ADVOCATES FOR THE WEST
AMERICAN BIRD CONSERVANCY
CENTER FOR BIOLOGICAL DIVERSITY
OREGON NATURAL DESERT ASSOCIATION
PRAIRIE HILLS AUDUBON SOCIETY
WESTERN WATERSHEDS PROJECT
WILDEARTH GUARDIANS

February 8, 2022

Submitted online via https://go.usa.gov/xMtJQ and via email to BLM_HQ_GRSG_Planning@blm.gov

A hard copy of these comments with electronic copies of literature cited and attachments has been delivered to the Bureau of Land Management's Utah State Office

Patricia Deibert
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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,

We appreciate the opportunity to provide scoping comments in response to the Bureau of Land Management's "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 submit these comments on behalf of the members of Advocates for the West, American Bird Conservancy, Center for Biological Diversity, Oregon Natural Desert Association, Prairie Hills Audubon Society, Western Watersheds Project, and WildEarth Guardians who have a well-established interest in the conservation of greater sage-grouse and their habitat.

Our organizations have long advocated for protections for the greater sage-grouse, and have been involved in the National Sage Grouse Planning Strategy since its inception. Throughout, we have called for durable, effective protections for sage-grouse adequate to protect this imperiled bird

and avoid the need for listing under the Endangered Species Act. We do so again, with added urgency.

In 2013, the U.S. Fish and Wildlife Service (FWS) warned of the "urgent need to 'stop the bleeding' of continued population declines and habitat losses by acting immediately to eliminate or reduce the impacts contributing to population declines and range erosion. There are no populations within the range of sage-grouse that are immune to the threat of habitat loss and fragmentation." U.S. Dept. of Interior, Greater Sage-Grouse Conservation Objectives: Final Report 31-32 (FWS February 2013) (hereinafter, "COT Report").

The situation has only grown more dire. According to BLM's recent five-year monitoring report (Herren et al. 2021), 1.9 million acres of sagebrush in priority sage-grouse habitat have been lost between 2012 and 2018. The report does *not* count as lost habitat areas that have been leased for oil, gas or coal or other leasable minerals, granted rights-of-way, or grazing allotments that do not meet land health standards.

Meanwhile, invasive plants, particularly cheatgrass, continue to spread rapidly–from being present on a little over 50% of sage-grouse habitat in 2013 to nearly 70% of habitat in 2018. The areas in which invasive plants are abundant (>25% of vegetative cover) has also increased, from about 10% in 2013 to nearly 30% in 2018. More concerning, the BLM found that hard and soft population triggers were tripped in 42 instances since 2015, signaling serious population declines.

The import of BLM's monitoring data is clear:

> The results presented in this report, in combination with the U.S. Geological Survey's rangewide population monitoring report (Coates et al. 2021) and sagebrush conservation strategy (Remington et al. 2021), emphasize the urgent need to expand ongoing efforts to conserve currently functional habitat and restore currently degraded habitat.

(Herren et al. 2021: viii).

Also clear is that BLM's 2015 land use plan amendments have failed to halt the slide of the greater sage-grouse towards extinction. As we discuss below, BLM must use this planning process to remedy deficiencies and inconsistencies in the 2015 plan amendments and associated National Environmental Policy Act (NEPA) analyses, and to strengthen the protections for this species on BLM-managed lands.

In addition to providing these scoping comments, we and other organizations are proposing under separate cover a network of Sagebrush Sea Reserves for designation as Areas of Critical Environmental Concern (ACECs). We have included the nomination as Attachment A. Though the 2015 land use plan amendments designated tens of millions of acres of Priority Habitat Management Areas (PHMAs), these designations and the range of management prescriptions have not stopped the sage-grouse's continued decline. ACEC designations would provide a much-needed measure of protection for greater sage-grouse as well as hundreds of other wildlife species that depend on sagebrush ecosystems throughout the West.

BACKGROUND

I. Greater Sage-Grouse Population Declines

The greater sage-grouse is a sagebrush obligate; it depends upon large expanses of contiguous sagebrush to survive. Although greater sage-grouse once numbered in the millions across the United States and Canada, the species has declined with the fragmentation and destruction of its sagebrush habitat. Greater sage-grouse populations have now declined by 80 percent since 1965, with the few remaining birds confined to roughly half of their former range.

The decline continues. A recent USGS report found a nearly 40% rangewide population decline since 2002, with an accelerated rate decline in the western portions of the species range in recent decades (Coates et al. 2021). BLM's most recent five-year monitoring plan found that 42 hard and soft population triggers have been tripped since 2015 (Herren et al. 2021). In Wyoming, which harbors over a third of the world's remaining birds, the state Game and Fish Department's 2021 spring lek count showed a 13% decline from 2020 and 46% decline from 2015.[1] These recent changes are alarming and indicate that immediate and meaningful action must be taken to protect and recover this species.

Sagebrush habitat across the West also continues to disappear due to wildfire, cheatgrass invasion, and a host of anthropogenic causes. According to BLM's five-year monitoring report, 1.9 million acres–approximately 3% of the existing sagebrush cover in priority habitats within Biologically Significant Units–were lost between 2012 and 2018 (Herren et al. 2021). The Sagebrush Sea is shrinking, and its obligate species are teetering on the brink.

[1] Angus M. Thuermer Jr., Wyo sage grouse counts fall again, marking a 5-year trend, WyoFile (Sept. 8, 2021), *available at* https://www.wyofile.com/wyo-sage-grouse-counts-fall-again-marking-a-5-year-trend/

II. Efforts to Federally Protect the Greater Sage-Grouse

As early as 1999, groups began petitioning the FWS to list the greater sage-grouse as a threatened or endangered species under the Endangered Species Act (ESA). In 2004, the Western Association of Fish and Wildlife Agencies (WAFWA) documented the declining trends of sagebrush habitats and sage-grouse populations (Connelly et al. 2004). In response, BLM adopted a National Greater Sage-grouse Habitat Conservation Strategy (BLM 2004). The strategy emphasized the use of BLM's land use planning process to conserve and restore sagebrush habitats in order to prevent further sage-grouse declines and avoid ESA listing, and specified that BLM will use the best available science and other relevant information to develop conservation efforts for sage-grouse and sagebrush habitats. WAFWA also published its own Conservation Strategy in 2006, with the goal of maintaining and enhancing greater sage-grouse populations and distribution by protecting and improving sagebrush habitats (Stiver et al. 2006).

In January 2005, and despite the threats to greater sage-grouse persistence identified in WAFWA's Conservation Assessment, FWS responded to several ESA petitions with a finding that the species was "not warranted" for protection under the ESA. 12-Month Finding for Petitions to List the Greater Sage-Grouse as Threatened or Endangered, 70 Fed. Reg. 2244-01 (Jan. 12, 2005). Two years later, the Federal District Court for the District of Idaho reversed and remanded that finding due to improper political interference with the listing process, and the Service's arbitrary treatment of the best available science. *W. Watersheds Project v. U.S. Fish and Wildlife Serv.*, 535 F. Supp. 2d 1173 (D. Idaho 2007).

The FWS then issued a new finding that the greater sage-grouse was "warranted" for protection under the ESA, but precluded by higher-priority species. 12-Month Findings for Petitions to List the Greater Sage-Grouse As Threatened or Endangered, 75 Fed. Reg. 13,910 (March 5, 2010) (hereinafter, the "2010 Finding"). The 2010 Finding hinged largely on the inadequacy of existing regulatory mechanisms—especially in BLM and U.S. Forest Service (Forest Service) land use plans—to protect the sage-grouse from continued decline: "[i]n many areas existing mechanisms (or their implementation) on BLM lands and the BLM-permitted actions do not adequately address the conservation needs of greater sage-grouse, and are exacerbating the effects of threats to the species. . . ." *Id.* at 13,979. Environmental groups challenged the "precluded" portion of this finding, and a settlement in separate litigation bound the FWS to complete a proposed listing rule by the end of fiscal year 2015.

III. Efforts to Avoid Listing Through the National Greater Sage-grouse Planning Strategy

Responding to the 2010 Finding, the BLM and Forest Service initiated the National Greater Sage-grouse Planning Strategy,[2] to revise or amend 98 land-use plans across ten western states with specific provisions to protect the bird. As part of the effort, the agencies convened teams of sage-grouse scientists to aid planning.

A. BLM's NTT Report

BLM's "National Technical Team" (NTT) issued a report in 2011 providing the best available science concerning sage-grouse threats and habitat needs. Sage-grouse National Technical Team, A Report on National Greater Sage-Grouse Conservation Measures (December 21, 2011) (hereinafter, the "NTT Report"). The NTT, composed of 23 federal and state agency biologists and land managers (including 14 BLM officials), drew from the extensive scientific record on sage-grouse to produce the report. The report authors were unequivocal that the conservation measures presented in the report were derived from "interpretation of the best available scientific studies" using their "best professional judgment" (NTT 2011: 58). This was confirmed by more than 100 scientists who described the report in a letter to then-Secretary of the Interior Ken Salazar as a "comprehensive compilation of the scientific knowledge needed for conserving Sage-Grouse" that "offers the best scientifically supportable approach to reduce the need to list Sage-Grouse as a Threatened or Endangered species" (Soulé and Braun, letter).

The NTT Report addressed key threats as follows:

Livestock Grazing

The NTT Report recommended "[m]anaging livestock grazing to maintain residual cover of herbaceous vegetation so as to reduce predation during nesting may be the most beneficial for sage-grouse populations (Beck and Mitchell 2000, Aldridge and Brigham 2003). . . . Treatments used to manipulate vegetation [for forage production] ultimately may have far greater effect on sage-grouse through long-term habitat changes rather than direct impacts of grazing itself (Freilich et al. 2003, Knick et al. 2011)" (NTT 2011: 14). Accordingly, it identified measures to benefit sage-grouse, including:

- "Within priority sage-grouse habitat, incorporate sage-grouse habitat objectives

[2] *See* Bureau of Land Management and U.S. Forest Service, National Greater Sage-Grouse Planning Strategy (January 2012), available at https://eplanning.blm.gov/public_projects/lup/21152/31106/32307/Conservation-508.pdf.

and management considerations into all BLM grazing allotments through AMPs or permit renewals";

- "Prioritize completion of land health assessments and processing grazing permits within priority sage-grouse habitat areas";
- "Manage riparian areas and wet meadows for proper functioning condition within priority sage-grouse habitats";
- "Only allow treatments that conserve, enhance or restore sage-grouse habitat (this includes treatments that benefit livestock as part of an AMP/Conservation Plan to improve sage-grouse habitat"; and
- "Maintain retirement of grazing privileges as an option in priority sage-grouse areas. . . . "

(NTT 2011: 14-17).

Oil and Gas and Other Mineral Development

The NTT Report recognized that impacts to sage-grouse from oil and gas development "are universally negative and typically severe." (NTT 2011: 19). The Report cited "strong evidence from the literature to support that surface-disturbing energy or mineral development within priority sage-grouse habitats is not consistent with a goal to maintain or increase populations or distribution." The Report took particular issue with BLM's conservation measures:

> Impacts as measured by the number of males attending leks are most severe near the lek, remain discernible out to >4 miles (Holloran 2005, Walker et al. 2007, Tack 2009, Johnson et al. 2011), and often result in lek extirpations (Holloran 2005, Walker et al. 2007).
> . . .
> Past BLM conservation measures have focused on 0.25 mile No Surface Occupancy (NSO) buffers around leks, and timing stipulations applied to 0.6 mile buffers around leks to protect both breeding and nesting activities. Given impacts of large scale disturbances described above that occur across seasons and impact all demographic rates, applying NSO or other buffers around leks at any distance is unlikely to be effective.

(NTT 2011: 20).

In general, the NTT Report recommended closing priority sage-grouse habitats to energy development: "the conservation strategy most likely to meet the objective of maintaining or

increasing sage-grouse distribution and abundance is to exclude energy development and other large scale disturbances from priority habitats" (NTT 2011: 20).

With respect to *already issued* leases, it recommended imposing certain conservation measures as terms and conditions of the approved resource management plan. These included (1) prohibiting new surface occupancy on federal leases within priority habitats during any time of the year, with limited exceptions; (2) applying a seasonal restriction on exploratory drilling that prohibits surface-disturbing activities during the nesting and early brood-rearing season in all priority sage-grouse habitat during this period; (3) not applying a Categorical Exclusion (CX) in priority sage-grouse habitats; (4) completing Master Development Plans in lieu of Application for Permit to Drill (APD) by APD processing for all but wildcat wells; (4) when permitting APDs on undeveloped areas, imposing a 3% surface disturbance cap, with limited exceptions (NTT 2011: 23).

For similar reasons, the NTT Report also recommended withdrawing priority sage-grouse habitats from locatable mineral entry, and recommended closing priority habitats to non-energy leasable mineral development and mineral material sales (NTT 2011: 25).

Wildfire and Vegetation Treatments

The NTT Report recognized wildfire as a serious threat to sage-grouse, and identified measures to address that threat:

- "Do not reduce sagebrush canopy cover to less than 15% (Connelly et al. 2000, Hagen et al. 2007) unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection of priority sage-grouse habitat and conserve habitat quality for the species";
- "Allow no treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and will maintain winter range habitat quality";
- "Do not use fire to treat sagebrush in less than 12-inch precipitation zones"; and
- "Rest treated areas from grazing for two full growing seasons unless vegetation recovery dictates otherwise (WGFD 2011)."

(NTT 2011: 26).

B. FWS' COT Report

The FWS's Conservation Objectives Team, composed of state and FWS representatives, made its recommendations in 2013 (the "COT Report"). Its framework relied on the conservation

biology concepts of redundancy, representation, and resilience as guiding principles (COT 2013: 12).

The COT Report recognized the primary threat to Greater sage-grouse as the loss and fragmentation of sagebrush habitat (COT 2013: 10). It identified the causes of these losses as: wildfire and its feedback loop with nonnative annual grasses; expansion of pinyon-juniper linked to livestock grazing and climate change; and nonrenewable energy development—in particular, oil and gas (COT 2013: 10). It also mapped "priority areas for conservation," or PACs (COT 2013: 14). These included not individual populations, but areas the states identified as necessary to ensure the redundancy, representation, and resiliency of the species. (COT 2013: 13) The COT Report specifically noted that the PACs were not meant to limit the amount of sagebrush habitat to be protected and that "[a]dditional finer scale planning efforts by states may determine that additional areas outside of PACs are also essential" (COT 2013: 13). Finally, it recommended specific conservation actions to address each threat. (COT 2013: 36-52).

The measures the COT Report recommended included the following:

Grazing and Invasive Weeds

- "Reduce or eliminate disturbances that promote the spread of these invasive species, such as reducing fires to a 'normal range' of fire activity for the local ecosystem, employing grazing management that maintains the perennial native grass and shrub community appropriate to the local site, reducing impacts from any source that allows for the invasion by these species into undisturbed sagebrush habitats, and precluding the use of treatments intended to remove sagebrush";
- "Ensure that [grazing] allotments meet ecological potential and wildlife habitat requirements; and, ensure that the health and diversity of the native perennial grass community is consistent with the ecological site"; and
- "[Range management structures] that are currently contributing to negative impacts to either sage-grouse or their habitats should be removed or modified to remove the threat."

(COT 2013: 42-45).

Renewable and Nonrenewable Energy and Mineral Development

- "Avoid energy development in PACs (Doherty et al. 2010). Identify areas where leasing is not acceptable, or not acceptable without stipulations for surface occupancy that maintains sage-grouse habitats";
- "If avoidance is not possible within PACs due to pre-existing valid rights, adjacent development, or split estate issues, development should only occur in non-habitat areas,

including all appurtenant structures, with an adequate buffer that is sufficient to preclude impacts to sage-grouse habitat from noise, and other human activities";

- "If development must occur in sage-grouse habitats due to existing rights and lack of reasonable alternative avoidance measures, the development should occur in the least suitable habitat for sage-grouse and be designed to ensure at a minimum that there are no detectable declines in sage-grouse population trends (and seek increases if possible) by implementing the following:
    - Reduce and maintain the density of energy structures below which there are not impacts to the function of the sage-grouse habitats (as measured by no declines in sage-grouse use), or do not result in declines in sage-grouse populations within PACs.
    - Design development outside PACs to maintain populations within adjacent PACs and allow for connectivity among PACs.
    - Consolidate structures and infrastructure associated with energy development.
    - Reclamation of disturbance resulting from a proposed project should only be considered as mitigation for those impacts, not portrayed as minimization.
    - Design development to minimize tall structures (turbines, powerlines), or other features associated with the development (e.g., noise from drilling or ongoing operations; Blickley et al. 2012)."

(COT 2013: 43-44).

The COT Report also suggested avoiding new mining activities or associated facilities in sage-grouse habitats, and avoiding any new energy infrastructure in sage-grouse habitat (COT 2013: 49, 51).

C. Finalization of the Land Use Plan Amendments

The majority of BLM and Forest Service sage-grouse land use plan amendments were finalized in four Records of Decision (RODs) in September 2015. (The Lander, Wyoming Resource Management Plan's ROD was finalized in June 2014.) The two agencies produced 15 Environmental Impact Statements (EISs) associated with the proposed plan amendments. Each EIS considered an "NTT Alternative," which would have adopted the measures recommended by the NTT. However, the plans–"Approved Resource Management Plan Amendments" (ARMPAs) or "Approved Resource Management Plans" (ARMPs)–generally took an approach that reflected a compromise between what the science dictated for conserving sage-grouse habitats and what industry and government stakeholders were willing to accept.

Though better than no habitat protections, the plans failed to do what the science and law require to protect the bird. Environmental groups have a pending lawsuit alleging numerous deficiencies

to the 2015 plans, though notably have not sought to enjoin them. *See* Compl., Case No. 1:16-cv-00083-EJL (D. Idaho Feb. 25, 2016) (Dkt. No. 1) (Attachment B). We discuss many of these deficiencies below as a way of pointing towards the necessary remedy in any forthcoming amendments

D. FWS' 2015 "Not Warranted" Finding

On October 2, 2015, the FWS found that listing the greater sage-grouse was "not warranted" under the ESA. The Service's finding relied upon the promised protections of the 2015 plans, including restrictions on oil and gas development and mining, disturbance caps, lek buffers, required design features intended to mitigate impacts, habitat objectives, and the net conservation benefit mitigation standard:

> The Federal Plans, Wyoming Plan, Montana Plan, and Oregon Plan provide adequate regulatory mechanisms to reduce the threats of human-caused habitat disturbance on the most important sage-grouse habitats (as discussed in detail in the Changes Since the 2010 Finding, above). . . . As a result of these measures, the Federal and three State Plans reduce the potential threat of habitat loss caused by human-caused disturbances on approximately 90 percent of breeding habitat across the species' range. These measures were effective immediately upon the implementation of the Federal Plans, the Wyoming Plan, the Montana Plan, and the Oregon Plan and will be in place for the next 20 to 30 years.

80 Fed. Reg. 59,858, 59,934 (Oct. 2, 2015).

However, as BLM's 2021five-year monitoring report and the USGS' 2021 report make clear (and as BLM tacitly recognizes in its November 2021 scoping notice), the 2015 plans have proven inadequate at stopping the greater sage-grouse's population decline. The 2015 plans must be strengthened to address a host of deficiencies and inconsistencies in order to provide adequate regulatory mechanisms so as to preclude ESA listing. Without substantial improvements, the backstop they were intended to provide against sage-grouse extinction and federal ESA intervention is unrealized.

IV. Deficiencies with the 2015 Plans

The 2015 plans provided an important step towards protecting greater sage-grouse. They established new sage-grouse priority habitat designations with heightened management protections across some 67 million acres of federal land, including PHMAs, Sagebrush Focal

Areas (SFAs) (a subset of PHMAs with a few additional protections), and "General Habitat Management Areas" (GHMAs), along with other priority habitat designation in certain states. PHMAs are "lands identified as having the highest value to maintaining sustainable GRSG populations," and "largely [but not entirely] coincide with areas identified as PACs in the COT Report." See Great Basin ROD at 1-15. GHMAs are "GRSG habitat that is occupied seasonally or year-round . . . where special management would apply to sustain GRSG populations." *Id.*

But as critics pointed out during the original planning process in both comments and protests, the plans are flawed. We request that the previous comments (submitted by various combinations of the undersigned) and protests from the 2015 decision record be incorporated into this new process and we've included them as Attachment C). Because the flaws identified in the protests largely persisted into the ARMPAs, the protests still accurately identify the issues with the current plans and what must be done to strengthen protections for sage-grouse on BLM lands.

The 2015 plans relied heavily on subsequent site-specific implementation and included far too many discretionary loopholes and actions, which ultimately undermined their effectiveness. Our organizations, for instance, have tracked the application of waivers, exemptions, and modifications that undercut the pledged protections, the widespread failure to incorporate habitat objectives into grazing permits and leases, and failure to conduct grazing evaluations. (Notably, these are failures that have resulted from the 2015 plans, as the subsequent Trump-era amendments were swiftly enjoined and have never been implemented on the ground, though certain Trump-era Instruction Memoranda and administrative changes did result in weakened protections with on-the-ground effect.)

A. Fragmentation of the Planning Process

Fragmenting the planning process into 15 EISs and 4 RODs—and failing to create a programmatic environmental impact statement to guide the process—prevented the agencies from undertaking comprehensive or rangewide analyses of sage-grouse habitats, populations, threats, or conservation needs. Without these rangewide analyses, the agencies were also unable to properly weigh the effects of climate change, which is expected to alter the character of sagebrush steppe habitat on the landscape and facilitate the spread of cheatgrass. Moreover, the RODs approved, revised or amended land use plans with differing and often inadequate conservation measures, and failed to assure the conservation of sage-grouse in accordance with the best available science.

B. Failure to Adequately Identify and Protect Priority Habitats

The 2015 plan amendments did not adequately identify and protect priority habitats. They identified sage-grouse habitat—in the process, reducing it by millions of acres identified as

important in the COT Report PACs[3]—and then further diluted it into three or more categories: PHMAs (which included SFAs) and GHMAs in most plans, plus Important Habitat Management Areas (IHMAs) in the Idaho and Southwestern Montana EIS, Other Habitat Management Areas (OHMAs) in the Nevada and Northeastern California EIS, linkage/connectivity habitat management areas (LCHMA) in Colorado and "core" and "connectivity" PHMAs in the Wyoming plans. The agencies did not include all key sage-grouse habitats, including all PACs and winter habitats, within the priority habitat designations. Since the agencies did not map or identify winter habitats, they also did not apply the protections the science recommended to these important habitats. In addition, they did not consider or adequately plan for connectivity between priority habitats, providing only downgraded protections to the few habitats (mostly GHMA, as well as LCHMA in Colorado) supposedly intended to address connectivity.

Each category of habitat carries its own management scheme. SFA is the only category of habitat that imposes something close to the protections the NTT and COT Reports recommended for priority habitats, including requiring any fluid mineral leasing to occur subject to No Surface Occupancy, and recommending a withdrawal of the lands from locatable mineral exploration and development. The other categories rely on lesser protections, some of which are proven ineffective at protecting sage-grouse.

C. Failure to Follow the Best Available Science

The 2015 planning effort did not adopt the measures recommended by the best available science.

First, the agencies did not follow the expert scientists' clear directions to reduce the threat from livestock grazing. The EISs did not adequately analyze livestock grazing impacts and alternatives, and the plan amendments did not require sufficient modifications of livestock grazing necessary to protect and restore sage-grouse habitats. Instead, the amendments committed only to applying standards and modifications to livestock grazing authorizations to protect sage-grouse at an unidentified future date and in subsequent NEPA processes. Nor did most of the Plans clearly specify where the measures would be applied. They did not identify additional monitoring methods to ensure all sage-grouse habitats would be adequately measured, either spatially or temporally. They did not identify grazing as a cause of cheatgrass invasion or curtail grazing to prevent cheatgrass from spreading; require riparian areas to achieve proper functioning condition; limit the construction of new range infrastructure; or identify allotments

[3] The COT identified the PACs as a whole as the essential foundation for the conservation of the sage grouse and stated that "loss of a PAC, or significant reduction in available habitat within a PAC, will reduce redundancy and representation across the sage-grouse range, thereby increasing the risk of local extirpation and loss of population connectivity…it is imperative that no PACs are lost as a result of further infrastructure development or other anthropogenic impacts" (COT 2013: 36-37).

for rest t or closure. The BLM's plans imposed no schedule for review of grazing allotments or implementation of changes, leaving such changes for the indefinite future; even the general prioritization schemes laid out in the 2015 amendments were largely ignored and subsequently undermined through additional discretion and directions provided in agency memos.[4]

Next, the agencies' treatment of fluid mineral (oil, gas, geothermal) leasing and development also fell short of the agencies' own science. The Plans failed to close priority habitats to future fluid mineral extraction, instead focusing on a "no surface occupancy" (NSO) stipulation that may be modified or jettisoned in all priority habitats except for SFAs. They claimed oil and gas leasing would be "prioritized" outside of sage-grouse habitats and that use restrictions like timing limitations and controlled surface use would be applied where leasing was allowed to compensate for this failure. Wyoming's plans did not even apply the NSO stipulation in priority habitats, and instead focused on the 0.6 mile lek buffer that the NTT Report specifically found inadequate. In addition, with the new plans in place, leases previously deferred to protect sage-grouse were made available for sale. And, like the Wyoming plans, which created a loophole to allow oil and gas development to continue as usual in fossil-fuel-rich lands in Wyoming, the Nevada/California plan carved out an exception to the rules to allow geothermal leasing to proceed unfettered on lands with geothermal potential. Priority habitats are not closed to coal leasing, and only a small subset of priority sage-grouse habitat, sagebrush focal areas (SFAs), were slated to be withdrawn from locatable mineral development (this has yet to occur). The plans lack a commitment to applying strong protections to existing fluid mineral leases; they rely on inadequate lek buffers; they fail to uniformly apply the 3% disturbance cap; and they fail to make all priority habitats exclusion areas for geothermal and other infrastructure development, as the NTT Report recommended. On this latter point, the plans create blanket exemptions for several large interstate transmission lines slated to cut through sage-grouse habitats.

Rather than following the clear guidance set forth in the NTT Report concerning vegetation treatments, many of the plans allow using prescribed fire in priority/winter habitats, and in less than 12-inch precipitation zones. They also permit vegetation treatments in sage-grouse habitat to increase forage for livestock. Not all the plans require closing treated areas to livestock grazing for two full seasons following vegetation treatments. And only one plan even included grazing permit retirement as an option in sage-grouse habitats.

Finally, the plans failed to require adequate lek buffers for activities that disturb sage-grouse habitat. In Wyoming, buffers are as low as 0.6 miles in PHMA and 0.25 miles in GHMA. The more protective plans incorporated the lowest recommended buffers from Manier et al. (2014) as a default. These lower-range buffers are the following:

[4] *See, e.g.*, BLM Instruction Memos. 2018-025 & 2018-024, *available at* https://www.blm.gov/policy/im-2018-025, https://www.blm.gov/policy/im-2018-024.

- linear features (roads) within 3.1 miles of leks;
- infrastructure related to energy development within 3.1 miles of leks;
- tall structures (e.g., communication or transmission towers, transmission lines) within 2 miles of leks;
- low structures (e.g., fences, rangeland structures) within 1.2 miles of leks;
- surface disturbance (continuing human activities that alter or remove the natural vegetation) within 3.1 miles of leks; and
- noise and related disruptive activities including those that do not result in habitat loss (e.g., motorized recreational events) at least 0.25 miles from leks.

Generally, the buffers are to be applied to "fully address" impacts to leks. However, BLM may depart from the buffer distances, even in PHMA, as long as it provides justification for its decision. The question of whether "lower-range" buffers are adequate remains relevant. And, it should be noted that buffers are a poor substitute for closing priority habitats to disruptive activities, which is what the best available science counseled.

D. Failure to Consider Cumulative Impacts

The failure to take a rangewide perspective also meant the agencies did not consider cumulative impacts from the activities potentially allowed under the plans. The 2015 plans adopted a smorgasbord of different "conservation measures" to respond to threats, but their lack of uniformity, unspecified implementation schedules, and complex regulatory web create uncertainty about how they will be applied. BLM conducted no analysis of how the exceptions and inconsistencies will affect sage-grouse.

E. Failure to Comply with Federal Laws, Including NEPA, the Federal Land Policy and Management Act, and the Administrative Procedure Act.

As detailed in the 2016 Complaint (Attachment B), the 2015 plans violated federal laws including NEPA, the Federal Land Policy and Management Act (FLPMA), and the Administrative Procedure Act (APA). Broadly, violations included:

- Failure to designate and protect sage-grouse areas of critical environmental concern, as required by FLPMA;
- Failure to prevent unnecessary and undue degradation and/or permanent impairment of the public lands as required by FLPMA, including by failing to adopt adequate sage-grouse protections;
- Eliminating and modifying conservation measures for the greater sage-grouse based on a desire to favor particular public land uses rather than the scientific record, in violation of NEPA and the Administrative Procedures Act (APA); and

- Applying different conservation measures within ecologically equivalent "management zones" without a reasoned explanation, in violation of FLPMA, NEPA, and the APA.

The claims against the 2015 plan amendments remain live. To the extent that 2015 plans violate NEPA, FLPMA, and the APA, these violations will persist unless corrected in this planning effort.

V. BLM's 2019 Plan Amendments and Resulting Litigation

Though deficient in many respects, the 2015 plan amendments do provide some important protections for greater sage-grouse despite lacking sufficient and durable measures ("adequate regulatory mechanisms") to protect the species from further imperilment (as evidenced by the USGS 2021 report) . For example, the plans designated over 11 million acres as SFAs, with much of this habitat protected by no-surface-occupancy (NSO) stipulations to protect the lands from energy development. *See* Great Basin ROD, 1-15 to 1-19 (designating 8.385 million acres of SFAs), Rocky Mountain ROD, 1-15 to 1-21 (designating 2.91 million acres). The plans also recommended withdrawing SFAs from hard rock mining (though as discussed below the Department of the Interior has yet to complete the withdrawal). And while subject to modification, waivers, and exceptions, the plans provided NSO stipulations for priority habitat and "Conditions of Approval" (COAs) and "Required Design Features" (RDFs) to guide fluid mineral development.

The 2015 plans also partially incorporated a number of NTT and COT report recommendations. The plans limited surface disturbance to 3% per square mile, and adopted lek buffers ranging from 1 to 4 miles (notably, however, the Wyoming plans provided a 5% disturbance cap and far smaller–.25 and .6 mile–lek buffers). *See* Great Basin ROD, 1-21 to 1-23; Rocky Mountain ROD, 1-22 to 1-25. Additionally, the plans directed BLM to prioritize fluid mineral leasing and development outside of both priority and general habitats, set population and disturbance thresholds as triggers for increased protections, and required compensatory mitigation "to provide a net conservation gain" from actions resulting in unavoidable habitat loss or degradation. *See, e.g.*, Great Basin ROD at 1-15 to 1-26; Rocky Mountain ROD at 1-15 to 1-27.

But on June 7, 2017, then-Interior Secretary Ryan Zinke issued Secretarial Order 3353, "Greater Sage-Grouse Conservation and Cooperation with Western States," which, among its provisions, directed that a DOI "Sage-Grouse Review Team" be assembled to review the 2015 sage-grouse plans and recommend modifications to "enhance State involvement." On August 4, 2017, the Review Team issued a report recommending a number of modifications to the 2015 plans, many of which had been developed and lobbied for by the oil and gas industry.

In October of 2017, BLM published a notice of intent to amend the 2015 sage-grouse plans. 82 Fed. Reg. 47,248 (Oct. 11, 2017). Several of the undersigned organizations submitted extensive scoping comments and scientific literature calling on BLM to strengthen, rather than weaken, the 2015 plans. We incorporate the 2017 comments here as Attachment D. Indeed, these scoping comments borrow heavily from those.

In May of 2018, BLM released six draft EISs and proposed amendments for plans in Idaho, Wyoming, Colorado, Utah, Nevada/Northeastern California, and Oregon. Several of our organizations again submitted extensive comments, which we incorporate here by reference and as Attachment E). In December, BLM published a notice of its final EIS, *see* 83 Fed. Reg. 63,161 (Dec. 7, 2018), to which several of the undersigned organizations filed protests.

On March 14 and 15, 2019, BLM issued six records of decision (the "2019 RODs") amending plans in the seven states. The 2019 RODs made a number of detrimental changes to the already weakened 2015 plans. BLM eliminated SFAs in all states beside Oregon, downgrading those lands to PHMA and removing protections such as non-waivable NSO stipulations. BLM also eliminated the compensatory mitigation requirement and "net conservation gain" standard to protect against unavoidable impacts from BLM-approved land use activities. The 2019 RODs weakened or eliminated other key protections as well, including lek buffers, disturbance and density caps, oil and gas prioritization requirements, Required Design Features, adaptive management triggers, and a host of measures meant to protect sage-grouse from excessive livestock grazing.

In 2019, conservation groups (again including many of the undersigned organizations) supplemented the legal challenge to the 2015 plan amendments to include claims against the 2019 amendments. On October 16, 2019, the District of Idaho granted the groups' motion for preliminary injunction against the 2019 amendments and enjoined the plans. *See W. Watersheds Project et al. v. Schneider*, 417 F. Supp. 3d 1319 (D. Idaho 2019). In granting the motion, the court found that the plaintiffs were likely to succeed on the merits of their NEPA claims against the 2019 plans, including failure to consider reasonable protective alternatives, failure to take the required hard look at weakened protections in light of the best available science, failure to consider cumulative impacts due in large part to BLM's fragmentation of the planning process into six separate EISs for each state, and failure to supplement NEPA analysis when deciding to eliminate compensatory mitigation. *Id.* at 1331-34.

While the resulting injunction ordered BLM to reinstate the 2015 plans, we note that many of the court's key findings in 2019–including on the importance of best available science and inherent problems with fragmented decisionmaking–likewise bear on pending claims against the 2015 plans.

In 2020, BLM initiated a supplemental EIS (SEIS) process to "clarify" and augment the NEPA analysis supporting its 2019 Sage Grouse Plan Amendments. *See, e.g.*, 85 Fed. Reg. 10,185 (Feb. 21, 2020). BLM published final SEISs in November 2020 and six RODs, adopting them on January 11, 2021. *See, e.g.*, 86 Fed. Reg. 3,180 (Jan. 14, 2021).

These latest SEISs and RODs have essentially no practical effect. The RODs did not purport to reconsider or re-adopt the 2019 amendments, and BLM expressly disclaimed that they constituted "a new planning decision" under FLPMA. *Id.* The "decision" made in those RODs was that the prior 2019 NEPA analyses "sufficiently addressed Greater Sage-Grouse habitat conservation and no new land use planning process . . . is warranted." *Id.* The SEISs also did not cure the deficiencies of the 2019 NEPA analysis—as a legal or factual matter. As a matter of law, agencies cannot "cure" a NEPA violation with analysis that post-dates the relevant decision. *See* 40 C.F.R. § 1502.5; *see also Idaho Sporting Cong. Inc. v. Alexander*, 222 F.3d 562, 568 (9th Cir. 2000); *Save the Yaak Comm. v. Block*, 840 F.2d 714, 718–19 (9th Cir. 1988) (both rejecting agency attempts to cure deficient NEPA analysis after the relevant decision had already been made). As a factual matter, the SEISs did not actually remedy the NEPA deficiencies the court identified in its preliminary injunction order.

In moving forward with this planning process, BLM must be mindful of this litigation history and not repeat the deficiencies of its 2015 and 2019 planning processes. New NEPA analysis and plans must incorporate the best available science, must assess rangewide habitat threats and conservation needs, must consider and account for the looming threat of climate change, and must prioritize the designation and protection of sage grouse ACECs.

SCOPING ISSUES

Many of the undersigned organizations submitted extensive scoping comments for earlier iterations of the National Greater Sage-Grouse Planning Strategy in 2012 and 2017, as well as comments on BLM's 2020 SEIS. We have included those comments as Attachments F, D, and G respectively, and incorporate them here by reference. These comments build on those, and our core position remains the same: BLM must use this planning process to enact adequate regulatory mechanisms sufficient to avoid listing the greater sage-grouse under the ESA and consistent with the best available science.

I. Considerations for the Planning Process

A. BLM Should Analyze the Proposed Amendments in a Single, Rangewide EIS, and Approve Amendments with a Single ROD.

The problems with the 2015 sage-grouse plan amendments began at the planning stage, when BLM and the Forest Service divided the planning process into a suite of different EISs and RODs. As already discussed, this fragmentation led BLM to adopt inconsistent protections and politically-driven modifications and exceptions, and frustrated any attempt to conduct a rangewide analysis of threats and conservation measures. The District of Idaho described the same flaw with the 2019 amendments:

> [T]he six EISs at issue are State specific despite clear evidence in the record that the sage grouse range covers multiple states and that a key factor – connectivity of habitat – requires a large-scale analysis that transcends the boundaries of any single State. The BLM is in a unique position, as compared to each individual State, to conduct an analysis that evaluates the cumulative impacts of each State plan – and the BLM's own actions – over the entire range of the sage grouse.

W. Watersheds Project, 417 F. Supp. 3d at 1333.

To remedy these and other problems, BLM should prepare a single EIS to analyze impacts and alternatives across the complete range of greater sage-grouse. We also call for a single decision record amending all relevant RMPs. Such an approach has precedent. In 1994, the Secretary of Agriculture and the Secretary of the Interior used a single joint ROD to approve and implement the Northwest Forest Plan, which amended land use plans for nineteen National Forests and seven BLM districts.[5]

By using a single EIS, BLM will be better equipped to evaluate rangewide status of the greater sage-grouse, the efficacy of protective measures, and the cumulative impacts from land use activities across districts. By issuing a single ROD, BLM can ensure every plan contains consistent measures to protect sage-grouse, facilitate their implementation, and monitor their effectiveness.

[5] U.S. Dept. of the Interior & U.S. Dept. of Agric., Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (April 13, 1994), *available at* https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3843201.pdf.

Immediately after this decision, the Department of the Interior should concurrently withdraw all priority habitat established by the RMP amendments from all forms of mineral location and development and for the conservation and restoration of greater sage-grouse and other native wildlife species (*see* Part XVI, Solid Mineral Leasing and Development, below).

We do note however that without a commitment from the Forest Service to retain the 2015 plans, the BLM's cumulative effects analysis and ability to determine the reasonably foreseeable actions affecting sage-grouse habitats will be greatly hindered. The BLM's ability to address cross-jurisdictional discrepancies or assess habitat connectivity will be limited to what the Forest Service intends to do on the millions of sage-grouse habitat within its jurisdiction. We are not in any way suggesting that the BLM wait for the FS to develop better protections for sage-grouse, but noting that the failure of the FS to do so puts an even greater reliance on the strength of the BLM's plans to provide meaningful protection.

B. BLM Must Disclose All Relevant Information for Public Review and Comment.

As part of the forthcoming NEPA process, BLM should gather and disclose all information necessary to evaluate the implementation and efficacy of the 2015 plan amendments.

NEPA has two principal aims. The first is "to ensure that agencies carefully consider information about significant environmental impacts," and the second is to "guarantee relevant information is available to the public." *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1085 (9th Cir. 2011). This latter requirement ensures the public can "play a role in both the decisionmaking process and the implementation of that decision." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

To start, BLM must take a hard look at the effects of development that has occurred under the 2015 plan provisions. As part of this inquiry, BLM should disclose existing leases and existing and approved rights of way in sage-grouse habitat and their likely effect on long-term habitat health and sage-grouse populations. BLM should also disclose surface disturbance calculations, as well as the methodologies used to reach the calculations (which, as discussed below, can produce materially different results).

BLM should also evaluate and disclose all instances where field offices rolled back discretionary protections. As noted above, many of protective measures provided by the 2015 plans are subject to exceptions, modifications, and waivers. A 2017 Government Accountability Office study of BLM field offices found that of the 54 recorded exception decisions (from just four offices that could provide data), 49 exception requests were approved and 5 were denied—that is, exception

requests were granted 90% of the time.[6] That same study found that BLM's decisions to grant exceptions, modifications, and waivers often takes place in the dark, without written justification, oversight, documentation of the request or field office's decision, or additional NEPA analysis.[7] The report concluded, "BLM may be unable to provide reasonable assurance that it is meeting its environmental responsibilities."[8] To allow both the agency and the public to understand the efficacy of the 2015 plan amendments, BLM should disclose all instances of requests for, and grants of, exceptions, modifications, and waivers from all relevant field offices.

BLM should also consider and disclose all necessary habitat information. The 2015 plans failed to include all key sage-grouse habitats within the priority habitat designations. Worse still, many of the plans failed to even identify winter habitats essential to sage-grouse survival and recovery. As part of the NEPA process, BLM should delineate and disclose (and where necessary, gather) winter concentration areas, genetic connectivity corridors, and late summer brood-rearing habitat range-wide.

We also call on BLM to share with the public input it receives from cooperating state, tribal, and federal agencies and other stakeholders. NEPA regulations call for scoping to be an "early and open process." 40 C.F.R. § 1501.9(a). Given the history of political influence in past sage-grouse planning efforts, as well as this administration's recognition that "[s]cientific findings should never be distorted or influenced by political considerations,"[9] BLM should daylight communications with all parties, and especially those entities who in the past have requested (and often obtained) planning measures inconsistent with conservation goals and the best available science.

II. Purpose and Need

As discussed in detail in the Background section above, the fundamental purpose and need for this planning process is to enact land use amendments sufficient to provide adequate regulatory mechanisms sufficient to avoid listing greater sage-grouse under the ESA and promote its recovery. We believe the purpose and need statement should more clearly reflect this fundamental goal.

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[6] U.S. Gov't Accountability Off., GAO-17- 307, Oil and Gas Development: Improved Collection and Use of Data Could Enhance BLM's Ability to Assess and Mitigate Environmental Impacts 16 n. 24 (Apr. 2017).
[7] *Id.* at 11–21.
[8] *Id.* at Intro.
[9] Memo. on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking (Jan. 27, 2021), *available at* https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/memorandum-on-restoring-trust-in-government-through-scientific-integrity-and-evidence-based-policymaking/.

According to BLM's scoping notice, the agency's preliminary need "is to amend land use plans to address issues related to GRSG land management raised by various interested parties; consider recent developments in relevant science; advance implementation of the Department of the Interior's Climate Action Plan; and address continued GRSG and sagebrush habitat loss and GRSG population declines." 86 Fed. Reg. at 66,332. None of these needs are objectionable on their face, but BLM should be more clear. The "issues" BLM needs to address are deficiencies in the 2015 ARMPAs, since those plans have not slowed (let alone halted or reversed) sage-grouse population declines and habitat losses.

BLM should make this fundamental need–to recover greater sage-grouse–explicit. And every alternative BLM considers in forthcoming NEPA analysis should be crafted to accomplish this need.[10]

Regarding BLM's preliminary purpose, we are concerned with the direction to "provide the BLM with *locally relevant decisions* that accord with range-wide GRSG conservation goals." 86 Fed. Reg. at 66,332 (emphasis added). While plans should reflect local conditions where appropriate, a glaring flaw of the 2015 plan amendments was the failure to provide consistent range-wide management prescriptions on matters such as habitat objectives, surface disturbance, lek buffers, and impacts from land uses that don't vary based on state or field office boundaries. A central purpose of this planning process should be to enact uniform standards and guidelines in accordance with the best available science, and to remedy the arbitrary inconsistencies across the 2015 plans.

III. Habitat Designations

A. BLM Should Use the Planning Process to Expand and Strengthen Priority Habitat Designations

Pervasive among the 2015 plan amendments was the failure to adequately designate the entirety of PACs as priority habitat in all states except Oregon, Colorado, and North Dakota. As discussed above, PACs were identified by a joint state and federal committee as the "most important areas needed for maintaining sage-grouse representation, redundancy, and resilience across the landscape" (COT 2013: 13).

[10] In our 2012 scoping comments, we included a "recovery alternative" with management prescriptions drawn from the NTT Report and other best available science. While we refer to that alternative below, we are not submitting it for consideration as a stand-alone alternative. Instead, because the recovery alternative reflects the scientific consensus on measures needed to protect and recover sage-grouse, BLM should incorporate and evaluate its management prescriptions across action alternatives.

In South Dakota, potentially occupied sage grouse habitats in the southwest corner of the state were excluded entirely from the South Dakota RMP provisions for sage-grouse. For this state, the plans should be expanded to designate habitat for the recovery of sage-grouse south of the Black Hills, including the designation of priority habitats in occupied portions of this range (see Molvar 2015, Attachment H, Figure 7). Given the very small and tenuous state of the South Dakota population, priority habitats (the habitat that gets the strongest protections) should be maximized in this state.

In Nevada, fully 47% of the PACs designated by the FWS were excluded from PHMA designations under the Nevada/Northeastern California ARMPA (Molvar 2015). This means that 10.5 million acres of land designated as priority habitats by the Service were not protected as such under the ARMPA. The remaining PHMA designations are tiny, fragmented, and often isolated, in striking contrast to the scientific understanding that sage-grouse are a landscape species that require large, unfragmented tracts of high-quality sagebrush habitats to survive and recover. Nevada's PHMA fragments also fall largely within a 1.9-mile zone of influence for industrial projects that would be allowed to be sited along the PHMA boundary under the ARMPA

In California, fully 70% of PACs designated by the FWS were excluded from PHMA designations under the Nevada/Northeastern California ARMPA (Molvar 2015), with only 0.4 million acres designated as PHMAs, and 1.3 million acres of PACs left undesignated and falling within the much less-protective designation of GHMA.

In Utah, only 5.5 million acres of PHMA were designated for the entire state, a very small total, leaving 2 million acres of designated PACs unprotected by the Utah ARMPA (Molvar 2015). The Utah PHMA designations tend to be narrow, small, and often isolated, increasing the likelihood of population extirpation. As noted above for Nevada, the designation of small or narrow PHMAs leaves the designated habitats vulnerable to disturbance from industrial activities approved along the boundary of PHMA in less-protected or unprotected habitats. In many cases, Utah sage-grouse habitats consist of valley-bottom sagebrush habitats bordered by hillsides clad in pinyon-juniper woodlands or other coniferous forest that are not habitat for sage-grouse. BLM should nonetheless expand PHMAs in Utah to encompass all lands within at least 4 miles of active sage-grouse leks, regardless of whether the encompassed lands are in fact grouse habitats, because industrial developments in non-habitat woodlands will absolutely have negative impacts that extend for miles into surrounding habitats, including those that are sage-grouse habitats. In order to create a scientifically defensible and legally robust system of PHMAs, BLM must in many cases provide levels of protection that extend beyond the limits of sagebrush itself.

In Idaho, only 62% of PACs designated by the FWS were given the status of PHMAs under the Idaho/Southwest Montana ARMPA, omitting 3.8 million acres of prime sage-grouse habitats

from the level of protection they deserved (Molvar 2015). Some of these excluded lands were designated as Important Habitat Management Areas and granted a weaker level of protection that is inadequate based on the best available science. All PACs in Idaho must be designated as PHMAs and given a level of protection equal to the NTT Report recommendations.

In its initial designation of Core Areas, the State of Wyoming made some major errors that have been implicated in subsequent population declines and threats to long-term viability for sage grouse populations (*see* Taylor et al. 2012). At the outset of the State's consensus-based Core Area mapping process, the original boundaries of Core Areas were drawn to exclude sage-grouse habitats that land users were interested in developing, particularly in the Powder River Basin, Atlantic Rim area, and upper Green River Valley (*see* Molvar 2015, Figure 4). As a result, thousands of acres of undeveloped habitat were denied protection despite their vibrant sage-grouse populations and relatively undeveloped condition. These excluded lands should be added to PHMA under the federal plans moving forward. Then, in 2010, Core Area boundaries were further gerrymandered to excluded Core Area lands previously designated that were desired for industrial exploitation by the wind industry (notably for the Chokecherry - Sierra Madre Wind Farm, as well as the DKRW coal-to-liquids plant and the Whirlwind LLC White Mountain wind farm, projects never built and subsequently abandoned). All lands eliminated from Core Area designation during the 2010 State of Wyoming boundary revision (*see* Molvar 2015, Figure 5) should be reinstated as PHMA through this planning process. In addition, expansions of state Core Area designations that occurred in 2015 by gubernatorial Executive Order (and were incorporated as expanded PHMAs in the 2020 ARMPAs) should be protected as PHMA.

The Buffalo Revised RMP stands out as requiring additional increases in PHMA designations above and beyond those listed above. According to Garton et al. (2015), the Powder River population (all of northeast Wyoming including Thunder Basin National Grassland, parts of Casper Field Office, and Newcastle Field Office) has a 98.7% chance of dropping below an effective population size of 50 in 30 years, with a 55% chance of sage grouse populations across the Great Plains (Management Zone I) dropping below 50 in 100 years. An effective population size of 50 is deep in the "extinction vortex." We are particularly concerned that the likely loss of this population through inadequate habitat protections and concomitant industrial development, along with the likely loss of the North and South Dakota populations due to intrinsic small size and vulnerability, will result in the isolation and ultimate extirpation of sage-grouse throughout the Great Plains ecosystem.

Designated PHMAs should be expanded to all lands designated as PACs in the COT Report, and include expansions of Core Areas adopted by the State of Wyoming in 2015. Intermediate habitat designations such as IHMA should also receive PHMA designation. In turn, SFA status and management parameters consistent with BLM's own recommendations in the NTT Report

should be expanded to all lands designated as PHMA if the BLM truly wants to protect and conserve sage-grouse throughout its range and use the plans to avoid ESA listing.[11]

B. BLM Should Identify, Map, and Designate Breeding Habitat, Winter Concentration Areas, and Connectivity Corridors as Priority Habitat.

In addition to remedying the deficiencies discussed above, BLM should extend rangewide priority habitat protections to all habitat types recommended for priority designation by the NTT Report, including breeding areas, winter concentration areas, and connectivity corridors (NTT 2011: 7).

The boundaries of PHMAs rangewide should be re-set to incorporate all lands within at least 4 miles of all active leks. BLM should also identify and protect winter concentration areas and connectivity corridors. Winter concentration areas can support several breeding populations of sage-grouse, and must contain adequate sagebrush height and cover to provide food and shelter throughout the winter (NTT 2011). "Sage-grouse typically show high fidelity for these areas, and loss or fragmentation can result in significant population impacts" (NTT 2011: 37).

Connectivity corridors likewise are also very important for sage-grouse conservation. "Genetic connectivity is the glue that holds populations together, and remaining core areas, though impacted, may help maintain connectivity among populations" (Taylor et al. 2012: 32). The COT Report recognized the vital importance of connectivity corridors given that many sage-grouse populations "are already isolated and at risk for extirpation due to genetic, demographic, and stochastic (i.e., unpredictable) events such as lightning caused wildfire" (COT 2013: 9; *see also* Crist et al. 2015). According to the Report, "[s]age-grouse habitats outside of PACs may also be essential, by providing connectivity between PACs (genetic and habitat linkages), habitat restoration and population expansion opportunities, and flexibility for managing habitat changes that may result from climate change. (COT 2013: 36) The Report also cited the pressing need for "robust, range-wide genetics-based connectivity analyses" (COT 2013: 31).

Despite the importance of both winter habitats and connectivity corridors, some plans failed to even identify these habitat types. *See, e.g.* 2015 Rocky Mtn. ROD at 1-40 (calling for future mapping of winter habitat and connectivity area mapping); 2015 Great Basin ROD at 1-42 (same). Others failed to provide adequate protections. The Wyoming ARMPA (at 38) allows vegetation treatments to reduce sagebrush canopy cover in winter habitats to less than 15%. The

[11] We have used a similar methodology to delineate our Sagebrush Sea Reserve ACEC proposal. *See* Attachment A. Given the management prescriptions necessary for priority habitat (including those consistent with BLM's own recommendations in the NTT Report related to oil and gas and other resource issues), ACEC designations would be the appropriate way to remedy the deficiencies in the 2105 plan amendments. *See* Part III.E, below.

Utah ARMPA (at 2-15) allows treatments reducing sagebrush within nesting and winter habitat should NEPA analysis document a "biological need for the treatment." The Nevada/Northeastern California ARMPA (at 2-15) even places emphasis on vegetation treatments in winter habitat.

As part of this planning process, we recommend that BLM extend priority habitat designation to key habitats including breeding areas, winter concentration areas (*see* Smith et al. 2019), and connectivity corridors.

C. BLM Should Consider Additional Categories of Habitat Designation with Appropriate Management Prescriptions.

Climate change, wildfire, cheatgrass invasion, and development continue to alter and degrade vast amounts of sage-grouse habitat. We urge BLM to consider additional designations to account for these changing conditions. The 2015 Oregon plan amendment, for example, designated "Climate Change Consideration Areas" consisting of higher altitude climate refugia, as well as "Restoration Opportunity Areas" for lands that could provide habitat if restored or act as habitat buffers. BLM should identify these lands across the bird's range and give protections and management direction equivalent to other priority habitats.

D. Plans Should Allow Land Managers to Upgrade Habitat Boundaries in Response to Changing Conditions and New Information.

If and when sage-grouse begin to recover, or as climate change alters habitat conditions, they will likely move into new areas and begin reoccupying restored and improving landscapes. With this in mind, it would be appropriate to provide increased habitat protections in these reoccupied areas. Thus, habitat boundaries should be able to extend protections–e.g., change areas from GHMA to PHMA–as conditions change or improve and occupation increases.

Importantly, this flexibility must only work in one direction: towards more protective designations. Allowing the opposite incentivizes departure from the best management practices within the existing category. For example, allowing exemptions and exceptions to lease stipulations, and thus degrading the quality of the habitat, could perversely be used to downgrade existing protections for the same lands. Until sage-grouse populations recover range-wide, habitat boundary changes should be confined to increasing acreage receiving greater protections.

E. BLM Should Designate a Network of Sagebrush Sea Reserves as Areas of Critical Environmental Concern.

As part of this scoping process, we are joining with other organizations and submitting a proposal under separate cover to designate a network of Sagebrush Sea Reserves, composed of

the most important greater sage-grouse habitat, as ACECs. Designating this network of ACECs, with the management prescriptions contained in our nomination, would remedy many of the inconsistencies and deficiencies with the 2015 plan amendments, especially those discussed in this subsection concerning habitat designations.

FLPMA defines ACECs 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); *see also* 43 CFR § 1601.0-5(a). A potential ACEC must meet both "relevance" and "importance" criteria outlined in BLM regulations. Relevance means "[t]here shall be present a significant historic, cultural, or scenic value; a fish or wildlife resource or other natural system or process; or natural hazard." 43 C.F.R. § 1610.7-2(a). Importance means that the value establishing relevance "generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern." *Id.*

FLPMA requires that the BLM give priority to designating ACECs in the land use planning process. 43 U.S.C. §§ 1701(a)(11), 1712(c). The priority afforded ACECs reflects Congress' intent to elevate the designation and protection of ACECs over BLM's default management for "multiple use." *Rags Over the Arkansas River, Inc. v. Bureau of Land Mgmt.*, No. 12-CV-0265-WJM, 2015 WL 59471, at *10 (D. Colo. Jan. 2, 2015) (citing 43 U.S.C. § 1732(a)).

As we discuss in the nomination form, our proposal meets multiple relevance and importance criteria. The proposed ACEC network contains the most important habitat for greater sage-grouse and many other sensitive and threatened native species that rely on healthy sagebrush ecosystems. Priority sage-grouse habitats are a wildlife resource (satisfying relevance), and a BLM Sensitive Species on the brink of an ESA listing could not more compellingly satisfy the "importance" prong.

In addition, the relevant and important values we are proposing for designation require special management attention. According to BLM's ACEC Manual:

> 'Special management attention' refers to management prescriptions developed during preparation of an RMP or amendment expressly to protect the important and relevant values of an area from the potential effects of actions permitted by the RMP, including proposed actions deemed to be in conformance with the terms, conditions, and decisions of the RMP. These are management measures which would not be necessary and prescribed if the critical and important features were not present.

BLM Manual 1613.12.

It is difficult to think of anything widespread on BLM lands more in need of special management attention than greater sage-grouse and their highest priority habitats. This is the third attempt to enact land use plan amendments sufficient to halt the decline of sage-grouse, and the agencies are plainly running out of time. The 2015 plans amendments, which uniformly rejected ACEC designations, have demonstrably failed to provide sufficient safeguards. And the 2019 plan amendments demonstrated just how vulnerable standard plan amendments can be to shifting political winds. BLM must now develop additional, durable protections for sage-grouse in the face of "rapid changes affecting the BLM's management of the public lands, including the effects of climate change (e.g., drought, loss of habitat, more frequent wildland fires, less riparian areas)." 86 Fed. Reg. at 66,331.

BLM's ACEC Manual instructs that "[m]anagement prescriptions providing special management attention should include more detail than prescriptions for other areas and should establish priority for implementation." BLM Manual 1613.12. In our ACEC nomination, we outline a suite of management prescriptions necessary to protect greater sage-grouse and their most important habitats based on the best available science. While we outline many of the same prescriptions in these scoping comments as necessary for priority habitat across action alternatives, they only underscore the need for the detailed, prioritized management ACECs provide.

IV. Habitat Objectives

A central task of this planning process should be to implement consistent habitat objectives in every plan, for all sage-grouse habitat types.

Connelly et al. (2000) continues to represent the best available science with respect to greater sage-grouse habitat objectives for breeding, nesting, brood-rearing, and winter habitat types. Its listing of vegetation height and canopy cover should serve as a benchmark across the greater sage-grouse's range (with the exception of grass height in the Dakotas, which we discuss below). Given the threat posed to sage-grouse habitat by climate change and drought, plans must provide consistent, effective management prescriptions to ensure habitat stays within these conditions, especially for grazing and vegetation management decisions. Plans should also contain a well-defined, effective adaptive management framework, and focus on restoring degraded habitat to functioning condition.

Table 3. Characteristics of sagebrush rangeland needed for productive sage grouse habitat.

	Breeding		Brood-rearing		Winter[e]	
	Height (cm)	Canopy (%)	Height (cm)	Canopy (%)	Height (cm)	Canopy (%)
Mesic sites[a]						
Sagebrush	40–80	15–25	40–80	10–25	25–35	10–30
Grass–forb	>18[c]	≥25[d]	variable	>15	N/A	N/A
Arid sites[a]						
Sagebrush	30–80	15–25	40–80	10–25	25–35	10–30
Grass/forb	>18[c]	≥15	variable	>15	N/A	N/A
Area[b]	>80		>40		>80	

[a] Mesic and arid sites should be defined on a local basis; annual precipitation, herbaceous understory, and soils should be considered (Tisdale and Hironaka 1981, Hironaka et al. 1983).

[b] Percentage of seasonal habitat needed with indicated conditions.

[c] Measured as "droop height"; the highest naturally growing portion of the plant.

[d] Coverage should exceed 15% for perennial grasses and 10% for forbs; values should be substantially greater if most sagebrush has a growth form that provides little lateral cover (Schroeder 1995)

[e] Values for height and canopy coverage are for shrubs exposed above snow.1

(Connelly et al. 2000: 977 tbl. 3).

Grass height in nesting and brood-rearing habitat is especially critical. The best available science has established that at least 7 inches (>18 cm) of residual stubble height needs to be provided in nesting and brood-rearing habitats throughout their season of use. According to Gregg et al. (1994: 165), "[l]and management practices that decrease tall grass and medium height shrub cover at potential nest sites may be detrimental to sage grouse populations because of increased nest predation. . . . Grazing of tall grasses to <18 cm would decrease their value for nest concealment. . . . Management activities should allow for maintenance of tall, residual grasses or, where necessary, restoration of grass cover within these stands."

Hagen et al. (2007) analyzed all scientific datasets up to that time and concluded that the 7-inch threshold was the threshold below which significant impacts to sage grouse occurred (*see also* Herman-Brunson et al. 2009). Prather (2010) found for Gunnison sage grouse that occupied habitats averaged more than 7 inches of grass stubble height in Utah, while unoccupied habitats averaged less than the 7-inch threshold. According to Taylor et al. (2010: 4):

> "The effects of grazing management on sage-grouse have been little studied, but correlation between grass height and nest success suggest that grazing may be one of the few tools available to managers to enhance sage-grouse populations. Our analyses predict that already healthy populations may benefit from moderate changes in grazing practices. For instance, a 2 in increase in grass height

> could result in a 10% increase in nest success, which translates to an 8% increase in population growth rate."

The exception to this 7-inch rule is found in the mixed-grass prairies of the Dakotas, where sparser cover from sagebrush and greater potential for tall grass have led to a recognition that a 26-cm stubble height standard is warranted (Kaczor 2008, Kaczor et al. 2011).

Doherty et al. (2014) found a similar relationship between grass height and nest success in northeast Wyoming and south-central Montana but did prescribe a recommended grass height. While there are those who have attempted to cast doubt on the necessity of maintaining grass heights to provide sage-grouse hiding cover, based on timing differences in grass height measurements between failed nests and successful nests, these concerns have been refuted for Wyoming. The significance of the Doherty et al. (2014) study was explicitly tested by Smith et al. (2018), who confirmed that grass height continued to have a significant effect on nest success for this Wyoming study after correction factors were applied to the data. Stiver et al. (2015) recommended greater than 18 cm grass height for all breeding and nesting habitats, and explicitly stated that this and other established measures should not be altered unless scientific evidence definitively indicates that the 7-inch threshold is inappropriate.

Despite the widespread, long-standing, and consistent scientific support for standard metrics for grass height and other habitat objectives, the plans vary widely and often fall short. For example, the Utah ARMPA fails to provide an objective for grass and forb height in nesting habitat. Utah ARMPA at 2-4. The same plan also provides a wide range of objectives for the same habitat types in different areas of the state. *Id.* The Northwest Colorado ARMPA calls for a 6-inch grass height minimum in nesting habitat, again in contravention of the best available science. Northwest Colorado ARMPA at 2-4.

Habitat objectives provide the foundation for greater sage-grouse recovery. BLM must use this planning process to ensure objectives in every plan reflect the best available science, and that they be applied consistently and without exception across the bird's range.

V. Adaptive Management

Adaptive management plans can provide important safeguards to greater sage-grouse and their habitat, but with two important caveats. First, while adaptive management provides an important safety net to stop and address population and habitat declines, it does not lessen BLM's obligation now to implement management actions to protect and restore greater sage-grouse and their habitat.

Second, adaptive management plans must be properly designed and implemented. A plan must begin with an accurate assessment of baseline conditions, then set clear goals and objectives as

well as consistent and effective monitoring protocols. Plans must also contain well-defined, enforceable threshold triggers for management actions, as well as processes for determining effective management prescription once triggers are met, and continued monitoring to ensure that goals and objectives are being achieved (*see generally* Williams and Brown 2014).

Based on BLM's five-year monitoring report, the agency needs to revisit and revise adaptive management plans in the 2015 amendments. The hard and soft trigger process should be retained and strengthened by lowering the thresholds.

The five-year monitoring report notes that 16 habitat triggers and 42 population triggers were tripped across the range (Herren et al. 2021), but provides little assurance monitoring has captured the full picture of habitat loss or population declines. A review of the monitoring reports attached as appendices shows an array of different monitoring protocols and triggers, meaning population or habitat declines may trigger adaptive management thresholds in one state but not another. The monitoring report also frequently fails to provide meaningful context (e.g., how many total triggers exist, spatial distribution of units that triggered, causes of triggers, causal analyses, and resulting management decisions) that would allow the public or BLM to evaluate the efficacy of the 2015 amendments and their adaptive management plans.

BLM must take a hard look at the efficacy of the protocols adopted in the 2015 amendments. BLM should examine whether population and habitat objectives and triggers, which vary across plans, have accurately detected losses. BLM should also evaluate how land managers have implemented adaptive management under the 2015 plans. As discussed above, BLM's recent five-year monitoring report found that population and habitat triggers were tripped nealy 60 times (Herren et al. 2021). BLM should evaluate–and disclose to the public–the spatial/temporal distribution of the triggers, the reasons why they tripped, the resulting causal factor analyses, and management responses, as well as follow-up monitoring information (or lack thereof).

With this information in hand, BLM should revise adaptive management plans where necessary. Every plan should provide for specific desired outcomes, enforceable triggers, consistent monitoring, accurate reporting, and outcomes from responsive management actions. Habitat and population triggers should operate independently, and should not be set at the low end of what science supports–such an approach ensures harm to the species will occur before land managers take corrective actions. Plans should also be transparent and enforceable. And while adaptive management is flexible by nature, plans should follow the precautionary principle: planners and land managers need to make every effort to err on the side of caution, and incorporate wide margins of safety to guard against loss of sage-grouse and their habitats, especially given the pressures exerted on sage grouse and its habitat from climate change.

VI. Limitations on Surface Disturbance

A. Lek Buffers

Industrial activities directly eliminate and fragment habitat. Equally, or perhaps even more importantly, the resulting facilities are hubs for human and vehicular activity that disturb and displace sage grouse, resulting in lower rates of survival and/or reproduction and leading to population declines. Lek buffers can provide critical protections to breeding and nesting habitats, but must be a sufficient size to insulate birds in these habitats from disturbance. "[A]ttempting to protect a lek, without protecting the surrounding habitat, provides little protection at all" (Taylor et al 2012: 27).

BLM's experts have recommended minimum 4-mile lek buffers. According to the National Technical Team (2011: 20), "protecting even 75 to >80% of nesting hens would require a 4-mile radius buffer (Table 1). Even a 4-mile NSO buffer would not be large enough to offset all the impacts reviewed above." For existing fluid mineral leases, the NTT Report recommends that a 4-mile No Surface Occupancy (NSO) buffer should be applied to leks, with an exception allowed in cases where the entire lease is within 4 miles of a lek, in which case a single wellsite should be permitted in the part of the lease most distal to the lek (NTT 2011).

In the context of the original 2015 plan amendment and revision effort, BLM's own NEPA analyses recognized the need for minimum 4-mile NSO buffers. The Wyoming Nine-Plan DEIS stated, "Walker et al. (2007) recommends a buffer distance of at least 4.0 miles containing extensive stands of sagebrush habitat for breeding populations to persist." Wyoming Greater Sage-grouse RMP Amendment DEIS at 4-291. For the Buffalo RMP revision, BLM's analysis of the science stated,

> Energy development within two miles of leks is projected to reduce the average probability of lek persistence from 87% to 5% (Walker et al. 2007a). Current research suggests that impacts to leks from energy development are discernible out to a minimum of 4 miles, and that some leks within this radius have been extirpated as a direct result of energy development (Apa et al. 2008). Even with a timing limitation on construction activities, Greater Sage-Grouse avoid nesting in oil and gas fields because of the activities associated with operations and production.

Buffalo RMP Revision DEIS at 367. For Montana, BLM observed, "[i]mpacts from energy development occur at distances between 3 and 4 miles. Impacts to leks caused by energy development would be most severe near the lek." HiLine RMP Revision DEIS at 4-135.

Despite these recognitions, none of the 2015 plans provided adequate lek buffers. Wyoming's plans stand out for adopting 0.6 mile lek buffers in priority habitat and 0.25 mile lek buffers in general habitat–buffer distances that the NTT Report specifically found inadequate. *See* Wyoming RMPA FEIS at 2-60.

But other plans fall short as well. All plans except Wyoming's apply NSO buffers as stipulations to future leases in PHMA, not to existing leases as recommended by the NTT Report. For most states, BLM purported to apply lek buffer distances in accordance with Manier et al. (2014) at the project stage of the NEPA approval process. These typically are set at 3.1 miles for roads and energy infrastructure, 2 miles for tall structures, and 1.2 miles for low structures, and represent the lowest (least protective) end of the protection spectrum described by Manier et al. (2014). However, Green et al. (2017) found that oil and gas development in proximity to leks contributed to a 2.5% per year decline in sage-grouse populations, and that the 3.1-mile buffer best explained these energy-driven declines. Moreover, these buffer distances allow disruptive and damaging features to be located in the midst of prime nesting habitat, which extends 5.3 miles from the lek site (Holloran and Anderson 2005).

Additionally, lek buffers vary widely–especially in GHMA. With respect to oil and gas development, buffers range from 0.25 miles in Wyoming to 0.6 miles (HiLine ARMP at 2-5; Miles City ARMP at 2-5; South Dakota ARMP at 2-4), to 1 to 2 miles (*see e.g.*, Oregon ARMPA at 2-23, Northwest Colorado ARMPA at 2-15) to 3.1 miles (Nevada/Northeastern California ARMPA at App. B; Idaho/Southwestern Montana ARMPA at App. B; South Dakota ARMP at 2-8; Utah ARMPA at App. B).

Lek buffers need to be made consistent–and consistently larger–throughout all sage-grouse habitat designations. A 4-mile lek buffer should be the starting point. Though a 4-mile buffer may include an average of 80 percent of nesting females (NTT 2011: 21); larger buffers may be necessary to conserve the species. Studies suggest buffers ranging from 4.6 miles (Coates et al. 2013) to 5.3 miles (Holloran and Anderson 2005) to 6.2 miles (Aldridge & Boyce 2007; Doherty et al. 2010). Even Manier et al. (2014: 2) cautioned against using the minimum end of the 3.1 to 5 mile "interpreted range," warning that "for some populations, the minimum distance inferred here (5 km [3.1 miles]) from leks may be insufficient to protect nesting and other seasonal habitats." The study recommended, in the absence of "population-specific information regarding the location of habitats and movement of birds," the use of a 5-mile buffer: "this generalized protection area (circular buffer around active leks with radius of 8 km [5mi]) offers a practical tool for determining important habitat areas" (Manier et al. 2014: 4). Still, the study warned "the cumulative effect of development may extend across the landscape many kilometers (>10 km [6.2 miles]) beyond the immediately affected areas" (Manier et al. 2014: 5).

B. Disturbance Density Caps

Surface disturbance caps provide vital protections for greater sage-grouse. Knick et al. (2013) found that 99% of active leks across the western half of the sage grouse's range were surrounded by lands with 3% or less human development, with the vast majority surrounded by much less disturbance. Accordingly, the NTT Report provides clear guidance on the necessary limit of surface disturbance in priority sage-grouse habitat:

> Manage priority sage-grouse habitats so that discrete anthropogenic disturbances cover less than 3% of the total sage-grouse habitat regardless of ownership. Anthropogenic features include but are not limited to paved highways, graded gravel roads, transmission lines, substations, wind turbines, oil and gas wells, geothermal wells and associated facilities, pipelines, landfills, homes, and mines.

(NTT 2011:7-8).

In priority habitat exceeding the 3% disturbance cap, the NTT Report instructed that "no further anthropogenic disturbances will be permitted by BLM until enough habitat has been restored to maintain the area under this threshold (subject to valid existing rights)" (NTT 2011: 8). Moreover, in areas exceeding the cap "an additional objective will be designated for the priority area to prioritize and reclaim/restore anthropogenic disturbances so that 3% or less of the total priority habitat area is disturbed within 10 years" (NTT 2011:8).

While many of the 2015 plans set a 3% cumulative limit on surface disturbance in PHMAs, the plans are far from consistent–none more so than plans for Wyoming and Montana. In Wyoming, the limit on surface disturbance is 5%, almost double the limit recommended as the maximum by the NTT Report and best available science. The Idaho/Southwestern Montana ARMPA adopted a 3% limit for Idaho, but left open the possibility of a 5% cap in Montana. Quite simply, there is *no* scientific evidence indicating that sage grouse can tolerate this greater percentage of surface disturbance.

Even plans with a 3% surface disturbance cap contain exceptions that kill the rule. Many plans exempt valid existing rights from counting towards disturbance caps. *See, e.g.*, BLM Rocky Mountain ROD at 1-18. Rather than apply a cap in Nevada, BLM instead relies on a "Disturbance Management Protocol," which is "intended" to limit surface disturbances to 3% except where a conservation gain to the species would occur. Nevada/Northeastern California ARMPA at E-2. Disturbance caps across plans are also subject to exceptions, waivers, and modification.

As part of this planning process, BLM should reevaluate whether the 3% disturbance cap sufficiently protects sage-grouse, particularly considering that the rangewide average in priority habitat is less than 1%. Monitoring reports indicate that disturbance has not yet reached 3% in most areas, and that there are few populations in areas greater than 1.5%. Given the concerning population declines and habitat loss by fire and cheatgrass invasion – and in light of improved understanding of how climate change is affecting and may affect sage grouse habitats – we believe the disturbance caps need to be reassessed and lowered to reflect current monitoring data.

Reassessment should start during the NEPA process by disclosing current levels, types, and spatial distribution of surface disturbances including disturbance measurements across land jurisdiction categories (e.g., BLM, Forest Service, state, private), as well as the methodologies used to calculate disturbance. Disturbance calculations should account for areas where cheatgrass invasion and wildfire has reduced sagebrush habitat, as well as areas of concentrated disturbance due to livestock grazing, such as around water sources. If necessary, areas of disturbance should be recalculated per square mile to ensure a consistent baseline.

We also call on plans to include the following direction, to ensure consistent application of disturbance caps:

- Require surface disturbance to be calculated per square mile. Calculations conducted at larger scales, such as the Disturbance Density Calculation Tool, Project Impact Analysis Area, or measurements taken at the Biologically Significant Unit scale, will allow disturbance greater than the per-square-mile calculation researchers use to measure impacts to sage grouse (*see, e.g.*, Copeland et al. 2013);
- Apply the disturbance cap so that it consistently across the range includes existing leases, claims, rights-of-way, and other valid existing rights, even when doing so would preclude new disturbance that would exceed the cap (or where the cap has already been exceeded) until such time as previously-disturbed areas have been restored to adequate habitat function;
- Limit disturbances to one per section;
- Include all anthropogenic disturbances pursuant to the NTT Report;
- Include disturbances on non-federal land and, where necessary, reduce caps on BLM lands accordingly to maintain the appropriate cap across jurisdictional boundaries; and
- Enforce disturbance caps without exceptions, waivers, and modification.

VII. Mitigation

We appreciate BLM's issuance of Instruction Memorandum 2021-046, which restores mitigation guidelines in both BLM Manual Section 1794 and BLM Handbook H-1794-1. We recommend

plan amendments include, as terms of the plans, mitigation guidance from relevant IMs to make the guidance more durable.

In the forthcoming NEPA analysis, BLM must take a hard look at the identification of avoidance areas where new disturbances would likely have significant negative impacts, require the use of available best management practices that reduce mortality, and assess the efficacy of compensatory mitigation. We are unaware of any cases in which a compensatory mitigation program has resulted in a significant increase in sage-grouse compared to an untreated landscape. To inform NEPA analysis, BLM needs to document any and all scientific studies that conclude that compensatory mitigation efforts have yielded an increase in sage-grouse populations for the area to which mitigation efforts apply. BLM must also determine the effectiveness of each category of compensatory mitigation at providing a net conservation benefit to sage-grouse, as required for land use plan amendments to serve as adequate regulatory mechanisms sufficient to defer ESA listing. *See* 80 Fed. Reg. at 59,881.

Should the BLM continue to allow compensatory mitigation in lieu of compliance with disturbance density and other requirements, restrictions must not be waived with the approval of off-setting mitigation. Further, BLM must document population-level benefits for sage-grouse to validate offsetting mitigation efforts. As Doherty et al. (2016) stated, "birds, not acres or dollars spent, would be the best currency in conservation plans because identical acreages of conservation actions can overlap with vastly different numbers of sage-grouse."

We are also again recommending that the plans include grazing permit retirement provisions that would allow for mitigation opportunities through livestock grazing cessation. The details of that mitigation could be worked out on a case-by-base basis, but the provision permitting it must be included in a land use plan in order to be adopted on the ground. Allowing for grazing permit retirement as a mitigation mechanism – especially since it would actually be a "net benefit" instead of "no future loss" – makes sense.

As mentioned elsewhere in these comments, the benefits of vegetation treatments to sage-grouse habitat are extremely limited and evidence of long-term efficacy is tenuous, at best. Surface disturbance in sagebrush habitat is a major impact and the inherent aridity of this ecosystem means that real restoration can take decades – if not hundreds of years. Vegetation treatments should not be used as compensatory mitigation unless the positive, near- and long-term benefit can be firmly established. Any mitigation method must also consider the strong site-fidelity traits of sage-grouse and the fact that destruction of any lek sites likely means a permanent loss of local grouse populations.

VIII. Climate Change

Climate change poses an overarching rangewide threat to greater sage-grouse and their habitats. Climate change has caused, and continues to cause, longer and more frequent droughts, larger and more frequent wildfires, accelerated cheatgrass invasion, and increased prevalence of West Nile virus, among other impacts. FWS cataloged many of these threats in its 2010 Finding, 25 Fed. Reg. at 13,954-57, and placed special emphasis on the link between climate change, cheatgrass, and wildfire: "the invasion of Bromus tectorum and the associated changes in fire regime currently pose one of the significant threats to greater sage-grouse and the sagebrush-steppe ecosystem." *Id.* at 13,956.

Numerous studies confirm the devastating effects of climate change. Most climate change simulations predict sagebrush steppe will shift and contract as mean temperatures increase and the frost line shifts northward (Balzotti et al. 2016; Blomberg et al. 2012; Neilson et al. 2005). Researchers have predicted a range of possible scenarios; in the worst-case scenario, sagebrush species are expected to contract to just 20 percent of current distribution (Wisdom et al. 2005: 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).

The U.S. Geological Survey found that climate change is likely to eliminate over 11 percent of sage-grouse nesting habitat in what is otherwise expected to be a future stronghold for the species in southwestern Wyoming. The authors cautioned "[g]iven declining sage-grouse populations are suffering from other habitat degradation forces, a potential additional 11% loss of future habitat from climate change could be very detrimental to some populations" (Homer et al. 2015: 141). Recent research indicates that the additive effects of development and climate-induced vegetation changes in southwest Wyoming could cut sage-grouse population abundance by half (Heinrichs et al. 2019). Meanwhile, modeling of the impacts of climate change under different land management scenarios in southeastern Oregon indicates that without active management (including juniper removal and control of invasive grasses), native sagebrush shrub-steppe could decline to approximately one-third its initial 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 decreased survival 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 movement (Caudill et al. 2016).

As an early step in the upcoming planning process, BLM must take a hard look at the effects of climate change on sage-grouse populations and habitat under NEPA. This was a glaring deficiency in the 2015 plans, where only a few of the 2015 EISs included discussions of potential climate change impacts. For example, the Nevada/Northeastern California, Oregon, and HiLine FEISs included climate change discussions and recommended partial management measures to address those threats (including Oregon's toothless designation of Climate Change Consideration Areas). But most of the challenged EISs gave little attention to climate change, the best available science on the topic, or the direct, indirect, and cumulative effects of climate change on populations or habitat. Uniformly, the EISs asserted that "[t]here is no BLM or Forest Service resource program in the proposed plan addressing this threat." *See, e.g.*, Utah FEIS at 2-10, Table 2.1.

The plans BLM adopted in 2015 failed to provide management prescriptions to address the effects of climate change. BLM admitted as much:

> While several ARMPAs acknowledge the potential impact of climate change on GRSG habitat and conservation, specific strategies to address the impacts of climate change are limited. The BLM and Forest Service, in coordination with FWS, *will continue to assess the potential impacts of climate change on GRSG and its habitat and will develop strategy to mitigate the anticipated effects on GRSG conservation, as necessary and appropriate. Changes to management decisions will require a plan revision or amendment, recognizing the need to ensure that future management direction improves the resilience of habitat areas essential to species conservation*.

BLM Rocky Mountain ROD at 1-28 (emphasis added).

Given the threat climate change poses to the continued existence of the greater sage-grouse, BLM must ensure the upcoming plans include effective, science-based measures for addressing the effects of climate change on the sage-grouse and the ecosystems on which the species depends. Measures should 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 habitat conditions in the future (Haak 2021; Chambers et al. 2017; National Fish, Wildlife and Plants Climate Adaptation Partnership 2012).

Our proposal for a network of Sagebrush Sea Reserve ACECs would ensure precisely these protections. As discussed above and in our nomination, the proposed ACEC protects the habitats most likely to sustain in the face of climate change including core areas in Wyoming, Oregon and Nevada, and, at the same time, protects the most vulnerable habitats in the western part of the range where sage grouse and their habitats, without special management, are most vulnerable to rapid environmental shifts. Special management attention will be needed to assure that habitats are as healthy as possible (e.g., enhanced monitoring of grazing and aggressive and swift course correction to maximize moisture retention and vegetative structure; beaver restoration to restore mesic conditions; aggressive monitoring of invasive species and aggressive removal of pioneering invasions). A key principle in helping ecosystems and species adapt to climate change is to reduce as much as possible human-induced stressors on the sage-grouse and its habitat. This proposed ACEC is designed to adhere to this principle, which is articulated, along with other relevant principles in the National Fish, Wildlife, and Plants Climate Adaptation Strategy (2012) authored by the Association of Fish and Wildlife Agencies, Council on Environmental Quality, Great Lakes Indian Fish and Wildlife Commission, National Oceanic and Atmospheric Administration, and U.S. Fish and Wildlife Service.

Across the entire range, BLM must limit land use activities that exacerbate the effects of climate change and drought, as we discuss below. BLM should also pay special attention to the restoration and protection of degraded habitats to enhance ecosystem resilience to climate (National Fish, Wildlife and Plants Climate Adaptation Partnership 2012).

IX. Wildfire

Wildfire poses an immediate risk to greater sage-grouse habitat. BLM's recent five-year monitoring report estimated a cumulative loss of 1.9 million acres of sagebrush in priority habitat from 2012 to 2018 (Herren et al. 2021). The primary driver has been wildfire, which accounts for 72% of the total loss, including 87% of sagebrush loss in the Great Basin (Herren et al. 2021). Wildfires, and particularly the large fires becoming more prevalent across the West, almost invariably causes sage-grouse declines, and can completely extirpate local populations (Dudley et al. 2021).

These losses from wildfire make it imperative that BLM use the planning process to further protect sage-grouse and their habitat from anthropogenic threats within the agency's control, such as grazing, recreation, roads, and infrastructure development. BLM should also use the forthcoming NEPA process to fully analyze climate change, drought, and the increased spread of cheatgrass and other invasive plants, all of which are driving patterns of rangeland fire.

In every action alternative, BLM should include the recommendations pertaining to wildfire and wildfire rehabilitation from the 2011 NTT Report. These include limits on the use of prescribed

burns, as referenced in our comments on vegetation management below. Additionally, all plans should contain the following directives:

- In priority sage-grouse habitat areas, prioritize suppression, immediately after life and property, to conserve the habitat;
- In general sage-grouse habitat, prioritize suppression where wildfires threaten priority sage-grouse habitat; and
- Require the best management practices for wildland fires and fuels contained in WO-IM-2011-138.

(NTT 2011: 27, 71–73).

Every action alternative should also include NTT Report recommendations for post-fire emergency stabilization and rehabilitation (ES&R). These include:

- Prioritizing native seed allocation for use in sage-grouse habitat in years when preferred native seed is in short supply (which should include establishing and strengthening networks and financial arrangements with seed growers to assure availability of native seed for ES&R projects)[12];
- Designing post-ES&R management to ensure long term persistence of seeded or pre-burn native plants, which may require temporary or long-term changes in livestock grazing, free-roaming horse and burro, and travel management, etc., to achieve and maintain the desired condition of ES&R projects to benefit sage-grouse (Eiswerth and Shonkwiler 2006); and
- Considering potential changes in climate (Miller at al. 2011) when proposing post-fire seedings using native plants, which includes considering seed collections from the warmer component within a species' current range for selection of native seed (Kramer and Havens 2009).

(NTT 2011: 27).

In addition to these measures, post-fire remediation should include establishing adequately sized exclosures (free of livestock grazing) that can be used to assess recovery. Livestock grazing should be excluded from burned areas until woody and herbaceous plants achieve sage-grouse habitat objectives (Williamson et al. 2019).

[12] Since this management prescription was authored the BLM has made considerable progress in establishing native seed and plant supply chains and infrastructure through its leadership and participation in the National Seed Strategy.

While the 2015 plan amendments address wildfire to varying degrees, the plans must be strengthened with consistent measures addressing suppression, post-fire rehabilitation, and the anthropogenic drivers of wildfire which BLM has the authority to regulate.

X. Roads and Off-Road Vehicles

BLM must use the planning process to provide adequate protections for greater sage-grouse from roads and off-road vehicles (ORVs)[13]. Roads have multiple impacts on sage-grouse and other wildlife, including mortality from vehicle collisions and behavioral disruption due to traffic, noise, and human presence (NTT 2011: 11). Holloran (2005) 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. Roads also destroy and fragment sage-grouse habitat, and alter habitat as a consequence of dust pollution and facilitate the spread of invasive, non-native plant species (NTT 2011: 11).

ORVs pose additional risks to sage-grouse and their habitat. In addition to noise impacts, ORVs when driven off established roads disturb soil, destroy vegetation, and spread invasive plants. (NTT 2011: 12; Knick et al. 2011; Ouren et al. 2017). ORVs can also result in the creation of new roads and trails. As BLM recognized in past NEPA analysis, "[e]ach year new trails are being created by a wide range of OHV users including, but not limited to, recreational users. Once a new trail becomes established it is considered by the public to be an existing route." Wyoming RMPA DEIS at 3-340.

To ensure land use plans contain adequate standards for road location and development, BLM should apply the 2011 NTT recommendations, as supplemented by the best available science on sage-grouse recovery.

Motorized travel should be restricted to designated roads in priority and general sage-grouse habitat. In priority habitat, BLM should require the same "white-arrow" approach as used on many National Forests, in which motorized routes are closed to motorized use unless specifically posted as open. BLM should publish and make easily accessible (and readable) maps of designated routes in sage-grouse habitats and initiate a public information campaign across the range about the importance of not driving off designated roads. Where designated route systems are not yet in place, BLM must prioritize travel management planning to establish them. The process of travel management planning is where the above-discussed public information campaign about responsible driving and recreating should start.

[13] We include in this category all-terrain vehicles, dirt bikes, 4x4s, and other vehicles that can drive off an established route.

A maximum road/route density of 0.7 liner miles per square mile should be applied in priority and general habitats (Hollaran 2005). In areas that already exceed this threshold, BLM should prioritize the decommissioning and removal (including restoration of natural conditions on the disturbed footprint) of existing roads/routes starting with those that are unneeded or in poor condition to meet this standard on a per-square-mile-section basis.

We also refer BLM to the 2012 Recovery Alternative submitted as scoping comments in the first sage-grouse planning process (*see* Attachment F at 35–37). by several organizations; it calls for plans to include the following prescriptions based on best science:

- Prohibit new road construction within 4 miles of active sage-grouse leks (Connelly et al. 2004; Moynahan 2004; Holloran and Anderson 2005) and avoid new road construction in priority sage-grouse habitat;
- Implement permanent seasonal road or area closures to protect breeding, nesting and brood-rearing sage-grouse;
- Limit route construction to realignments of existing designated routes if that realignment has a minimal impact on sage-grouse habitat, eliminates the need to construct a new road, or is necessary for motorist safety. Mitigate any impacts with methods that have been demonstrated to be effective to offset the loss of sage-grouse habitat;
- Use existing roads, or realignments as described above to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then, following the 4-mile prohibition from leks, build any new road constructed to the absolute minimum standard necessary (jeep trails should be the primary form of access road in priority areas), and add the surface disturbance to the total disturbance in the priority area. If that disturbance exceeds 3% for that area, then make additional mitigation that has been demonstrated to be effective to offset the resulting loss of sage-grouse habitat;
- Allow no upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless it is necessary for motorist safety, or eliminates the need to construct a new road. Any impacts shall be mitigated with methods that have been demonstrated to be effective to offset the loss of sage-grouse habitat;
- Close and restore to natural habitat all primitive roads and trails not designated in travel management plans. This includes primitive routes/roads that were not designated in Wilderness Study Areas and within lands with wilderness characteristics that have been selected for protection;
- For sage-grouse habitat areas that do not have a travel management plan, the amended Resource Management Plan shall include an interim transportation plan

that assesses road densities and closes and restores routes for sage-grouse conservation;

- Adopt a new definition of "spot maintenance" for primitive roads or ways within all sage-grouse habitat that does not allow for continuous maintenance (e.g., blading), but is limited to spots of minimal maintenance necessary to maintain the passage of high clearance vehicles. This maintenance shall preserve the primitive characteristics of the route and cannot cause an upgrade in route consideration or road maintenance level in future wilderness or route inventories or transportation decisions, thereby preventing the further fragmentation of sagebrush habitat;
- Consider closing designated routes in sage-grouse priority habitat;
- When reseeding closed roads, primitive roads and trails, use appropriate native seed mixes and require the use of transplanted sagebrush; and
- Adequately regulating off-road vehicle travel to disallow cross-country driving and damaging disturbance to sage-grouse and their habitat

Forthcoming NEPA analysis must fully analyze the harmful effects of roads, motorized vehicles including ORVs on greater sage-grouse and their habitat. The action alternatives BLM considers need to protect against these effects by incorporating adequate management prescriptions without exceptions, modifications, or waivers.

XI. Recreation

Apart from ORVs, other forms of recreation can adversely impact greater sage grouse habitat (Joslin and Youmans 1999). BLM should evaluate recreational impacts in forthcoming NEPA analysis, and include appropriate prescriptions to protect greater sage-grouse through the placement of facilities and infrastructure and the allowance of certain types of activities. For example, recreational facilities should not be constructed within 4 miles of a lek and should only be constructed if they help reduce impacts on sage grouse consistent with COT Report (COT 2013: 50) recommendations. We also note that the Society of Outdoor Recreation Professionals developed planning principles to address resource sustainability (https://www.recpro.org/planning-principles). While many of the principles address resource sustainability, Principles 16 and 18 are particularly helpful for directing management in GrSG habitat:

> 16. **Resource Sustainability**: Whereas natural and cultural resources define an outdoor recreation setting, it is fundamental that recreation resource planning and plans address how to integrate recreation use so as to harmonize with, protect, enhance, and sustain these important resources.
> . . .
> 18. **Recreation Stewardship**: Recreation planning should consider how to best design, manage, and interpret settings so as to foster public appreciation, understanding, respect, behaviors, and

partnerships that contribute to the stewardship of an area's natural and cultural resources, and special values.

XII. Native Plants and Invasive Species

It is vital that BLM use genetically appropriate native seeds and plants in its rehabilitation and restoration activities (Society for Ecological Restoration 2020; National Academy of Sciences 2020) and avoid using non-native plants or cultivars. Per Manual 1740 and Handbook H1740-2, field offices must use locally adapted native plant materials unless they can demonstrate a compelling ecological need for using non-native plant materials. Field offices are encouraged to proactively consider native plant material needs and initiate strategies to meet them. Yet, BLM field managers often continue to use non-native plant materials or cultivars[14] in its restoration and vegetation treatments even though doing so undermines the long-term genetic integrity of native vegetation and ecosystems. Unlike a few decades ago, BLM is much better able to acquire and develop genetically appropriate native seed for its restoration projects. BLM is committed to a private/public partnership effort called the National Seed Strategy[15] designed to ensure the use of the 'right plant in the right place at the right time." And, in the recent federal Infrastructure bill BLM just received targeted funding to implement the National Seed Strategy and vegetation planning. To assure adequate native plant materials for sage-grouse habitat restoration work, BLM must engage in proactive seed and plant material planning as part of its sage grouse work. Through proactive planning and financial contributions to native plant material development, BLM can acquire the native plant materials it needs when it needs it for restoration and rehabilitation in the ACECs (and more broadly GrSG, habitat).

Invasive species as discussed throughout this document are spreading across the range especially the western half, degrading sage-grouse habitat and increasing wildfire risk. In its recent 5-year monitoring plan, BLM acknowledges that, across BLM holdings in sage-grouse habitat since 2015, invasive plants have increased from being present on a little over 50% of GrSG habitat in 2013, to nearly 70% of habitat in 2018; and the percent of the Sagebrush Sea where invasive plants are abundant (>25% of vegetative cover) has also increased, from about 10% in 2013 to nearly 30% in 2018 (Herren et al. 2021). Best practices to address invasive species call for regular monitoring of intact habitat to identify pioneering invasions and their rapid eradication including seeding as appropriate with native plant material.

In every action alternative, BLM should include the following management direction:

- Develop multi-year native plant material supply plans to meet the anticipated restoration (including post-fire) needs in sage-grouse habitats (general and priority) in coordination with the Plant Conservation and Restoration Program;

[14] BLM presented to the National Academy of Sciences in 2021 as part of the Academy's development of an assessment of native seed supplies and capacity. See National Academy of Sciences 2020. In that presentation, BLM shared that a significant fraction of the seed that it uses is non-native or cultivars.

[15] https://www.blm.gov/programs/natural-resources/native-plant-communities/national-seed-strategy.

- Regularly monitor pioneering invasions and rapid implementation of measures to remove the invading species and bolster native vegetative resistance. As technologically possible, reduce the area dominated by invasive annual grasses to 5 percent or less within 4.0 miles of all occupied leks. (e.g., see Objective VEG 3 in the Oregon Greater Sage-Grouse Approved Resource Management Plan, p. 2-10; Chambers et al. 2017);
- Use only genetically appropriate native plant material in restoration projects (Society for Ecological Restoration 2020).

XIII. Vegetation Management

All manner of vegetation management—including prescribed fire, chaining, mowing, mastication, herbicide application, and fuels treatments—can degrade greater sage-grouse habitat. This is especially true for treatments that remove sagebrush. Sagebrush is the most critical habitat component for maintaining and recovering greater sage-grouse populations, making up the vast majority of the species' diet year-round and providing necessary hiding cover and key nesting habitat (Connelly et al. 2000). "The intentional removal or treatment of sagebrush (using prescribed fire, or any mechanical and chemical tools to remove or alter the successional status of the sagebrush ecosystem) contributes to habitat loss and fragmentation, a primary factor in the decline of sage-grouse populations" (COT 2013: 44).

Given the risks posed by vegetation management actions–even when done to ostensibly improve sage-grouse habitat or mitigate threats posed by conifer encroachment and wildfire–BLM must take a hard look at their efficacy and effects (at the site, landscape, and range-wide scales) s in forthcoming NEPA analysis.[16]

Additionally, BLM must ensure that forthcoming plan amendments include appropriate limitations on vegetation treatments. To start, BLM should prohibit vegetation treatments that reduce or eliminate sagebrush in all sage-grouse habitat. This includes treatments ostensibly done to benefit sage-grouse. As FWS noted in 2013, "[a]lthough many treatments are often presented as improving sage-grouse habitats, data supporting the positive impacts of sagebrush manipulation on sage-grouse populations is limited" (COT 2013: 44). Even more forcefully, Dr. John W. ("Jack") Connelly, a leading expert on sage-grouse biology and management, stated in 2019 that "sagebrush and vegetation manipulation efforts—including mechanized methods using aerator with seeding, harrow or chain with seeding, drill seeding, hand planting plugs, and aerial seeding—are generally harmful to sage-grouse populations, with only weak evidence (at best) suggesting some treatments might be helpful (Dahlgren et al. 2015)." Attachment I at 11.

The FWS recommended against any treatments removing sagebrush in PACs with minor exceptions for pinyon-juniper removals and late summer brood-rearing habitat (COT 2013).

[16] Jones (2019) provides a comprehensive literature review regarding various vegetation treatments.

Given the widespread decline of sagebrush throughout the sage-grouse range (Herren *et al.* 2021), the prescription should extend to all priority and general habitat without exception.

BLM should also place strict limits on the use of prescribed fire. As with other types of vegetation treatments, there is little support showing benefit to sage-grouse. As treatments, they "may not increase either yield or nutritional quality of forbs eaten by sage-grouse, and also may decrease abundance of insects that are important for growth of sage-grouse chicks (Beck et al. 2009, Rhodes et al. 2010)" (NTT 2011: 25). Plans should also prohibit the use of grazing to reduce fuel loads, since such "treatments" do not appear effective and, counterproductively, promote cheatgrass invasion (Williamson et al. 2019).

Plan amendments should also limit pinyon-juniper treatments. Pinyon-juniper removals intended to benefit sage-grouse can lead to unintended consequences including invasion of annual grasses (Bates et al. 2005; Owen et al. 2009; Ross et al. 2012) and degradation of habitat for other at-risk species such as the pinyon jay, *Gymnorhinus cyanocephalus* (Somershoe et al. 2020; Jones 2019; Floyd 2021). Pinyon jays are experiencing a long-term population decline similar to the GrSG and are a species of concern (Boone et al. 2021; Somershoe 2020). In order to not accelerate this decline, pinyon-juniper forest treatments must be carefully planned with careful attention put towards site history and conditions and pinyon jay behaviors (Boone et al 2021; Floyd 2021). In our efforts to conserve GrSG we must be very careful to avoid inadvertently pushing the pinyon jay toward extinction. Treatments should only occur where pinyon-juniper are invading otherwise suitable sage grouse habitats and sufficient native shrub, forb, and grass understory exists to support sage grouse post-removal and inhibit cheatgrass expansion, and after a careful analysis of the impacts to pinyon jay and other pinyon-juniper obligates.. Treatments should be as non-invasive as possible which means restricted to hand cutting and jackpot burning so as to minimize disturbance to soils, carbon loss from soils, and opportunities for weeds to invade.

The 2015 plan amendments must be updated to reflect the best available science (and scientific uncertainty) regarding vegetation management. The 2015 amendments did not clarify the limited role of conifer removal in sage-grouse habitat restoration. Nor did they acknowledge the high degree of controversy and uncertainty surrounding vegetation treatments in general. The result has been a profusion of ill-conceived and inappropriate projects that diminish habitat quality in the name of sage-grouse conservation.

The plan amendments are also inconsistent. For example, while some amendments limit the use of vegetation treatments in sage-grouse habitat to increase livestock forage, others do not. The North Dakota ARMPA (at 2-15) allows treatments that benefit livestock, and the Buffalo Field Office ARMP "[a]llow[s] increases in livestock stocking rates as a result of vegetation treatments when resource objectives are met." Buffalo ARMP at 151. Many of the amendments also fail to close vegetation treatment areas to livestock for at least two full growing seasons per NTT Report recommendations, let alone until treated sites meet sage-grouse habitat objectives

(Miller *et al.* 2005). *See, e.g.*, Lewistown ARMPA at 2-13 to 2-14; Nevada and Northeastern California ARMPA at 2-20 to 2-27; South Dakota ARMP at 3-32; Buffalo ARMP at 76; Cody ARMP (absent); Utah ARMPA at 2-17; Miles City ARMP at 3-12; HiLine ARMP at 3-11.

Further, BLM's approach to vegetation treatments is decentralized and without strong scientific leadership or coordination. The reality is that field offices conduct treatments without an understanding of the larger spatial context (e.g., where else are treatments being conducted or habitat disturbed) and scientific context (e.g., what is the most recent science saying, consistent approaches to monitoring and rigorous project designs with reference sites and post-treatment changes in land use). Institutional sharing of treatment schedules, designs, results, and lessons learned is limited, which leads at best to landscape-scale inefficiencies and at worst landscape-scale degradation of habitat condition and function. Absence of centralized coordination and transparency also makes it very hard for the public to understand or participate in the scientific conversation.

To ensure greater sage-grouse recovery, BLM should include—in every action alternative—management prescriptions for vegetation treatments that protect against habitat degradation and fragmentation and ensure landscape patterns which most benefit greater sage-grouse. These should include prescriptions from the 2011 NTT Report, 2013 COT Report, and other best available science, including:

- Only allowing vegetation treatments that are demonstrated to benefit sage-grouse, and retaining sagebrush height and cover consistent with sage-grouse habitat objectives;
- Evaluating the role of existing seedlings that are currently composed of primarily introduced perennial grasses in and adjacent to sage-grouse habitat to determine if they should be restored to sagebrush or habitat of higher quality for sage-grouse.
- For any vegetation treatment plan, use reference sites, analysis of ecological and anthropogenic history, data from nearby restoration projects, pre-treatment monitoring, projected climate data, etc. to inform project design. Establish long-term monitoring plan that includes specific indicators and triggers for corrective action. Also establish long-term non-grazing exclosures, and make necessary modifications to post-treatment land use to preserve the benefits of the treatment;
- Prohibit grazing until a treated site meets sage-grouse habitat objectives, which may be many years as research indicates long-term rest may be required to restore native vegetation (Anderson 1991; Anderson and Inouye 2001; Hormay and Talbot 1961; Mueggler 1975).

BLM must also ensure that fuels treatments designed to mitigate wildfire be done in a manner to protect intact sagebrush habitat. While wildfires cause the greatest proportional loss of greater sage-grouse habitat, fuels treatments themselves contribute to habitat loss.

Many of the 2015 plan amendments allow for prescribed fire in sage-grouse PHMAs, and even in sage-grouse winter habitats, as long as a burn plan is completed and/or BLM explores alternative techniques through NEPA analysis. *See, e.g.*, Miles City ARMP at 3-37; Lewiston ARMPA at 2-12; HiLine ARMP at 2-8; Oregon ARMPA at 2-17; Idaho and Southwestern Montana ARMPA at 2-22; South Dakota ARMP at 3-32. Many plans also fail to incorporate the NTT Report directive against using prescribed fire to treat sagebrush in less than 12-inch precipitation zones unless no other options exist to create fuel breaks (NTT 2011: 26).

Forthcoming plan amendments must ensure fuels treatments minimize the probability of large-scale fire in greater sage-grouse habitat, while not resorting to techniques that themselves destroy or degrade sage grouse habitats. Prescriptions to address fuel treatments should include:

- Designing and implementing fuels treatments to not disturb intact sagebrush habitats;
- When considering fuel breaks, locate them in degraded habitat (*e.g.*, mainly invasives or non-native species away from water sources) and outside of intact sagebrush habitats, and have a feasible plan for maintaining them (as under-maintained fuel breaks can actually worsen fire risk);
- Allowing no fuels treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and will maintain winter range habitat quality;
- Designing fuels management projects in priority sage-grouse habitat to strategically and effectively reduce wildfire threats in the greatest area, which may require fuels treatments implemented in a more linear versus block design (Launchbaugh et al. 2007);
- Applying appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present;
- Allowing no use of prescribed fire to treat sagebrush in less than 12-inch precipitation zones, unless it is the only option to create fuel breaks (Connelly et al. 2000; Hagen et al. 2007; Beck et al. 2009);
- Designing post fuels management projects to ensure long term persistence of seeded or pretreatment native plants, including sagebrush, which may require temporary or long-term changes in livestock grazing management, free-roaming horse and burro management, travel management, or other activities to achieve and maintain the desired condition of the fuels management project (Eiswerth and Shonkwiler 2006); and
- Providing for monitoring and control of invasive vegetation post-treatment.

For all vegetation treatments, the BLM must only use genetically appropriate locally-sourced native plants and seeds. This likely will require advance seed supply planning including wild collecting in nearby locations and multi-year growing contracts to expand quantity.

In addition, for all vegetation treatments BLM should utilize a scientifically rigorous approach and long-term monitoring of habitat conditions and sage grouse outcomes, with centralized reporting so that lessons can be effectively learned and communicated to practitioners across the range.

XIV. Livestock Grazing

Our organizations have submitted extensive comments and literature detailing the array of direct, indirect, and cumulative effects of livestock grazing on greater sage-grouse and sagebrush ecosystems. *See, e.g.*, Attachment D at 18-27. Grazing disturbs the soil, alters hydrologic regimes, removes native vegetation, and spreads invasive species in sagebrush steppe, impairing the functionality of sage-grouse habitats and exacerbating wildfire and conifer encroachment. Livestock also disturb sage-grouse, trample nests, and cause nest abandonment. According to a 2014 study, researchers linked cattle presence to increased levels of stress hormones in grouse (levels approached those associated with the acute stress from capture), and postulated that the increases in the stress hormone may be a physiological response to the direct visual presence of cattle on the landscape, infrastructure associated with cattle grazing, or the use of degraded habitats (*e.g.*, reductions in perennial grasses or trampled riparian areas) (Jankowski et al. 2014).

Grazing infrastructure also negatively impacts sage-grouse. Hundreds of thousands of miles of fence criss-cross the species' range. As FWS recognized in its 2010 finding, "[f]ences cause direct mortality through collision and indirect mortality through the creation of predator perch sites, the potential creation of predator corridors along fences (particularly if a road is maintained next to the fence), incursion of exotic species along the fencing corridor, and habitat fragmentation (Call and Maser 1985, p. 22; Braun 1998, p. 145; Connelly et al. 2000a, p. 974; Beck et al. 2003, p. 211; Knick et al. 2003, p. 612; Connelly et al. 2004, p. 1-2)." 75 Fed. Reg. at 13941. Water developments, such as the diversion or development of seeps, springs, and other water sources, can also have profound detrimental effects. Diversions can destroy important riparian and wet meadow habitats. *Id.* Water developments concentrate livestock, causing increased trampling and degradation. *Id.* Developments can also create places for mosquitoes to breed, facilitating the spread of West Nile virus. *Id.*

BLM must fully analyze these impacts as part of the planning process. The EISs BLM prepared in connection with the 2015 plan amendments are strikingly deficient with regards to livestock grazing. The EISs largely ignored the extensive scientific evidence showing that livestock grazing poses numerous direct, indirect, and cumulative adverse impacts to sage-grouse habitats and populations. They also largely failed to identify livestock grazing as a cause of cheatgrass invasion, or to acknowledge the link between livestock grazing and pinyon-juniper encroachment and shifted fire and hydrologic regimes.

The plan amendments themselves failed to address the many ways in which livestock grazing facilities and practices contribute to sagebrush steppe degradation and fragmentation, weed invasions, and other adverse impacts. Rather than adopt management requirements to protect sage-grouse and their habitats from grazing, BLM only committed to "prioritize" the review and processing of grazing permits in SFAs, followed by PHMAs. BLM further committed to "prioritize" field checks in SFAs, followed by PHMAs, to ensure compliance with the terms and conditions of grazing permits. The plan amendments indicate that the NEPA analysis for renewals and modifications of grazing permits and leases would include specific management thresholds, based in part on sage-grouse habitat objectives, land health standards, and ecological site potential. So rather than require any meaningful or immediate changes in existing grazing management, the 2015 plan amendments "kicked the can down the road" by indefinitely delaying any revisions for grazing management to protect sage-grouse habitats and populations.

This approach makes no practical sense. As with other threats, grazing affects sage-grouse in consistent, predictable ways throughout the bird's range; plans must contain consistent, effective prescriptions. For example, sage-grouse require at least 7 inches of grass height (10.2 inches in the far eastern end of their range) for hiding cover to maximize their nest success and ability to escape predation, and this has been demonstrated definitively from northeastern Wyoming (Doherty et al. 2014) to Oregon (Gregg et al. 1994). And research has long established that "if livestock grazing is permitted on public rangelands, [it] is to not exceed 25-30% utilization of herbaceous forage each year" (Braun 2006: 7). Yet the 2015 plans fail to prescribe consistent grazing utilization limits in greater sage-grouse habitat and the subsequent plans and IMs make implementation even more discretionary and less enforceable.

As another example, spring livestock grazing disturbs nesting and brood-rearing sage-grouse regardless of grass height. Yet none of the existing plans require that authorized grazing in sage-grouse nesting and brood-rearing habitat be deferred until mid-June, as directed in the best available science (Braun 2006).

These omissions fly in the face of the clear understanding that limitations on stocking rates and forage utilization can confer fast and effective benefits to sage-grouse. A BLM report (Taylor et al. 2010: 4) notes that "correlations between grass height and nest success suggest that grazing may be one of the few tools available to managers to enhance sage-grouse populations. . . . For instance, a 2 inch increase in grass height could result in a 10% increase in nest success, which translates to an 8% increase in population growth rate." According to Connelly (2013: 63), "[w]here allotments are not meeting rangeland health standards and livestock grazing is shown to be a major contributing factor, federal agencies could alter grazing systems to improve habitat over a relatively short period of time."

The 2015 plans lack prescriptions to redress other well-understood effects of grazing on sage-grouse, such as prohibitions or limitations on the construction of new range infrastructure including cattle guards, fences, exclosures, corrals, pipelines, troughs, storage tanks, windmills, ponds/reservoirs, and spring developments. Instead, they merely require that range infrastructure be designed to have a neutral effect or to conserve, enhance, or restore sage-grouse habitat "through an improved grazing management system relative to GRSG objectives." *See, e.g.*, Utah FEIS at 2-29.

BLM's "deferral" approach to grazing management has - and has had - adverse effects. First, the 2015 plans failed to include a clear schedule for evaluating grazing impacts and conducting land health evaluations, and creating implementation schedules for imposing habitat objectives. Second, the plans rely on rangeland health assessments and Properly Functioning Conditions (PFC) assessments that do not factor in the habitat characteristics sage grouse require and, thus, fail to identify impaired conditions. For example, rangeland health assessment methods and PFC assessments do not consistently include measuring grass and forb height and canopy cover, key components of habitat suitability for sage-grouse. Thus upland areas and riparian areas may have little grass and forb cover or be grazed nearly to the ground in June and still meet rangeland and PFC assessment standards, depending on when and where the cover is measured.[17] Moreover, none of the BLM plans specify the spatial extent where these habitat criteria will be applied or measured. The current key area monitoring scheme used by BLM is not tied to the seasonal habitats of sage-grouse, and the existing data sets would be insufficient to ensure these criteria are being met at the relevant locations.

Third, BLM's deferral approach failed to factor in the 2015 FLPMA amendments[18] allowing the indefinite perpetuation of grazing authorizations without adjustment. The 2015 plans envisioned the application of habitat objectives at the point of grazing permit renewals and for habitat protections to be applied henceforth from that point. What the BLM did not anticipate – or did not heed our cautions about – is the extent to which grazing permits and leases would continue to

[17] We note the 2015 plans contain a number of deficiencies and inconsistencies regarding land health and PFC assessments. Not all of the 2015 plan amendments mandate PFC for riparian and wetlands. Some instead allow "progress towards" meeting PFC to avoid grazing management changes. *See, e.g.*, North Dakota ARMPA at 2-14; Buffalo ARMP at Riparian-4002, Lander ARMP at 12; Cody ARMP at 75. Others make PFC a habitat objective only during certain times of the year. *See, e.g.*, Wyoming ARMPA at 30, 33; Idaho/Southwestern Montana ARMPA at 2-6; Miles City ARMP at 2-15. Additionally, habitat objectives are not consistent across plans, and some plans do not require strict conformance with objectives. *See, e.g.*, Idaho/Southwestern Montana ARMPA at 2-4 (calling for incorporation of GRSG Seasonal Habitat Objectives "as appropriate" based on listed criteria).

[18] *See* BLM, Instruction Memo. 2015-122 (July 15, 2015), *available at* https://www.blm.gov/policy/im-2015-122.

be renewed without any NEPA, depriving millions of acres of sage-grouse habitat from any review of or improvement in grazing management.

According to an analysis by Western Watersheds Project, there are 10,097 grazing allotments that overlap PHMA, GHMA, and SFA based on the 2015 ARMPA maps of those habitats. Of these, 57.6 percent (5816 allotments) have been renewed under FLPMA Sec. 402. In SFA, the most important sage-grouse habitat, 69 percent of allotments' current permits were renewed without any environmental analysis; in PHMA, 61 percent of allotments are in that same category. What this means on the ground is that not only is BLM not looking at a range of alternatives to current grazing management, it is not even using the permit renewal opportunity to bring grazing into compliance with the land use plan amendments. In fact, in SFA the use of FLPMA's NEPA workaround has been *increasing* since the 2015 amendments were adopted: in 2013, the Bureau used the grazing rider on SFA allotments 40.1 percent of the time; by 2017, the Bureau used FLPMA's codification of the rider 52.8 percent of the time; and in 2021, the Bureau used FLPMA to waive NEPA's requirements on permit renewals in SFA 69.1 percent of the time. Rather than give SFA the critical attention it deserves, the BLM has increasingly been abandoning its obligations to sage-grouse and the sage-grouse habitat objectives more frequently than ever.

Because there is no limit on the times that the non-analyzed renewals may be repeated under FLPMA 402(c)(2), current grazing management could continue indefinitely, without any scrutiny and without any consideration of sage-grouse habitat needs. BLM should fully analyze the effects of the automatic permit renewals, and amend the 2015 plans to ensure they provide immediate, enforceable, and effective protections (including appropriate monitoring indicators, triggers, and schedules) for sage-grouse and their habitat.

In addition to remedying the deficiencies and inconsistencies noted above, BLM should also authorize grazing permit retirement as a key component of every plan in all sage–grouse habitat. By allowing for grazing permit retirement upon voluntary relinquishment of grazing permits, the agency is accomplishing two things: 1) enabling willing sellers to receive compensation for relinquishments which provide habitat gains for sage-grouse, and 2) enabling grazing retirement to become a possible mechanism for "net conservation gain" under the compensatory mitigation strategy.

XV. Fluid Mineral Leasing and Development

BLM must use this planning process to adopt strong, consistent protections to shield greater sage-grouse from the effects of fluid mineral leasing and development. As BLM has long recognized:

> There is strong evidence from the literature to support that surface-disturbing energy or mineral development within priority sage-grouse habitats is not consistent with a goal to maintain or increase populations or distribution. None of the published science reports a positive influence of development on sage-grouse populations or habitats. Breeding populations are severely reduced at well pad densities commonly permitted (Holloran 2005, Walker et al. 2007a). Magnitude of losses varies from one field to another, but findings suggest that impacts are universally negative and typically severe.

(NTT 2011:19).

More recent studies confirm these established findings. Green et al. (2017) examined greater sage-grouse lek attendance, oil and gas well, and habitat and precipitation data from Wyoming over the period 1984 to 2008, and, consistent with numerous prior studies, found that lek attendance declines are closely associated with the density of oil and gas development, regardless of sagebrush cover and participation:

> Oil and gas development correlates well with sage-grouse population declines from 1984 to 2008 in Wyoming, which is supported by other findings (Doherty et al. 2010b, Harju et al. 2010, Hess and Beck 2012, Taylor et al. 2013, Gregory and Beck 2014). As with other studies, we also found support for 4-year lag effects of oil and gas development on lek attendance (Walker et al. 2007, Doherty et al. 010a, Harju et al. 2010, Gregory and Beck 2014). This result suggests that development likely affects recruitment into the breeding population rather than avoidance of wells by adult males or adult survival. Adult sage-grouse are highly philopatric to lek sites (Dalke et al. 1963, Wallestad and Schladweiler 1974, Emmons and Braun 1984, Dunn and Braun 1985, Connelly et al. 2011a), and males typically recruit to the breeding population in 2–3 years. We would expect a delayed response in lek attendance if development affects recruitment, either by reducing fecundity or avoidance of disturbance by nesting females, as adult males die and are not replaced by young males. On average, lek attendance was stable when no oil and gas development was present within 6,400m (Fig. 4). However, attendance declined as development increased.

(Green et al. 2017: 54).

A study analyzing sage-grouse persistence under mitigation measures in Wyoming similar to those in the BLM sage-grouse plans, Gamo and Beck (2017: 190), stated:

> Energy development has been shown to specifically impact male sage-grouse lek attendance, lek persistence, recruitment of yearling male and female grouse to leks, nest initiation and site selection, nest survival, chick survival, brood survival, summer survival of adult females, early brood-rearing habitat selection, adult female summer habitat selection, and adult female winter habitat selection (citing literature).

We again call on BLM to impose, as terms of the all resource management plans, limitations on fluid mineral leasing and development consistent with the recommendations of the NTT Report. All priority sage-grouse habitat should be closed to fluid mineral leasing. For existing leases, BLM should impose seasonal restrictions on drilling and prohibit new surface occupancy (with exceptions for occupancy of no more than 3% outside a 4-mile lek buffer, if the entire leasehold is within such habitat) (NTT 2011: 23).

More generally, BLM should strive to eliminate the threats of oil and gas development by canceling leases found to be unlawfully issued and consider buying out leases in priority habitat accompanied with a broad-based mineral withdrawal (to prevent re-leasing of the same lands in the future) as discussed elsewhere in these comments.

None of the 2015 plan amendments incorporated the NTT Report recommendation to close priority habitat to leasing. They instead rely on stipulations and conditions subject to modification and waiver, or which fail to adequately protect sage-grouse. For instance, the NTT Report recognized that commonly-used seasonal timing restrictions "do not prevent impacts of infrastructure (e.g., avoidance, mortality) at other times of the year, during the production phase, or in other seasonal habitats that are crucial for population persistence (e.g., winter; Walker et al. 2007)" (NTT 2011: 21).

The plan amendments are again inconsistent. Plans in Montana and Wyoming, where oil and gas development poses the greatest threat to sage-grouse, provide fewer protections than plans in states with less development potential. The deficiencies in Wyoming are especially glaring, where plans allow surface disturbing drilling as close as 0.6 miles to active leks in priority habitat and 0.25 miles to leks in general habitat.

As part of this planning process, BLM must ensure land use plans provide durable, uniform protections consistent with NTT Report recommendations for fluid mineral development. Plans should "exclud[e] mineral development and other large scale disturbances from priority habitats

where possible, and where it is not limit disturbance as much as possible" (NTT 2011: 21).[19] Plans should also incorporate conservation measures into existing leases, including prohibitions on new surface occupancy in priority habitat and a maximum 3% disturbance cap (NTT 2011: 23). As they stand, the 2015 plans only encourage BLM to reach voluntary agreements with lessees and operators to reduce impacts to sage-grouse on existing leases. *See*, *e.g.*,Wyoming FEIS at 2-13; Northwest Colorado ARMPA at 2-15; HiLine ARMP at 2-9.

While imperative that BLM include NTT Report recommendations in every action alternative, the agency should also use the planning process to re-evaluate the adequacy of buffers, disturbance caps, timing stipulations, and other measures meant to protect sage-grouse.

Green et al. (2016) confirmed that declines in sage-grouse populations may continue even within Wyoming's core areas, where density of wells is limited to approximately one pad per square mile, indicating the need for protections beyond those provided by the 2015 plan amendments. The USGS likewise recognized in 2018 that "[a]llowable well densities that average one well pad per 640 acres within Core Areas may only be sufficient for limiting population declines to current rates but not for reversing the trend." (Hanser et al. 2018:46).

Similarly, a recent study of greater sage-grouse in Wyoming from 2008 to 2014, Kirol et al. (2020), measured the impacts to grouse from both fossil fuel energy and renewable energy and found that ongoing surface disturbance from energy development within 8 km (4.97 miles) of a greater sage-grouse nest decreased the likelihood of nest success. Sage-grouse broods within 1 km (0.62 miles) of ongoing surface disturbance from energy development were less likely to survive than those further away. As ongoing disturbance increased, sage-grouse nests had an increasing rate of failure. Furthermore, female sage-grouse avoided habitat with higher levels of disturbance in favor of habitat with lower levels of disturbance. The study indicates that current BLM nest buffers are too small to conserve grouse and implementing disturbance caps of 3-5% does not eliminate the negative impacts of ongoing disturbance on nest survival.

Recent science also casts further doubt on the efficacy of seasonal timing restrictions. Smith et al. (2016: 585) found "use of winter habitats occurred over a longer period than current Core

[19] While outside the scope of BLM's Notice, we request the agency immediately defer fluid mineral leasing in all greater sage-grouse habitat at least until completion of this planning process. BLM is currently proposing to lease nominated parcels in sage-grouse habitat as part of its first quarter 2022 competitive oil and gas lease sales. *See, e.g.*, BLM Montana/Dakotas First Quarter Oil and Gas Lease Parcel Sale Draft Environmental Assessment (Attachment J). As discussed in more detail in comments to the proposed lease sales, parcels in greater sage-grouse habitat should be deferred for at least two reasons: 1) the inadequacy of the 2015 plan amendments, and need for further terms and conditions for fluid mineral leasing and development; and 2) the need for further NEPA analysis on the impacts of leasing and development on sage-grouse. Attachment K at 41-47.

Area winter timing stipulations and a substantial amount of winter habitat outside of Core Areas was used by individuals that bred in Core Areas, particularly in smaller Core Areas." Sage-grouse moved from their fall to winter habitat earlier and moved from their winter to breeding habitat later than current seasonal restrictions.

BLM should also examine the efficacy of mitigation measures. Fedy et al. (2015: 14-15), found mitigation measures related to oil and gas development to be insufficient: "mitigation efforts within the study resulted in less avoidance of wells overall. However, sage-grouse still avoided areas of high-density wells. No nests were found in areas with greater than 4 wells per km2 and most nests (62.82%) were located in areas with ≤ 1 well per km2."

These recent studies indicate a pressing need to re-evaluate the adequacy of protections from fluid mineral development to reverse sage-grouse population declines.

XVI. Solid Mineral Leasing and Development

Like fluid mineral development, surface and subsurface mining has profound negative impacts on greater sage-grouse. The USGS recently recognized that "[i]n general, infrastructure (for example, processing facilities, and roads) and human activities (for example, presence and traffic) associated with oil and gas development (including coal-bed methane, oil shale, and tar sands) have similar impacts to the sagebrush ecosystem and wildlife as described for mining." (Remington et al. 2021:171). According to FWS' COT Report:

> Surface mining and appurtenant facilities within sage-grouse habitats result in the direct loss of habitat, habitat fragmentation, and indirect impacts from disturbance (e.g., noise, dust). Current reclamation activities do not always consider sage-grouse habitat needs. Those that do may take decades to restore habitats and experience the same limitations as restoration activities. Surface facilities supporting underground mining activities can have similar impacts. (COT 2013:49)

New studies confirm the damaging effects of mining on sage-grouse and sagebrush habitat. Pratt and Beck (2019) studied the effects of bentonite mining on 321 female greater sage-grouse at three research sites in Wyoming and Montana's Bighorn Basin from 2011-2015. Bentonite is a locatable mineral extracted by open pit mining, requiring complete removal of vegetation, topsoil, subsoil, and the bentonite clay. The study found that nest site selection decreased within 800 meters (0.50 miles) of bentonite mining disturbance and observations of hens during the breeding season decreased within 200 meters (0.12 miles) of bentonite mining disturbance, demonstrating avoidance. The study also documented avoidance of active and reclaimed mining disturbance in nesting, breeding, and winter habitat. Female sage-grouse survival during the

breeding season was 73% higher in areas with no active mining disturbance within 1,600 meters (0.99 miles) than in areas with 7% active mining disturbance within 1,600 meters. Brood failures resulting from the death of the hen were greater in areas with active mining disturbance than in areas without.

The 2011 NTT Report recommended withdrawing all priority sage-grouse habitat from non-energy mineral development to conserve the species (NTT 2011: 25). The Report also recommends to "[f]ind unsuitable all surface mining of coal under the criteria set forth in 43 CFR 3461.5 [and]…[g]rant no new mining leases unless all surface disturbances (appurtenant facilities) are placed outside of the priority sage-grouse habitat area…." (NTT 2011: 24).

The COT Report went further, calling for management to "[a]void new mining activities and/or any associated facilities within occupied habitats, including seasonal habitats" (COT 2013:49). Indeed, as part of its decision not to list sage-grouse under the Endangered Species Act, FWS relied on the assumption that large expanses of essential sage-grouse habitat would be withdrawn from mineral development as part of federal strategies to conserve and recover the species. 80 Fed. Reg. 59915-59,916 (Oct. 2, 2015).

We appreciate the Department of the Interior's renewed consideration of its 2015 proposal to withdraw approximately 10 million acres of SFAs from location (hardrock mining) and entry to protect greater sage-grouse and their habitat, and consider such a mineral withdrawal vital to protecting the bird. *See* 86 Fed. Reg. 44,742 (Aug. 13, 2021). We have included our October 5, 2021 comments on the proposed withdrawal as Attachment L, and incorporate the comments and studies cited therein by reference here. As we discuss, the withdrawal should be expanded to include other types of mineral extraction activities (*e.g.*, leasable fluid and other minerals, saleable minerals such as sand and gravel, coal, and non-energy leaseables such as sodium and potash), as well as to include priority habitat beyond SFAs–including PACs, excised SFA acreage in Wyoming, connectivity habitat, and winter concentration areas. Finally, in addition to withdrawing the area *from* harmful mineral development, to also reserve the area for a public public purpose, in this case the conservation of greater sage-grouse and other native wildlife.

But whether by withdrawal or plan amendment, BLM must use this planning process to address deficiencies in the 2015 plans. None of the plans closed priority habitats to future coal leasing as recommended by the NTT Report. Instead, many provide for suitability determinations pursuant to 43 C.F.R. part 3461.5 when BLM receives an application for a new coal lease or lease modification. *See, e.g.*, Utah ARMPA at 2-30; Idaho and Southwestern Montana ARMPA at 2-30. Several plans, including Bighorn Basin, Buffalo, and those in Wyoming, allow future leasing for non-energy leasable minerals and future sale for mineral materials.

We urge the Department of the Interior to issue a comprehensive withdrawal of priority habitat from all types of mineral location and extraction and for protection of the bird. *See* Attachment L.

In any case, BLM should use the planning process to protect all priority habitat from mineral leasing and development in accordance with the NTT and COT reports.[20] BLM should also use this process to provide consistent directives to reclaim mined lands, with a focus "on restoring habitats usable by sage-grouse, and the re-establishment of sage-grouse in these areas" (COT 2013: 49).

XVII. Renewable Energy Development, Transmission Lines, and Other Infrastructure

Utility-scale wind, solar, and geothermal development, and associated infrastructure such as transmission lines, can harm greater sage-grouse in the same ways as other large-scale anthropogenic developments, including by habitat loss and fragmentation, predation (and thus behavioral avoidance by sage-grouse) caused by tall structures, and disturbance from noise, motion, and human activity. In a study of the effects of wind turbines on sage-grouse, researchers noted that "sage-grouse during the brood-rearing and summer period were responding to the infrastructure associated with a wind energy development similarly to that found in a natural gas field" LeBeau et al. (2017: 707).

In accordance with the NTT Report, BLM should exclude all priority habitat, including connectivity areas and winter concentration areas, from renewable energy leasing, new right-of-way grants, and infrastructure development. (NTT 2011: 21). Development of valid existing rights in priority habitat should be limited to one disturbance per section, with surface disturbance not exceeding a 3% or lower cap.

BLM should also follow NTT Report guidance regarding overhead power lines in priority habitat. Overhead power lines–which cause sage-grouse to avoid habitat and increase the risk of mortality due to predation and collisions–effectively influenced at least 39% of the bird's range as of 2011 (NTT 2011: 13). In addition to making priority habitat exclusion areas for new rights-of-way, plans should ensure obsolete power lines (as well as other obsolete infrastructure such as wells and fences) be removed, and existing power lines be buried or modified.

Plans should designate general habitat as avoidance areas. Infrastructure development should be avoided and, if allowed, guided by measures to protect sage-grouse, including the same limits on surface disturbances applicable to oil and gas projects and other large-scale anthropogenic developments. New rights-of-way, if necessary, should use existing right-of-way corridors wherever possible.

[20] Protections should extend to priority habitat with split mineral estates (NTT 2011: 25).

Plans should also address threats to sage-grouse unique to renewable energy development. For example, guy lines on meteorological evaluation towers ("MET towers") used to measure wind characteristics pose a collision risk to grouse; plans should only allow line-less designs. *See* Wyoming RMPA FEIS at 2-30. Tall structures such as wind turbines and MET towers should be cited at least 5.3 miles from leks (after Hollaran and Anderson 2005).

Many of the 2015 plan amendments made progress towards NTT Report recommendations. But the amendments are inconsistent and riddled with exceptions. While the Oregon amendment excluded wind development from PHMA in much of the state, the Great Basin amendment permitted wind and solar development in PHMAs in Lake, Harney, and Malheur counties. BLM Great Basin ROD at 1-17 to -18. Similar inconsistencies can be found in Wyoming, where PHMAs are designated only as avoidance areas for solar development. The Lander ARMP excludes PHMA from wind development only "[u]ntil research on impacts of wind energy to greater sage-grouse is completed and adequate mitigation can be developed, exclude wind-energy development in Core Area." Lander ARMPA at 19. The Nevada amendment exempts geothermal energy development from restrictions that otherwise apply in the planning area.

The 2015 plan amendments also permit major transmission corridors to cross both priority and general sage-grouse habitat in a number of states, including the Gateway West (Wyoming, Idaho, Oregon), Gateway South (Wyoming, Colorado, Utah, Nevada), TransWest Express (Wyoming, Colorado, Utah, Nevada), Boardman to Hemingway (Oregon, Idaho) and Greenlink North (Nevada) proposed transmission lines.

Our organizations fully appreciate the importance of developing renewable energy to address the climate crisis. But development need not come at the expense of greater sage-grouse recovery. Analysis in our ACEC nomination of the overlap of wind and solar resources shows that ample renewable resources are present outside of sage-grouse priority habitat (*see* Attachment A). However, several proposed new transmission lines will cut through greater sage grouse habitat and trigger development of industrial scale renewable energy, both of which are harmful to greater sage grouse. BLM should in the EIS disclose the widespread availability of renewable resources outside of sage-grouse priority habitat including in places close to population centers through, for instance, distributed solar.

Additionally, every action alternative BLM considers should include the protections called for by the 2011 NTT Report and other best science, without exception, modification or waiver. This includes designating all priority habitat as renewable energy and infrastructure exclusion areas and general habitat as avoidance areas with appropriate prescriptions.

CONCLUSION

The 2015 plan amendments must be strengthened to protect and recover the greater sage-grouse and its sagebrush steppe habitat. We appreciate the chance to comment, and look forward to participating further in the planning process.

Sincerely,

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Attachment A

Nomination for a Sagebrush Sea Reserve Areas of Critical Environmental Concern (ACEC) Network

(Other attachments are included via USB drive in the folder "Attachments")

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

February 8, 2022

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

Dear Ms. Deibert:

On behalf of the undersigned organizations and our millions of members and supporters, we respectfully submit for your consideration the attached nomination for a Sagebrush Sea Reserve Areas of Critical Environmental Concern (ACEC) Network. We welcome the planning process to strengthen conservation measures for the Greater sage-grouse across its range through targeted resource management plan amendments that you announced via a scoping notice issued November 22, 2021. We believe that establishing the ACECs outlined in this proposal would play a critical role in protecting Greater sage-grouse.

A recent report by the U.S. Geological Survey found that Greater sage-grouse populations have declined significantly, with an 80% rangewide decline since 1965 and 40% decline since 2002. Threats to sage-grouse habitat – e.g., climate change, invasive species, and wildfires – are adding to the impacts of past and present activities that have already compromised the diversity and natural resilience of the sagebrush system. In this context, building on the 2015 land use plan amendments for Greater sage-grouse is imperative to curb the decline of the species.

This nomination exceeds the necessary criteria for establishing an ACEC. The areas in question are both relevant and important, identified by relevant agencies as sagebrush habitat that is necessary to sustain this imperiled species. The nomination is largely informed by the US Fish and Wildlife Service's Conservation Objectives Team Report (2013) and the BLM National Technical Team Report (2011) and recent best available science. As climate change continues to take a toll on greater sage-grouse habitat, it is more imperative than ever that we reduce human-induced stressors on the sage-grouse's habitat. This ACEC nomination is designed to adhere to this principle, which is articulated, along with other relevant principles, in the National Fish, Wildlife, and Plants Climate Adaptation Strategy (2012) authored by the Association of Fish and Wildlife Agencies, Council on Environmental Quality, Great Lakes Indian Fish and Wildlife Commission, National Oceanic and Atmospheric Administration, and U.S. Fish and Wildlife Service.

Thank you for considering this nomination. Please do not hesitate to reach out to the undersigned if you have questions.

Sincerely,

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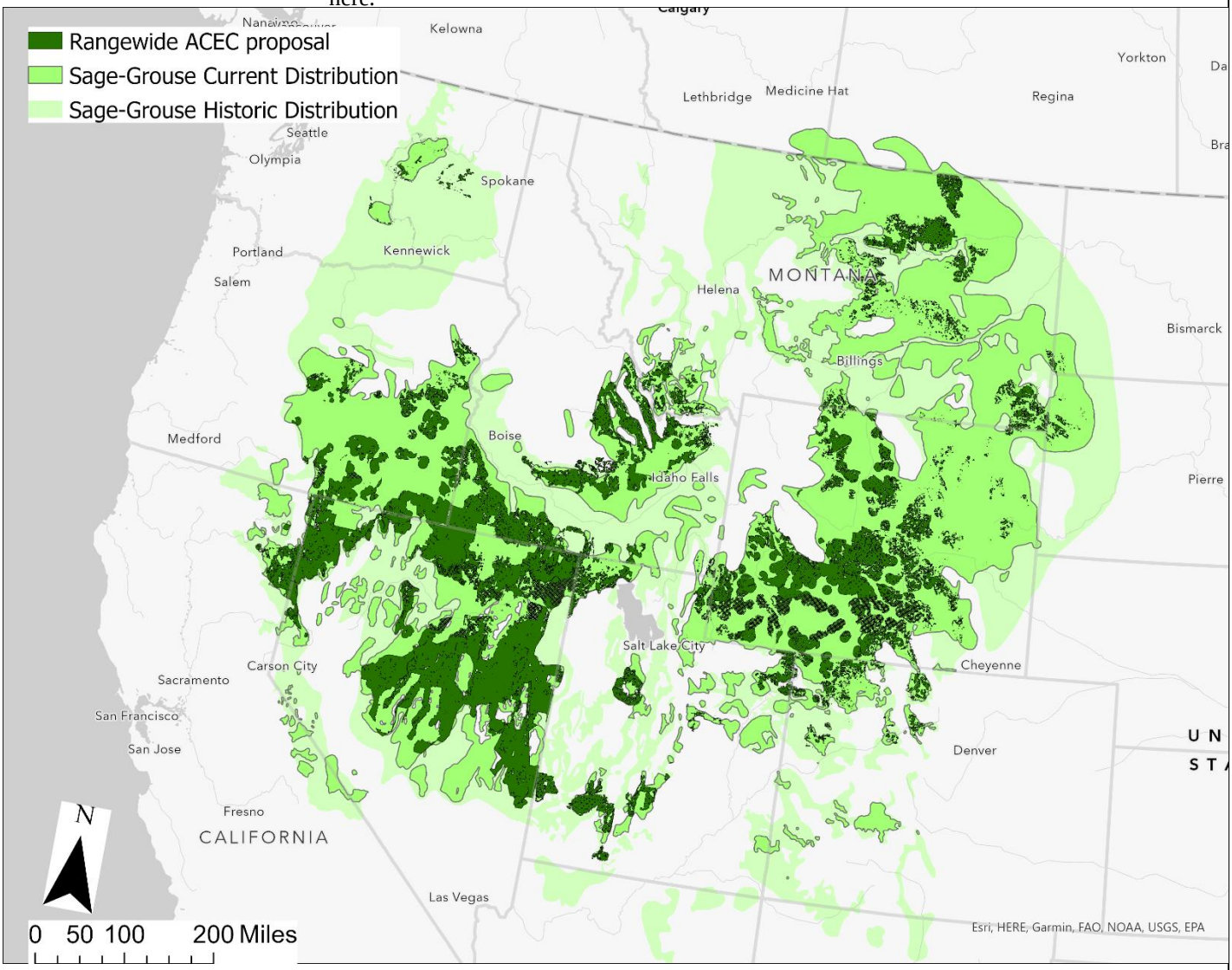
Areas of Critical Environmental Concern (ACEC) Nomination

Name: Steve Holmer, Vice President of Policy, American Bird Conservancy
Address: 4301 Connecticut Ave. NW #451, Washington DC 20008

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Describe the Area to be Nominated

General location description: The Sagebrush Sea Reserve ACEC network includes much of the currently occupied priority habitats of the Greater sage-grouse (GrSG) in 10 western states. Map included here:



Acreage: 48,202,418 acres

Values considered: Biological; Ecological; Wildlife Habitat, especially for the Greater Sage-grouse (GrSG); Imperiled, Sensitive and Migratory Species Habitat; Resilient Sagebrush Habitat.

To be considered as a potential ACEC and analyzed in RMP alternatives, an area must meet at least one relevance criteria **and** at least one importance criteria as established in BLM Guidance 43 CFR 1610.7-2.

1) RELEVANCE CRITERIA		
Relevance Criteria: *There shall be present a "significant" historic, cultural, or scenic value; a fish or wildlife resource or other natural system or process; or natural hazard. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:*		
Relevance Value	**Yes/No**	**Describe Rationale**
1)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).	No	We did not analyze this relevance criteria.
1) 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).	Yes	The nominated network of Sagebrush Sea Reserves ACECs (Figure 1 above) contains the most important habitat for GrSG across its range and other sensitive and threatened native species that rely on healthy sagebrush systems. We have captured the most important places for GrSG because our ACEC proposal is squarely based on the Sage-grouse Priority Areas for Conservation (PACs, USFWS 2013). The PACs were delineated in a joint effort of the US Fish and Wildlife Service (USFWS) and state fish and wildlife agencies, based on the 75% GrSG breeding density analysis performed by Doherty et al. (2010) which captured all the area (within a 4-mile radius) around 75% of the leks across the range. In addition, to ensure connectivity within and between the PACs, the PACs also reflect important winter and/or brood rearing habitat that were known at the time. Moreover, because the proposed network of Sagebrush Sea Reserve ACECs include, by design, a mixture of the most important breeding habitat and winter and/or brood rearing habitat, the network incorporates a diverse assemblage of different sagebrush species and associated herbaceous species, elevations, aspects and soil types.
1) c. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relict plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Currently high-functioning and properly conserved sagebrush communities with adequate resiliency, redundancy, and representation critical to support GrSG and other sagebrush dependent at-risk species are rare and declining (Remington et al. 2021). As discussed in the attached Nomination Report in the section on long-term resilience of sagebrush systems in the West (and also discussed in Remington et al. 2021), many models currently indicate that sagebrush cover is vulnerable to a drying and warming climate.
1) d. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.	No	We did not analyze this relevance criteria.

2) IMPORTANCE CRITERIA		
Importance Criteria: *The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness or cause for concern. A natural hazard can be important if it is a significant threat to human life or property.*		
Importance Value	**Yes/No**	**Rationale for Determination**
2) 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.	Yes	The nominated proposed network of Sagebrush Sea Reserves ACECs is based on the PACs. US Fish and Wildlife Service identified the PACs as a whole as the essential foundation for the conservation of the sage grouse and stated that "...loss of a PAC, or significant reduction in available habitat within a PAC, will reduce redundancy and representation across the sage-grouse range, thereby increasing the risk of local extirpation and loss of population connectivity…it is imperative that no PACs are lost as a result of further infrastructure development or other anthropogenic impacts" (USFWS 2013 at 36-37). These statements demonstrate that the nominated ACEC network that is based on the PACs is nationally significant and that it is necessary to protect the entire network and not just parts of it for the long-term conservation of the sage grouse. It should also be noted that the nominated ACEC network contains patches that link to others across state lines and patches that link to higher elevation habitats that the birds are likely to utilize more extensively into the future as temperature regimes continue to change and push big sagebrush-steppe plant communities and sage-grouse higher in elevation (Remington et al. 2021).
2) b. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The current proposed network of ACECs has already been identified by USFWS in coordination with state wildlife agencies to contain habitat that is valuable and necessary for all GrSG life stages, including lekking, brood-rearing, and winter range (USFWS 2013). Collectively, this network encompasses fragile ecosystems that are degrading in their functionality for GrSG and other sagebrush obligate species and, if current trends continue, may be profoundly impacted by increased habitat loss and degradation caused by land use activities (e.g., energy development) and stressors (e.g., drought, invasives, & climate change as summarized by Remington et al. 2021).
2) c. Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Establishing the proposed Sagebrush Sea Reserves ACECs for GrSG and other sagebrush obligates is in line with national priorities, such as: • Those outlined by President Biden's Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad" (speaks to the need to conserve our lands and waters and the biodiversity they contain, and lays out steps that the United States should take to achieve the goal of conserving at least 30 percent of our lands and waters by 2030). • Secretary Zinke's 2018 Secretarial Order 3362: "Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors" (which emphasizes the importance of conserving & improving elk, mule deer, and pronghorn habitat) • Amending 98 Forest Service and BLM Land Use Plans for GrSG (based on the level of effort that went into the original 2015 RMP amendments, planning for the future persistence of this species is a national priority)

		• BLM's FLPMA mandate to manage our public lands in a manner "that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values." Additionally, BLM is expected to preserve "certain lands in their natural condition; that will provide food and habitat for fish and wildlife."[5] The designation of our proposed ACEC network will advance these statutory mandates. • BLM's FLPMA's multiple use mandate, within which wildlife habitat is a "use"; the agency must balance resources to take into account "the long-term needs of future generations for renewable and nonrenewable resources, including… wildlife and fish" to achieve the "harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment." The designation of our proposed network of critical GrSG habitat as ACECs will advance achieving this important mandate of FLPMA.
2) d. Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	We did not analyze this importance criteria.
2) e. Poses a significant threat to human life and safety or to property.	No	We did not analyze this importance criteria.

Please attach a map depicting the BLM lands being recommended. Please attach additional pages as necessary. Alternatively, please download form online and complete electronically (www.blm.gov/ak/cyrmp).

A .jpg map of the proposed, and nominated, Sagebrush Sea Reserve ACEC network is inserted at the beginning of this form. In addition, we are submitting all the GIS data used to create the proposal, as well as all the overlays in the attached nomination report, to the BLM via a google drive link: https://drive.google.com/drive/folders/1dBL665SehRTVd8G3RrDGMr6Jr1vz9NJw?usp=sharing

We are attaching a full nomination report to this form, which goes into detail on the methods used to create this ACEC proposal, justification for the need to better protect these units of the proposed Sagebrush Sea Reserve for Greater sage-grouse and other sagebrush-dependent species, and the need for special management attention for these important places on BLM lands. Literature Cited above we include here:

Doherty, K.E., J.D. Tack, J.S. Evans, J.SN. and D.E. Naugle. 2010. Mapping breeding densities of greater sage-grouse: a tool for range-wide conservation planning. BLM completion report: Agreement # L10PG00911.

Remington, T.E., P.A. Deibert, S.E. Hanser, D.M Davis, L.A. Robb, L.A. and J.L. Welty. 2021. Sagebrush conservation strategy—Challenges to sagebrush conservation: U.S. Geological Survey Open-File Report 2020–1125, 327 p., https://doi.org/10.3133/ofr20201125.

U.S. Fish and Wildlife Service (USFWS). 2013. Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report. U.S. Fish and Wildlife Service, Denver, CO. February 2013.

NOMINATION FOR A NETWORK OF SAGEBRUSH SEA RESERVE AREAS OF CRITICAL ENVIRONMENTAL CONCERN TO BENEFIT THE GREATER SAGE-GROUSE AND SAGEBRUSH HABITAT

I. INTRODUCTION

Over the past two centuries the extent and diversity of sagebrush systems have diminished substantially. The degradation, conversion, and fragmentation of the sagebrush landscape due to agricultural development, pervasive livestock grazing, fire, and energy development has led to increased isolation of the Greater sage-grouse (GrSG, *Centrocercus urophasianus*) across its range and steady population declines. In fact, a recent report by the U.S. Geological Survey (USGS) has found that Greater sage-grouse populations have declined significantly over the last six decades, with an 80% rangewide decline since 1965 and 40% decline since 2002 (Coates et al. 2021).

Even as state fish and wildlife agencies, and more recently the U.S Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS) and the Bureau of Land Management (BLM) have attempted to address these problems and employ better land management practices to help the plight of the sage-grouse, rising threats to sage-grouse habitat are adding to the cumulative impacts of past and present activities that have already compromised the diversity and natural resilience of the sagebrush system on which GrSG rely. This situation is now being compounded by a rapidly changing climate and the proliferation of exotic and invasive vegetation (Remington et al. 2021) as well as ongoing habitat loss and degradation resulting from a range of land use activities. Numerous modeling studies indicate that the combined effect of climate change, increased exotic annuals, and the increase in fire that result from that interaction, will lead to further decreases in sagebrush cover across the range of GrSG (Remington et al. 2021). In response to the threat of climate change on imperiled wildlife, the National Fish, Wildlife and Plants Climate Adaptation Partnership (2012) stressed that reducing human-induced stressors is now more important than ever in a climate-changed world and makes the call to "[r]educe non-climate stressors to help fish, wildlife, plants, and ecosystems adapt to a changing climate."

In 2015 the Land Use Amendments for GrSG were implemented with the hope this would lead toward the stabilization and reversal of downward GrSG population trends and avoid listing the species as threatened or endangered. Yet, in its recent 5-year monitoring plan, BLM acknowledges that, across BLM holdings in sage-grouse habitat since 2015, sagebrush availability has decreased by ~3%. Invasive plants have increased from being present on a little over 50% of GrSG habitat in 2013, to nearly 70% of habitat in 2018; and the area of the Sagebrush Sea where invasive plants are abundant (>25% of vegetative cover) has also increased, from about 10% in 2013 to nearly 30% in 2018 (Herren et al. 2021). And, since 2015, in 16 cases habitat triggers established in the plan amendments were tripped, indicating that habitat losses have exceeded thresholds set in the respective land use plan (Herren et al. 2021). Even more concerning, the BLM found 42 cases where both hard and soft population triggers have been tripped since 2015 (Herren et al. 2021). This comports with similar findings in the recent comprehensive USGS report, which found a nearly 40% decline in populations of GrSG rangewide since 2002 (Coates et al. 2021).

It is abundantly clear that the 2015 land use plan amendments that established tens of millions of acres of Priority Habitat Management Areas with a range of management prescriptions are not effectively curbing the GrSG's current trend toward extinction across its range. The undersigned propose that the unique and valuable resources of a collective network of proposed units described herein merit protection through designation as Areas of Critical Environmental Concern (ACEC). While this collective network of units was delineated based on the habitat needs of GrSG (including the Columbia Basin population of GrSG but not the bi-state population),[1] the protection of these units will benefit many other imperiled or diminishing

[1] The bi-state population of GrSG has been identified as a Distinct Population Segment because it is genetically distinct and geographically isolated, and as such has been petitioned for federal listing since it is in danger of extirpation due to low population levels and downward population trends. Thus, we are not including this population's habitat in this ACEC proposal as this population is being treated separately from the rest of the species by the federal agencies like USFWS. While the Columbia Basin population is likely also genetically distinct and

sagebrush-dependent species as well. The nominated ACEC network meets multiple relevance and importance criteria and, as we demonstrate below, requires special management to protect and prevent irreparable damage to these relevant and important values and resources.

II. BLM REQUIREMENTS FOR ACEC DESIGNATION

The Federal Land Policy and Management Act (FLPMA) planning requirements[2] obligate the Bureau of Land Management to "give priority to the designation and protection of [ACECs]." ACEC inventory and evaluation criteria are set forth in regulation[3] and agency guidance (BLM Manual 1613). A potential ACEC must possess *relevance* (such that it has significant value(s) in historic, cultural or scenic values, fish and wildlife resource, other natural systems/processes, or natural hazards) and *importance* (such that it has special significance and distinctiveness by being more than locally significant or especially rare, fragile or vulnerable). BLM Manual 1613 states that for an area to be considered as an ACEC, it must meet at least one criterion for both relevance and importance.

In addition, the potential ACEC must require "special management attention"[4] to protect the relevant and important values where current management is not sufficient to protect these values or where the needed management action is considered unusual or unique. All ACECs meeting at least one relevance criterion and at least one importance criterion must be considered as potential ACECs under at least one alternative in the upcoming environmental impact statement (EIS) to further amend the resource management plans (RMPs) for GrSG.

The BLM Manual also sets out more specific requirements for how consideration of ACECs should be conducted during the land use planning process. The BLM Manual requires that each area recommended for consideration as an ACEC—including when externally nominated—be considered by BLM, through collection of data on relevance and importance and evaluation by an interdisciplinary team. If they are not to be designated, the analysis supporting the negative conclusion "must be incorporated into the plan and associated environmental document" (BLM Manual 1613.21).

III. METHODS USED TO DELINEATE UNIT BOUNDARIES OF ACEC PROPOSAL

We generated the ACEC proposal[5] by incorporating all Priority Areas for Conservation[6] (PACs, USFWS 2013) that overlapped with BLM Lands (clipped to surface management lands[7]) for all states in GrSG range, except for Wyoming[8] and Nevada where we modified this base layer as follows. For Wyoming, we

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geographically isolated, it has not yet been designated as a Distinct Population Segment, so this population's habitat is included in this ACEC proposal.

[2] 16 USC § 1712(c)(3)

[3] 43 CFR § 1610.7-2

[4] 43 USC § 1702(b)

[5] All shapefile data used in this report, both in this section and for various overlays featured below, are referenced as they are first described. The final shape file of the ACEC proposal is here: https://drive.google.com/drive/folders/1dBL665SehRTVd8G3RrDGMr6Jr1vz9NJw?usp=sharing.

[6] https://databasin.org/datasets/120d1f61616a4770b2959b8bccb43aed/

[7] https://landscape.blm.gov/geoportal/catalog/search/resource/details.page?uuid=%7B2A8B8906-7711-4AF7-9510-C6C7FD991177%7D

[8] We created an ACEC proposal for Wyoming built on the Doherty 2010 breeding density coverage and the original PACs for Wyoming because state Core Area designations were modified to exclude places of interest for oil and gas development during the designation process, and the USFWS adopted the modified core area designations into their PAC designations rather than adhering to US Fish and Wildlife Service's assertion that all PACs were essential habitats necessary for the greater sage grouse's long-term survival (USFWS 2013).

added to the Wyoming PACs the Doherty et al. (2010)[9] breeding density (75%) layer, as well as the new Wyoming Core Area designations that occurred in 2015[10] by gubernatorial Executive Order (and were incorporated as expanded PHMAs in the 2020 ARMPAs). We excised out of the ACEC proposal areas in Wyoming that had a density of active oil and gas wells that exceed 5 wells per square mile based on the Wyoming-specific oil and gas active drilling layer (drilling and pumping)[11].

For Nevada, the boundary was drawn and cross-checked consulting relevant data sets including NDOW (2012)[12] and Coates (2016), and ground-truthed through extensive field visits to the areas proposed for protection. The goal was to increase coverage of important seasonal habitats for GrSG (NDOW described Summer Range, Winter Range and Nesting/early Brood Rearing habitat) and ensure connectivity between numerous patches of high-quality habitat that are separated by rocky mountain ranges, playas, and other expanses of marginal quality habitat, which is a unique topographic feature of Central Nevada GRSG habitat among other greater sage grouse populations. The ACEC proposal includes habitat in central Nevada south of I-80 and is made up of 57.2% of winter range, 73.3% of summer range and 43.7% of nesting habitat with a total of 79.2% of habitat being in at least one of these 3 essential seasonal habitats. The balance of these acres in Nevada's part of the ACEC proposal will ensure connectivity and gene flow between high quality habitat patches by limiting disturbance and fragmentation in those areas in order to reduce population isolation and maintain connectivity and gene flow (Bush et al 2011, Cross et al 2018).

Figure 1. depicts the nominated Sagebrush Sea Reserve network of ACECs. Our GIS mapping process did not allow for the refinement of the proposed ACEC boundaries to accommodate non-federal (state or undeveloped private) inholdings that are otherwise surrounded by BLM ownership.

We have not provided names for each proposed ACEC that form the network of the Sagebrush Sea Reserve. We recommend that, consistent with *BLM Manual* 1613.33A, that BLM name each ACEC in the following form: "[Place Name] Sagebrush Sea Reserve Area of Critical Environmental Concern." The place name should reflect "a particular physical feature of an area," as called for in the BLM Manual.

As explained below, this network of ACECs meets BLM's Relevance and Importance Criteria for ACEC designation. Below we also describe why this network of units requires special management attention and include overlays with both special values (such as known ranges of other rare and imperiled sagebrush species) and as looming threats to further justify the need for this network of units to be protected together as one holistic network of ACECs.

[9] https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/Pages/sagegrouse.aspx
[10] https://wgfd.wyo.gov/Habitat/Sage-Grouse-Management/Sage-Grouse-Data
[11] http://pipeline.wyo.gov/legacywogcce.cfm
[12] https://www.fws.gov/nevada/nv_species/documents/sage_grouse/392012-Maps/Printable_Greater_Sage-Grouse_Habitat_Categorization_Map.pdf

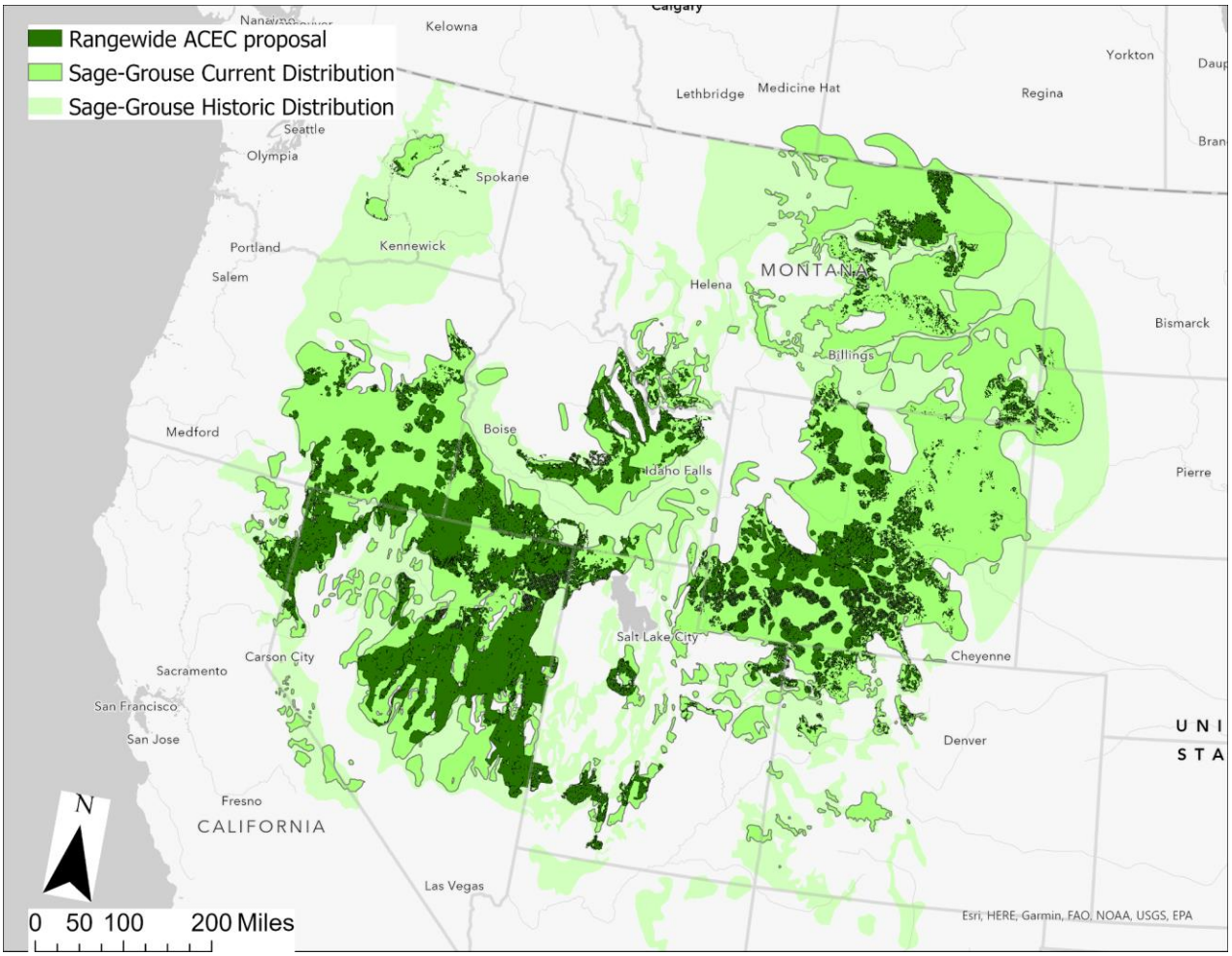

Figure 1. The proposed Sagebrush Sea Reserve network of ACECs.

IV. THE ACEC PROPOSAL MEETS BLM'S RELEVANCE AND IMPORTANCE CRITERIA

a) The proposed network of ACECs meets one or more of BLM's Relevance criteria

BLM Criterion: *Fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species, or habitat essential for maintaining species diversity)*. The nominated network of Sagebrush Sea Reserves ACECs (Figure 1) contains the most important habitat for GrSG across its range and many other sensitive and threatened native species that rely on healthy sagebrush. Our ACEC proposal is squarely based on the Sage-grouse Priority Areas for Conservation (PACs, USFWS 2013) which were delineated in a joint effort of the USFWS and the state fish and wildlife agencies. PACs are based on the 75% GrSG breeding density analysis performed by Doherty et al. (2010) which captured all the area (within a 4-mile radius) around 75% of the leks across the range. In order to ensure connectivity within and between the PACs, the PACs also reflect critical winter and/or brood rearing habitat that were known at the time.[13] Moreover, because the proposed network of Sagebrush Sea Reserve ACECs include,

[13] The COT report (USFWS 2013) explains that the USFWS worked with the individual state fish and game agencies, with the "Doherty breeding density circles" (Doherhty et al. 2010) as the original basis to develop the PACS specific to each state. This included the best available spatial coverages for occupied sage-grouse habitat, including brood

by design, a mixture of most important breeding habitat and winter and/or brood rearing habitat, the network incorporates a diverse assemblage of different sagebrush species and associated herbaceous species, elevations, aspects and soil types.

BLM Criterion: *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)*. Currently high-functioning and properly conserved sagebrush communities with adequate resiliency, redundancy, and representation critical to support GrSG and other sagebrush dependent at-risk species are rare and declining (Remington et al. 2021). Many models currently indicate that sagebrush cover is vulnerable to a drying and warming climate (Remington et al., and references therein).

b) The proposed ACEC network meets one or more of BLM's importance criteria.

BLM Manual 1613 requires that the value, resource, system, process, or hazard that meet(s) the "relevance" criteria must also have substantial significance and values in order to satisfy the "importance" criteria. Collectively, and individually, the units of our Greater sage-grouse ACEC nomination meet the following criteria:

BLM Criterion: *The proposed ACEC has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.* The nominated proposed network of Sagebrush Sea Reserves ACECs is based on the PACs with refinements in Nevada and Wyoming as described in the methods section. USFWS identified the PACs as a whole as the essential foundation for the conservation of the sage grouse and stated that "...loss of a PAC, or significant reduction in available habitat within a PAC, will reduce redundancy and representation across the sage-grouse range, thereby increasing the risk of local extirpation and loss of population connectivity…***it is imperative that no PACs are lost as a result of further infrastructure development or other anthropogenic impacts***" (USFWS 2013 at 36-37) (emphasis added). Since USFWS has determined that every PAC is critical, the nominated ACEC network that is based on the PACs is nationally significant and that it is necessary to protect the entire network and not just parts of it for the long-term conservation of the sage grouse. It should also be noted that the nominated ACEC network contains patches that link to others across state lines and patches that link to higher elevation habitats that the birds are likely to use more extensively into the future as temperature regimes continue to change and push big sagebrush-steppe plant communities and sage-grouse higher in elevation (Remington et al. 2021).

BLM Criterion: *The proposed ACEC has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.* The current proposed network of ACECs has already been identified by the state wildlife agencies and the USFWS to contain habitat that is valuable and necessary for all GrSG life stages, including lekking, brood-rearing, and winter range (USFWS 2013). Collectively, this network encompasses fragile ecosystems that are degrading in their functionality for GrSG and other sagebrush obligate species and, if current trends continue, may be profoundly impacted by increased habitat loss and degradation caused by land use activities (e.g., energy development and transmission) and stressors (e.g., drought, invasives, climate change, as summarized by Remington et al. 2021).

BLM Criterion: *The proposed ACEC has been recognized as warranting protection in order to satisfy national priority concerns to carry out the mandates of FLPMA*.

rearing and important winter habitat. The states used the best data they had at the time, but in 2012 the data was not comprehensive and inconsistent, especially that for important GrSG winter habitats.

Establishing the proposed Sagebrush Sea Reserves ACECs for GrSG and other sagebrush obligates is also in line with national priorities, such as those outlined by President Biden's Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad." Specifically, Section 216 of EO 14008 speaks to the necessity of conserving our lands and waters and the biodiversity they contain, and lays out steps that the United States should take to achieve the goal of conserving at least 30 percent of our lands and waters by 2030. The establishment of a large network of Sagebrush Sea Reserve ACECs, along with a concurrent withdrawal from mining, mineral location, and leasable minerals for the primary purpose of bolstering conservation for GrSG, would significantly further these efforts.

In addition, establishing this network of connected, protected ACECs aligns with Secretary Zinke's 2018 Secretarial Order 3362 (Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors) which emphasizes the importance of conserving and improving elk, mule deer, and pronghorn habitat. In particular, S.O. 3362 directs that the BLM apply site-specific management activities that conserve or restore habitat necessary to sustain local and regional big-game populations. Because the Sagebrush Sea Reserve ACEC network is by design well-connected across the landscape, adequately conserving this network for the long-term will be highly beneficial for wide-ranging migratory species.

In addition, based on the level of effort that went into the original 2015 RMP amendments of 98 Forest Service (USFS) and BLM land and/or resource management plans for GrSG, planning conservatively and correctly for the future persistence of this species is a national priority. To this effect the BLM Washington Office issued two instructional memorandums, Instruction Memorandum 2012-043 and Instruction Memorandum 2012-044, to help guide the BLM through its land use planning processes for GrSG across each state and to identify these processes as a national priority.

Protecting the proposed network of sage-grouse ACECs will significantly further BLM's FLPMA mandate to manage our public lands in a manner "that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values."[14] Additionally, BLM is expected to preserve "certain lands in their natural condition; that will provide food and habitat for fish and wildlife."[5] Because of these mandates, FLMPA encourages the development of ACECs.[15]

Under FLPMA's multiple use mandate, within which wildlife habitat is a "use," the agency must balance resources to take into account "the long-term needs of future generations for renewable and nonrenewable resources, including… wildlife and fish" to achieve the "harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment."[16] The designation of our proposed network of critical GrSG habitat as ACECs will go a long way toward achieving this important mandate of FLPMA – "FLPMA balancing." The basic principle of FLPMA balancing is that the agency cannot plan for all the multiple uses at once on all the lands (Feller et al. 1996). Conserving a portion of western BLM lands as ACECs to ensure persistence of GrSG (and many other rare sagebrush-dependent species as we outline below) will help the BLM achieve FLMPA balancing across BLM lands.

In summary, designating this network of proposed units as ACECs would satisfy current national priorities and enable the BLM to better meet the mandates of FLPMA. This designation and the accorded special management attention would balance the resources in a way that benefits greater sage-grouse and many other species by protecting and preserving the quality of the habitat in a natural condition, while continuing to allow many other multiple uses outside the ACECs across the Resource Areas.

[14] 43 U.S.C. § 1701(a)(8))
[15] 43 U.S.C. § 1701(a)(11)
[16] 43 U.S.C. § 1702(c)

V. THE HABITATS INCLUDED IN THE SAGEBRUSH SEA RESERVES ACEC PROPOSAL REQUIRE SPECIAL MANAGEMENT ATTENTION

"Special management attention" refers to management prescriptions developed during preparation of an RMP expressly to protect the important and relevant values of an area from the potential effects of actions permitted under the RMP. These are management actions that would not be necessary if the relevant and important values were not present.[17]

One of the chief reasons the network of ACECs proposed in the Sagebrush Sea Reserves require special management attention is that currently designated Priority Habitat Management Areas and attendant management prescriptions (PHMA) on BLM lands are not stabilizing or reversing GrSG declining population trends (Coates 2021, Remington 2021). USFWS identified Priority Areas for Conservation (USFWS 2013) which they deemed as the essential foundation for greater sage-grouse conservation. PHMAs are a subset of those essential PACs. Further, the 2015 plans' prescribed management for PHMAs is based on the approach of avoiding, minimizing and mitigating damage including allowing waivers, exceptions, and modifications. In light of the continued downward trend in sage-grouse populations, this ACEC nomination promotes a more certain and scientifically justified approach to habitat conservation.

BLM's recent Rangewide Monitoring Report for 2015-2020 reports that 1.9 million acres, or approximately 3% of the existing sagebrush cover in PHMA/IHMA within Biologically Significant Units was lost between 2012 and 2018 due to a combination of factors and 16 habitat triggers and 42 population triggers were tripped (Herren et al. 2021). Coates et al. (2021) concluded that "There is only a 50% chance that most leks will be productive in about 60 years from now *if current conditions persist*."[18] (Emphasis added). Critically, this rangewide report does *not* count as lost habitat areas that have been leased for oil, gas or coal or other leasable minerals, granted rights-of-way or grazing allotments that do not meet land health standards.

Below a series of GIS analyses and overlays illustrate why special management attention that departs from the current approach to PHMA[19] management is warranted.

a.) 929,705 acres have been leased for oil and gas extraction in PHMAs since 2015

Since 2015, 1,632,957 acres of oil and gas leases have been offered for sale and 929,705 acres leased in PHMA. Figure 2 depicts oil and gas leases both offered[20] and sold[21] since 2015 in PHMA. As described in-depth in Section VI. (a), oil and gas development within a few miles of a lek and within and nearby nesting habitat has been shown in numerous studies (cited below) to be highly detrimental to GrSG populations.

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[17] 43 CFR § 1601.0-5(a)

[18] See https://www.usgs.gov/news/national-news-release/new-research-highlights-decline-greater-sage-grouse-american-west.

[19] For the purposes of these PHMA overlays, we define PHMA as PHMA plus Idaho Habitat Management Areas (IHMA) plus Landscape Connectivity Habitat Management Areas (LCHMA). https://www.sciencebase.gov/catalog/item/5d8106dde4b0c4f70d057b55

[20] Center for Biological Diversity compiled quarterly lease sales statistics offered based on E-planning for the years 2015-2021 and converted the information to GIS data.

[21] Center for Biological Diversity compiled quarterly lease sale statistics and converted to GIS data for use in this report.

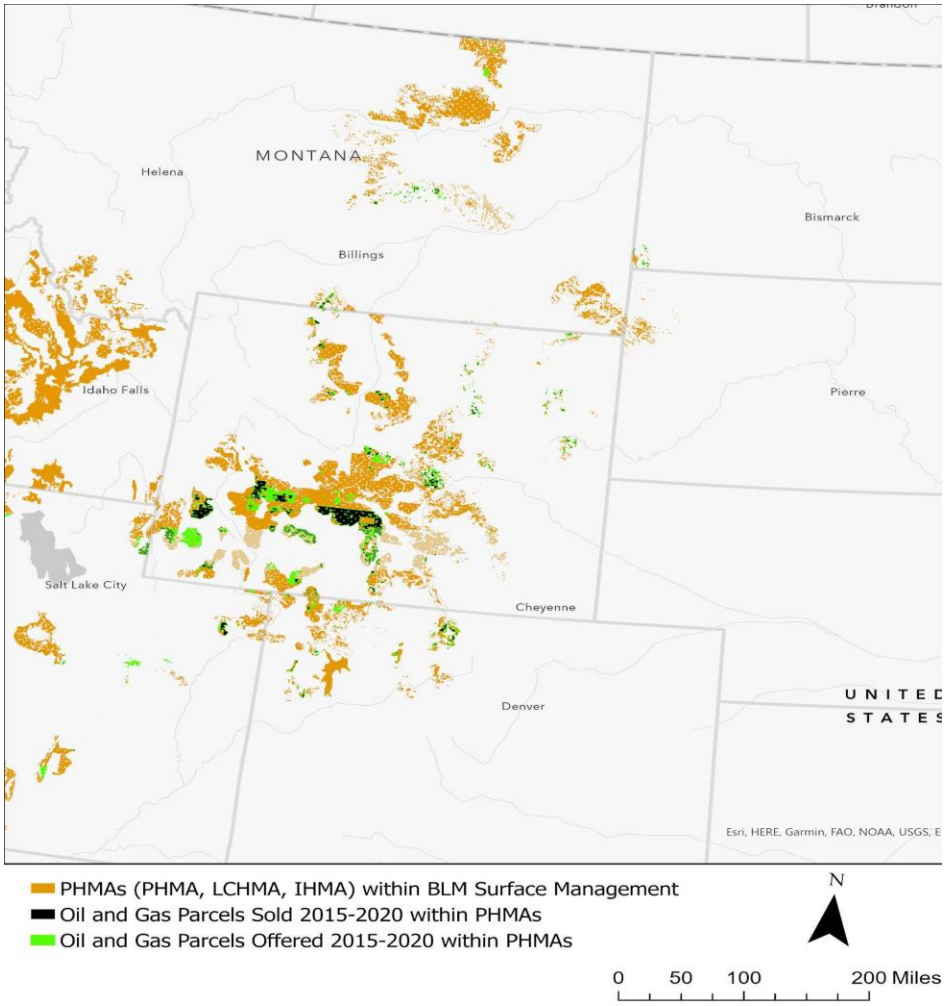

Figure 2. Oil and gas leases both offered and sold since 2015 in Priority Habitat Management Areas.

b.) 13,677 miles of new Rights of Way have been established in PHMAs since 2015

Per the 2015 RMPAs, the establishment of new rights of way (ROW) is to be avoided where possible in PHMA. Despite this plan direction, Figure 3 illustrates where 13,677 miles of new ROWs[22] have been established in PHMA since 2015. Granting ROWs for roads and transmission lines negatively affect greater sage-grouse and facilitates further habitat degradation and loss. Roads have multiple impacts on sage-grouse which are well studied (e.g., SGNTT 2011), including that sage-grouse may be affected by roads up to 6.9 km (4.2 miles) away (Connelly et al. 2004). We go into more details on the effects of roads and transmission lines on GrSG and other wildlife in the section justifying our proposed ACEC management stipulations below.

[22] https://data.doi.gov/dataset/blm-national-rights-of-way-public-display-polygons1

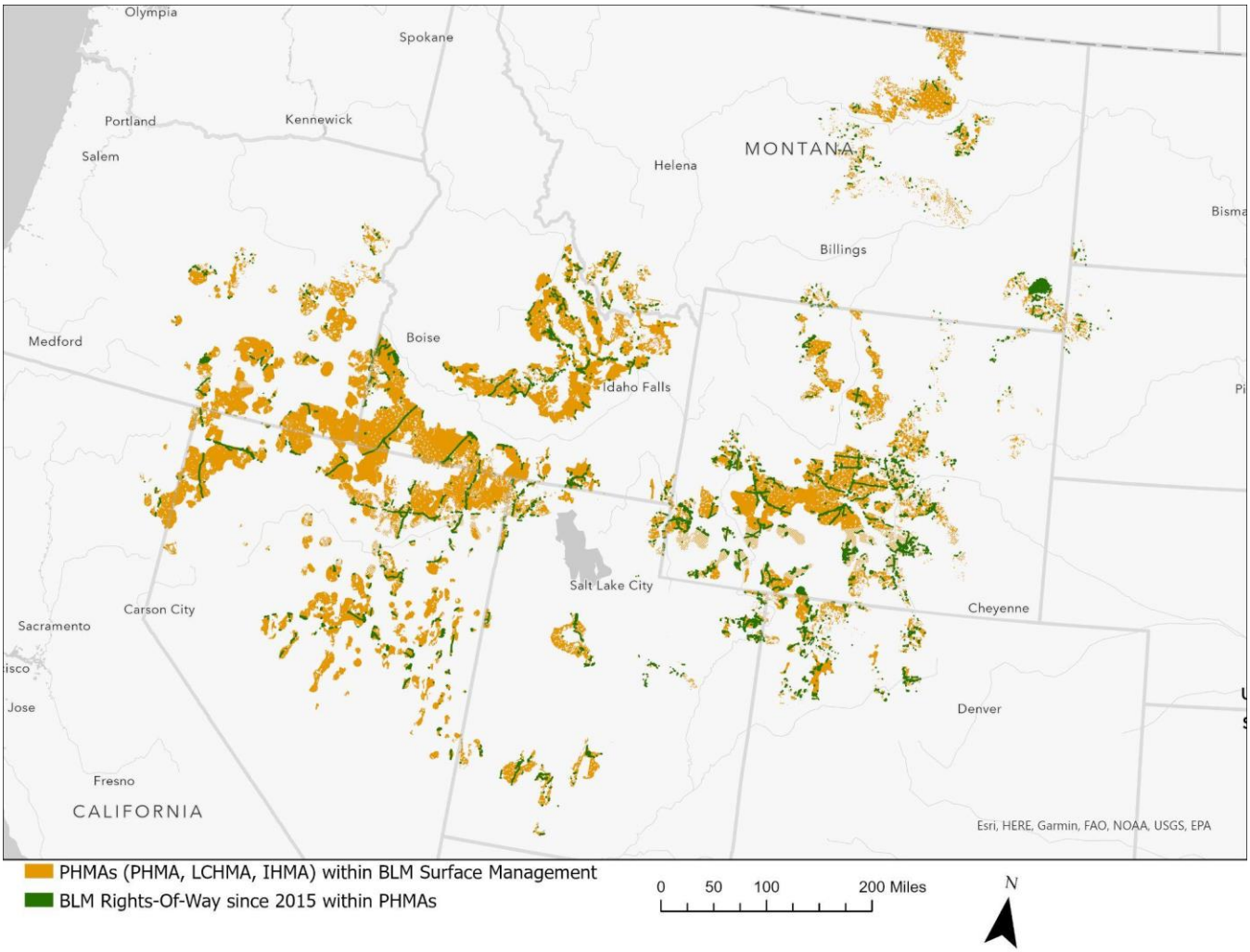

Figure 3. 13,677 miles of new ROWs have been established in Priority Habitat Management Areas since 2015.

Power and transmission lines are detrimental to sage-grouse because of increased predation risk (Steenhof et al. 1993; Lammers and Collopy 2007). Sage-grouse habitat use increased with distance (up to 600 meters) from power lines (Braun, unpublished data, reported in Strickland 2004). Deaths resulting from collisions with power lines are also a source of mortality for sage-grouse (Beck et al. 2006; 75 FR 13910). The NTT report concluded that overhead power lines cause sage-grouse to avoid habitat and increase the risk of mortality due to both predation and collisions (SGNTT 2011).

Since GrSG avoid surface disturbances, the actual acreage of habitat lost by these rights-of-way is many times larger than the ROW footprint alone. We are especially concerned about future rights-of-way in the form of several of the proposed transmission corridors that are being contemplated in GrSG habitat. See section VI.c. on renewable energy below.

c.) 16.5 million acres of grazing allotments within PHMA are failing the Rangeland Health Standards, and an additional 8.2 million acres have not been evaluated

The 2015 Sage-grouse RMPA amendments require the BLM to evaluate whether allotments are meeting the federal Rangeland Health (RLH) Standards with PHMA as a top priority for evaluation (e.g., BLM 2015a). The Plan amendments call on the BLM to focus monitoring and management activities on allotments found

not to be achieving the Rangeland Health Standards where livestock grazing is identified as a causal factor and that have the best opportunities for conserving, enhancing or restoring habitat for GRSG. Figure 4 shows that 16.5 million acres within PHMAs are currently not meeting (but moving towards) RLH standards, and 8.2 million acres, have yet to be assessed. Of the 16.5 million acres in PHMA not meeting the Rangeland Health standards, the BLM reports that 12.2 million acres are not meeting standards due to livestock grazing. So far, the BLM has found that only 9.8 million acres are meeting the RLH standards within PHMA.[23]

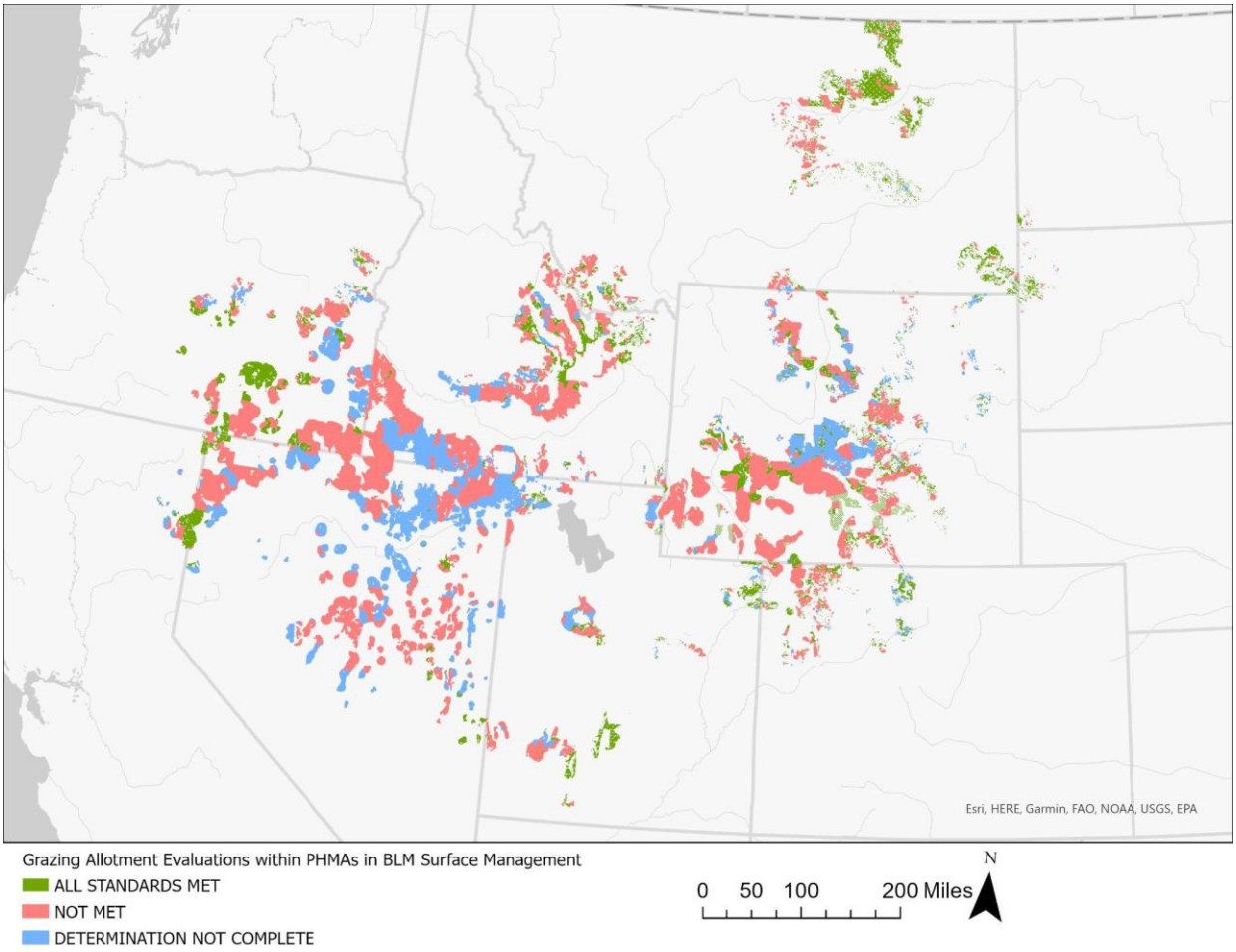

Figure 4. Areas (representing BLM grazing allotments or portions of allotments) that are currently meeting the federal Rangeland Health Standards, are not currently meeting Standards or have yet to be assessed for Rangeland Health.

d.) Since PHMAs were established in 2015, sage-grouse have continued their steady decline across its range

The USGS in 2021 published a report on greater sage-grouse populations and concluded that populations have declined 80% rangewide since 1965 and nearly 40% since 2002. Further, the authors found that there is only a 50% chance that most leks will be productive in about 60 years from now ***if current conditions***

[23] Data sources: BLM Rangeland Health Status (2020) - The Significance of Livestock Grazing on Public Lands
BLM's allotment Land Health Standards (LHS) assessment records (1997 - 2019)
BLM LAND HEALTH STATUS (2020) (https://mangomap.com/peer/data/blm_natl_grazing_allot_lhs2020.shp)

persist (Coates 2021).

This finding comports with the BLM Rangewide Monitoring Report for 2015-2020 that found that populations of GrSG in nearly all states where the species exist are continuing long-term population declines. BLM concluded that "This report, along with the USGS rangewide population monitoring report and the USGS sagebrush conservation strategy, emphasizes the urgent need to expand ongoing efforts to conserve currently functional habitat and restore currently degraded habitat" (Herren et al. 2021).

Below we restate population numbers and trends taken from the 5-year monitoring report[24] (Herren et al. 2021), including not only short-term trends from 2015 to today, but also concerning long-term trends.

Idaho populations. GrSG populations in Idaho have not done well since 2015. The BLM (Herren et al. 2021) reports that in Idaho since 2015, 2 soft and 6 hard population triggers have been tripped. Unfortunately, the BLM's Rangewide Monitoring Report for 2015-2020 only includes Idaho sage-grouse population data for 2015 through 2020, instead of back to 2000 or earlier, like the other states provide. The state-wide numbers for GrSG in Idaho were 5,539 in 2015 but have dropped to 3,249 in 2020.

Nevada populations. GrSG populations in Nevada have not done well since 2015. Since 2015, 15 soft and 5 hard population triggers have been tripped. This population decline comports with longer term trends seen in average male lek attendance since 2000. According to BLM, average male lek attendance went from an average of 19.7 males per lek in 2000 to 15.4 males per lek in 2019. A negative log regression line shown through the male attendance summary chart in appendix 11 of Herren et al. (2021) indicates that this trend is real and concerning.

Oregon populations. Populations of greater sage-grouse in Oregon have reached their lowest point ever recorded. Since the Oregon RMPA plan amendments were implemented, 24 soft population triggers and 13 hard population triggers have been tripped. This comports with longer term trends seen in both overall population numbers and average male lek attendance in the state since 1980. The BLM and Oregon Department of Fish and Wildlife report that overall population numbers were almost 45,000 in the late 1980's, but those numbers have dropped to less than 15,000 in 2020. Moreover, average male lek attendance reached an average of 32 or more males/lek three times between 1985 and 2005; but by 2020 this number had dropped to an average of only 13 males/lek (Herren et al. 2021, ODFW 2021). And male lek attendance in the 2020 population count, which represents the true nadir of the current "population trough" (it edged slightly up in 2021), was lower than the nadir of the previous trough in 2010/2011. The same trend can be seen in average male lek attendance; the 2020 low point was also less than the average lek attendance of the previous low point in 2010/2011 (Herren et al. 2021, ODFW 2021).

Utah populations. Since 2015, the BLM (Herren et al. 2021) reports 2 soft and 1 hard population triggers tripped. Since 2000, the Utah Division of Wildlife Resources reports that overall population numbers in the state were 2,497 in 2020, down from just over 3,000 in 2001. Moreover, average male lek attendance was 29 in 2001 (reflecting a steadily decline from a record high of 48 males/lek on average in 1961, UDWR 2020), but by 2020 this number had dropped to an average of only 11 males/lek (Herren et al. 2021, UDWR 2020). Importantly, and of further cause for concern, the population count in 2020, which represents the nadir of the current population trough was lower than the nadir of the previous trough in 2010/2011. The same trend can be seen in average male lek attendance. The 2019 low point (the number edged up just slightly in 2020) was also less than the

[24] The variations in reported monitoring data from the various states occur because not all states reported the same data or the same span of years to BLM for the 5-year monitoring report.

average lek attendance of the previous low point, in 2010/2011 (Herren et al. 2021, UDWR 2020).

Washington population. Washington contains a small percentage of individuals that make up the North American population of GrSG. The long-term trend of the Washington population is cause for concern. In 1970, 3,200 individuals were known to comprise the Washington population of GrSG. In 2015 when the plan amendments were implemented, this number had dropped to only 987 birds. In the most recent count in 2019, this number had dropped even further, to only 688 individuals (Herren et al. 2021). If this disturbing trend continues, this northwestern-most distribution of the species, isolated from other populations in Idaho and Oregon, could be extirpated in the not-too-distant future, an outcome even more likely with climate change.

Wyoming populations. The BLM (Herren et al. 2021) reports one soft population trigger tripped since 2015. Unfortunately, the BLM's (2020) Rangewide Monitoring Report for 2015-2020 only includes Wyoming sage-grouse population data for 2015 through 2020, instead of 2000 or earlier, like the other states provide. The state-wide numbers for GrSG in Wyoming were 36,542 in 2015, dropping steeply to 19,099 in 2020. Wyoming Game and Fish does provide data going back further on average male lek attendance over the last 20 years. Average males per lek in Wyoming reached a high in 2006 of 41.8 males/lek, but in 2021 this number fell to only 16.9 (WyoFile 2022). Wyoming Game and Fish biologists recently voiced concern over drops in GrSG populations, cautioning that the latest data on GrSG in Wyoming indicate an "alarming" likelihood of populations regressing to a 1996 nadir. The biologists cited preliminary data showing a 2021 ratio of 0.8 chicks per hen, which is below what's needed to stabilize the shrinking population (WyoFile 2022).

Colorado population. Numbers of this relatively small population (relative to the species' overall numbers) appear to be relatively stable according to population trend charts going back to both 2000, and 1976 (Herren et al. 2021).

Montana population. Numbers of this relatively small population (relative to the species' overall numbers) appear to be relatively stable according to population trend charts going back to 2000 (Herren et al. 2021).

As evidenced in the summaries of the eight states featured above, the adoption of the 2015 RMPA plan amendments is not reversing the largely downward trends of GrSG populations.

VI. JUSTIFICATION FOR INCREASED PROTECTION OF THESE UNITS

Our team mapped and summarized disturbances, threats, and vulnerabilities that currently or will threaten the proposed units of the Sagebrush Sea Reserves ACECs proposal. We also identified many other imperiled and rare native sagebrush-steppe obligate species that stand to gain from this new network of properly conserved ACECs. Current GrSG plans allow disturbance caps to reach 3-5%. Yet, on-going population declines are occurring with average disturbance rates of 0.71% range-wide, providing another strong indicator that increased protections are urgently needed for GrSG.

a.) Essential habitats for sage-grouse face continuing and increased threats from oil and gas development

Since 2015 2,978,133 acres of oil and gas leases have been offered for sale and 1,307,226 acres sold for lease within the boundaries of the ACEC proposal. Figure 5 depicts oil and gas leases both offered[25] and

[25] Center for Biological Diversity compiled quarterly lease sales statistics offered based on E-planning for the years 2015-2021 and converted relevant information to GIS.

sold[26] since 2015 within the ACEC proposal in the eastern portion of the GrSG range. According to Remington et al. (2021), oil and gas development has impacted 20% of the sagebrush habitat in the Rocky Mountain Region. Energy development directly destroys habitat, diminishes habitat quality surrounding the development and contributes to climate change, a growing threat to the sagebrush sea.

There is perhaps no aspect of sage-grouse and its habitat that has been studied more thoroughly than the impact of energy and mineral development. The individual synergistic and cumulative effects of expanded oil and gas development and related effects, such as surface disturbance, noise, and creation and use of access roads continue to fragment, degrade and eliminate sage-grouse habitat across its range (Connelly et al. 2011). The Sage Grouse National Technical Team's (SGNTT 2011) report and Salvo (2015) thoroughly review the effects of fluid mineral development on sage-grouse.

The NTT report underscores the profound impacts energy and mineral development has on GrSG habitat:

> "There is strong evidence from the literature to support that surface disturbing energy or mineral development within priority sage-grouse habitats is not consistent with a goal to maintain or increase populations or distribution. None of the published science reports a positive influence of development on sage-grouse populations or habitats. Breeding populations are severely reduced at well pad densities commonly permitted (Holloran 2005, Walker et al. 2007a). **Magnitude of losses varies from one field to another, but findings suggest that impacts are universally negative and typically severe"** (SGNTT 2011, emphasis added).

[26] Center for Biological Diversity compiled quarterly lease sale statistics and converted to GIS data for use in this report.

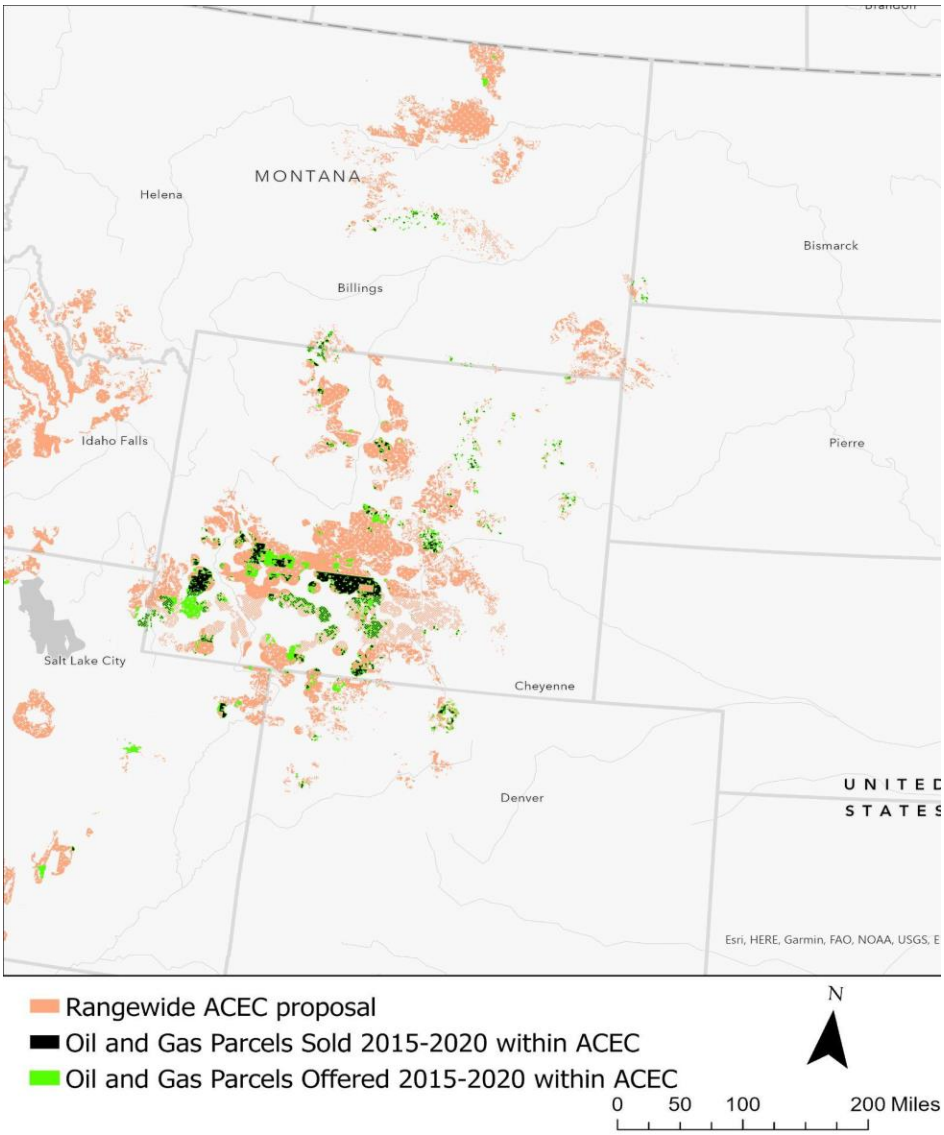

Figure 5. Oil and gas leases both offered and sold since 2015 in proposed ACEC units.

More recent studies confirm the NTT findings, especially regarding fluid mineral development. For example, Green et al. (2017) examined greater sage-grouse lek attendance, oil and gas well, and habitat and precipitation data from Wyoming over the period 1984 to 2008 and, consistent with numerous prior studies, found that lek attendance declines are closely associated with the density of oil and gas development, regardless of sagebrush cover and precipitation (Green et al. 2017 and references therein). Importantly, Green et al. (2017) confirmed that declines in sage-grouse populations continue even within Wyoming's core areas, which were initially considered adequate to recover sage-grouse populations. In addition, another recent study analyzing sage-grouse persistence in developed areas in Wyoming, Gamo and Beck (2017: 190), found that "energy development has been shown to specifically impact male sage-grouse lek attendance, lek persistence, recruitment of yearling male and female grouse to leks, nest initiation and site selection, nest survival, chick survival, brood survival, summer survival of adult females, early brood-rearing habitat selection, adult female summer habitat selection, and adult female winter habitat selection" (citing literature). And in yet another recent Wyoming study from 2008-2014, Kirol et al. (2020), measured the impacts to grouse from both fossil fuel energy and renewable energy and found that ongoing surface disturbance from energy development within 8 km (4.97 miles) of a

greater sage-grouse nest decreased the likelihood of nest success. Sage-grouse broods within 1 km (0.62 miles) of ongoing surface disturbance from fossil fuel and renewable energy development were less likely to survive than broods exposed to less disturbance. As ongoing disturbance increased, GrSG nests had an increasing rate of failure. Furthermore, female sage-grouse avoided habitat with higher levels of disturbance in favor of habitat with lower levels of disturbance. The study indicates that BLM's current approach to lek buffers and disturbance caps (3-5%) is too high and will lead to further declines in population and habitat loss.

Oil, gas and other forms of energy development are known to impact other species of native wildlife as well, especially ungulates. For example, two 15-year studies of pronghorn response to energy development in the southern Greater Yellowstone Ecosystem and Upper Green River Basin (Sawyer et al. 2017, 2019) found that pronghorn response to increased oil and gas development results in both avoidance of infrastructure and partial abandonment of traditional winter ranges and that mule deer consistently avoided energy infrastructure and used habitats that were an average of 913m farther from well pads compared with pre-development patterns of habitat use (Sawyer et al. 2019). Using global positioning system data from 56 deer over 15 years in Wyoming, Sawyer (2020) found that declines in deer habitat use during migration were related to surface disturbance and were non-linear, where migratory use sharply declined when surface disturbance from energy development exceeded 3% of the area. And, in a series of studies of mule deer in Colorado's Piceance Basin from 2008-2010 the researchers found that deer will reduce use of areas within their critical winter range within 600-800m of a well pad disturbance site during the drilling phase and within 400m during the producing phase (Northrup et al. 2015). In two companion studies in the Piceance Basin, Petersen et al. (2017, 2018) found that mule deer fetal survival was lower in the higher energy development areas.

The data is clear that fossil fuel energy development causes sage-grouse and migratory species to abandon or avoid habitat leading to population declines. Over 1.3 million acres of new oil and gas leases have been sold since the 2015 plans were implemented. And as these new oil and gas leases get developed in GrSG habitat, population declines are certain to continue and possibly accelerate. To stem these declines, habitat needs to be protected from further surface disturbing development including oil and gas wells. Figure 5 illustrates the problem with new oil and gas leases in the areas proposed for ACECs within the Sagebrush Sea Reserve network.

b.) Many of these essential habitats face a certain threat of additional cheatgrass infestation and increased fire frequency unless management is changed.

Figure 6 depicts the future fire hazard[27] for the western portion of the proposed ACEC network. Wildfire poses a significant risk to greater sage-grouse habitat. BLM's recent five-year monitoring report estimated a cumulative loss of 1.9 million acres of sagebrush in priority habitat from 2012 to 2018 (Herren et al. 2021). The primary driver has been wildfire, which accounts for 72% of the total loss, including 87% of sagebrush loss in the Great Basin (Herren et al 2021). Moreover, along with the increased incidence of fire across the Sagebrush Sea in recent decades, exotic annuals, especially cheatgrass, have also expanded (Remington et al. 2021, and references therein). In fact, these two phenomena go hand in hand.

Comprehensive literature reviews by Welch and Criddle (2003) and Jones (2019), indicate that the historic fire return interval in sagebrush-grass communities and big sagebrush communities was likely between 50 to 125 years. In Wyoming big sagebrush, fire cycles historically were of longer duration with average fire rotation likely ranging from 100 to over 300 years, depending on climate, topography, plant composition, and ecological site characteristics (Jones 2019). However, in recent decades a combination of fire and the spread of highly flammable nonnative plants has drastically altered the natural fire regime throughout

[27] https://www.fs.usda.gov/rds/archive/catalog/RDS-2015-0047-3 and https://doi.org/10.2737/RDS-2015-0047-3

much of the sagebrush steppe (Jones 2019) especially in the western part of the GrSG's range. Wildfires now burn larger, hotter, and more frequently in affected lower elevation (i.e., Wyoming big sagebrush) habitats. Burned areas are often vulnerable to reinvasion by cheatgrass, which can completely occupy a burned site (Brooks et al. 2004, Chambers et al. 2017a). Remington et al. (2021) comprehensively reviewed the existing literature on the many documented negative effects of cheatgrass on GrSG. In addition, livestock grazing significantly exacerbates the spread of cheatgrass (e.g., Reisner et al 2013, 2015; Williamson 2019), which in turn further drives uncharacteristic wildfire. Stemming this trend will require aggressive conservation measures to eliminate and minimize surface disturbance in and stressors to intact habitats, including livestock grazing.

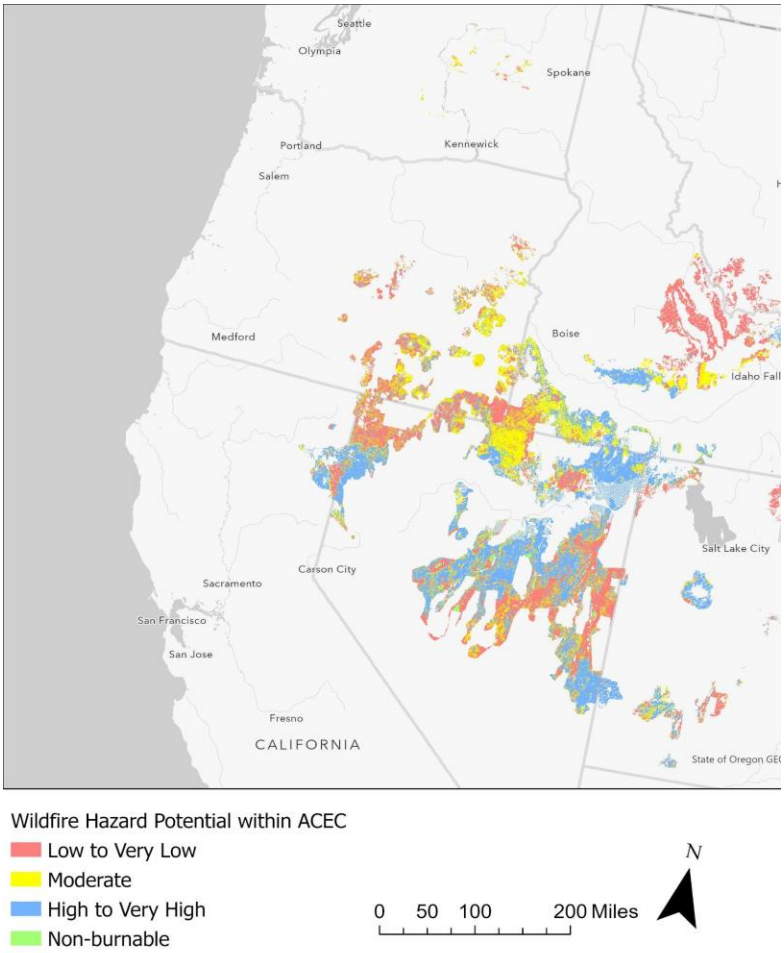

Figure 6. The potential fire hazard for the western portion of the proposed ACEC network. By and large the potential fire hazard is greater in the western part of GrSG range compared to the eastern portion.

The BLM has documented the increase of exotic annuals in GrSG habitat in its recent 5-year monitoring report; invasive plants have increased from being present on a little over 50% of GrSG habitat in 2013, to nearly 70% of habitat in 2018. The percentage of the Sagebrush Sea where invasive plants are abundant (>25% of vegetative cover) has also increased, from about 10% in 2013 to nearly 30% in 2018 (Herren et al. 2021). The impacts of both fire and exotic annual weed proliferation on GrSG are well studied (as summarized in Remington et al. 2021). Fires, prescribed and natural, have long-term negative effects (>10 yr. Sage-grouse may continue to avoid burned areas even after sagebrush has recovered (Nelle et al. 2000). Sagebrush may return to pre-burn occurrence within 15 to 20 years after fire if conditions are

favorable (e.g., proximate seed sources, quick seedling establishment, conducive weather, etc.). If not, various sagebrush varieties may require between 30 to 50 years to re-occupy a burned site (Baker 2006; Knick et al. 2005). While small, infrequent fires can maintain a mosaic of successional habitats that benefit sage-grouse, ecological modeling indicates that frequent, large fires in sagebrush steppe can lead to lek abandonment and with too many, very large fires, may even lead to extirpation of the species in some areas (Aldridge et al. 2008).

The losses of GrSG habitat to both wildfire and cheatgrass infestation make it imperative that BLM place sufficient acreages of currently occupied and adjacent healthy and suitable GrSG habitat in the highest levels of protection, such as large and connected ACECs with strong provisions for eliminating surface disturbance. This can help protect these habitats from anthropogenic threats that can exacerbate the cheatgrass/fire cycle, and which are within the agency's control such as grazing, energy development, mining, recreation, and road management.

c.) Renewable energy infrastructure poses threats to sage-grouse

Our organizations support renewable energy development as a key tool to mitigate the climate crisis that threatens virtually all species, including sage-grouse. At the same time, we acknowledge that utility-scale wind, solar, and geothermal development and associated infrastructure such as transmission lines and roads can harm GrSG in the same ways as other large-scale anthropogenic developments through habitat loss and fragmentation, predation (and thus behavioral avoidance by sage-grouse) caused by tall structures, and disturbance from noise, motion, and human activity.

GrSG avoid areas with surface disturbance, resulting in lower reproduction rates and nesting success and declining populations. In a study of the effects of wind turbines on sage-grouse, researchers noted 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 nine 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). In the 2013 COT report, the USFWS noted that, while there was not yet a lot of renewable energy yet built in GrSG 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" (citing Becker et al. 2009; Hagen 2010; LeBeau 2012; USFWS 2012).

Renewable energy development impacts other sensitive species of the Sagebrush Sea as well. These impacts, especially for wind power, are summarized in many comprehensive reviews, including for raptors (see Madders and Whitfield 2006, Molvar 2008, ONDA 2009, and Jones 2012); other birds, i.e., passerines (see Erickson et al. 2001, Stewart et al. 2004 and Strickland 2004); bats (see Arnett 2005, Arnett et al. 2008 and Johnson 2005); and wildlife in general, including ungulates (see Arnett et al. 2007 and Jones 2012).

Figure 7 identifies significant areas available for renewable energy that occur outside the nominated ACEC proposal. However, several proposed transmission lines will slice through GrSG habitat and should be reevaluated and rerouted. Based on this analysis, designating the nominated ACEC Sagebrush Sea Reserve network with restrictions on renewable energy development and associated transmission lines as recommended by BLM in the NTT Report (SGNTT 2011: 21) can help protect important sage-grouse habitat and at the same time not significantly impede renewable energy development in the western United States.

Pursuing development outside of these areas (and sage-grouse habitat more generally) would avoid negative impacts to sage-grouse and other species. As one example, we are concerned about Greenlink North (and the utility-scale renewable projects likely to be built along it) that would fragment GrSG habitat, isolating populations and leading to further decline.

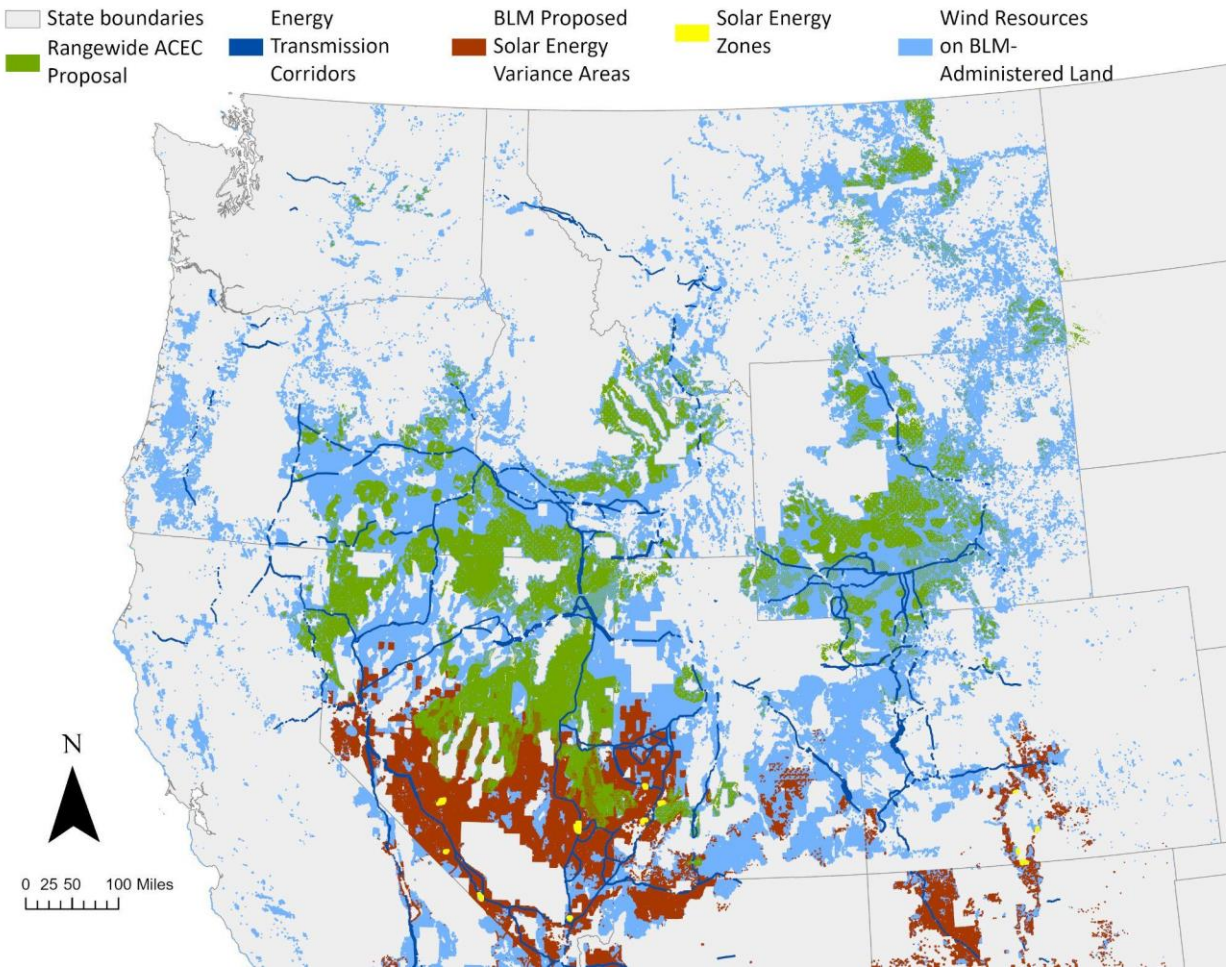

Figure 7. Energy transmission corridors, solar energy variances, solar energy zones, and wind resources vis-a-vis the proposed ACEC network. There is ample opportunity for renewable energy and transmission outside of the ACEC proposal.

d.) Protection of this network of ACECs will also help many other imperiled species

The Sagebrush Sea is home to a number of species that are considered at-risk (e.g., Dobkin and Sauder 2004, Pilliod et al. 2020, Remington et al. 2021), including up to 50 species that are listed, candidate or proposed under the Endangered Species Act (ESA). These include for instance the pygmy rabbit (*Brachylagus idahoensis, Figure* 8), piping plover (*Charadrius melodus*, Figure 8), monarch butterfly (*Danaus plexippus*), Colorado pikeminnow (*Ptychocheilus lucius*, Figure 9), Lahontan cutthroat trout *(Oncorhynchus clarkii henshawi*, Figure 9) and many plants.[28] Protecting the nominated ACEC network

[28] Ranges are derived from publicly available range data (ECOS provided by USFWS and USGS GAP data).

will have the added effect of protecting habitat for the listed and at-risk species that share habitat with GrSG.

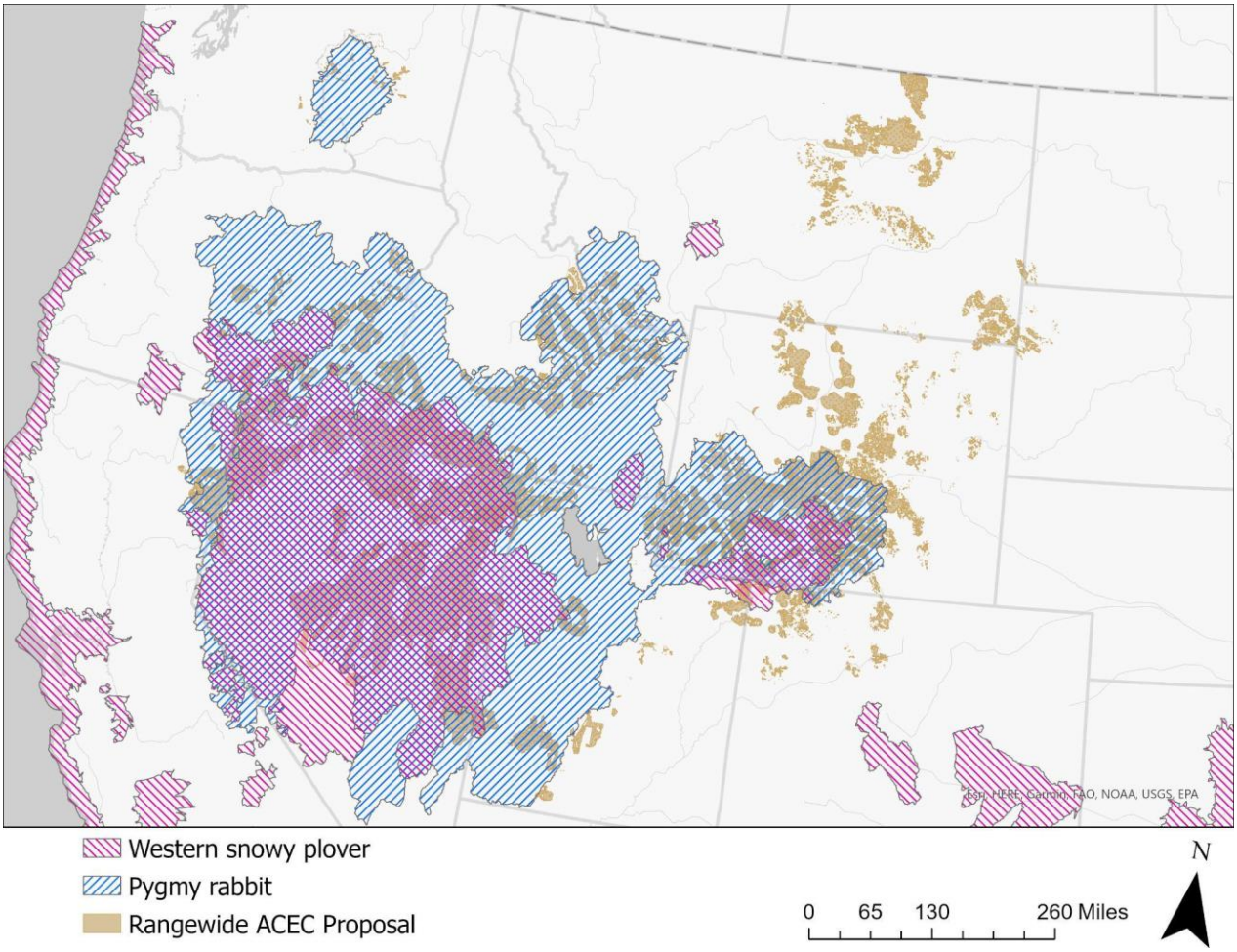

Figure 8. The ranges of an ESA-listed mammal and bird that substantially overlap the nominated ACEC network.

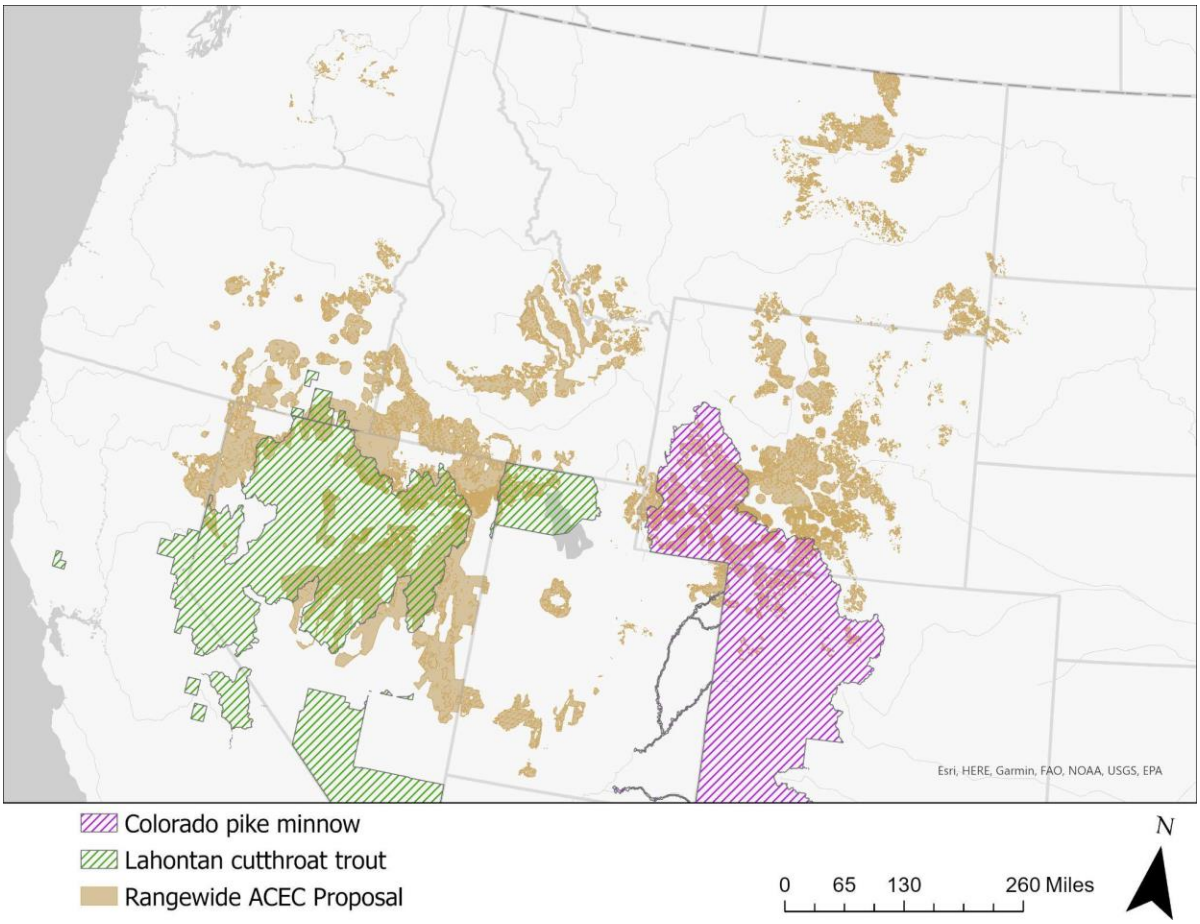

Figure 9. The ranges of two fish species listed under the ESA that substantially overlap the nominated ACEC network.

In addition, there is substantial overlap with the ACEC proposal and the ranges of many iconic western ungulates, including pronghorn antelope, elk, mule deer and bighorn sheep (Appendix A). Because the proposed Sagebrush Sea Reserve ACEC network is, by design, well connected, its protection will serve well wide-ranging migratory ungulates such as these. It will also go a long way toward meeting goals laid out in Secretarial Order 3362 (Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors) which emphasizes the importance of conserving and improving elk, mule deer, and pronghorn habitat necessary to sustain local and regional big-game populations.

e.) All sagebrush-steppe-dependent species, especially wide-ranging ones, benefit from large, protected and connected expenses of functioning habitat as proposed here.

In the last few decades, the need to conserve relatively wide-ranging species (such as sage-grouse) through a connected network of conservation reserves or networks, has become well established (e.g. Dobson et al. 1999, Soule and Terborgh 1999, Prugh et al. 2008, Hilty et al. 2020, Carroll and Noss 2021). Threats that have been degrading, dissecting and fragmenting GrSG habitat, over the last few decades are well documented (e.g., Herren et al. 2021, Remington et al. 2021 and references therein); these direct anthropogenic and anthropogenic-influenced stressors have contributed to the steady decline of GrSG across its range (Herren et al. 2021, Coates et al. 2021). This dynamic has left the various populations of GrSG more isolated from one another, and, in certain worrisome cases like the Columbia Basin population in Washington, perhaps nearing the point of getting too small to persist. Habitat fragmentation that isolates populations affects specialized needs of native wildlife, such as limiting dispersal, reducing reproduction,

and other life cycle needs. Increases in distance between populations and thus reduced migration rates reduces the likelihood of local populations in many patches sustaining one another; and small populations have been shown to suffer deleterious population-level effects resulting from isolation—such as inbreeding, low genetic diversity, and extirpation (Ross 1983, Harris 1984, Newmark 1995, Prugh et al. 2008, Dobson et al. 1999).

Conservation scientists agree that the long-term solution to the above problems related to population isolation is to protect connected networks of large "core areas" of habitat; with this solution we can prevent local extinction through demographic rescue, allow for recolonization after local extinction, and allow for gene flow, seasonal migration, and other ecological processes to better function across the landscape, ranging from pollination to seed dispersal to predator-prey interactions (Dobson et al. 1999, Soule and Terborgh 1999, Prugh et al. 2008, Hilty et al. 2020, Carrol and Noss 2021). And, perhaps most importantly as we face a changing climate, a connected, protected network of core habitat can offer climate change refugia for many species, facilitating the persistence of sensitive species, and preventing the loss of genetic diversity to buy time for adaptation over longer timescales (Hilberg 2020, Carrol and Noss 2021). Conserved, connected core networks can also protect populations from extirpation following extreme events (e.g., severe drought or wildfires), allowing recolonization of the surrounding landscape (Hilberg 2020, Carrol and Noss 2021). This is important because predicted climate disruption changes include reduced habitat suitability and possible species range shifts towards northern latitudes and/or higher elevations (Beever et al. 2011, Padgett et al. 2018).

Regarding the connectivity issue's relevance with the Sagebrush Sea Reserve ACEC proposal, recent studies find extensive gene flow across sage-grouse's range, with central "keystone" nodes facilitating connectivity through a "hub and spoke" mechanism (Cross et al 2018). Identified keystone nodes have been included within our ACEC proposal. However, it's not enough to protect the keystone nodes alone. The matrix habitat between core population areas of sage-grouse is essential to maintaining gene flow between the hubs and the spokes and much of the matrix habitat between core population areas is winter or summer range. Protecting habitat which comprises the entirety of the sage-grouse's annual life cycle increases connectivity and resilience for the populations. We strove to achieve this by including all the PACs across the range of the GrSG in our ACEC proposal. Since USFWS Priority Areas for Conservation (which are by design already fairly well connected across the landscape) form the basis of the Sagebrush Sea Reserve ACECs proposal, the proposal effectively and collectively meets the long-term, large landscape conservation goals called for by the science cited above.

Lastly, conservation scientists tell us that to halt mass extinction and solve the climate crisis, we need to not only preserve existing habitats, but conserve at least 30% by 2030 (Dinerstein et al. 2017). This call to action has prompted the Biden administration to adopt the "30 by 30 goal" of conserving 30% of America's natural lands by 2030. Designating the lands identified in this proposal as ACECs with management prescriptions as recommended would go a long way towards meeting this important, national goal.

VII. BLM ANALYZED MANY OF THESE AREAS IN 2015 AND CONCLUDED ACECS WERE JUSTIFIED

Further illustrating the significant value provided by protecting the areas identified in this proposal, significant acreage across the greater sage-grouse range have already been found to meet the relevant and important criteria for ACEC designation.

a.) Idaho.

In Appendix H of the 2015 Idaho ARMPA EIS in (BLM 2015a) which analyzed potential ACECs for GrSG for inclusion as an alternative put forward for analysis in the EIS, the BLM found that 8,714,479

acres of nominated areas of sage-grouse habitat met Relevance and Importance Criteria (Figure 10). These proposed ACECs were included for consideration in Alternative F of the Idaho 2015 RMPA.

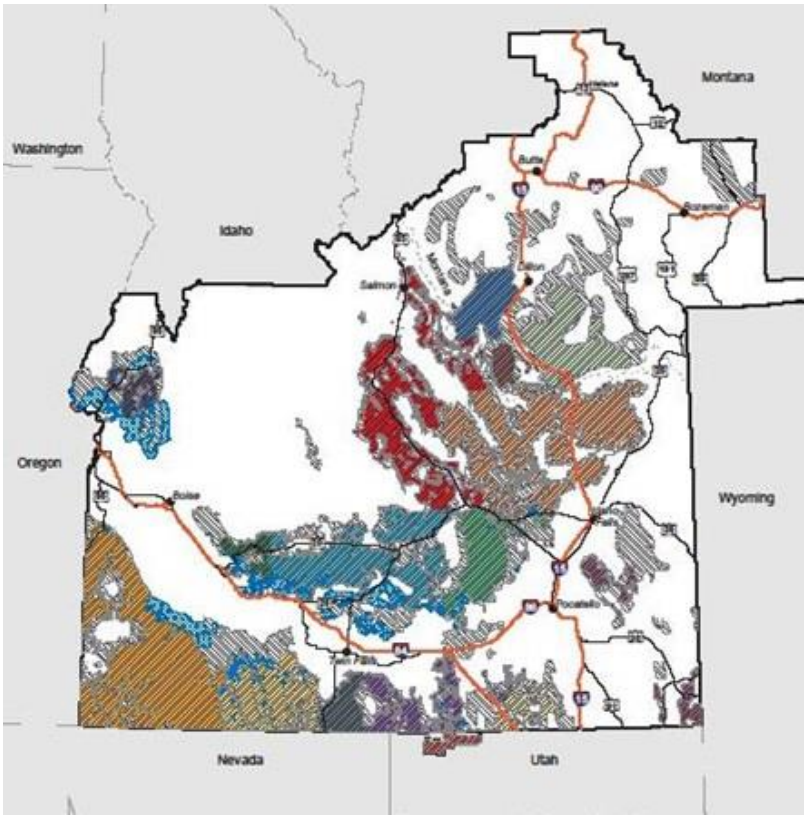

Figure 10. GrSG habitat in Idaho found by the BLM in 2015 to meet Relevance and Importance Criteria, and analyzed for designation as ACECs, under Alternative F of the ARMPA EIS (2015).

b.) Nevada.

In the Appendix of the 2015 Nevada ARMPA EIS (BLM 2015b) which analyzed potential ACECs for GrSG for inclusion in an alternative put forward for analysis in the EIS, the BLM found that 12,249,107 acres of nominated areas of sage-grouse habitat met Relevance and Importance Criteria (Figure 10). Specifically, BLM found that the set of units considered for ACEC designation in Alternative C of the Nevada 2015 RMPA met Importance Criteria #1 (The proposed ACEC has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource), and Criteria #2 (The proposed ACEC has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to change).

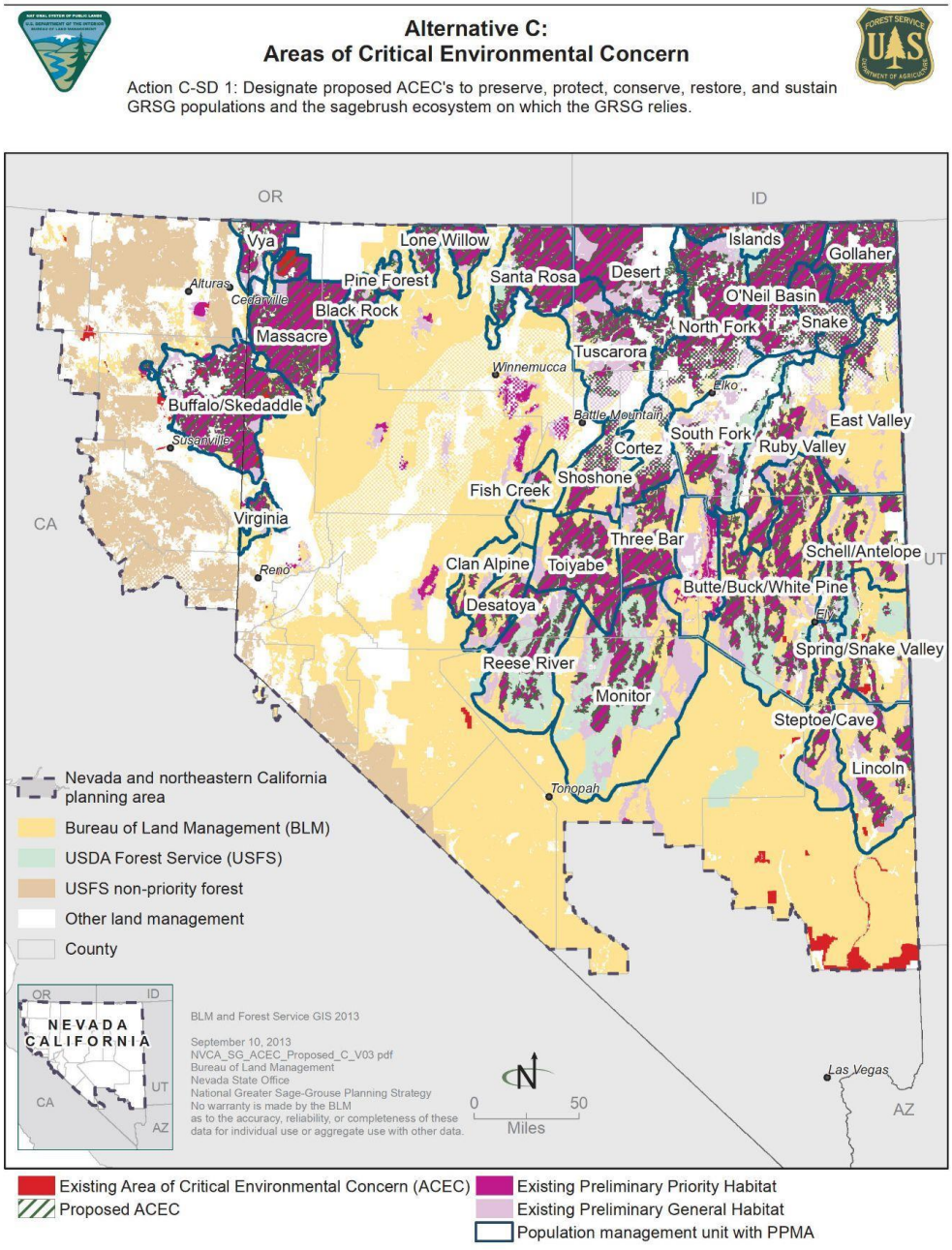

Figure 11. GrSG habitat in Nevada found by the BLM in 2015 to meet Relevance and Importance Criteria and analyzed for designation as ACECs under Alternative C of the ARMPA EIS (2015).

c.) Oregon.

During the 2015 GrSG Land Use Plan Amendment process the Oregon State BLM Office identified 17 potential ACECs for Oregon through an interdisciplinary process comprising 4,041,905 acres (BLM 2015c). The ACEC boundaries were created by merging all active GrSG leks and occupied habitat, sage-grouse brooding, transitional and winter habitat, and high-quality sagebrush habitat. Many potential ACECs included large blocks of sagebrush habitats in Preliminary Priority Habitat (PPH) and Preliminary General Habitat (PGH) at higher elevation (> 5,000 feet) with the intent that with vegetation changes because of climate change, many sagebrush habitats will be moving upslope through time and could serve as refugia for the birds in the future (i.e., future suitable habitat). Attention was paid to connectivity between the 17 ACECs and to existing ACECs and RNAs and isolated leks, with an attempt to provide for movement corridors. All ACECs were also designed to follow BLM ownership and livestock grazing allotment boundary or pasture fences, resulting in both PPH and PGH habitat being included. Because they met the Importance and Relevance criteria, 17 ACECs were identified on 4,041,905 acres within the four districts and analyzed in the OR RMPA EIS (BLM 2015c).

VII. NOMINATION OF ACECs

Pursuant to the Federal Land Policy and Management Act (FLPMA),[29] we nominate for ACEC designation all units depicted in Figure 1 above as Sagebrush Sea Reserve ACECs. We are making the shape file along with meta-data available at https://drive.google.com/drive/folders/1dBL665SehRTVd8G3RrDGMr6Jr1vz9NJw?usp=sharing. We respectfully submit this nomination in response to BLM's notice in the federal register soliciting scoping comments on sage-grouse planning and related ACEC nominations.[30] We identified this network of sage-grouse reserves as potential ACECs based on the criteria set out in applicable laws and regulations, and as outlined in BLM Manual 1613. Our nomination form for the Sagebrush Sea Reserve ACEC network is included as Appendix B.

VIII. RECOMMENDED MANAGEMENT PRESCRIPTIONS FOR THESE PROPOSED SAGEBRUSH SEA RESERVE ACEC UNITS

BLM Manual 1613 states that for an area to be designated as an ACEC, it must "require special management attention to protect the important and relevant values."[31] "Special management attention" refers to management prescriptions developed during preparation of an RMP expressly to protect the important and relevant values of an area from the potential effects of actions permitted by the RMP. These are management actions that would not be necessary if the relevant and important values were not present.

For designated ACECs, management prescriptions are established in the land use plan to ensure *protection* of these special values.[32] BLM's guidance on this issue includes size requirements and mineral withdrawal. Manual 1613, Section .22.B.2 states that an ACEC is to be as large as is necessary to protect the important and relevant values. Further, the manual explicitly recognizes mineral withdrawal as an appropriate management prescription for protecting ACEC values.[33]

Withdrawal

[29] 43 U.S.C. § 1701, *et seq*
[30] 86 FR 66331 (Monday, November 22, 2021).
[31] See also, 43 CFR 1601.0-5(a).
[32] Manual 1613, Section .22.
[33] 1613, Section .33.C.

This ACEC nomination also includes a request that BLM submit an application to the Secretary of the Interior to withdraw, for the maximum period of time allowed by law,[34] all lands within the nominated Sagebrush Sea Reserve ACEC network from all forms of mineral location and development, for the conservation and restoration of greater sage-grouse and other native wildlife species. The withdrawal should be both:

1. *from* certain uses harmful to the conservation of GrSG (e.g. mineral development of any kind (location [hardrock], leasing [fluid, coal, and other minerals, including geothermal), or sale (common minerals such as sand and gravel); and
2. *for* the conservation of greater sage-grouse and other native wildlife and plants and the sagebrush-steppe and adjacent ecosystems on which they depend.

We urge that the withdrawal be initiated as soon as possible following the publication of the ROD(s). History has shown that while many BLM resource management plans establishing ACECs include a statement that BLM will seek a withdrawal, the withdrawal application to the Secretary languishes and is not carried out.

Management Prescriptions

In addition to the withdrawal proposed above, we recommend the following mandatory (no exceptions, waivers, or modifications) management prescriptions be required for the nominated ACECs. Rationales based on best available science are provided below.

- Disallow new mineral leasing or sales within the ACECs. Pursue initiatives for early relinquishment of existing fluid mineral leases. Ensure that all existing grandfathered leases comply fully with existing stipulations and are subject to the most protective conditions of approval permitted by law. Ensure careful scrutiny of any requests for suspension of grandfathered leases to avoid improper extension of primary lease term. Cancel leases issued unlawfully since 2015 within the nominated ACECs. Consider buying back undeveloped leases within the nominated ACECs.

- Surface disturbance should be limited to restorative activities such as removing current infrastructure or performing necessary vegetation treatments in degraded sage-grouse habitat (for example in post-fire scenarios, removing exotic species invasions).

- New roads shall not be constructed subject to valid existing rights or except where realignment/rerouting is needed to benefit sage-grouse habitat. Prioritize unnecessary roads for decommissioning and restoration to achieve the road density standard of 0.7 mile/square mile. Where road systems are not yet designated, complete travel plans within five years.

- Motorized use shall be limited to designated roads.

- Prohibit new rights-of-way unless they are within an established ROW developed footprint. Existing rights-of-way permits should only be renewed upon a finding that the need for the continued right-of-way is in the public interest and that no reasonable alternative exists. Make ACECs renewable energy exclusion zones.

- Prioritize the removal of infrastructure (including unneeded energy development equipment, roads, fencing and other range developments).

- Cap forage utilization annually at no more than 25% for livestock use and maintain grass height at not less than 7 inches (10.2 inches for areas within the Great Plains). Write these stipulations into Allotment Management Plans and monitor allotments annually to assure that the utilization and grass height

[34] 43 USC 1417

standards are being met.

- Grazing permits and associated allotment management plans shall receive prioritization for full environmental review and implementation, including an assessment of whether an allotment is meeting BLM rangeland health standards.
- When an allotment is found to not meet rangeland health standards immediately develop a strategy to achieve rangeland health standards within 10 years.
- Facilitate the voluntary relinquishment of grazing permits and leases.
- Establish large grazing exclosures or reference areas in representative habitats to use as baseline to measure sagebrush habitat health in the absence of grazing.
- 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. This includes regular monitoring of pioneering invasions and rapid implementation of measures to remove the invading species and bolster native vegetative resistance. As technologically possible, reduce the area dominated by invasive annual grasses to 5 percent or less within 4.0 miles of all occupied leks.
- Use best practices for ecological restoration of degraded lands including using only genetically appropriate native seeds and plants. Monitor and continue restoration activities as needed until project objectives are met and at least for three years. Livestock grazing should be excluded from restored or rehabilitated areas until woody and herbaceous plants achieve sage-grouse habitat objectives. Develop revegetation plans so that native seed supplies are developed and available when needed.
- Manage recreational uses as necessary so that they do not conflict with the conservation of GrSG and its habitat.
- After assuring the protection of life and property from wildfire, prioritize fire suppression to conserve GrSG habitat in the ACECs. Develop fire response plans so that equipment and personnel can be readily mobilized and unnecessary surface disturbance is avoided.

Justification for the above management stipulations for ACECs

The literature is replete with studies that demonstrate that the above proposed management stipulations for the new Sagebrush Sea Reserve ACECs are integral to ensure that these key habitats will allow sage-grouse, and many other native sagebrush dependent species, to persist for the long-term, as well as being reasonable, actionable and science-based.

a.) *No new mineral leasing or sales will be permitted within the ACECs. Pursue initiatives for early relinquishment of existing fluid mineral leases. Ensure that all existing grandfathered leases comply fully with existing stipulations and are subject to the most protective conditions of approval permitted by law. Ensure careful scrutiny of any requests for suspension of grandfathered leases to avoid improper extension of primary lease term. Cancel leases issued unlawfully since 2015 within the nominated ACECs. Consider buying back undeveloped leases within the nominated ACECs*. We present the literature describing the impacts of fluid mineral development on GrSG above on pages 16 and 17. Similar to fluid mineral development, surface and subsurface mining has profound negative impacts on greater sage-grouse. New studies confirm the damaging effects of mining on sage-grouse and sagebrush habitat and underscore the need for conformance with the NTT Report recommendation to disallow and "[f]ind unsuitable all surface mining of coal under the criteria set forth in 43 CFR 3461.5 [and]…[g]rant no new mining leases unless all surface disturbances (appurtenant facilities) are placed outside of the priority sage-grouse habitat area…." (SGNTT 2011). A similar need to keep mining disturbance out of

the most important GrSG habitat can be found in the COT Report: "Surface mining and appurtenant facilities within sage-grouse habitats result in the direct loss of habitat, habitat fragmentation, and indirect impacts from disturbance (e.g., noise, dust) …Surface facilities supporting underground mining activities can have similar impacts." (USFWS 2013). The COT Report went further, calling for management to "[a]void new mining activities and/or any associated facilities within occupied habitats, including seasonal habitats" (USFWS 2013).[35]

b.) *Surface disturbance should be limited to restorative activities such as removing current infrastructure or performing necessary vegetation treatments in degraded sage-grouse habitat (for example in post-fire scenarios, removing exotic species invasions)*. Surface disturbance directly and indirectly diminishes habitat. It can have significant negative impacts on GrSG. For example, the USGS recently recognized that infrastructure (for example, processing facilities and roads) have similar impacts to the sagebrush ecosystem and wildlife as described for mining (Remington et al. 2021). According to the USFWS' COT Report, "surface mining and appurtenant facilities within sage-grouse habitats result in the direct loss of habitat, habitat fragmentation, and indirect impacts from disturbance (e.g., noise, dust). Recent research confirms the COT report findings on negative impacts of surface disturbance to GrSG; Kirol et al. (2020), found that ongoing surface disturbance from energy development within 8 km (4.97 miles) of GrSG nests decreased the likelihood of nest success, and broods within 1 km (0.62 miles) of ongoing surface disturbance were less likely to survive than broods exposed to less disturbance. As ongoing disturbance increased, sage-grouse nests had an increasing rate of failure. Furthermore, female sage-grouse avoided habitat with higher levels of disturbance in favor of habitat with lower levels of disturbance (Kirol et al. 2020).

c.) *New roads shall not be constructed subject to valid existing rights or except where realignment/rerouting is needed to benefit sage-grouse habitat. Prioritize unnecessary roads for decommissioning and restoration to achieve the road density standard of 0.7 mile/square mile. Where road systems are not yet designated, complete travel plans within five years*. Roads have multiple impacts on sage-grouse, including mortality from vehicle collisions and behavioral disruption due to traffic, noise, and human presence (SGNTT 2011). Holloran (2005) 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 (and see similar results for Gunnison sage-grouse by Aldridge et al. 2012). 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). Connelly et al. (2004) found that GrSG may be affected by roads up to 6.9 km (4.2 miles) away. Restricting new roads in the Sagebrush Sea Reserve ACECs comports with the 2011 NTT recommendation that motorized travel be restricted to designated roads and routes in priority sage-grouse habitat.

Roads are known to impact many other species of wildlife that occur in the nominated ACEC network. The impacts of roads and road density on wildlife and its habitat in the West are well-studied. Roads and trails are the primary vectors by which human impacts are dispersed over the landscape. Without question, most human impacts harmful to ecosystems are contingent on access, even where these impacts occur away from the roadbed. Human activity and associated impacts on or near roads disturb and displace a wide range of wildlife species, especially those that are hunted or are on mating grounds or nesting (Bowles 1995). New power lines, pipelines, and even railroad tracks are often constructed alongside these roads, further reducing and fragmenting habitat (Weller 2002). Scientists have

[35] Indeed, as part of its decision not to list sage-grouse under the Endangered Species Act, FWS relied on the assumption that large expanses of essential sage-grouse habitat would be withdrawn from mineral development as part of federal strategies to conserve and recover the species. 80 Fed. Reg. 59,915, 59,916 (Oct. 2, 2015).

determined that in areas with limited cover, effective elk habitat is lost at a road density of only 0.5 miles of road per square mile (Weller 2002). An extensive literature review was conducted by Rowland et al. (2004) concerning elk avoidance of roads and found that the average negative "zone" of influence on elk extended 1000 – 2000 meters from roads.

More generally, Trombulak and Frissell (2000, and see The Wilderness Society 2014) found that roads are associated with negative effects on biotic integrity in both terrestrial and aquatic ecosystems, and that these effects include wildlife mortality from road construction, mortality from collision with vehicles, modification of animal behavior, alteration of the physical environment, alteration of the chemical environment, spread of exotic weeds, and increased use of areas by humans. Roads have abiotic effects as well (WildEarth Guardians 2020 and references therein) For example, roads almost always lead to accelerated erosion (Burroughs and King 1989). And there is a growing body of science that shows that fires can be more prevalent in areas with higher road density; wildland fire ignition is much more likely to occur in a roaded area than in a roadless area (USDA 2000, Morrison 2007; Hann 1997, TWS 2000). Roadbeds and associated construction disturb or remove native vegetation and act as vectors for non-native exotic plants. Furthermore, vehicles create seedbeds for weeds and promote their dispersal.

d.) *Motorized use shall be limited to designated roads.* Motorized vehicles that travel off road (ORVs) pose risks to sage-grouse and their habitat (SGNTT 2011, Knick et al. 2011). In addition to noise impacts, ORVs are known to disturb soil, destroy vegetation, and spread invasive plants within GrSG habitat.

The ecological effects of ORVs, including impacts to wildlife and wildlife habitat, are well studied. One of the most comprehensive literature reviews on the topic was conducted by the USGS (Ouren et al. 2017 and references therein). Ouren et al. describe the primary effects of ORV activity on soils and overall watershed function including altered soil structure (soil compaction in particular), destruction of soil crusts (biotic and abiotic) and desert pavement (fine gravel surfaces) that would otherwise stabilize soils, and soil erosion. Ouren et al. (2017) also review the literature on ORV impacts to vegetation, in which soil compaction from ORVs affects plant growth by reducing moisture availability and precluding adequate taproot penetration to deeper soil horizons. Above-ground portions of plants also may be reduced through breakage or crushing, potentially leading to reductions in photosynthetic capacity, poor reproduction, and diminished litter cover. Likewise, blankets of fugitive dust raised by ORV traffic can disrupt photosynthetic processes, thereby suppressing plant growth and vigor, especially along OHV routes. In turn, reduced vegetation cover may permit invasive and/or non-native plants—particularly shallow-rooted annual grasses and early successional species capable of rapid establishment and growth—to spread and dominate the plant community (Ouren et al. 2007 and references therein). Ouren et al. also review the literature on ORV impacts to native wildlife, including habitat fragmentation and reduced habitat connectivity as ORV roads and trails proliferate across the landscape. Reduced habitat connectivity may disrupt plant and animal movement and dispersal, resulting in altered population dynamics and reduced potential for recolonization if a species is extirpated from a given habitat fragment. Wildlife is also directly affected by excessive noise (decibel levels/noise durations well above those of typical background noise) and other perturbations associated with ORV activities. Disturbance effects range from physiological impacts—including stress and mortality due to breakage of nest-supporting vegetation, collapsed burrows, inner ear bleeding, and vehicle-animal collisions—to altered behaviors and population distribution/dispersal patterns, which can lead to declines in local population size, survivorship, and productivity (Ouren et al. and references therein).

Lastly, ORVs create new routes and trails when they leave established roads. As BLM recognized in past NEPA analysis, "[e]ach year new trails are being created by a wide range of OHV users including, but not limited to, recreational users. Once a new trail becomes established it is considered by the public to be an existing route." (BLM 2015d at 3-340).

e.) *Prohibit new rights-of-way unless they are within an established ROW developed footprint. Existing*

rights-of-way permits should only be renewed upon a finding that the need for the continued right-of-way is in the public interest and that no reasonable alternative exists. Make ACECs renewable energy exclusion zones. See Section VI. c, above regarding impacts of renewable energy on GrSg. ROWs lead to infrastructure development (e.g., power and transmission lines, roads). Roads have multiple impacts on sage-grouse which are well studied (e.g., see SGNTT 2011; see discussion above), and sage-grouse may be affected by roads up to 6.9 km (4.2 miles) away (Connelly et al. 2004). Power Lines are detrimental to sage-grouse because of increased predation risk (Steenhof et al. 1993; Lammers and Collopy 2007) due to perching of raptors and corvids. Deaths resulting from collisions with power lines are also a source of mortality for sage-grouse (Beck et al. 2006; 75 FR 13910). Power lines negatively affect lek trends up to 2.8 km, and nest and brood success were negatively affected by transmission lines up to distances of 2.6 and 1.1 km, respectively (Kohl et al. 2019). Negative effects of power lines, depending on the behavior or demographic rate, extended 2.5–12.5 km, which exceeds current recommendations for the placement of structures in areas around sage-grouse leks (Gibson 2018). The NTT report concluded that overhead power lines cause sage-grouse to avoid habitat and increase the risk of mortality due to both predation and collisions (SGNTT 2011). The BLM should follow the guidance of the NTT report, making priority habitat exclusion areas for new rights-of-way and renewable energy, as well ensuring that obsolete power lines be removed, and existing power lines be buried or modified (SGNTT 2011).

f.) *Prioritize the removal of infrastructure (e.g., unneeded energy development equipment, roads, fencing and other range developments*). In the ACECs, BLM should follow NTT Report guidance to remove obsolete power lines (as well as other obsolete infrastructure such as wells and fences) and bury or modify existing power lines. In particular, it is important to prioritize removal of unnecessary tall structures of any sort because predators such as raptors can perch and hunt from these structures (Utah Department of Natural Resources 2010). In terms of opportunities for road removal, as discussed above, a maximum road density of 0.7 linear miles per square mile should be applied if possible in the new ACECs, as Holloran (2005) 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. In areas that already exceed this threshold, existing roads should be decommissioned as opportunities arise and revegetated with native plants to meet this standard on a per-square-mile-section basis.

g.) *Cap forage utilization annually at no more than 25% for livestock use and maintain grass height at not less than 7 inches (10.2 inches for areas within the Great Plains). Write these stipulations into Allotment Management Plans and monitor allotments annually to assure that the utilization and grass height standards are being met.* There are many studies and agency sources that demonstrate that best practices for maintaining functioning sage-grouse habitats include utilization levels that do not exceed 25 percent annually on occupied sage-grouse habitats, including uplands, meadows, flood plains and riparian habitat (BLM & USFS 1994, Galt et al. 2000, Braun 2006, Holecheck et al. 2010). A lower utilization rate is more likely to support sage-grouse 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 (Van Poolen and Lacey 1979; Holechek et al. 1998; Briske et al. 2008). Reducing livestock utilization is recommended to support rangeland restoration objectives (Van Poolen and Lacey 1979, defining light utilization as 20–40 percent utilization of annual forage production by weight; Holecheck et al. 1999, defining light-moderate utilization as 30–35 percent utilization). Holechek et al. (2010), 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 in occupied sage-grouse habitat.

While definitions of light grazing use vary, numerous references have settled on a general 25 percent harvest coefficient for allocating forage for livestock (Troxel and White 1989; Lacey et al. 1994; NRCS 1997; White and McGinty 1997; Galt et al. 2000; Holechek et al. 2010). 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) 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; Manier et al. 2013). 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).

The best available science, and indeed, the preponderance of evidence, has established that at least 7 inches (18 cm) of residual stubble height needs to be provided in nesting and brood-rearing habitats throughout their season of use. According to Gregg et al. (1994), "Land management practices that decrease tall grass and medium height shrub cover at potential nest sites may be detrimental to sage grouse populations because of increased nest predation.... Grazing of tall grasses to <18 cm would decrease their value for nest concealment.... Management activities should allow for maintenance of tall, residual grasses or, where necessary, restoration of grass cover within these stands." Hagen et al. (2007) analyzed all scientific datasets up to that time and concluded that the 7-inch threshold was the threshold below which significant impacts to sage grouse occurred (see also Herman-Brunson et al. 2009 who reiterated those findings). Prather (2010) found for Gunnison sage grouse that occupied habitats averaged more than 7 inches of grass stubble height in Utah, while unoccupied habitats averaged less than the 7-inch threshold. According to Taylor et al. (2010), "The effects of grazing management on sage-grouse have been little studied, but correlation between grass height and nest success suggest that grazing may be one of the few tools available to managers to enhance sage-grouse populations. Our analyses predict that already healthy populations may benefit from moderate changes in grazing practices. For instance, a 2 in. increase in grass height could result in a 10% increase in nest success, which translates to an 8% increase in population growth rate."

The exception to this 7-inch rule is found in the mixed-grass prairies of the Dakotas, where sparser cover from sagebrush and greater potential for tall grass have led to a recognition that a 26-cm stubble height standard is warranted (Kaczor 2008, Kaczor et al. 2011). Foster et al. (2014) found that livestock grazing could be compatible with maintaining sage grouse populations, but stubble heights they observed averaged more than 18 cm during all three years of their study and averaged more than 10.2 inches in two of the three years of the study.

Importantly, currently accepted rangewide guidance for managing sage grouse populations and their habitats, Connelly et al. (2000) and Stiver et al. (2015) reviewed the science of that time and recommended an 18-cm residual stubble height standard. Connelly et al. prescribed >18 cm grass height in breeding habitats in both arid and mesic sites. Stiver et al. (2015) recommended 18 cm grass height for all breeding and nesting habitats, and explicitly stated that this and other established measures should not be altered unless scientific evidence definitively indicates that the 7-inch threshold is inappropriate. Because of these widely accepted, range-wide guidance on grass heights in occupied sage-grouse habitat, the 2015 Land Use Plan amendments for Forest Plans also included this component of range management in the amended Plans (e.g., the Forest Plan Amendment for Utah, cited below as BLM 2015a).

h.) *Grazing permits and associated allotment management plans shall receive prioritization for full environmental review and implementation, including an assessment of whether an allotment is meeting BLM rangeland health standards*. Per the 2015 Sage-grouse RMPA amendments, the BLM is obligated within GrSG habitat, with PHMA as a top priority, to evaluate the federal Rangeland Health (RLH) Standards. The Plan amendments call on the BLM to focus monitoring and management activities on allotments found not to be achieving the Rangeland Health Standards where livestock grazing is

identified as a causal factor and that have the best opportunities for conserving, enhancing or restoring habitat for GRSG. An analysis of grazing allotments (see discussion above and Figure 4) found that 837 grazing allotments within PHMAs are currently not meeting RLH standards, and 362 grazing allotments, have yet to be assessed; 415 allotments are meeting the RLH standards within PHMA.

i.) *When an allotment is found to not meet rangeland health standards immediately develop a strategy to achieve rangeland health standards within 10 years*. The COT report states that, "Livestock… numbers must be managed at levels that allow native sagebrush vegetative communities to minimally achieve Proper Functioning Conditions (PFC; for riparian areas) or Rangeland Health Standards" (USFWS 2013). As detailed above, within PHMA (and thus this ACEC proposal) 12.2 million acres are not meeting federal rangeland health standards due to livestock grazing.

Because livestock grazing is practically ubiquitous in GrSG habitat, occurs on large scales (on the order of allotments that can be thousands of acres), and can potentially indirectly affect so many aspects of GrSG habitat[36] that can in turn affect GrSG vital rates and population trends, it is a difficult system in which to design non-confounded, replicated studies that can conclusively point to effects of livestock grazing on GrSG. For example, Dettenmaier et al. (2017) conducted a meta-analysis of studies that examined effects of livestock grazing on all species of grouse, world-wide. Since to be eligible for meta-analysis, the data need to be collected in such a way (such as with an experimental and control group) to enable the calculation of variances to be used to measure effect sizes, Dettenmaier et al. were only able to include 4 eligible studies in their pool of grazing effects on grouse. While the results of the meta-analysis revealed an overall negative effect of livestock grazing on grouse populations, the lack of studies eligible for meta-analysis underscore that better designed (replicated, treatment and control) studies of the effects of livestock grazing on GrSG populations and vital rates are sorely needed.

There have been a few attempts to use modeling to get at the effects of livestock grazing on GrSG. One of the stronger models built by Monroe et al. (2017) used public land records to characterize livestock grazing across Wyoming, and with annual counts of male GrSG from 743 leks during 2004–2014, modeled population trends in response to grazing level (represented by a relative grazing index) and timing across a gradient in vegetation productivity as measured by the Normalized Vegetation Difference Index (NDVI). Monroe et al. found that GrSG populations responded positively to higher grazing levels after peak vegetation productivity, but populations declined when similar grazing levels occurred earlier, likely reflecting the sensitivity of cool-season grasses to grazing during peak growth periods.

Livestock grazing exacerbates cheatgrass invasion which in turn has been shown to be detrimental to GrSG. Changes in vegetation composition and structure associated with invasive annual grasses may indirectly affect local GrSG populations by outcompeting native perennial plants after wildfires, reducing this important part of sage-grouse habitat. Pre-laying and nesting females selectively feed on herbaceous forage (e.g., Barnett and Crawford 1994), and broods initially feed almost entirely on a variety of native forbs and associated insects (Klebenow and Gray 1968; Drut et al. 1994; Gregg and Crawford 2009, Dumroese et al. 2015). Remington et al. (2021) comprehensively reviewed the existing literature documenting the negative correlation between increased incidence or abundance of cheatgrass and GrSG microsite habitat selection (citing Lockyer et al. 2015); nest-site selection (citing Kirol et al., 2012), recruitment and annual survival (citing Blomberg et al. 2012); male sage-grouse lek attendance (citing Johnson et al.2011 and Blomberg et al. 2012); survival of adult males (citing Blomberg et al. 2012); and general habitat occupation (Arkle et al. 2014). In some of the above studies cited by Remington et al. that documented negative impacts of cheatgrass on GrSG, cheatgrass cover in the area studied was as low as 5% (Remington et al. 2021, and references therein).

[36] i.e., indirect influences of ranching on sage-grouse habitat include fencing, watering facilities, treatments to increase livestock forage, and targeted grazing to reduce fine fuels (Boyd et al. 2014).

The role of livestock grazing in leading to and/or exacerbating cheatgrass invasion has also been well studied. For example, Reisner et al. (2013, 2015) 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. 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 (Knick et al. 2003; Reisner et al. 2013; Pyke et al. 2015; Chambers et al. 2017; Chambers et al. 2019). Bock et al. (2007) 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, in a 22-year study. Their results demonstrated what many other researchers have found: that livestock grazing serves as an exogenous disturbance on the landscape that can favor exotics (Milchunas et al. 1988; Milchunas 2006; Bock et al. 2007). The latest research by Williamson et al. (2019: 12) further supports these findings; it suggests a strong positive relationship between the presence and prevalence of cheatgrass and livestock grazing.

j.) *BLM shall take all measures allowed by law to facilitate the voluntary relinquishment of grazing permits and leases*. Voluntary grazing permit buy-outs in the ACECs are a market-based approach to easing grazing pressures on sage-grouse. They are a mechanism to establish and maintain sufficiently large areas free of livestock as reference areas to aid in describing ecological site potential and as a measure of the comparative effects of livestock grazing—and relief from livestock grazing—on sage-grouse populations. In addition, grazing permit retirement within the new Sage-grouse ACECs could be an important tool of compensatory mitigation plans, for offsetting development in non-priority GRGS habitats. And permit retirement/allotment closure would also contribute to terrestrial carbon sequestration goals. Both the Forest Service and BLM addressed the concept in the 2015 sage-grouse planning process, demonstrating that these agencies can and will authorize themselves to close allotments in planning. The examples include:

- U.S. Forest Service, Humboldt-Toiyabe National Forest. 2016. Greater Sage-grouse Bi-state Distinct Population Segment Forest Plan Amendment Record of Decision (page 16, Table ROD-1; p. 45, Table 4): "*RP-G-01. In bi-state DPS habitat, **consider closure of grazing allotments**, pastures, or portions of pastures or managing the allotment as a forage reserve consistent with maintaining sage-grouse habitat based on desired conditions as opportunities arise under applicable regulations, where removal of livestock grazing would enhance the ability to achieve desired habitat conditions (reference to table of desired conditions).*"

- Bureau of Land Management, Lander Field Office. 2014. Record of Decision and Approved Resource Management Plan for the Lander Field Office Planning Area (page 98, associated with management objectives 10.3, 10.5, 10.6): "*Record 6062: **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*."

- Bureau of Land Management, Billings Field Office. 2015. Record of Decision and Approved Resource Management Plan Amendments for the Rocky Mountain Region, Billings Field Office Approved Resource Management Plan (pages 2-28, 3-61): "*MD LG-17: 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 or fire breaks. This does not apply to or impact grazing preference transfers, which are addressed in 43 CFR, Part 4110.2-3.*" We also note this separate, associated provision (pages 2-27, 3-60):

"MD LG-11: ***All allotments wholly located in Greater Sage-Grouse PHMA will be considered for retirement****, where the base property owner relinquishes their preference."*

- Bureau of Land Management, Oregon/Washington State Office. 2015. Record of Decision and Approved Resource Management Plan Amendments for the Great Basin Region, Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment (page 2-21): "*MD LG 15: 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 transfers, which are addressed in 43 CFR, Part 4110.2-3.*"

k.) *Establish large grazing exclosures or reference areas in representative habitats to use as baseline to measure GrSG habitat improvement in the absence of grazing*. One of the key pieces of monitoring and research that is now largely absent on BLM lands is a suite of large, ungrazed ecological reference areas to use as benchmarks for assessing progress towards meeting GrSG habitat objectives and Rangeland Health Standards. For example, rangeland health assessments rely on comparison of current conditions with the potential expected for the same area. More importantly, without large ungrazed reference areas to compare to, the BLM is unable to assess the true effects of habitat restoration or vegetation treatments that are not confounded by livestock grazing returning too soon to the treatment site. In short, if BLM does not examine through exclosures the consequences of resuming livestock grazing on the treatment sites, it will have little knowledge of the long-term consequences of the treatments themselves.

BLM should establish a suite of these large ungrazed reference sites across the Sagebrush Sea Reserve ACEC network that collectively represent the major habitat types, including 1 km stretches of riparian areas (Stacey et al. 2008); ideally the network of large exclosures will represent all the major NRCS Range Site Types present in the ACEC network. Moreover, establishing this network of representative ecological reference areas would be in line with calls from conservation biologists to establish a network of large-scale grazing exclosures throughout western North America (Bock et al. 1993).

It is important that the ungrazed ecological reference areas are large, at least 50 ha (Sarr 2002). Small exclosures often provide the last remaining source of lush forage, and are usually easily accessible to rodents, rabbit, and deer. Therefore, heavy use of small exclosures by native herbivores is common (Catlin et al. 2003).

l.) *Manage vegetation to retain resistance to invasion where invasive annual grasses dominate more than 5 percent of the area within 4.0 miles of such leks. This includes regular monitoring of pioneering invasions and rapid implementation of measures to remove the invading species and bolster native vegetative resistance. As technologically possible, reduce the area dominated by invasive annual grasses to 5 percent or less within 4.0 miles of all occupied leks.* This is similar to one of the objectives (Objective VEG 3) in the Oregon Greater Sage-Grouse Approved Resource Management Plan, p. 2-10. It would follow that if this objective can be achieved in Oregon, it should be able to be achieved in other parts of the range of GrSG. The ramifications of cheatgrass invasion to GrSG and the sagebrush biome is a well-studied topic, as we summarize above.

m.) *Use best practices for ecological restoration of degraded lands including using only genetically appropriate native seeds and plants. Monitor and continue restoration activities as needed until project objectives are met and at least for three years. Livestock grazing should be excluded from restored or rehabilitated areas until woody and herbaceous plants achieve sage-grouse habitat objectives. Develop revegetation plans so that native seed supplies are developed and available when needed*. In the new ACECs, the BLM should utilize restoration methods reviewed in Remington et al. (2021), as well as

follow the NTT Report recommendations for post-fire emergency stabilization and rehabilitation (ES&R) (SGNTT 2011). These include:

- Designing post-ES&R management to ensure long term persistence of seeded or pre-burn native plants, which may require temporary or long-term changes in livestock grazing, free-roaming horse and burro, and travel management, etc., to achieve and maintain the desired condition of ES&R projects to benefit sage-grouse (Eiswerth and Shonkwiler 2006); and
- Considering potential changes in climate (Miller at al. 2011) when proposing post-fire seedings using native plants, which includes considering seed collections from the warmer component within a species' current range for selection of native seed (Kramer and Havens 2009, SGNTT 2011).

It is vital that BLM use genetically appropriate native seeds and plants in its rehabilitation and restoration activities (Society for Ecological Restoration 2020; National Academy of Sciences 2020) and avoid using non-native plants or cultivars. Per Manual 1740 and Handbook H1740-2, field offices should use locally adapted native plant materials unless they can demonstrate a compelling ecological need for using non-native plant materials. Field offices are encouraged to proactively consider native plant material needs and initiate strategies to meet them. Yet, BLM field managers often continue to use non-native plant materials or cultivars[37] in their restoration and vegetation treatments even though doing so can undermine the long-term genetic integrity of native vegetation and ecosystems.

Unlike a few decades ago, BLM is now more able to acquire and develop genetically appropriate native seed for its restoration projects. BLM is committed to a private/public partnership effort called the National Seed Strategy[38] designed to ensure the use of the 'right plant in the right place at the right time." And, in the recent federal Infrastructure bill BLM just received targeted funding to implement the National Seed Strategy and vegetation planning. To assure adequate native plant materials for sage-grouse habitat restoration work, BLM must engage in proactive seed and plant material planning as part of its sage grouse work. Through proactive planning and financial contributions to native plant material development, BLM can acquire the native plant materials it needs when it needs it for restoration and rehabilitation in the ACECs (and more broadly GrSG, habitat).

n.) *Manage recreational uses as necessary so that they do not conflict with the conservation of GrSG and its habitat.* Outdoor recreation provides wonderful benefits to those who engage in it. However, like other human activities, some forms of recreation can adversely impact greater sage grouse habitat (Joslin and Youmans 1999). Hence, it is vital to manage outdoor recreation, through the placement of facilities and infrastructure and the allowance of certain types of activities, to ensure that it does not unduly impact GrSG.[39] Consistent with recommendations in COT (USFWS 2013: 50), recreational facilities should not be constructed within 4 miles of a lek and should only be constructed if they help reduce impacts on sage grouse.

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[37] BLM presented to the National Academy of Sciences in 2021 as part of the Academy's development of an assessment of native seed supplies and capacity. See National Academy of Sciences 2020. In that presentation, BLM shared that a significant fraction of the seed that it uses is non-native or cultivars.

[38] https://www.blm.gov/programs/natural-resources/native-plant-communities/national-seed-strategy

[39] The Society of Outdoor Recreation Professionals developed planning principles https://www.recpro.org/planning-principles.) Principles 16 and 18 are particularly helpful for directing management in GrSG habitat:
16. Resource Sustainability: Whereas natural and cultural resources define an outdoor recreation setting, it is fundamental that recreation resource planning and plans address how to integrate recreation use to harmonize with, protect, enhance, and sustain these important resources.
18. Recreation Stewardship: Recreation planning should consider how to best design, manage, and interpret settings to foster public appreciation, understanding, respect, behaviors, and partnerships that contribute to the stewardship of an area's natural and cultural resources, and special values.

o.) *Following assuring the protection of life and property from wildfire, prioritize fire suppression to conserve GrSG habitat in the ACECs. Develop fire response plans so that equipment and personnel can be readily mobilized, and unnecessary surface disturbance is avoided*.

As outlined (and summarized through literature review) above, wildfire poses a significant risk to GrSG and sagebrush-steppe habitat. BLM's recent five-year monitoring report estimated a cumulative loss of 1.9 million acres of sagebrush in priority habitat from 2012 to 2018 (Herren et al. 2021). The primary driver has been wildfire, which accounts for 72% of the total loss, including 87% of sagebrush loss in the Great Basin (Herren et al 2021). Along with the increased incidence of fire across the Sagebrush Sea in recent decades, there has also been greatly expanding occurrence of exotic annuals, especially cheatgrass (Remington et al. 2021, and references therein), and as also outlined above, these two phenomena go hand in hand.

The impacts of fire on GrSG are well studied. Fires, prescribed and natural, have long-term effects (>10 yr.) and sage-grouse may continue to avoid burned areas even after sagebrush has recovered (Nelle et al. 2000). While small, infrequent fires can maintain a mosaic of successional habitats that benefit sage-grouse, ecological modeling indicates that frequent, large fires in sagebrush steppe can lead to lek abandonment and with too many, very large fires, may even lead to extirpation of the species in some areas (Aldridge et al. 2008).

In recent decades a combination of fire and the spread of highly flammable nonnative plants has drastically altered the natural fire regime throughout much of the sagebrush steppe (Jones 2019, and references therein) especially in the western part of the range. Wildfires now burn larger, hotter, and more frequently in affected lower elevation (i.e., Wyoming big sagebrush) habitats. Burned areas are often vulnerable to reinvasion by cheatgrass, which can completely occupy a burned site (Brooks et al. 2004, Chambers et al. 2017). Moreover, future habitat loss and fragmentation from a daunting interaction of fire, climate change and ever-increasing exotic annuals is likely to accelerate (Remington et al. 2021). Stemming this trend will require effective fire suppression measures in the new Sagebrush Sea Reserve ACEC network.

X. CONCLUSION

The proposed network of Sagebrush Sea Reserve Areas of Critical Environmental Concern proposed herein are worthy of ACEC designation both individually and as a network of sagebrush sea reserves. These proposed ACECs meet multiple relevance and importance criteria. The strength of this proposed system of ACECs is its collective whole, since it is based on the PACs which in turn are based on the Doherty 75% breeding density polygons. Conserving the entire network of ACECs is a necessary step to assure that the Greater sage-grouse will persist and not eventually go extinct.

The evidence presented in this proposal demonstrates the national (i.e., more than local) significance and exemplary nature of these values as compared to other places in the west and within BLM's jurisdiction. The proposed ACECs constitute a significant fish and wildlife resource in its provision of habitat for the Greater sage-grouse, and other species that share the sage-grouse's habitat.

The establishment of a network of ACECs using the above proposed management prescriptions along with a withdrawal from mineral location, leasing, or sale and for greater sage-grouse could significantly contribute to:

- "adequate regulatory mechanisms" that could help obviate the need to list greater sage-grouse (and possibly other sagebrush-steppe obligates) under the Endangered Species Act;
- reducing carbon emissions from fossil fuel development and increasing carbon storage and sequestration in native ecosystems;

- reducing the stress on native species of human-caused ecological impacts, thereby making them more resistant to and resilient to changing climates; and
- the Biden administration's goal of conserving 30% of America's natural lands by 2030.

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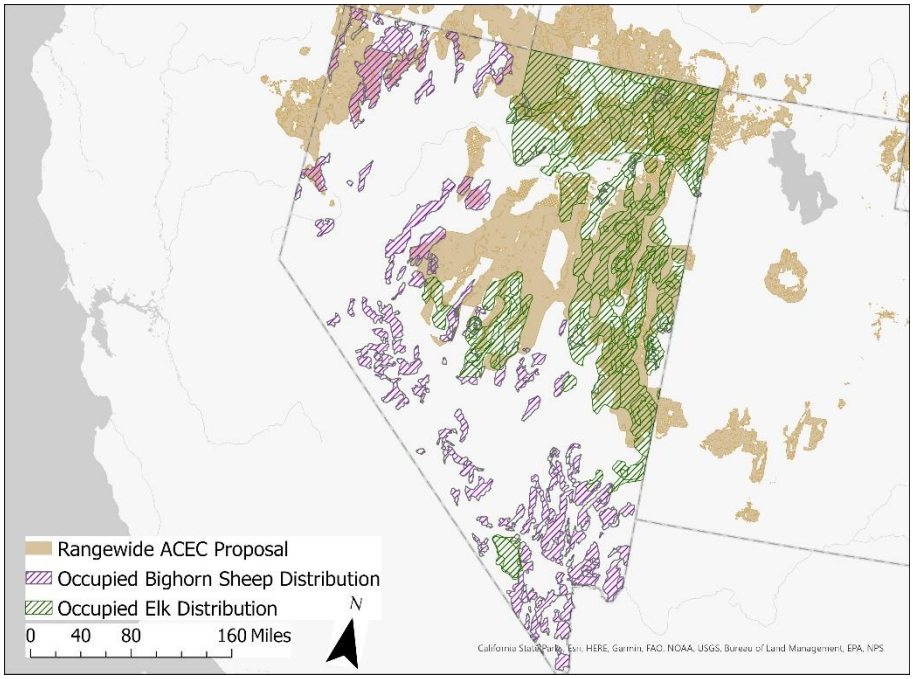
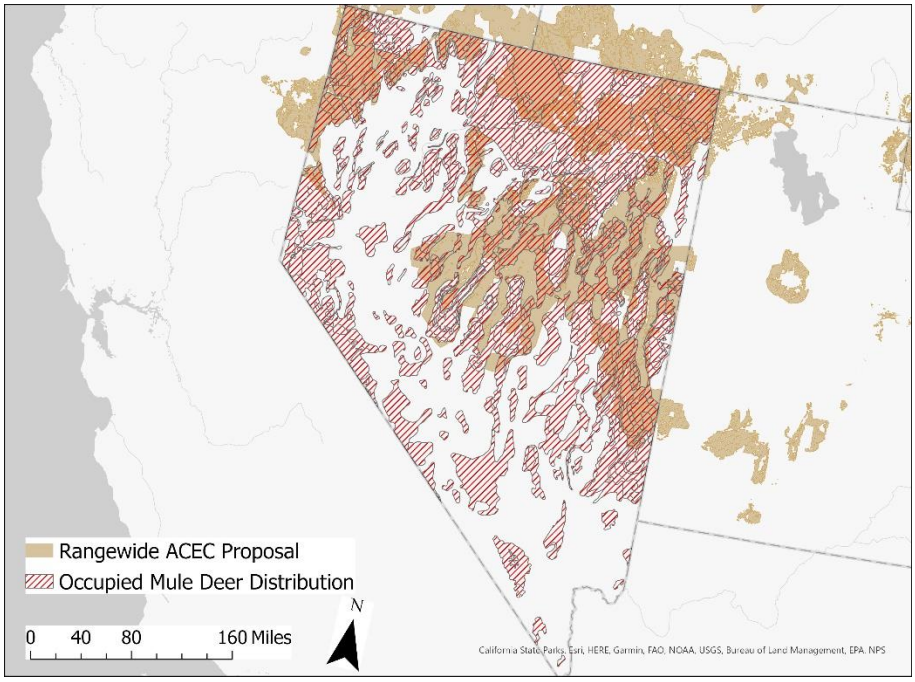
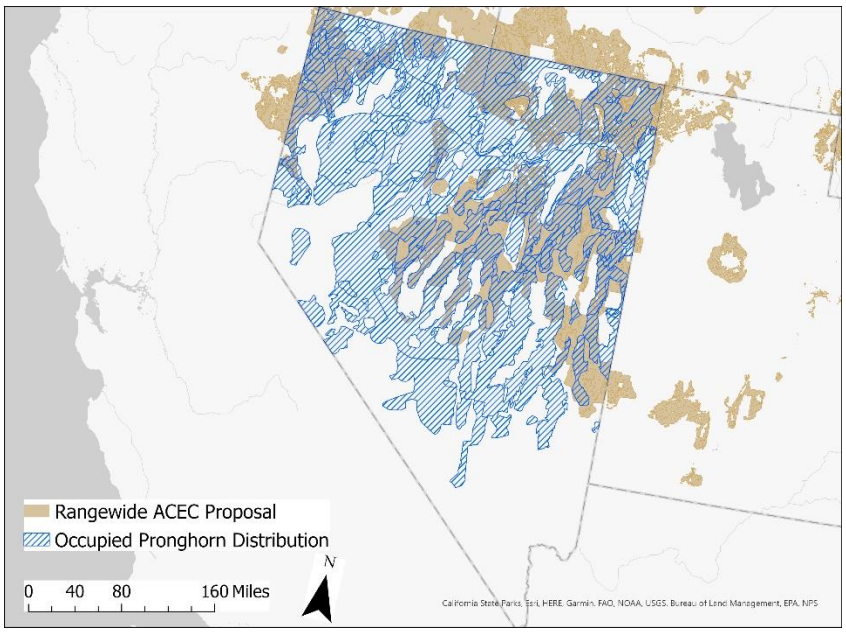
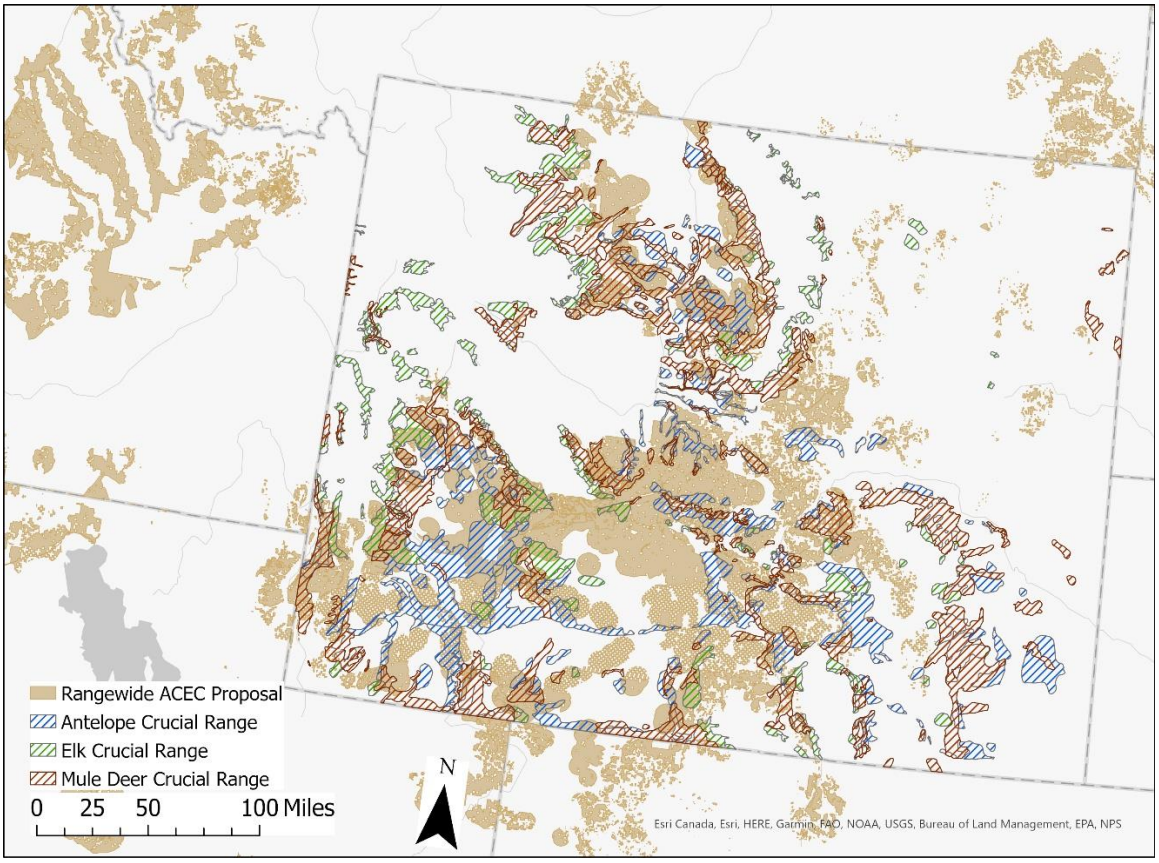
Appendix A. Maps showing the relationship of ungulate habitat and proposed Sagebrush Sea Reserve ACEC in Nevada and Wyoming.






Rangewide ACEC Proposal
Occupied Pronghorn Distribution
0 40 80 160 Miles
N
California State Parks, Esri, HERE, Garmin, FAO, NOAA, USGS, Bureau of Land Management, EPA, NPS


Rangewide ACEC Proposal
Antelope Crucial Range
Elk Crucial Range
Mule Deer Crucial Range
0 25 50 100 Miles
N
Esri Canada, Esri, HERE, Garmin, FAO, NOAA, USGS, Bureau of Land Management, EPA, NPS