's planning, mapping and management support tools (*see* Attachment 1). The Bureau can use this information, in combination with relevant new scientific research, to model and map late brood-rearing habitat in Oregon. Seasonal habitat layers should be developed and incorporated into this planning process to ensure, for example, that any habitat areas outside

of existing priority habitat management areas are appropriately considered, while also providing land managers with the information needed to implement conservation provisions.

1.1.3. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment: conserving sage-grouse late brood-rearing habitat

While the 2015 Oregon ARMPA recognized the importance of late brood-rearing habitats to sage-grouse ecology, it failed to prescribe adequate measures to conserve these rare and fragile areas on the landscape. In the limited instances where brood-rearing habitats were discussed, the failure to map or otherwise identify late brood-rearing habitats in Oregon left land managers without a pathway for implementation.

The ARMPA defined brood-rearing, including late brood-rearing habitats in its "habitat objectives" table:

- Brood-rearing/Summer Including Late-brood Rearing, Summering and Early Autumn (Seasonal Use Period July1 - October 31). Relevant management objectives include:
    - Sagebrush cover 10 to 25%
    - Sagebrush height 15 to 31 inches
    - Grass and forb cover 10 to >50% (depending on site characteristics)
    - A majority of riparian and mesic meadows are in Preferred Functioning Condition
    - Forb species are common with 5 to 10 species present in upland and riparian plant communities
    - 70 to 75% of seasonal habitat within 4.0 miles of leks meeting a majority of the desired conditions (depending on site characteristics)

(Oregon 2015 ARMPA: 2-4, Table 2-2).

In contrast, the ARMPA's management directives for conserving late brood-rearing habitats are less specific:

- MD VEG 1: "Priority areas for greater sage-grouse habitat restoration and maintenance projects" (Oregon 2015 ARMPA: 2-12). This provision identifies "sites with a higher probability of success" and "seasonal habitats thought to be limiting to greater sage-grouse populations," but does not explicitly include late brood-rearing habitats among them.

- MD SSS-11: "Anthropogenic disturbances or activities disruptive to GRSG (including scheduled maintenance activities) shall not occur in seasonal GRSG habitats unless the project plan and NEPA document demonstrate the project will not impair the life-cycle or behavioral needs of GRSG populations" (Oregon 2015 ARMPA: 2-9).

- Required Design features for livestock management: "Construct new livestock facilities, such as livestock troughs, fences, corrals, handling facilities, and 'dusting bags,' at least

1.2 miles from leks or other important areas of GRSG habitat (i.e., wintering and brood-rearing areas) to avoid concentrating livestock, collision hazards to flying birds, or avian predator perches" (Oregon 2015 ARMPA: C-7).

- Fluid Mineral Stipulations and Exceptions, modifications and waiver criteria, only include timing stipulations for brood rearing/summer habitat from July 1 to October 31 (Oregon 2015 ARMPA: G-6).

1.1.4. Management prescription: conserve sage-grouse brood-rearing habitat

The announced planning process is an opportunity to provide direction for identifying and mapping late brood-rearing habitats and adopting science-based prescriptions for managing and restoring these key habitats–including riparian and mesic habitats–to support sage-grouse conservation and other wildlife, and habitat resilience against climate change, drought, and wildfire. Adopting these measures is also essential to managing livestock grazing and other uses in sage-grouse habitat, and designing, planning and protecting sagebrush reserves.

1.2. Identify appropriate areas for restoration of riparian zones and associated mesic habitats through restoration of beaver

Beaver-managed floodplains can create and maintain mesic habitats in arid landscapes critical to sage-grouse (Fesenmyr et al. 2018; Silverman et al. 2018). The geographic extent of these beaver-managed systems is potentially vast and highly ecologically productive. They could be especially important for addressing sage-grouse's vegetative and invertebrate food source limitations during increasingly frequent, extended and severe annual drought conditions when these limitations are most extreme (NRCS SGI; Donnelly et al. 2016). Beaver managed floodplains also provide refugia to wildlife and flora during increasingly frequent and severe wildfires, thereby providing for faster and more comprehensive ecological recovery of adjacent landscapes and populations following wildfire (Fairfax and Whittle 2021).

Negative, self-perpetuating feedback loops have resulted in the loss of a substantial amount of beaver-managed floodplains and associated mesic habitat quality within sage-grouse habitat due to historical, intentional extirpation of beaver in the West, and the concurrent historical impacts of livestock grazing management (Jones and Carter 2016; Castro et al. 2018; Wohl 2021; Belsky and Matzke 1999).

The recovery of beaver-managed floodplains at a given location is prevented by varying combinations of one or more of the following three correctable limiting factors (Dittbrenner et al. 2018; Scrafford et al. 2018; Castro et al. 2018; MacFarlane et al. 2015; Vanderhoof 2020):

1) Beaver Persistence: Beaver must be present in a stream reach long enough and consistently enough to establish and maintain functional management and survival infrastructure in support of restorative processes such as aggradation, seasonal water banking and vegetation irrigation.

2) Hydrology: Sufficient water must be present at the right times and power to provide a) escape cover for beaver, and b) moisture for the required types and amounts of vegetation.

3) Vegetation: Sufficient vegetation amounts, types, densities, in the correct locations must be present to support beaver food and construction requirements.
   a. >3 acres
   b. >6,000 stems/acre or equivalent
   c. <100 feet from the water channel and >2.5 feet above thalweg

1.2.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

Neither the 2015 Oregon ARMPA or supporting final environmental impact statement mentions beaver restoration as a strategy to conserve habitats for sage-grouse and other wildlife.

1.2.2. Management prescription

Beaver restoration is an increasingly common, natural and low-cost management alternative for restoring damaged riparian zones and associated habitats across the West. The Bureau should use the current planning process as an opportunity to work with partners to identify appropriate areas on public lands and promote beaver reintroduction as a strategy for conserving and restoring functional riparian zones and associated mesic habitats in sagebrush steppe.

Restoring viable beaver colonies involves following the stepwise process below to: 1) identify intrinsically suitable riparian locations (within known sage-grouse utilization areas) and 2) mitigate all factors that may affect successful beaver establishment.

I. Delineate intrinsically suitable stream reaches for prioritizing the reestablishment of beaver-managed floodplains within sage-grouse utilization areas

Intrinsically suitable stream reaches where management actions can most effectively enable the beaver management of floodplains and creation of mesic habitat are those which satisfy all of the following criteria within a 0.75-mile length:

1) "Wadeable Stream" (typically a 5th-order or smaller in size)
2) An average valley bottom gradient of <3%
3) A historical floodplain of >3 acres
4) The presence of perennial flow, OR the ability to attenuate periodic flows to result in the perennial presence of water throughout the reach.

II. Mitigate all limiting factors to beaver establishment concurrently within intrinsically suitable habitat

1) Persistence:
   a. Collaborate with Oregon Department of Fish and Wildlife to close intrinsically suitable beaver habitat to recreational beaver trapping and hunting.

b. Engage in educational outreach to the hunting public and federal grazing permittees that beaver are protected furbearers on federally managed public land and cannot be harvested outside of stated seasons or without a furbearer license.
c. Utilize non-lethal co-existence strategies before resorting to lethal management to resolve conflicts between beaver and infrastructure maintenance.
d. If beaver are not currently present within the watershed, indicate to ODFW the Bureau's desire to list the restoration reach as a site where translocation of beaver is preferred once conditions are suitable.

2) Hydrology:
   a. Increase stream roughness with tools such as Beaver Dam Analogues to sufficiently attenuate non-perennial flows to allow for adequate perennial soil moisture to sustain sufficient and required riparian vegetation.

3) Vegetation:
   a. Eliminate consumptive stressors suppressing passive vegetation restoration by excluding grazing from the intrinsically suitable floodplains either via wildlife-friendly riparian fencing, range riders, or virtual fencing.
   b. Supplement passive vegetation recovery with active planting to achieve required minimum vegetation requirements and diversity.
   c. Protect passive and active plantings from native browsers and beavers for at least two years of establishment until the minimum area and densities of vegetation are achieved.

2. Identify and conserve greater sage-grouse winter habitat

High quality, accessible winter habitat is essential to the sage-grouse's life cycle. Sage-grouse winter habitat must provide tall, healthy sagebrush for food and cover to support the birds throughout the season (Braun et al. 2005; Connelly et al. 2011a, *citing others*). As the Bureau has described, "[d]uring the winter months, [the] greater sage-grouse's diet consists almost entirely of sagebrush leaves and buds" (North Steens Transmission Line 2011 FEIS: 3.5-23). Sage-grouse in the winter months "tend toward areas with high canopy and taller sagebrush plants. . . . Sagebrush must be exposed at least 9.8 to 11.8 inches (25 to 30 cm) above the snow level to provide adequate forage and cover" (North Steens Transmission Line 2011 FEIS: 3.5-23). Wintering areas are often on windswept ridges, south-facing slopes or in protected draws where sagebrush is not completely covered in snow (Braun et al. 2005; Wyoming 2014 FEIS: 98-99). These landscape features may be geographically limited in some areas (*e.g.,* Beck 1977). Big sagebrush communities typically used for winter habitat are also becoming increasingly rare in the West (Welch 2005).

Sage-grouse typically show high fidelity to winter habitat areas, and a single wintering area may support several different breeding populations (i.e., populations of males and females that use different breeding and nesting habitats in spring) (Oregon 2013 DEIS: 8-39; SGNTT 2011: 51). Moynahan et al. (2007) also observed that the quality of winter habitat appears to influence the abundance and condition of female sage-grouse and their nesting effort and clutch sizes in spring. Healthier females are more likely to have larger clutches and re-nest in case of nest failure (*i.e.*, from predation). Given the importance of winter habitat, the loss or fragmentation of

these areas can have a disproportionate impact on sage-grouse population size locally and regionally (Caudill et al. 2013; Oregon 2013 DEIS: 8-39).

2.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment: identifying sage-grouse winter habitat

Five proposed final sage-grouse plan amendments from the 2011 National Greater Sage-Grouse Planning Strategy identified sage-grouse winter habitat within their planning areas, but not for the Oregon subregion. Rather, the proposed final plan for Oregon stated that designated priority habitat contains 99 percent of known sage-grouse wintering areas (Oregon 2015 FEIS: 3-7; *see also* 3-6, Oregon core areas contain 99 percent of 1,695 known winter locations), but did not include a map of winter habitat or winter conservation areas (*see* Oregon FEIS at 2-56, Oregon Department of Fish and Wildlife updating sage-grouse habitat maps), despite describing winter habitat as "crucial" to the species (Oregon 2013 DEIS: 8-11). A comparison of priority habitat areas in the ARMPA and modeled "higher" and "lower" probability winter habitat also indicates that large expanses of winter use areas occur outside of designated priority habitat (*see* Attachment 2). Notably, a federal court has held that the failure to map sage-grouse winter habitat could be grounds for remanding a land use plan back to the responsible federal agency to address the omission (WWP v. Salazar, 4:08-CV-516BLW, Slip Op. at 3).

2.2. Management prescription: identify sage-grouse winter habitat

The Bureau in Oregon has recently funded a project to map seasonal habitats for sage-grouse in the state. Utilizing numerous GPS collaring datasets, the final report linked a set of 22,546 known sage-grouse locations to different environmental variables, producing a series of maps for winter, summer, and spring sage-grouse habitats within the state (*see* Henderson 2019). The report's modeled habitat maps have since been incorporated into the Oregon Sage-Grouse Conservation Partnership's planning, mapping and management support tools. The Bureau should incorporate winter habitat layers–as well as other relevant seasonal habitat layers–into this planning process to ensure, for example, that any winter habitat areas outside of existing priority habitat management areas are appropriately considered (*see* Attachment 2). At a minimum, this will provide land managers with information required to implement conservation provisions for these areas. As the Bureau has noted, winter habitat "could be difficult to restore to original conditions [once disturbed]…due to the composition and size of sagebrush in these areas" (Bighorn Basin 2015 FEIS: 4-315).

The plan also should not assume that designated priority habitat includes all winter habitat. Priority habitat areas, based on Doherty et al. (2010) and similar data and mapping, are generally established around sage-grouse leks. Connelly et. al. (2004: 4-19) (unpublished) noted that females migrate an average of 9.9 km between summer and winter habitat. Fedy (2012: 1066) reported average summer-to-winter migration of 21.18 km and average nest-to-winter migration of 12.55 km in north-central Wyoming. Manier et al. (2013: 26) summarized that a majority of sage-grouse move 10 km from summer to winter locations with movements of up to 90 mi (145 km) documented. Data in Oregon have identified "higher" and "lower" probability sage-grouse habitat far beyond designated priority habitat areas (*see* Attachment 2).

2.3. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment: conserving sage-grouse winter habitat

The Oregon ARMPA includes a basic objective to conserve important use areas for sage-grouse, including wintering habitat (Oregon 2015 ARMPA: 2-3, Obj SSS 1), a seasonal restriction on anthropogenic disturbance in winter habitat (Oregon 2015 ARMPA: 2-9, MD SSS-11), and direction to prioritize fire suppression in winter range (Oregon 2015 ARMPA: 2-16, MD FIRE 3). The ARMPA's direction for prescribed burning may not provide adequate protection for winter habitat (Oregon 2015 ARMPA: 2-17, MD FIRE 18). Travel planning, as described in the ARMPA, also might not adequately conserve wintering areas (Oregon 2015 ARMPA: 2-31, MD TTM 1). Construction of new livestock facilities must buffer winter habitat areas by 1.2 miles (Oregon 2015 ARMPA: C-7). The ARMPA only seasonally restricts disturbance from fluid minerals development in winter habitat in general habitat management areas (Oregon 2015 ARMPA: G-6 - G-7,Table G-1, although managers could modify or grant an exception to these stipulations).

2.4. Management prescription: conserve winter habitat

The scientific literature recommends protecting sage-grouse winter habitat (Braun et al. 2005, *citing* Connelly et al. 2000 and others; Moynahan et al. 2007). This should include restricting surface disturbance in or adjacent to winter habitat any time of year (Walker 2008). As the Bureau also acknowledged, "many [winter concentration] areas support several different breeding populations of sage-grouse. Sage-grouse typically show high fidelity for these areas, and loss or fragmentation can result in significant population impacts" (Oregon 2015 ARMPA: 8-45). Consequently, management prescriptions should protect winter habitat from occupancy throughout the year, not just in winter when the birds are present (*see* SGNTT 2011: 21). (It makes little sense to restrict disturbance in winter habitat during the season of use, only to allow the same development at other times of the year, since sage-grouse will eventually return to find the habitat degraded and potentially unavailable the following winter.) These should include restrictions on energy development (*see* Doherty et al. 2008) and other disturbance and vegetation management that reduces sagebrush cover (Caudill et al. 2013).

Protections offered for sage-grouse winter habitat in the Bureau's proposed plan for South Dakota developed as part of the 2011 Greater Sage-grouse National Planning Strategy may be a model for adopting similar measures in Oregon. The agency identified sage-grouse wintering areas on a map (South Dakota 2015 FEIS: Map 2-9). It generally prohibited surface occupancy associated with fluid minerals development in wintering areas in both priority and general habitat (South Dakota 2015 FEIS: 95, Table 2-5; 143, Table 2-6, Action 14); it prohibited renewable energy development, and required managers to avoid granting other rights-of-way in winter habitat (South Dakota 2015 FEIS: 95, Table 2-5; 143, Table 2-6, Action 15; 154, Table 2-6, Action 30); and it required that all new power lines be buried in wintering areas, where feasible (South Dakota 2015 FEIS: 95, Table 2-5). Finally, the Proposed Plan only allowed prescribed fire in/around winter range to preserve the areas by reducing future fire risk (South Dakota 2015 FEIS: 48).

3. Mitigate climate change impacts on sage-grouse and sagebrush habitats

Species and ecosystems will be forced to adjust to progressively more extreme climates as atmospheric CO_2 increases in the coming century (IPCC 2021). For the Pacific Northwest, this will mean increased average temperatures, drier summers and decreased snowpack, all of which will pose significant challenges for conserving sage-grouse populations into the future (Creutzburg et al. 2015).

To persist under these climate stressors, species must adjust through rapid evolutionary adaptation, behavioral or phenotypic plasticity, or by moving to more climatically suitable areas (McGuire et al. 2016). Species ranges have already shifted poleward and higher in elevation in response to recent climate shifts, and will continue to do so in the coming decades (McGuire et al. 2016; Heller and Zavaleta 2009).

3.1. Analyze direct, indirect and cumulative effects of climate change on greater sage-grouse and sagebrush habitats

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 (Balzotti et al. 2016; Blomberg et al. 2012; Neilson et al. 2005). In the worst case scenario, sagebrush species are simulated to decrease to just 20 percent of current distribution (Wisdom et al. 2005a: 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). Research modeling the impacts of climate change under different land management scenarios in southeastern Oregon indicates that without active management, native sagebrush steppe could decline to approximately one-third its current extent (Creutzburg et al. 2015).

Future climate models also predict that climatic changes in the Northern Great Basin will result in increased cheatgrass cover, particularly in susceptible areas (Boyte et al. 2016). In the face of climate change, sage-grouse habitats that are near areas currently dominated by this invasive species will require special management attention to prevent habitat loss to cheatgrass.

In addition to habitat impacts, temporal movements of sage-grouse are likely to be affected by climate change, negatively affecting the survival of juvenile individuals (Caudill et al. 2016). Juvenile sage-grouse experience increased mortality when they migrate to winter habitat too late, which is likely to occur more often as climate change delays the arrival of winter environmental conditions that trigger this migration (Caudill et al. 2016).

3.1.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

The Bureau acknowledged in all of its plan amendments published as part of the National Greater Sage-Grouse Planning Strategy that climate change presents challenges to resource management, and many listed climate change as a planning issue to be addressed in management alternatives. Several plans specifically identified sage-grouse as vulnerable to climate change, including the HiLine draft resource management plan amendment. "[S]ensitive species in the planning area, such as greater sage-grouse, which are already stressed by declining habitat, increased development, and other factors, could experience additional pressures due to climate change" (HiLine 2013 DEIS: 260; 434). The draft plan for Oregon similarly recognized that climate change interacts with other factors to threaten sage-grouse habitat (Oregon 2013 DEIS: 2-11).

The 2015 Oregon ARMPA included a habitat objective of increasing resiliency to disturbances such as fire and climate change to reduce habitat loss and fragmentation (*see* Oregon 2015 ARMPA: 2-10). The Oregon plan provided management direction on using climate change science to guide projected changes in species ranges and in site capability to inform habitat restoration and maintenance (*see* Oregon 2015 ARMPA: 2-12, MD VEG 2). The final plan also uniquely established 2,222,588 acres of "Climate Change Consideration Areas" ("CCCA") (including nearly 1.5 million acres of priority habitat) in the planning area (Oregon 2015 FEIS: 2-47, Table 2-7). Climate change Consideration Areas are generally high elevation areas (typically above 5,000 feet) with limited habitat disturbance. The BLM identified these areas as likely to provide the best habitat for sage-grouse over the long term, according to recent climate change modeling (Oregon 2015 FEIS: 2-48). We address CCCAs further below (see § 3.4).

Unfortunately, and despite provision of these general measures, every one of the proposed final plans in the 2011 National Greater Sage-Grouse Planning Strategy asserted that "[t]here is no BLM … resource program in the proposed plan addressing this threat" (Oregon 2015 FEIS: 2-12, Table 2-1). This interpretation of the Bureau's authorities might have discouraged the agency from adopting more specific prescriptions for managing and bolstering ecosystem resilience against climate change. It was also surprising given the explicit direction and support the Obama administration provided to federal agencies to research, assess and manage climate change impacts.

3.1.2. Management prescription

The current administration has directed federal agencies to promote and protect public health and the environment, reduce greenhouse gas emissions, and bolster climate resiliency in recognition of the threat climate change poses to both natural and human communities in the United States. E.O. 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. 86 Fed. Reg. 7,037 (Jan. 25, 2021). Sage-grouse and sagebrush steppe may be counted among resources most vulnerable to climate change. The Bureau must use this new planning process to thoroughly analyze climate change impacts on sage-grouse and their habitat under each management alternative, as well as the contribution each management alternative would make to mitigating climate change effects on the species. 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 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).

3.2. Improve sagebrush habitat resistance and resilience to drought

Drought and other climatic variables work independently and cumulatively to drive vegetation dynamics throughout the mountainous regions of western North America, affecting wildlife habitat parameters (Guttery et al. 2013). Rangewide patterns of sage-grouse persistence indicate that extirpation of sage-grouse populations is related to the prevalence of droughts among other factors, with a 5.6 percent decrease in sage-grouse persistence per severe drought since 1950 (Aldridge et al. 2008).

In southeastern Oregon, the interaction of vegetation and climate shapes the presence of sage-grouse, with summer drought conditions constraining the distribution of sage-grouse (Creutzburg et al. 2015). Additionally, research has shown that drought conditions result in reduced nest success (Holloran and Anderson 2005a), as well as decreased chick survival (Drut et al. 1994b; Aldridge 2005; Aldridge et al. 2008). In part, this is due to the fact that drought forces sage-grouse to transition to a fall/winter diet of sagebrush earlier in the season, thus limiting their ability to fill their protein needs with a diet rich of forbs and insects before making the transition (Hagen et al. 2011).

Drought also can act as a multiplier for other disturbances such as excessive livestock grazing, increasing adverse effects on vegetation and soils (Creutzburg et al. 2015; Hagen et al. 2011). This cross interaction can result in limited plant regrowth, increased invasion by exotic grasses and overuse of wet meadows and riparian areas (Creutzburg et al. 2015).

3.2.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

The 2015 Oregon ARMPA failed to adequately provide management prescriptions to address the wide-spread and persistent threat of drought conditions in sage-grouse habitat. In fact, the 2015 ARMPA only provides two management directives that are directly related to drought.

- MD LG 5: During drought conditions use a recognized drought indicator, such as the Drought Monitor or Palmer Drought Severity Index, to determine when abnormally dry or drought conditions are developing, present, or easing. When such conditions are developing or present:

    1. Conduct pre-season assessments prior to livestock turn out.

    2. Monitor vegetation conditions during authorized livestock use periods to determine need for early removal or other changes to meet seasonal PHMA and GHMA objectives.

If livestock grazing is deferred due to drought, reevaluate vegetation and Greater Sage-grouse habitat indicators that measure Greater Sage-grouse habitat prior to reauthorization of grazing.

- MD WHB 7: Consider removals or exclusion of WHB during or immediately following emergency situations (such as fire, floods, and drought) to facilitate meeting GRSG habitat objectives where HMAs overlap with GRSG habitat.

(Oregon 2015 ARMPA: 2-19 - 2-20, 2-22)

3.2.2. Management prescription

In 2021, the U.S. Drought Monitor[1] reported drought conditions to be the most expansive and intensive drought the western United States has experienced in the past century, with eastern Oregon's sagebrush steppe recording the lowest total precipitation relative to the average of anywhere in the state. As climate change results in higher incidence and severity of droughts, it is increasingly important to mitigate and account for the effects of drought in sage-grouse conservation efforts.

The Bureau should use this planning process as an opportunity to provide additional and more specific management direction related to drought. Of particular importance is the incorporation of key aspects of the adaptive management approach outlined in Williams et al. (2009), where objective-driven management depends on effectively linking monitoring and assessment to a structured decision-making process. The 2015 ARMPA failed to provide needed direction to properly guide effective decision-making related to drought.

For example, while the Oregon ARMPA did identify the importance of monitoring drought conditions and livestock use, the plan did not identify a single quantitative threshold that triggers a change in management, or clearly identify management actions that should be implemented or discontinued in response to a threshold being met (Williams et al. 2009). One example of management direction the Bureau should consider is requiring all BLM districts experiencing multi-year, extreme or exceptional drought (as determined by a recognized drought indicator) to substantially, systematically and verifiably reduce stocking of domestic livestock on public lands to relieve pressure on natural resources. Given the multiplicative interaction of drought and excessive grazing, herd reductions are especially important to consider during drought to reduce the impact on native ecosystems (Beever and Aldridge 2011). This type of direction would provide managers with much needed decision-making support to consistently address this and similar resource conflicts exacerbated by drought.

Further, given that decreased chick survival is associated with drought conditions, efforts to manage brood-rearing habitats will be essential to maintaining viable sage-grouse populations into the future. Both sage-grouse adults and chicks depend on riparian and wet meadows for high quality forage, and these areas are especially important when upland communities have desiccated (Hagen et al. 2011). Management provisions should focus restoration efforts on

[1] https://droughtmonitor.unl.edu/

riparian/mesic areas to help buffer chick survival rates from declining during drought years (see our comments on Identifying and Conserving Late Brood-rearing Habitat above, § 1).

Finally, improving estimates in climate models of where and to what degree droughts are likely to constrain sage-grouse habitat is imperative to helping identify priority areas for active management and habitat restoration (Creutzburg et al. 2015; Aldridge et al. 2008).

3.3. Identify and conserve greater sage-grouse habitat connectivity

Maintaining habitat connectivity and limiting fragmentation in sagebrush steppe is imperative for the long-term welfare of sagebrush-associated species (Knick and Hanser 2011; Connelly et al. 2004; Hagen et al. 2011). Protecting core regions and maintaining connectivity between sage-grouse populations may help stabilize or reverse the processes of range contraction and isolation that have resulted in long-term population declines (Knick and Hanser 2011). Maintaining connectivity by protecting habitat between separated sage-grouse populations is also a key strategy to mitigate against the impacts of climate change (McGuire et al. 2016; Crist et al., 2015; Hagen et al. 2011). Connectivity also promotes genetic exchange and reduces complications that may arise from inbreeding (Hagen et al. 2011; McGuire et al. 2016; Crist et al. 2015). Genetically diverse populations tend to be more adaptable to change, putting a premium on managing for genetic diversity through landscape connectivity (Jones 2015; Heller and Zavaleta 2009). Conversely, failure to protect habitat connectivity could contribute to the continued decline of sage-grouse (Knick et al. 2011; Knick and Hanser 2011; Johnson et al. 2011).

3.3.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

The 2015 Oregon ARMPA included scant direction on identifying and conserving sage-grouse connectivity habitat within priority habitat, even as it defined Priority Habitat Management Areas to include "connectivity corridors" (Oregon 2015 ARMPA: 1-5). The plan included a couple of general objectives to protect connectivity corridors within priority habitat areas, and between priority habitat areas in Oregon and adjoining states to promote sage-grouse movement and genetic diversity (Oregon 2015 ARMPA: 2-3, Obj. SSS 1, Obj. SSS 2). "Genetic diversity" is not mentioned anywhere else in the ARMPA and the plan does not include any specific direction for conserving connectivity habitat. Notably, the ARMPA does include an objective to "[i]dentify Greater Sage-grouse habitat outside of PHMA that can function as connecting habitat. Consider the habitat connectivity map developed by The Nature Conservancy and BLM for Oregon (Jones and Schindel, 2015)" (Oregon 2015 ARMPA: 2-9, MD SSS-12).

3.3.2. Management prescription

In addition to Jones et al. (2015) referenced in the ARMPA, Henderson (2019) generated a series of maps for winter, summer, and spring sage-grouse habitats in Oregon based on an extensive dataset. The Bureau should use this information, in combination with other relevant data, to model and map connectivity habitat both within and between priority habitat areas in the current planning process and specially manage for connectivity as a climate change adaptation strategy. Focusing conservation efforts on core, highly connected priority areas and connecting corridors

will help mitigate against climate change and improve the long term sustainability of sage-grouse populations (Crist et al. 2015).

3.4. Identify and specially manage climate refugia for greater sage-grouse and other fish and wildlife

Conserving wildlife affected by climate change will require management that preserves and restores habitat resiliency and connectivity over the long-term. Recognizing this, the Bureau's plan for Oregon included an innovative and promising approach to address climate change effects on sage-grouse and their habitat. The final environmental impact statement designated a network of Climate Change Consideration Areas ("CCCA") totaling 2.2 million acres of occupied and potential sage-grouse habitat in eastern Oregon to serve as climate change refugia for grouse and other wildlife (Oregon 2015 FEIS: 2-47 - 2-28 and Table 2-7). These areas, which are generally higher elevation with limited surface disturbance, were deemed most likely to provide the best available habitat to sage-grouse over the long-term based on climate change modeling (Oregon 2015 FEIS: 2-48). The Bureau even described a process for adjusting the boundaries of CCCAs over time as habitat shifts and sage-grouse populations move across the landscape (Oregon 2015 FEIS: 2-48).

The Bureau maintained throughout the planning process that strategic areas such as CCCAs "do not have any management actions defined for them, as they establish priorities for only certain types of BLM administrative actions and do not restrict or prohibit activities" (Oregon 2015 FEIS: 2-48). However, the agency did not delineate specific management actions it might implement in CCCAs, while its decision not to limit, restrict or prohibit activities undermines the potential effectiveness of CCCAs to conserve sage-grouse habitat and bolster resilience in the face of climate change.

3.4.1. Management prescription

The Bureau should retain CCAAs and other strategic area designations (see § 7 below) in the new planning process as an important component of its strategy to support sage-grouse and ecosystem adaptation to climate change. The agency should also adopt management prescriptions to help ensure CCCAs fulfill these purposes.

4. Manage domestic livestock grazing to support greater sage-grouse conservation and ecosystem resiliency

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 remains 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).[2] Livestock grazing disturbs the soil, removes native vegetation, spreads invasive species and limits productivity in sagebrush steppe (Knick et al. 2005; Knick et al. 2003; Reisner et al. 2013; West 1983). Cattle or sheep grazing in sage-grouse nesting and brood-rearing habitat can negatively

[2] 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).

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 2005a; Coates 2007).

Grazing management was identified as a threat to sage-grouse by three expert panels and in reviews (Connelly et al. 2011b: 555-556, Tables 24.1, 24.2). Impacts attributable to historic or heavy grazing in sage-grouse habitat have not been remedied because plant communities are still not given rest from grazing, even under ecologically oriented grazing schemes (Connelly et al. 2004: 7-30 – 7-31, citing others). Furthermore, water developments have increased the area that can be grazed, increasing the distribution and often the intensity of grazing, so that even where livestock numbers have been reduced, they still exert a significant influence on those habitats (Connelly et al. 2004: 7-33). "Even though livestock numbers [are] considerably [reduced from historic use], and management across the West has steadily improved, [areas] continue to transition away from reference (historic, potential, and [or] desired) conditions" (Manier et al. 2013: 100, *citing* Cagney et al. 2010). Federal government scientists have suggested that "livestock grazing across the public lands of western landscapes … will continue to impact the quality of those habitats and their ability to support source populations of sagebrush bird species" (Rich et al. 2005: 592).

4.1. Manage grazing to maintain habitat objectives in greater sage-grouse nesting and brood-rearing habitat

Fundamental to the 2015 ARMPA was its science-based habitat objectives to support key sage-grouse life history stages. As the dominant land use in sage-grouse habitat, managing livestock to maintain or restore desired habitat conditions is essential to providing healthy habitats for sage-grouse and other wildlife on Bureau-managed lands.

Quantitative, measurable objectives are a core element of adaptive management (*see* Williams et al. 2009, describing adaptive management as an iterative approach to objective-driven management that depends on effectively linking monitoring and assessment to a structured decision-making process). As the Bureau explained in 2015, managers should "[u]se the desired conditions [for each habitat objective] to evaluate management actions that are proposed in [sage-grouse] habitat to ensure that habitat conditions are maintained if they are currently meeting objectives or habitat conditions move toward these objectives if the current conditions do not meet these objectives" (Oregon 2015 ARMPA: 2-4). As part, knowing and managing relevant management thresholds and responses can help ensure that managers have the appropriate tools to address and adjust land use practices to "move toward" desired conditions where land uses may be incompatible with achieving objectives.

Further, habitat objectives are an important tool for land managers in determining whether an area is meeting Rangeland Health Standards. For Special Status Species (SSS), such as the sage-grouse, land health standards direct the Bureau to meet specific habitat objectives when a SSS is present. As described in the Bureau's 2017 memorandum, *Clarification of the relationship between the greater sage-grouse habitat objectives, rangeland health standards and evaluations,*

and use authorization including grazing permit renewals, "when evaluating areas containing habitat for SSS or Threatened and Endangered (T&E) species, habitat objectives specified in the land use plan (e.g., Sage-Grouse habitat objectives table) should be used" (BLM 2017: 5; *see also* BLM 2018, "Sage-grouse habitat assessments help to inform the BLM's land health evaluation for Special Status Species" and "The Land Health Assessment and LHS evaluation tasks, including sage-grouse habitat assessments, should not be viewed as, or completed as, separate workloads").

4.1.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

The 2015 ARMPA identified and prescribed habitat objectives for key sage-grouse life history stages in a table, "Habitat Objectives for Greater Sage-Grouse" (Oregon 2015 ARMPA: 2-4 - 2-6, Table 2-2). Further, the ARMPA included additional objectives and management direction for how to incorporate sage-grouse habitat objectives into management planning and project level decisions related to a variety of uses and values (*see* Oregon 2015 ARMPA: 2-7, 2-18 - 2-20, Obj. SSS 4, MD SSS-8, MD LG 2, MD LG 4, MD LG 13).

4.1.2. Management prescription

The Bureau should retain the 2015 ARMPA's suite of habitat objectives detailed in Table 2-2 and accompanying objectives and management directives. The Bureau should also build upon existing habitat objectives and management direction in five key areas.

1. The Bureau should strengthen and expand on existing direction for achieving habitat objectives where monitoring data has shown that the minimum desired conditions are not being met across broad spatial scales (*see* Herren et al. (2021). Important examples include habitat objectives for perennial forb cover in arid and mesic sites in priority and general habitat areas (Herren et al. 2021: A 12-14). By providing additional management direction for these objectives, the Bureau can further improve the process for assessing the appropriateness of management actions proposed in sage-grouse habitat.

2. The Bureau should build upon the 2015 ARMPA's habitat objectives to include additional key life history stages and habitats–such as winter habitat and connectivity corridors–to strengthen management direction for the full complement of annual habitats important to the conservation and recovery of sage-grouse.

3. The Bureau should consider additional management directives to better incorporate the use of measurable habitat objectives in project planning. Relevant examples include actions already analyzed by the Bureau in its draft environmental impact statement for Oregon in 2013, such as Action F-WFM 27: "Livestock grazing should be excluded from burned areas until woody and herbaceous plants achieve GRSG habitat objectives" (*see* Oregon 2013 DEIS: 2-75). Provisions related to the intersection of livestock grazing and wildfire are of particular importance given their profound influence on sage-grouse habitats in Oregon and beyond.

4. The Bureau should strengthen and build upon the important direction provided in the ARMPA concerning the habitat objectives and renewal and modification of grazing permits in priority

habitat and Sagebrush Focal Areas (Oregon 2015 ARMPA: 2-20, LG MD 13, "NEPA for renewals and modifications of permits within SFA/PHMA will include specific management thresholds based on habitat objectives 2-2"). One of the key tenets of adaptive management is the development *and incorporation* of clear thresholds that trigger change in management, where each threshold is accompanied by clearly identified management actions that should be implemented or discontinued in response to a threshold being met (Williams et al. 2009). The Bureau should provide management direction to ensure that the agency both analyzes and adopts grazing management thresholds based on the ARMPA's habitat objectives–as well as adopting defined management responses–in the terms and conditions of all permits or leases within Sagebrush Focal Areas and priority habitat.

5. The Bureau should update relevant, expired instruction memoranda related to interpretation, implementation and incorporation of sage-grouse habitat objectives into planning and management.

4.2. Limit annual grazing use to 25-30 percent forage utilization in greater sage-grouse priority habitat

A lower utilization rate is more likely to support habitat objectives for vegetation height, cover and diversity in sage-grouse seasonal habitats. Range scientists have determined that stocking rate (rather than grazing system) is the primary factor affecting rangeland production (Briske et al. 2008; Holechek et al. 1998; Van Poolen and Lacey 1979). Reducing livestock utilization is recommended to support rangeland restoration (Van Poolen and Lacey 1979, defining light utilization as 20–40 percent utilization of annual forage production by weight; Holechek et al. 1999, defining light-moderate utilization as 30–35 percent utilization). Holechek et al. (2010: 290), citing Gregg et al. (1994) and Sveum et al. (1998), noted that grazing must be kept at conservative levels (25 to 35 percent use) "for high nesting success by sage-grouse." Braun (2006, unpublished) similarly recommended limiting grazing use to 25–30 percent utilization.

While definitions of light grazing use vary, numerous references have settled on a general 25 percent harvest coefficient for allocating forage for livestock (Holechek et al. 2010: 157, citing Troxel and White 1989; Galt et al. 2000; Lacey et al. 1994; Johnson et al. 1996; White and McGinty 1997; NRCS 1997). Although this rate is more conservative than others prescribed for light grazing, it allows both forage species and livestock to maximize their productivity, allows for error in forage production estimates, accounts for the potential effects of drought, and supports multiple use values (Holechek et al. 2010). Holechek et al. (2010: 157) also noted that, because most ranchers have difficulty monitoring and measuring annual grazing utilization (and the BLM often does not regularly monitor and collect utilization information), use of grazing coefficients higher than 25 percent "invariably leads to land degradation . . . when drought occurs because of rancher reluctance [to reduce livestock numbers]." Limiting livestock grazing to 25 percent utilization would also support other sage-grouse habitat objectives, such as maintaining a minimum stubble height (see Holechek et al. 2010: 164; Manier et al. 2013: 97). A case study of the Antelope Springs Allotment in southern Idaho demonstrates that ranching operations can be successful and improve sage-grouse habitat using a 20 percent utilization standard (Stuebner, *Times-News*, 12/29/13).

4.2.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

The 2015 Oregon ARMPA failed to prescribe a forage utilization rate for livestock grazing in sage-grouse habitat and public lands managers in Oregon have been allowing various utilization in sagebrush steppe, usually at much higher rates than 25-30% and without explanation for how those grazing levels achieve habitat management goals for sage-grouse.

4.2.2. Management prescription

The announced planning process is an opportunity to adopt a science-based, precautionary approach to grazing management by adopting a forage utilization rate that can support sage-grouse conservation and other wildlife, and habitat resiliency against climate change, drought, invasive annual grasses and wildfire.

4.3. Manage grazing to limit annual grass to five percent of vegetative cover within 4 miles of active/pending greater sage-grouse leks

- **Cheatgrass and other exotic annual grasses are rapidly spreading across the West.**

Biological invasions, especially invasion by exotic annual grasses, is consistently cited as among the most important challenges to maintenance of healthy sagebrush communities (Miller et al. 2011; Wisdom et al. 2005b; Suring et al. 2005). At least 46 exotic plants occur in sagebrush steppe (Pyke 2000). Estimates of the rapid spread of weeds in the West include 2,300 acres per day on BLM lands and 4,600 acres per day on all western public lands (65 Fed. Reg. 54544).

Cheatgrass (*Bromus tectorum*), an invasive annual grass, is now the dominant species on 100 million acres (158,000 square miles) in the Intermountain West (Rosentreter 1994: 170, *citing* Mack 1981). It was estimated in 1999 that 25 percent of the original sagebrush ecosystem has been converted to cheatgrass/medusa-head rye (*Taeniatherum caput-medusae)* annual grassland, and an additional 25 percent of sagebrush steppe has only cheatgrass as understory vegetation (West 2000). Cheatgrass is estimated to spread at a rate of 14 percent annually in the United States (Duncan et al. 2004: 1412, Table 1). The conversion of sagebrush steppe to exotic annual grassland has been described as "massive" (Allen 2003) and is expected to continue (Miller et al. 2011; Hemstrom et al. 2002). The Bureau estimates that cheatgrass now occurs in 70 percent of sage-grouse habitat (Herren et al. 2021).

- **Domestic livestock grazing contributes to the spread of invasive annual grasses in sagebrush steppe.**

Reisner et al. (2013) found that, even after controlling for other factors that may contribute to the spread of cheatgrass, there is a strong correlation between grazing effects and cheatgrass incursion (*see also* Reisner 2015). Cattle grazing increases cheatgrass dominance in sagebrush steppe by decreasing bunchgrass abundance, altering and limiting bunchgrass composition, increasing gaps between perennial plants, and trampling biological soil crusts (Reisner et al. 2013; Knick et al. 2003; *see* Chambers et al. 2016a; Chambers et al. 2019). "These annual grasses tend[] to fill vacant spaces among native perennial plants creating a continuous fuel for wildfires to burn and spread (Brooks and others, 2004), especially in areas where perennial herbs

had been depleted by inappropriate livestock grazing (Reisner and others, 2013)" (Pyke et al. 2015: 4).

Bock et al. (2007: 233) similarly found that "livestock grazing facilitated the invasion [of exotic grasses] into native grasslands, such that the proportion of total grass cover consisting of exotics was 2.5-fold greater on grazed than on ungrazed areas 22 years after we began this study." Their results demonstrated that livestock grazing served as an exogenous disturbance on the landscape in a manner that was more favorable to exotics than to most native southwestern grasses (Milchunas et al. 1988; Milchunas 2006; Bock et al. 2007). The latest research by Williamson et al. (2019: 12) further support these findings: "[o]ur results suggest a strong positive relation between the probability of presence and prevalence of cheatgrass and livestock grazing, particularly in unburned locations, where resistance to cheatgrass is greater than in burned locations."

- **Domestic livestock grazing degrades biological soil crust, facilitating the spread of invasive annual grasses in sagebrush steppe.**

Livestock trampling can reduce and fragment biological soil crust in sagebrush steppe (Warren and Eldridge 2001; Reisner et al. 2013; Root et al. 2020), increasing the susceptibility of the landscape to invasion by *Bromus* and other weedy species in arid ecosystems (Chambers et al. 2016b; Root et al. 2020). "Cheatgrass, however, may be less effective at invading areas with an intact biological soil crust (Kaltenecker et al. 1999). This notion is supported by field observations and growth chamber experiments that indicate that the presence of certain types of biological soil crusts decreases cheatgrass germination compared to bare soil (Larsen 1995; Serpe et al. 2006)" (Deines et al. 2007: 2). Root et al. (2020: 10.1002/eap.2016) similarly found that "...biocrusts increase site resistance to invasion at a landscape scale and mediate the effects of disturbance. Biocrust species richness, which is reduced by livestock grazing, also appears to promote native perennial grasses."[3] Damage to the soil crust caused by livestock hooves can increase the number of favorable sites available to annual grasses to emerge and establish (Pyke et al. 2016).

The degradation and loss of biological soil crust (a natural barrier to invasive plant species, Reisner et al. 2013) can accelerate cheatgrass invasion in sagebrush steppe. As summarized by Chambers et al. (2016a: 37), "biological soil crusts, which are an important component of plant communities in warmer and drier sagebrush ecosystems, can reduce germination or establishment of cheatgrass (Eckert et al. 1986; Kaltenecker et al. 1999). Disturbances or management treatments that reduce abundance of native perennial grasses and biological soil crusts and increase the distances between these perennial grasses often are associated with higher resource availability and increased competitive ability of cheatgrass (Chambers et al. 2007; Reisner et al. 2013, 2015; Roundy et al. 2014)."

Excessive grazing may eventually lead to reductions in perennial plants, increases in *B. tectorum* dominance, and ultimately result in the conversion of sagebrush steppe habitats to (annual) grasslands (Pyke et al. 2016). Loeser et al. (2007: 87) found that high-intensity grazing had "strong directional effects that led to a decline in perennial forb cover and an increase in

[3] These findings were subject to review and further consideration in O'Connor and Germino (2021).

annual plants, particularly *B. tectorum"* in grasslands near Flagstaff, Arizona. In managing for "fire fuels" (including native plants), Chambers et al. (2016b: 294-295) cautioned that "any potential gains resulting from fine fuel removal by livestock may be counterbalanced by decreased resistance to *B. tectorum* due to herbivory of native plants that compete with *B. tectorum*, increased soil disturbance, and damage to biocrusts (Reisner et al. 2013)."

Lastly, the Bureau, in multiple planning documents prepared as part of the National Greater Sage-Grouse Planning Strategy (BLM 2011), acknowledged that livestock grazing and "excessive grazing" (undefined) can spread invasive plants (*e.g.,* Buffalo 2013 DEIS: 306; Bighorn Basin 2011 DEIS, vol. 2: 4-146; Billings-Pompeys Pillar 2013 DEIS: 3-88; Miles City 2013 DEIS, vol. 1: 3-77; South Dakota 2013 DEIS: 361; Oregon 2015 FEIS: 5-36). The draft Nevada/Northeastern California plan observed that "[l]ivestock grazing is one of the vectors to introduce and or increase the spread of invasive weeds" and that "[m]ultiple factors can influence an area's susceptibility to cheatgrass invasion, including livestock grazing, perennial grass cover and biological soil crusts" (Nevada 2013 DEIS: ch. 4, 54, *citing* Reisner et al. 2013).

- **Cheatgrass evolved with herbivory, rendering persistent and targeted domestic livestock grazing ineffective at controlling continued incursion in sagebrush steppe at needed scales.**

Many annual grasses, including cheatgrass, have evolved grazing tolerance through adaptations over time, often selected through evolution with grazing animals (Strauss and Agrawal 1999). Even targeted grazing management might only impede the spread of cheatgrass temporarily. "As populations of *B. tectorum* decrease in one generation, and in the absence of competition from native perennial plants, the remaining individuals tend to produce more seeds for the next generation compensating for temporary population reductions (Mack and Pyke 1983; Hempy-Mayer and Pyke 2008)" (Pyke et al. 2016: 318-319). Moreover, "[s]eed banks in soil may not be impacted directly by grazing intensities (Clements et al. 2007); therefore, once *Bromus* becomes abundant within plant communities, their seed densities tend to dominate seed banks (Chambers et al. 2015)" (Pyke et al. 2016: 319).

In a study conducted to mimic the impact of frequent grazing, plants were clipped to 2.5 cm in height and then re-clipped two weeks later. Results from the study showed that cheatgrass seeds still dominated the landscape, "calling into question the potential for using livestock grazing as a biocontrol in *B. tectorum*-dominated areas (Hempy-Mayer and Pyke 2008). Grazing tolerance in *B. tectorum* may result from continued growth of its root system despite defoliation (Arredondo and Johnson 2009)" (Chambers et al. 2016b: 293).

Further, "[i]n good moisture years when cheatgrass production is very high and fire risk is high, the amount of livestock needed to reduce cheatgrass would be extremely high. Even if enough livestock were brought in to effectively reduce the extent of cheatgrass, remaining large, native bunchgrasses would be adversely affected since the grazing use would be partially during the critical growing season for these species. Natural re-establishment of large, native bunchgrasses would be inhibited by excessive livestock pressure during these periods" (UCRB 1997 DEIS: 83).

- **There is no scientific evidence that domestic livestock grazing can shift site dominance from invasive annual grasses to native perennial plants.**

Grazing system designs such as the Green-Brown grazing method (Smith et al. 2012), in which livestock graze when invasive annual grasses are green earlier in spring and native species are cured later in the year, have been proposed as a biocontrol for annual grasses to help shift dominance to native sagebrush steppe. The U.S. Department of Agriculture (USDA) has investigated this method and determined that "there are no published papers demonstrating success of this method for sagebrush steppe. In addition, if locations for targeted grazing are sage-grouse nesting or brood rearing habitat, then adequate perennial grass height for maintaining habitat guidelines may be required" (Pyke et al. 2017: 27).

As the Bureau has also acknowledged, "[i]ntensive livestock grazing is often suggested for controlling cheatgrass competition. Although targeted grazing may have some applications for fuels management, it is not effective in reducing cheatgrass competition…. During the short time when cheatgrass is highly palatable in the spring, a sufficient number of livestock cannot be concentrated on a small enough area to reduce the cheatgrass seed significantly or reduce cheatgrass seed lying on the soil surface. In addition, this type of grazing can be detrimental to remaining perennial grasses, opening the site up for further cheatgrass expansion in the future" (Idaho/SW Montana Greater Sage-Grouse 2013 DEIS, vol. 2: 3-64 – 3-65).

The USDA's recent review of best management strategies for preventing unnatural fire in the sagebrush steppe also noted that "[i]n general, improper livestock use, such as heavy grazing during the critical growth period, can decrease perennial grasses and forbs, increase woody biomass (fuel loads), and elevate susceptibility to invasive annual grasses" (Chambers et al. 2016a: 83). Williamson et al. (2019: 2) concluded from 14 years of field research that "grazing corresponds with increased cheatgrass occurrence and prevalence regardless of variation in climate, topography, or community composition, and provide no support for the notion that contemporary grazing regimes or grazing in conjunction with fire can suppress cheatgrass."

4.3.1. Oregon Greater Sage-grouse Approved Resource Management Plan Amendment

The Oregon ARMPA identified the spread of invasive annual grasses as a "major threat" to sage-grouse or their habitat on Bureau lands in Oregon (Oregon 2015 ARMPA: 1-7), and for all populations identified in Oregon identified in the Conservation Objectives Team report (Oregon 2015 ARMPA: 1-9, Table 1-5).

Chambers et al. (2014: 7-8), included as Appendix H in the ARMPA, described impacts of annual grasses on sage-grouse occurrence, including at breeding sites:

> In their analysis of active leks, Knick et al. (2013) found that most leks had very little annual grassland cover (2.2%) within a 5-km (3.1-mi) radius of the leks; leks that were no longer used had almost five times as much annual grassland cover as active leks. Johnson et al. (2011) found that lek use became progressively less as the cover of invasive annual species increased at both the 5-km (3.1-mi) and 18-km (11.2-mi) scales. Also, few leks had >8% invasive annual vegetation cover within both buffer distances.

> Patterns of nest site selection also suggest local impacts of invasive annual grasses on birds. In western Nevada, Lockyer (2012) found that sage-grouse selected large expanses of sagebrush-dominated areas and, within those areas, sage-grouse selected microsites with higher shrub canopy cover and lower cheatgrass cover. Average cheatgrass cover at selected locations was 7.1% compared to 13.3% at available locations. Sage-grouse hens essentially avoided nesting in areas with higher cheatgrass cover. Kirol et al. (2012) also found nest-site selection was negatively correlated with the presence of cheatgrass in south-central Wyoming.
>
> Sage-grouse population demographic studies in northern Nevada show that recruitment and annual survival also are affected by presence of annual grasslands at larger scales. Blomberg et al. (2012) analyzed land cover within a 5-km (3.1-mi) radius of leks and found that leks impacted by annual grasslands experienced lower recruitment than non-impacted leks, even following years of high precipitation. Leks that were not affected by invasive annual grasslands exhibited recruitment rates nearly twice as high as the population average and nearly six times greater than affected leks during years of high precipitation.

Perhaps based on this information, the Oregon ARMPA (2015: 2-10) included science-based management provisions to limit annual grass occurrence in sage-grouse breeding and nesting habitat:

> Goal VEG 1: Increase the resistance of Greater Sage-grouse habitat to invasive annual grasses and the resiliency of Greater Sage-grouse habitat to disturbances such as fire and climate change to reduce habitat loss and fragmentation.
>
> Objective VEG 3: Reduce the area dominated by invasive annual grasses to no more than 5 percent within 4.0 miles of all occupied or pending leks. Manage vegetation to retain resistance to invasion where invasive annual grasses dominate less than 5 percent of the area within 4.0 miles of such leks.

4.3.2. Management prescription

The current objective for limiting the occurrence of annual grass to no more than 5 percent of the area within a four-mile radius of all active and pending leks must be retained and even strengthened in the new planning process.

Science-based prescriptions are available for managing livestock grazing to both achieve this objective and the larger goal of providing for habitat resilience against the spread of annual grasses. Research conducted on invasive grasses found that cheatgrass and clasping pepperweed (*Lepidium perfoliatum*, a non-native mustard) out-compete native grasses where vegetative communities are stressed by higher surface temperatures, limited moisture and grazing pressure (i.e., on south facing slopes) (Reisner et al. 2015). Managing grazing to maintain soil and hydrologic functioning and capacity of native perennial herbaceous species, especially perennial grasses, should help native plants to compete effectively with invasive plant species (Chambers et al. 2017). The U.S. Geological Survey recommends adjusting and, if necessary, suspending

livestock grazing as part of a passive restoration program to maintain and reestablish resilient sagebrush steppe (Pyke et al. 2015).

Reisner et al (2013: 1) provided clear, science-based prescriptions for managing grazing to avoid contributing to the spread of invasive annual grasses such as cheatgrass:

> "If the goal is to conserve and restore resistance of [big sagebrush] systems, managers should consider maintaining or restoring:
>
> (i) high bunchgrass cover and structure characterized by spatially dispersed bunchgrasses and small gaps between them;
>
> (ii) a diverse assemblage of bunchgrass species to maximize competitive interactions with *B. tectorum* in time and space; and
>
> (iii) biological soil crusts to limit *B. tectorum* establishment. Passive restoration by reducing cumulative cattle grazing may be one of the most effective means of achieving these three goals."

4.4. Inventory and assess need for current range infrastructure by BLM district; require no net additional range infrastructure in greater sage-grouse priority habitat

Range developments that support livestock grazing can have significant impacts on sage-grouse and their habitats (*see* COT 2013: 46, 52; Oregon 2013 DEIS: 2-10). Range developments include structures such as cattle guards, fences, exclosures, corrals or other livestock management facilities; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments (Oregon 2013 DEIS: 2-85).

Two of the more prominent range developments identified as a threat to sage-grouse are fences and water developments (COT 2013: 52, App. A; Oregon 2013 DEIS: 2-10). While exact data are not available, it has been estimated that there are nearly 10,000 miles of fence criss-crossing Bureau-managed sage-grouse habitat in Oregon alone (Manier et al. 2013; Oregon 2013 DEIS: 3-80)--enough fence to extend the length of the United States–from California to Maine–more than three times. The number of water developments on Bureau-managed lands in Oregon is unknown (Oregon 2013 DEIS), though it is estimated there are more than 56,500 water developments across all Bureau-managed sage-grouse habitat in the West (Connelly et al. 2004; Manier 2013). The primary function of these range developments is to support livestock grazing (*see* Oregon 2013 DEIS: 3-78, describing current grazing authorizations for 927,660 Animal Unit Months (AUMs) on 749 allotments in sage-grouse range in Oregon).

In addition to degrading habitat and causing direct mortality of sage-grouse, range developments subsidize generalist predators that have the potential to impact sage-grouse populations (O'Neil et al. 2018), in some cases very significantly. O'Neil et al. (2018: 2) concluded that "[i]n semiarid ecosystems of the western U.S., predator-prey communities are undergoing transformation partly in response to the increased availability of anthropogenic food and water subsidies in regions where these resources were historically limited."

4.4.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

The 2015 ARMPA failed to provide adequate management direction to meaningfully address direct and indirect impacts of range developments on sage grouse and their habitat. The plan did list some general measures related to "range management structures," including:

- Allow range improvements that do not impact GRSG or that provide a conservation benefit to GRSG, such as fences for protecting important seasonal habitats.
- Maintain, enhance, or reestablish riparian areas in PHMA and GHMA.
- Remove, modify, or mark fences identified as high risk for GRSG collision.

(Oregon 2015 ARMPA: 1-11, Table 1-6). But this amorphous direction is without impetus.

The plan also includes one management directive addressing concerns related to fences (Oregon 2015 ARMPA: 2-20, MD LG 9, "[r]emove, modify, or mark fences identified as high risk for collisions, generally within 1.2 miles of occupied or pending leks").

The ARMPA also offers a handful of management decisions and guidance related to water developments. Examples include:

- MD LG 6: Authorize new, relocate, or modify existing range improvements that use seeps or springs as a water source to enhance their year round functionality. Install or retrofit wildlife escape ramps in all livestock water troughs or water storage facilities (e.g., catchments, storage tanks).

  Maintain, enhance, or reestablish riparian areas in PHMA and GHMA (Oregon 2015 ARMPA: 2-20).

- MD LG 7: Identify playas, wetlands, and springs that have been modified for livestock watering within PHMA and GHMA. Identify those water improvements that have Greater Sage-grouse population limiting implications, and develop projects for rehabilitation. Further actions should be instigated for development of water off site; new water should be available before existing water is eliminated (Oregon 2015 ARMPA: 2-20).

- MD LG 8: Design new and maintain existing water projects to avoid standing pools of shallow water that would spread West Nile Virus (Oregon 2015 ARMPA: 2-20).

Finally, the current plan includes several relevant Required Design Features (RDFs) related to water developments. Examples include:

- Locate new or relocate existing livestock water developments within GRSG habitat to maintain or enhance habitat quality (Oregon 2015 ARMPA: C-6).
- Ensure wildlife accessibility to water and install escape ramps in all new and existing water troughs (Oregon 2015 ARMPA: C-7).
- Construct new livestock facilities, such as livestock troughs, fences, corrals, handling facilities, and "dusting bags," at least 1.2 miles from leks or other important areas of

GRSG habitat (i.e., wintering and brood-rearing areas) to avoid concentrating livestock, collision hazards to flying birds, or avian predator perches (Oregon 2015 ARMPA: C-7).

- Place new taller structures, including corrals, loading facilities, water storage tanks, windmills, out of the line of sight or at least 1.2 miles from occupied leks, where such structures would increase the risk of avian predation (Oregon 2015 ARMPA: C-7).

4.4.2. Management Prescription

The Bureau should provide additional, and more detailed management direction related to range developments in sage-grouse priority habitat. Importantly, the agency should require no net increase in range developments in priority habitat to stem a potential increase in impacts on sage-grouse from these facilities over time. Several important examples of additional management direction have already been analyzed in previous NEPA analyses, or otherwise authorized in instruction memorandum. Below we highlight three key measures the Bureau should consider in this planning process.

1. Avoid new range developments in greater sage-grouse priority habitat

The Bureau should direct that managers avoid construction or placement of any new range developments in priority habitat, particularly new fences or water developments. In fact, the Bureau previously analyzed a similar provision in both its draft and final environmental impact statements for the 2015 planning process.

> Action F-LG/RM 24: Avoid all new structural range developments in occupied GRSG habitat unless independent peer-reviewed studies show that the range improvement structure benefits GRSG. Structural range developments, in this context, include but are not limited to cattle guards, fences, exclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments"

(Oregon FEIS 2015: 2-139; Oregon 2013 DEIS: 2-85).

The Bureau also previously provided guidance on fence construction in Instruction Memoranda 2012-043, *Greater Sage-Grouse Interim Management Policies and Procedures*, directing managers to "[c]onsider deferring fence construction unless the objective is to benefit Greater Sage-Grouse habitat, improve land health, promote successful reclamation, protect human health and safety, or provide resource protection" (BLM 2012).

Providing management directives to avoid all new range developments, while allowing for specific, limited exceptions would allow the Bureau to protect important resources where appropriate, while ensuring that range developments for livestock grazing do not further impact sage-grouse and their habitat.

2. Require no net increase in range developments in greater sage-grouse priority habitat

The Bureau should require no net increase in range developments within priority habitat, and specifically no increase in miles of fence and number of water developments, measured by

grazing allotment, BLM resource area and district. In addition to an avoidance standard (see above), this management directive would ensure managers take meaningful steps to, at a minimum, halt the accumulation of livestock infrastructure within a given sage-grouse habitat area, effectively "capping" this key threat identified by the U.S. Fish and Wildlife Service (COT 2013). A no net increase provision, in combination with an updated range development inventory (see below), would also provide much needed data and direction to remove unneeded infrastructure before implementing new projects, and to reduce habitat fragmentation and degradation and subsidies to predators.

3. Conduct district-level fence inventory and assessment in greater sage-grouse priority habitat

The Bureau should conduct a full inventory and accounting of existing fence and water developments within priority habitat. This inventory should document fence or water development condition, whether it meets wildlife-management specifications, and its current purpose in managing land uses within sage-grouse habitat. The assessment should be conducted at the district level and compiled into a report provided to the state office within a specified time period. In addition to a baseline inventory, the Bureau should specifically document all range developments that are removed or modified and publicly publish an annual report of completed actions.

In fact, a similar directive was made in the Bureau's Instruction Memoranda 2012-043, where the Bureau stated:

> Until further direction is provided, and within the range of the Greater Sage-Grouse, the Wildlife Program (1110) will collect, consolidate, and report the following annually to the Division of Fish and Wildlife Conservation (WO-230):
>
> - Miles, acres, and/or number of structures (e.g., fences, water developments, well pads, gravel pits, roads) removed, installed, relocated, decommissioned, modified, or mitigated to benefit Greater Sage-Grouse and its habitat

(BLM 2012). Combining an inventory and assessment of range developments with transparent tracking of related restoration and development activities will better assist the Bureau and the public in tracking implementation of conservation strategies and evaluating the effectiveness of management actions.

4.5. Close key research natural areas to livestock grazing to support research and management

By the time the 2015 ARMPA issued, Oregon's sage-grouse population had fallen to fewer than 20,000 individual birds (Vold 2021). An indispensable part of the Bureau's conservation plan for Oregon, to avoid listing sage-grouse under the ESA, is scientific research to be conducted in 15 specially-identified "key" research natural areas (RNA). The Bureau recognized these areas as being critical for sage-grouse conservation due to their high habitat value for the bird and their high management value for gauging plan effectiveness.

In 2015, the Bureau described that removal of grazing from these areas would "provide baseline vegetation information to document successional changes, to serve as areas for comparison to treated areas, and to document future vegetation shifts in the plant communities from changes in precipitation and temperature (climate change)" (Oregon 2015 FEIS: 8-21). Removing grazing disturbance from the RNAs and conducting subsequent scientific research is an irreplaceable prerequisite to understanding how "natural successional processes would proceed" in plant communities understood to be essential for sage-grouse recovery (Oregon 2015 FEIS: 2-46). Setting aside reference areas for scientific research is also consistent with the Bureau's obligation under the Federal Land Policy and Management Act ("FLPMA") to "prepare and maintain on a continuing basis an inventory of public lands and their resources and other values." 43 U.S.C. § 1711(a); *see Or. Nat. Desert Ass'n v. Bureau of Land Mgmt*., 625 F.3d 1092, 1096–97 (9th Cir. 2010) (describing FLPMA's land management and continuing inventory requirements).

The record of decision ("ROD") for Oregon's ARMPA defines Objective LG 2, Objective SD 4, and Management Decision LG 1 as "Immediate Decisions" that "go into effect when the ROD is signed" (Great Basin 2015 ROD: 1-41, listing "goals, objectives, allowable uses, and management direction" as immediate "decisions [that] require no additional analysis and guide future land management actions and subsequent site-specific implementation decisions"). The accompanying final environmental impact statement advised the public that permitted grazing "would be unavailable for grazing within 5 years on all or portions of" the 13 key RNAs where grazing still occurred (Oregon 2015 FEIS: 2-46). It also specified that the Bureau would complete "[s]ite specific RNA activity plans identifying actions to conserve and manage the RNA values and to utilize these areas for baseline research for plant communities important for GRSG . . . within 5 years" (Oregon 2015 FEIS: 2-46).

Despite the ARMPA's decision to close the RNAs, the Bureau has withheld implementation of the closures and failed to plan and conduct any scientific research in those areas. The Trump administration not only failed to implement the research closures ordered by the 2015 ARMPA, but then, in 2019, directed the Bureau to abandon them altogether. Although a federal district court in Idaho quickly enjoined the Bureau from implementing the 2019 ARMPA and ordered that the 2015 ARMPA remains in effect, the Bureau has continued to delay implementation of the RNA closures. *W. Watersheds Proj. v. Schneider*, 417 F. Supp. 3d 1319, 1335 (D. Idaho 2019).

4.5.1. Management prescription

The 2015 ARMPA made a critical decision to remove livestock grazing from a fraction of one percent of grazed public lands in sage-grouse range to study and evaluate this most pervasive use of sagebrush habitats in Oregon and across the West. We urge the agency to retain this direction in the new planning process, consider additional RNAs to become key RNAs and immediately close these areas to grazing in accordance with the 2015 ARMPA and record of decision.

4.6. Authorize voluntary grazing permit retirement in greater sage-grouse priority habitat, including as part of departmental and BLM mitigation strategies

Domestic livestock grazing is the most pervasive land use in sage-grouse range and can negatively affect sage-grouse and their habitat in a variety of ways. Voluntary grazing permit[4] retirement can help reduce effects of livestock grazing on sage-grouse, while also providing federal grazing permittees with another option for managing their grazing permits. The Bureau has previously defined grazing permit "retirement" as "[e]nding livestock grazing on a specific area of land" (i.e., the associated public lands grazing allotment) (Lander 2014 ROD: 175).

The BLM has identified multiple benefits of retiring livestock grazing in sage-grouse habitat, including in Colorado: "[e]limination of livestock grazing...would maintain or improve overall watershed health and water quality...decrease hoof compaction of soil surfaces. When combined with the annual freeze-thaw cycle, this may decrease soil bulk density and improve soil moisture conditions, which facilitates vegetation germination and root development. Removing livestock would also increase plant litter and live vegetative ground cover, which would provide more protection from wind and water erosion. Eliminating livestock grazing...would also eliminate water quality impacts associated with the deposition of manure and urine into surface water" (Northwest Colorado 2013 DEIS: 776). The Bureau similarly noted in North Dakota that retirement of grazing privileges would likely result in a reduction in conflicts between grazing and other land uses and may improve range health and forage conditions for remaining permitted use in the area (North Dakota 2015 FEIS, vol 1: 4-107). Reducing livestock grazing in sagebrush habitats is also specifically recommended to help increase ecosystem resiliency against invasion by cheatgrass (*Bromus tectorum*), a key threat to sage-grouse, particularly in the western portion of its range (Reisner et al. 2013; *see also* Blank and Morgan 2012).

Federal agencies have facilitated voluntary grazing permit retirement in land use plans and amendments across the West. Permittees are typically compensated by a third party to relinquish their grazing permits for retirement, which could include conservation and sporting interests, or other public lands stakeholders. Voluntary grazing permit retirement could be a mechanism for helping to mitigate impacts on sage-grouse habitat and implemented in the context of departmental and agency mitigation and climate adaptation strategies (DOI 2021; BLM IM 2021-046, *Reinstating the Bureau of Land Management (BLM) Manual Section (MS-1794) and Handbook (H-1794-1) on Mitigation*).

4.6.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

The 2015 Oregon ARMPA included a voluntary grazing permit retirement provision, similar to many other plan amendments produced from the previous planning process:

> "At the time a permittee or lessee voluntarily relinquishes a permit or lease, the BLM will consider whether the public lands where that permitted use was authorized should remain available for livestock grazing or be used for other resource management objectives, such as reserve common allotments. This does not apply to or impact grazing preference

[4] "Permit" includes Bureau of Land Management grazing permits (section 3) and leases (section 15).

transfers, which are addressed in 43 CFR, Part 4110.2-3" Oregon 2015 ARMPA: 2-21, MD LG 15).

The direction provided creates ambiguity on whether grazing permits voluntarily relinquished to the agency will actually result in grazing allotments being permanently closed to grazing. This, in turn, has probably discouraged potential transactions between permittees and third parties to support grazing permit retirement.

4.6.2. Management prescription

The voluntary grazing permit retirement provision in the Record of Decision for the Lander Field Office would lead more directly to allotment closure (in part because it doesn't include the possibility of reallocating those allotments to "reserve common allotments" for future grazing):

> "When livestock grazing permits and/or grazing preference are voluntarily relinquished in portions of or all of an allotment, analyze suitable livestock grazing management, including closure to livestock grazing where appropriate, based on benefits to resources and other uses" (Lander 2014 ROD: 98, Record 606).

The Bureau should in this new planning process provide more specific direction on voluntary grazing permit retirement than included in the current plan to facilitate this increasingly popular mechanism for resolving management conflicts on public lands.

5. Preserve greater sage-grouse priority habitat from new disturbance

5.1. Prohibit new rights-of-ways in greater sage-grouse priority habitat, including for renewable energy development

New rights-of-way, including for renewable energy leasing and infrastructure development, should be excluded in sage-grouse priority habitat (SGNTT 2011: 21).

The Bureau has described renewable energy development as a significant threat to sage-grouse, similar to fossil fuel development. "Renewable energy facilities, including wind and geothermal power, typically require many of the same features for construction and operation as do nonrenewable energy resources. Therefore, impacts from direct habitat loss, habitat fragmentation through roads and power lines, noise, and increased human presence are generally similar to those discussed for nonrenewable energy development (USFWS 2010). In a Wyoming study, LeBeau (2014) found that the risk of a nest or brood failing decreased as the distance increased from a wind turbine; female survival did not appear to be affected by the relative distance to roads and transmission lines, although the relationship was not substantial because of the 90 percent confidence intervals" (Oregon 2015 FEIS: 4-23 - 4-24).

Continued research on renewable energy development impacts found that "sage-grouse during the brood-rearing and summer period were responding to the infrastructure associated with a wind energy development similar to that found in a natural gas field" (LeBeau et al. 2017). In Idaho near Cotterel Mountain, a drastic decline in lek attendance across 9 local leks was attributed to the placement of eight meteorological (met) towers erected to measure wind

velocity for a commercial wind power feasibility study (Reynolds and Hinckley 2005). Utility-scale wind, solar, and geothermal development and associated infrastructure can affect sage-grouse in a variety of ways, through habitat loss and fragmentation, increased predation (and thus behavioral avoidance by sage-grouse) facilitated by development, and disturbance from noise, motion, and human activity.

The Bureau has similarly identified habitat fragmentation by transmission lines as a "major threat" to sage-grouse (Oregon 2015 FEIS: 1-6). "Comparing environmental conditions and levels of human disturbance on areas of former range (extirpated range) with areas still occupied by GRSG (occupied range), Wisdom et al. (2011) identified five key factors most likely to lead to extirpation of local populations: sagebrush area, elevation, distance to transmission lines, distance to cellular towers, and landownership" (Oregon 2015 FEIS: 3-16).

Transmission lines can affect individual birds and populations of sage-grouse. "Bird mortality or injury could occur from collision or electrocution with transmission lines and other ROW structures. …Indirect impacts could include introduction of invasive vegetation that may result in alteration of wildfire frequency; increase in predators or predation pressure; decreased survival or reproduction of the species; and decreased habitat effectiveness" (Oregon 2015 FEIS: 4-125).

The U.S. Fish and Wildlife Service identified transmission lines as a threat to sage-grouse in its 2010 list listing determination for the species, noting that the "impact of [a] powerline is greater than the actual footprint. Knick et al. (in press, p. 111) estimated these impacts may influence up to 39 percent of all sagebrush in the SGCA. Powerlines can directly affect greater sage-grouse by posing a collision and electrocution hazard (Braun 1998, pp. 145-146; Connelly et al. 2000a, p. 974), and can have 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)" (75 Fed. Reg. 13928).

5.1.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

The Oregon ARMPA designated priority habitat outside of Sagebrush Focal Areas as exclusion areas for renewable energy leasing, except in Lake, Harney and Malheur counties (the majority of priority habitat in Oregon), where priority habitat was inexplicably designated as "avoidance" rather than "exclusion" for new rights-of-way for renewable energy development (Oregon 2015 ARMPA: 2-25 - 2-26, MD RE 1, MD RE 2). This was a surprising allowance both for its declination of applicable science and departure from every other agency plan amendment produced as part of the 2011 National Greater Sage-Grouse Planning Strategy. Nearly all of the proposed final sage-grouse plans excluded renewable energy development in sage-grouse priority habitat, including the Billings-Pompeys Pillar, HiLine, Idaho/SW Montana, Lewistown, Miles City, Nevada/NE California, North Dakota, South Dakota, and Utah. Plans in Wyoming only allowed renewable energy development in priority habitat where it can be sufficiently demonstrated that the development activity would not result in declines of sage-grouse populations (*e.g.,* Wyoming FEIS: 2-29, Table 2-4, Action 36).

The Oregon ARMPA similarly only designated sage-grouse priority habitat as "avoidance" rather than "exclusion" areas for new rights-of-way for high voltage transmission and major pipelines (Oregon 2015 ARMPA: 2-28, MD LR 6). Even Sagebrush Focal Areas are only managed for avoidance for major new transmission (Oregon 2015 ARMPA: 2-6, MD SSS-2). Moreover, the final plan allowed for continued consideration of Section 368 transmission corridors, designating them as open through what otherwise became Sagebrush Focal Area and priority habitat (e.g., Section 368 Priority Corridor 7-24, which traverses large expanses of southeastern Oregon in Malheur, Harney and Lake Counties, crossing Sagebrush Focal Area and priority habitat).

5.1.2. Management prescription

In its Conservation Objective Team (COT 2013: 10) report, the U.S. Fish and Wildlife Service noted that, while there was not yet a lot of renewable energy developed in sage-grouse habitat, "impacts resulting from renewable energy development are expected to have negative effects to sage-grouse populations and habitats due to their similarity in supporting infrastructure (Becker et al. 2009; Hagen 2010; LeBeau 2012; USFWS 2012)." The plan amendments produced in 2015 appropriately excluded renewable energy development from the most important sage-grouse habitats in most states and planning areas. The Bureau should adopt the same measure in priority habitat in Lake County, Harney County and Malheur County in Oregon.

The Bureau should similarly exclude all new rights of way for new high-voltage energy transmission in sage-grouse priority habitat and Sagebrush Focal Areas, including Section 368 corridors and other lines currently under consideration in priority habitat. In addition to avoiding habitat fragmentation, restricting new rights-of-way in priority habitat and Sagebrush Focal Areas is also important for conserving and supporting sage-grouse use of late brood-rearing and winter habitat areas, bolstering habitat resilience against invasive species and climate change, and designating and planning for sagebrush reserves.

5.2. Account for vegetation management in priority habitat disturbance cap

The National Technical Team (NTT) (2011) report and Conservation Objective Team (COT) (2013) report both recognized the importance of tracking and limiting anthropogenic disturbances that remove sagebrush in sage-grouse habitat. The NTT report concluded that "[l]and uses, habitat treatments, and anthropogenic disturbances will need to be managed below thresholds necessary to conserve not only local sage-grouse populations, but sagebrush communities and landscapes as well" with "[t]he overall objective [being] to protect priority sage-grouse habitats from anthropogenic disturbances that will reduce distribution or abundance of sage-grouse" (SGNTT 2011: 6, 7). Similarly, the COT report recommended "[r]educ[ing] or eliminat[ing] disturbances that promote the spread of these invasive species" including by "precluding the use of treatments intended to remove sagebrush" (COT 2013: 42).

Under the COT report's conservation objective "Avoiding sagebrush removal or manipulation in sage-grouse breeding or wintering habitats," the team wrote that:

> Although many treatments are often presented as improving sage-grouse habitats, data supporting the positive impacts of sagebrush manipulation on sage-grouse populations is limited (Beck et al. 2012)....Exceptions to this can be considered where minor habitat losses are sustained while implementing other habitat improvement or maintenance efforts (e.g., juniper removal) and in areas used as late summer brood habitat (Connelly et al. 2000). Appropriate regulatory and incentive-based mechanisms must be implemented to preclude sagebrush removal and manipulation for all other purposes.

(COT 2013: 44)

The "[l]oss of sagebrush habitat has been and continues to be [a] threat to the [sage-grouse] population in Oregon. Between 1963 and 1974, 500,000 acres of sagebrush habitat was seeded to crested wheatgrass or sprayed with herbicide, and 1,600 water developments and 463 miles of pipeline were installed in the Vale District BLM's area for the Vale project" (COT 2013: 79). More recently, in Oregon and Idaho, the Bureau has proposed to mow and remove sagebrush and seed with non-native species across huge swaths of Sagebrush Focal Areas and sage-grouse priority habitat (*see* BLM 2020, where over 40,000 acres of sagebrush treatments are proposed in priority sage-grouse habitats, with 99 percent of identified seeding treatments using non-native seed mixes).

5.2.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

The 2015 Oregon ARMPA provided disturbance caps to track and limit habitat disturbance at both the PAC and project scales. The disturbance caps specifically monitor and limit discrete anthropogenic disturbances in sage-grouse habitats, which generally are considered to include "paved highways, graded gravel roads, transmission lines, substations, wind turbines, oil and gas wells, geothermal wells and associated facilities, pipelines, landfills, agricultural conversion, homes, and mines." (Oregon 2015 ARMPA: 5-2).

- "MD SSS-3: If the 3% anthropogenic disturbance cap, not to exceed 1% increase per decade, is exceeded on lands (regardless of landownership) within GRSG Priority Habitat Management Areas in the affected Oregon PAC, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the General Mining Law of 1872, as amended, valid existing rights, etc.) will be permitted by BLM within GRSG Priority Habitat Management Areas in the affected Oregon PAC until the disturbance has been reduced to less than the cap" (Oregon 2015 ARMPA: 2-7).

- "MD SSS-4: If the 3% disturbance cap, not to exceed 1% increase per decade, is exceeded on all lands (regardless of landownership) within a proposed project analysis area in Priority Habitat Management Areas, then no further anthropogenic disturbance will be permitted by BLM until disturbance in the proposed project analysis area has been reduced to maintain the area under the cap (subject to applicable laws and regulations, such as General Mining Law of 1872, as amended, valid existing rights, etc.). Within existing designated utility corridors, the 3% disturbance cap may be exceeded at the project scale if the site specific NEPA analysis indicates that a net conservation gain to the species will be achieved. This exception is limited to projects which fulfill the use for

which the corridors were designated (ex., transmission lines, pipelines) and the designated width of a corridor will not be exceeded as a result of any project co-location" (BLM 2015: 2-7).

5.2.2. Management prescription

In implementing and interpreting the 2015 ARMPA, the Bureau does not include vegetation treatments that remove sagebrush in its disturbance cap calculations. In alignment with the direction provided in the NTT and COT reports, and to effectively track, plant and, where necessary, prevent further removal of sagebrush, the Bureau should include anthropogenic vegetation treatments that remove or manipulate sagebrush through mowing and planting of non-native species in disturbance cap calculations at all prescribed spatial scales.

6. Plan and manage travel in greater sage-grouse habitat

Roads have multiple effects on sage-grouse, including mortality from vehicle collisions and behavioral disruption due to traffic, noise, and human presence (SGNTT 2011). Holloran and Anderson (2005b) found that road densities greater than 0.7 linear miles per square mile within 2 miles of leks resulted in significant negative impacts to sage-grouse populations. Anthropogenic noise associated with roads has been shown to decrease abundance of males at leks by 73 percent, relative to paired controls (Blickley et al. 2012). These effects are not limited to the immediate vicinity surrounding a road, as Connelly et al. (2004) reported that male attendance at leks up to 7.5 km (4.66 miles) away declined at higher rates than leks located farther away from roads.

Roads also destroy and fragment sage-grouse habitat, and alter habitat as a consequence of edge effect (changes to aridity, dust pollution, noise, increased activities, increased garbage and roadkill) and facilitate the spread of invasive, non-native plant species (SGNTT 2011). In addition, fires are much more likely to ignite along roads. Areas where sage-grouse have been extirpated have 25 percent more roads compared to habitat where sage-grouse persist (Wisdom et al. 2011).

6.1. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

Recognizing the importance of transportation planning and management to sage-grouse conservation, the Bureau promised in both the 2015 Oregon ARMPA and the proposed plan in the supporting final environmental impact statement to initiate travel management planning within five years of the 2015 record of decision (Oregon 2015 ARMPA: 2-32, TTM 5; Oregon 2015 FEIS: 2-34, Action TM 5). It's been seven years since and the Bureau has yet to initiate travel planning in any area of sage-grouse range pursuant to this conservation strategy. The ARMPA further identified objectives and management direction on how to evaluate and modify off-highway vehicle/off-road vehicle use areas to conserve sage-grouse habitat and minimize disturbance (Oregon 2015 ARMPA: 2-30, Obj. TTM 1, Obj. TTM 2; 2-30 - 2-32, MD TTM 1-10).

6.2. Management prescription

The Bureau should prioritize travel management planning in the new sage-grouse plan amendments to minimize habitat loss, fragmentation and disturbance to sage-grouse, including planning for off-highway/off-road vehicle use areas given the continued increasing popularity and impacts from off-highway/off-road travel in sage-grouse range. Comprehensive planning and management of travel in sage-grouse range is also essential to conserving late brood-rearing and winter habitat areas, habitat resiliency against invasive species, and sagebrush reserve design, designation and protection.

7. Retain, designate and manage sagebrush reserves for greater sage-grouse and other fish and wildlife

Conservation biology recommends protecting habitat reserves to conserve sensitive species (Rodrigues and Gaston 2001). A system of reserves should be large enough to achieve the goals of biological representation, and ecological redundancy and resiliency within an ecosystem (Svancara et al. 2005). The size of individual areas and the reserve system should be determined by the biological requirements of the species of concern (*e.g.,* Haight et al. 2002).

A reserve system for sage-grouse should protect centers of abundance, seasonal habitats and connectivity. The commonly cited goal of conserving 10 percent of a given landscape lacks basis in science (Soulé and Sanjayan 1998; Svancara et al. 2005). Much larger areas may be necessary to conserve biodiversity and ecosystem integrity (Soulé and Sanjayan 1998).

A system of reserves should also protect peripheral and/or genetically distinct populations of a species. Peripheral populations are often located at the ecological limits of a species range, where species are exposed to environmental circumstances that may later become prevalent in central populations, such as effects from climate change. Such testing of the periphery can act to stabilize the entire species in the face of environmental change (Lesica and Allendorf 1995). Genetically distinct populations increase genetic diversity in a species and expand the genetic background against which natural selection occurs (Lesica and Allendorf 1995).

Sage-grouse are a useful, if imperfect, umbrella species[5] for sagebrush steppe. Establishing a system of reserves for sage-grouse could benefit hundreds of other species, including as many as 350 species of conservation concern in sagebrush steppe (Wisdom et al. 2005a: 21 and App. 2). A suite of sagebrush birds are declining and would benefit from increased protection of sagebrush steppe (Knick et al. 2003; Dobkin and Sauder 2004). Rich et al. (2005: 602) contended that "conservation of Greater and Gunnison Sage-grouse populations in reasonable numbers well distributed across their historical ranges also will provide for the conservation of many, or even most, other bird species that co-occur with these grouse." Rowland et al. (2006) also found that conserving greater sage-grouse may benefit other species, particularly sagebrush obligate wildlife.

[5] An "umbrella species" is defined as one "whose conservation confers a protective umbrella to numerous co-occurring species" (Fleishman et al. 2001: 1489). Functionally, an umbrella species should having the following characteristics: "they represent other species, their biology is well known, they are easily observed or sampled, they have large home ranges, are migratory, and are persistent" (Rich and Altman 2001: 10).

- **Areas of Critical Environmental Concern**

The Federal Land Policy Management Act (FLPMA) (43 U.S.C. §§ 1701 *et seq.*) (FLPMA) declared that the United States will develop regulations and plans for the protection of public land "areas of critical environmental concern" (43 U.S.C. § 1701(11)). FLPMA directs the Secretary of the Interior to "prepare and maintain on a continuing basis an inventory of all public lands [managed by BLM] and their resource and other values…giving priority to areas of critical environmental concern" (43 U.S.C. § 1711(a)). The Secretary is instructed to "give priority to the designation and protection of areas of critical environmental concern" on public lands administered by BLM when developing and revising land use plans (43 U.S.C. § 1712(c)(3)).

FLPMA defines areas of critical environmental concern (ACEC) as areas of public land "where special management attention is required…to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes…" (43 U.S.C. § 1702(a); 43 CFR § 1601.0-5(a)). A potential ACEC may only be designated if it meets both "relevance" and "importance' criteria outlined in BLM regulations (43 CFR § 1601.0-5(a)(1)-(2)). A BLM Manual defines these criteria:

1. Relevance

   An area meets the relevance criteria if it contains one or more of the following:

   a. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to native Americans).
   b. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species, or habitat essential for maintaining species diversity).
   c. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).
   d. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs).
   e. A hazard caused by human action may meet the relevance criteria if it is determined through the RMP process that it has become part of a natural process.

2. Importance

   The value, resource, system, process, or hazard described in the relevance section must have substantial significance and values to meet the importance criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

   a. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

b. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.
c. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.
d. Has qualities that warrant highlighting in order to satisfy public or management concerns about safety and public welfare.
e. Poses a significant threat to human life and safety or to property.

(BLM Man. 1613.1)

ACECs are typically identified, evaluated, and designated through BLM resource management planning or amendment process (BLM Man. 1613.06). However, BLM managers must consider proposed ACECs, even if a planning effort is not underway or imminent (BLM Man. 1613.21.E). If, upon preliminary evaluation, the proposed area meets relevance and importance criteria, the agency must initiate a plan amendment to further evaluate the potential ACEC or provide temporary management until an evaluation is completed through resource management planning (BLM Man. 1613.21.E).

To be designated as an ACEC, an area must require "special management attention" to protect the relevant and important values (BLM Man. 1613.12). At least one additional management prescription must be developed for each ACEC (BLM Man. 1613.22) (that distinguishes management of the area from other, surrounding public land). Management prescriptions for ACECs are developed during the resource management planning or amendment process (BLM Man. 1613.12). The BLM identifies a number of factors that may influence management prescriptions, including conditions or trends of the potential ACEC; relationship to other resources and activities; opportunities for protection and/or restoration of potential ACEC values; the wisdom of highlighting the resource with an ACEC designation; the proposed boundaries of the potential ACEC; relationship of the potential ACEC to non-BLM designations; opportunities for management by another agency; and relationship to existing rights (BLM Man. 1613.22.A.1-8).

- **Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment**
    - **Sagebrush Focal Areas**

The 2015 Oregon ARMPA and Great Basin Record of Decision established 1,929,580 acres of "Sagebrush Focal Areas" (SFA) as "strongholds" for sage-grouse (Oregon 2015 ARMPA: 2-6, MD SSS-2; 5-20) and with additional protections than afforded designated priority habitat, including:

1. Recommended for withdrawal from the General Mining Law of 1872, as amended, subject to valid existing rights.
2. Managed as no surface occupancy, without waiver, exception, or modification, for fluid mineral leasing.
3. Prioritized for vegetation management and conservation actions in these areas, including, but not limited to land health assessments, wild horse and burro management actions, review of livestock grazing permits/leases, and habitat restoration.

(Oregon 2015 ARMPA: 2-6, MD SSS-2)

- **Strategic Areas**

The Oregon ARMPA also uniquely identified networks of "strategic areas" to support management and conservation of sage-grouse habitat, including individual and overlapping "Climate Change Consideration Areas," "Restoration Opportunity Areas," and "High Density Breeding Areas" (Oregon 2015 FEIS: 2-49, Fig. 2-4). Strategic areas cover more than 5,169,871 acres in the state, including 3,778,694 acres in designated priority habitat areas and 1,391,178 acres in general habitat areas (Oregon 2015 FEIS: 2-48). Strategic areas include Bureau-manged lands, other federal and state lands, and even private lands. However, they do "not have any management actions defined for them, as they establish priorities for only certain types of BLM administrative actions and do not restrict or prohibit activities" (Oregon 2015 FEIS: 2-48). The Bureau also noted that "strategic areas are not meant to be permanently fixed to a given area and are expected to shift over time as the landscape changes and the habitat most important to the [sage-grouse] shifts" (Oregon 2015 FEIS: 2-48).

- **Areas of Critical Environmental Concern**

Nearly all of the *draft* federal sage-grouse plans prepared as part of the 2015 National Greater Sage-grouse Planning Strategy determined that expansive networks of new sage-grouse ACECs met both relevance and importance criteria for designation. The Oregon DEIS, typical of the others, analyzed more than 4 million acres for protection as ACECs, finding that they contained *relevant* resources, including sage-grouse leks, seasonal habitats, and high quality sagebrush steppe, which are *important* because sage-grouse were candidate species for federal protection and a high priority to the agency (Oregon 2014 DEIS: J-4). The draft plan for Northwest Colorado analyzed 926,800 acres for potential designation as ACECs and included a series of maps that showed the overlap between the potential ACECs and other important wildlife habitats in the state, including elk and mule deer winter concentration areas, streams with threatened or endangered fish, and suitable habitat for threatened and endangered plants (NW Colorado 2013 DEIS: B-25 - B-28).

The BLM appears to have believed that, while new ACECs could benefit sage-grouse, the proposed management schemes in the selected management alternatives would be sufficient to "protect the relevant and important values… independent of an ACEC designation" (Oregon 2014 DEIS: 4-222). This is in contrast to other BLM plans that have designated substantial new ACECs for species conservation. The BLM land use plan for the Gunnison Gorge National Conservation Area determined that ACEC designation was important to conserve Gunnison sage-grouse—even in a Congressionally designated national conservation area. In southeastern Oregon, BLM designated the Borax Lake Area of Critical Environmental Concern to help conserve the Borax Lake chub. Increased protections within the ACEC were a contributing factor in FWS's recommendation to downlist the species from "endangered" to "threatened" in 2012, and then to delist it in 85 Fed. Reg. 35,574, Endangered and Threatened Wildlife and Plants; Removing the Borax Lake Chub From the List of Endangered and Threatened Wildlife (June 11, 2020) (determining that "the Borax Lake chub is no longer at risk of extinction now nor likely to become so in the foreseeable future" based, among other factors, on "[r]emoval of threats to subsurface waters from geothermal energy exploration or development" and "[p]permanent

protection" of lands on and surrounding lake). And the Las Vegas Field Office in Nevada has designated ten ACECs to protect wildlife habitat, six of which were allocated to safeguard designated critical habitat for federally listed threatened and endangered species, including the desert tortoise. ACECs established to protect that species cover 1,097 square miles (702,160 acres) of critical habitat as "desert tortoise ACEC reserves."

7.1. Retain Sagebrush Focal Areas in Oregon

Sagebrush Focal Areas in Oregon were the only SFAs in six states spared from elimination in the Bureau's last sage-grouse plan revisions finally completed in early 2021. It is imperative for conservation of the species that the Bureau retain these SFAs in the current planning process.

7.2 Retain and provide management direction for strategic areas

The networks of strategic areas identified in Oregon are important for identifying and prioritizing both Bureau management actions and collaborative efforts on public and private lands where they might have the greatest benefit for conserving and recovering sage-grouse and adapting populations to climate change and other stressors. Not only is it important for the agency to retain these designations as part of its conservation strategy in Oregon, but the Bureau should also consider providing additional management direction to support more and more effective conservation action in Climate Change Consideration Areas, Restoration Opportunity Areas, and High Density Breeding Areas.

7.3. Designate a network of Areas of Critical Environmental Concern to conserve greater sage-grouse and other sagebrush-dependent species

Oregon Natural Desert Association has joined a nomination to the Bureau to designate a network of Sagebrush Sea Reserve ACECs to conserve sage-grouse in Oregon and across the West, consistent with the agency's findings of the relevance and importance of proposed ACECs in the 2015 planning process.

ACEC designation is an administrative, public declaration of the importance of protecting certain areas to conserve natural resources. It also helps lay the groundwork for more durable forms of protection in the future. The BLM is authorized under existing law and policy to provide durable protection for lands and resources identified for conservation purposes and compensatory mitigation, including granting rights-of-way (43 U.S.C. §§ 1761(a)(4),(7)), securing easements (43 U.S.C. § 1732(b); 43 C.F.R. § 2920), and executing land withdrawals (43 U.S.C. § 1714(d)(1), § 1702(c)) under FLPMA.

ACEC designation would also benefit other fish, wildlife and plants, furthering the administration's goals of conserving biodiversity and natural landscapes. The Bureau recognized this fact when it designated the Frenchman Breaks Area of Critical Environmental Concern in the HiLine District in Montana as part of the 2015 sage-grouse planning process (HiLine 2015 ARMP: 3-57). Comprising 42,020 acres, the Bureau designated the area to conserve mule deer, elk, moose, white-tailed deer, colonial water birds, passerine birds, including grassland birds, sharp-tailed grouse and a number of agency sensitive species, as well as sage-grouse (HiLine 2015 FEIS: 1449, App. K).

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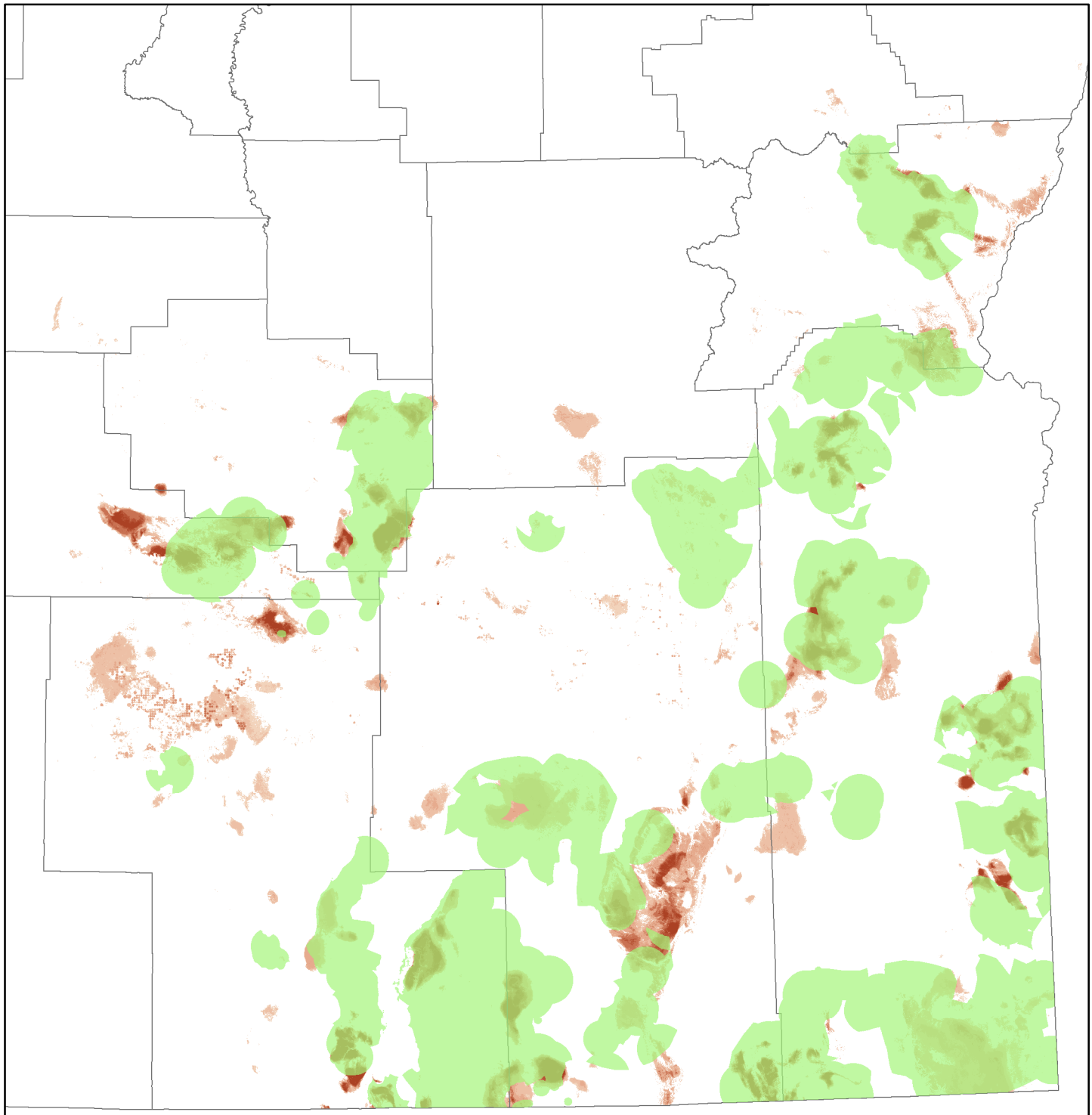
Attachment 1: Greater Sage-Grouse Summer Habitat Compared to Priority Habitat in Oregon

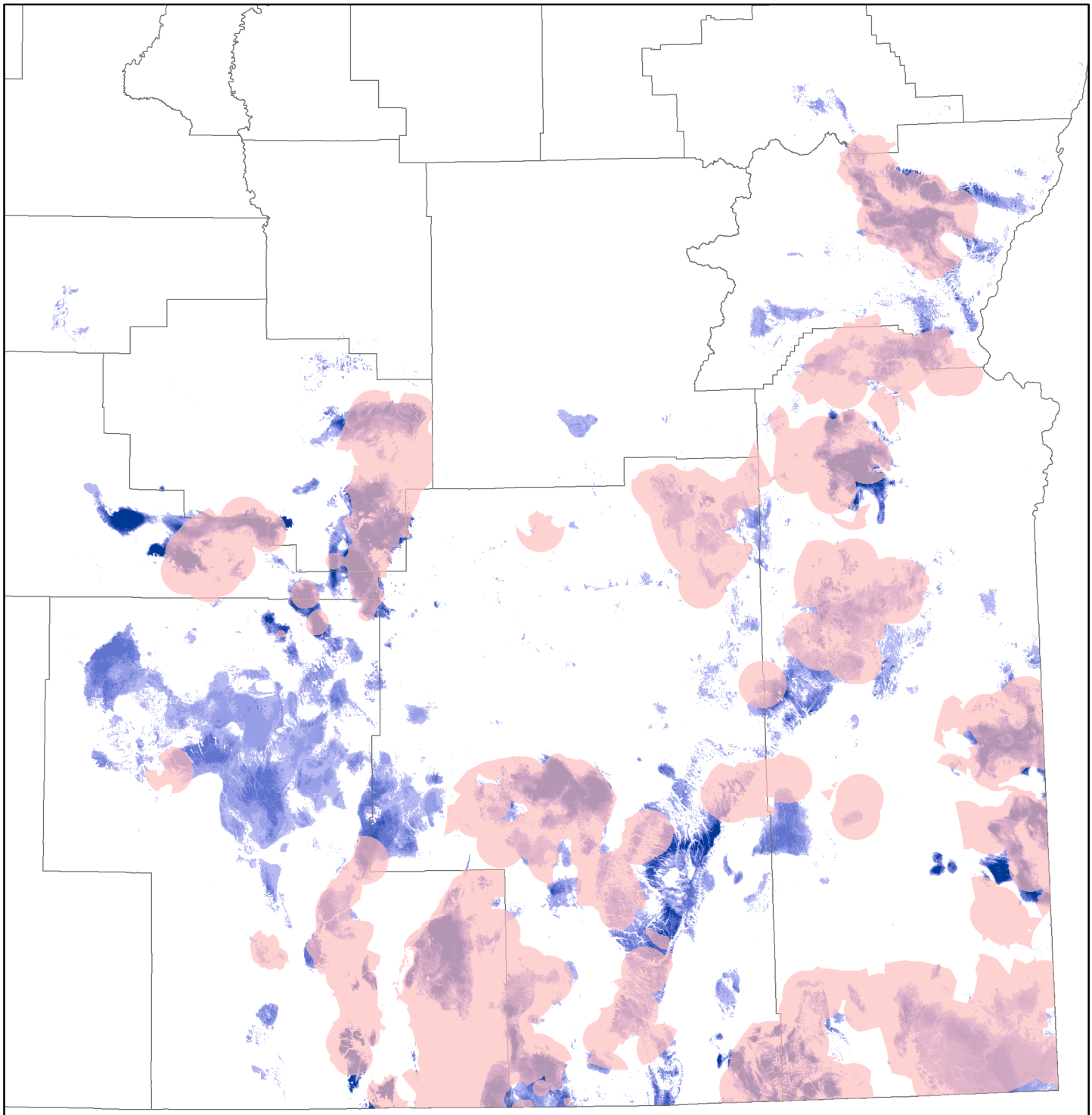


Greater Sage-Grouse Priority Habitat (ARMPA 2015)

Lower-Probabililty Summer Habitat (Henderson 2019)

Higher-Probability Summer Habitat (Henderson 2019)

Attachment 2: Greater Sage-Grouse Winter Habitat Compared to Priority Habitat in Oregon



Greater Sage-Grouse Priority Habitat (ARMPA 2015)

Lower-Probability Winter Habitat (Henderson 2019)

Higher-Probability Winter Habitat (Henderson 2019)