October 1, 2019

USDA Forest Service
Attn: Objection Reviewing Officer
1400 Independence Ave. SW
EMC-PEEARS, Mailstop 1104
Washington, DC 20250

Re: 2019 Greater Sage-Grouse Proposed LMPAs

Dear Reviewing Officer:

Thank you for the opportunity to review and comment on the U.S. Forest Service's Proposed Land Management Plan Amendments (LMPAs). I evaluated proposed management approaches as those approaches relate to the published science[1] focusing on proposed changes to the management of general habitats and mitigation.

I specialize in the long-term research of sagebrush-obligate wildlife species, and my research over the past 20 years has focused on investigating the effects of anthropogenic activity, especially energy development, on sage-grouse populations. In the course of my work I have become familiar with the federal 2015 resource management plan amendments (ARMPs) addressing sage-grouse conservation, the 2019 BLM ARMPs, DOI's instructional memoranda and other guidance documents for implementing the 2015 ARMPs, and most state-level sage-grouse conservation planning documents.

Summary

Federal approaches to managing sage-grouse were originally developed to complement state-level conservation by incorporating many of the specifics established in localized plans, while considering larger-scale dynamics important for landscape-scale and range-wide management of the species. The overall goal of aligning federal and state management through the 2019 amendment of the original ALMPs fails to account for this unique role played by the Federal Government. I recognize that conservation and management ultimately occur at the local level; however, site-specific decisions must be informed and guided by the potential consequences of those decisions at larger spatial scales. Consideration of landscape-scale dynamics are critical aspects of local efforts addressed through federal engagement. By relying almost solely on state-level strategies to manage federal lands, the USFS is not fulfilling its critical role when it comes to conserving sage-grouse, and the species may suffer as a consequence.

The majority of sage-grouse populations across the range of the species have been in decline since the 1960s.[2] Most recent regional population trends are also negative; for example, the State of Montana recently reported that statewide populations had declined approximately 44% from 2016 to 2019.[3] Population declines at these scales cannot be attributed to a single factor or management decision, but these trends do suggest that this is not the time to undermine and weaken the work done in support of sage-grouse conservation in 2015. If anything, sage-grouse population decline, the science published since the 2015 ARMPs,[4] and recent losses in habitat especially throughout western portions of the

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[1] As reviewed by Manier et al. 2013; https://pubs.usgs.gov/of/2013/1098/OF13-1098.pdf and Hanser et al. 2018; https://pubs.usgs.gov/of/2018/1017/ofr20181017.pdf

[2] Nielson et al. 2015; https://www.wafwa.org/Documents%20and%20Settings/37/Site%20Documents/News/GRSG%20Report%20for%20WAFWA.pdf

[3] Montana Fish, Wildlife and Parks 2019; https://leg.mt.gov/content/Committees/Interim/2019-2020/EQC/Meetings/Sept-2019/sage-grouse-2019.pdf

[4] Hanser et al. 2018; https://pubs.usgs.gov/of/2018/1017/ofr20181017.pdf

species' range[5] suggest that the only defensible management approach is for the USFS to strengthen protections. Instead, from Feb 2017 to Mar 2019, the per month rate of leasing and applications for permits to drill (APD) approval in all designated sage-grouse habitats (PHMA and GHMA) increased 2 to 3 times, and these rates increased 7 to 10 times in priority habitats as compared to rates from Oct 2015 to Jan 2017.[6] Populations across the species' range are projected to continue to decline if current trends in habitat degradation and loss continue. Unfortunately, data suggest that impacts to habitat are increasing, which will likely result in increased sage-grouse population declines especially given the weakened approaches to conservation being pursued by the USFS and BLM.

General Habitat Management Areas

Because priority habitat management areas (PHMAs) are discrete areas located throughout the range of sage-grouse, the long-term success of current conservation strategies depends not only on maintaining suitable habitats within each priority area, but also in large part on maintaining the connectivity of populations among these priority areas. The loss of connectivity among sage-grouse population strongholds due to human-related or naturally occurring disturbance is a strong predictor of long-term population declines and decreased population-level genetic diversity. In most regions throughout the sage-grouse range, specific movement corridors among priority habitats were not identified and included as management priorities. However, because designated general habitat management areas (GHMAs) provide potential movement corridors between most of the priority habitats, most potential movement corridors were included as designated sage-grouse habitat.

Additionally, climate change could cause a shift in the distribution of sage-grouse habitats and populations resulting in increased conservation importance of habitats currently supporting low densities of sage-grouse. Areas projected to increase in importance for sage-grouse populations in the future are currently designated as GHMA,[7] suggesting that these habitats may be critical for long-term sage-grouse population persistence.

Federal agencies (both the USFS and the BLM) are downplaying the importance of GHMA as a critical component of the overall conservation framework developed to sustain sage-grouse populations by weakened protections in, and in some cases eliminated, GHMAs in the 2019 ALMPs. The science definitively suggests that general habitats are important for effective management of sage-grouse populations in priority habitats currently by providing for connectivity among those habitats. Further, in the face of climate change and potential changes in the distribution of sage-grouse habitats and populations, retaining the functional integrity of general habitats may be important for retaining management options for long-term conservation of the species.

Management decisions in certain GHMAs that disrupt connectivity and effective dispersal among priority areas could have consequences for sage-grouse populations that extend through space and time far beyond the decision area itself.[8] [9] [10] For example, disruption of "pinch points" (narrow stretches along connectivity corridors) could contribute to the physical and genetic isolation of peripheral sage-grouse

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[5] E.g., cheatgrass-induced fires in the Great Basin; https://www.fws.gov/mountain-prairie/factsheets/Inv_Fire_101813.pdf

[6] Gardner et al. 2019; https://www.audubon.org/sites/default/files/greater_sage-grouse_habitat_reportfinal_20190725.pdf

[7] Heinrichs, J.A., M.S. O'Donnell, C.L. Aldridge, S.L. Garman, and C.G. Homer. 2019. Influences of potential oil and gas development and future climate on sage-grouse declines and redistribution. Ecological Applications e01912. 10.1002/eap.1912.

[8] Knick, S.T., Hanser, S.E., and Preston, K.L. 2013. Modeling ecological minimum requirements for distribution of greater sage-grouse leks—Implications for population connectivity across their western range, USA. Ecology and Evolution 3:1539–1551.

[9] Row, J.R., Oyler-McCance, S.J., and Fedy, B.C. 2016. Differential influences of local subpopulations on regional diversity and differentiation for greater sage-grouse (*Centrocercus urophasianus*). Molecular Ecology 25:4424–4437.

[10] Burkhalter, C., Holloran, M.J., Fedy, B.C., Copeland, H.E., Crabtree, R.L., Michel, N.L., Jay, S.C., Rutledge, B.A., and Holloran, A.G. 2018. Landscape-scale habitat assessment for an imperiled avian species. Animal Conservation doi:10.1111/acv.12382.

population strongholds.[11] Because of distance effects of energy developments,[12] the infrastructure associated with the development of limited numbers of sites situated in a pinch point has the potential to restrict sage-grouse movement.

Not all GHMAs throughout the sage-grouse range have the same level of conservation importance. However, the USFS does not provide substantive or directly relevant analyses of the reasonably foreseeable impacts to sage-grouse of the changes to management of GHMA established in the LMPAs. Because of this lack of direct information on the potential impacts of the decisions made in the LMPAs, it is necessary to rely on the scientific literature to establish the potential consequences to sage-grouse of the management changes proposed. The scientific literature unequivocally supports the conclusion that increased disturbance in general habitats could negatively impact priority sage-grouse populations presently and into the future.

Mitigation

The mitigation hierarchy adhered to by USFS[13] is established as a set of prioritized steps meant to maintain the ecological integrity of a landscape: (1) avoid and then (2) minimize harmful effects to natural resources and ensure that any remaining harmful effects are (3) offset effectively. Avoidance and minimization measures are meant to preserve ecological conditions in their current state. The federal approach to sage-grouse management is a good example—the prioritization of development outside of sage-grouse habitats[14] and restrictions on anthropogenic infrastructure surface disturbance and densities in PHMAs are measures designed to avoid and minimize degradation of important sagebrush habitats, respectively. However, to effectively offset remaining impacts, habitat enhancement and restoration is necessary. In this way the offset step of the hierarchy differs fundamentally from the first two steps; this step is focused on improving habitat quality, whereas avoidance and minimization are focused on maintaining habitat quantity.

"Net conservation gain" and "no net loss" standards differ in the level of change from baseline conditions required to realize each. Net conservation gain means that mitigation actions result in conditions where the species is better off in terms of long-term population prospects after the impact than before the impact occurred. No net loss occurs when mitigation actions fully offset the effects of an impact such that the species has the same long-term population prospects after the impact than before the impact occurred. Although a net conservation gain standard is generally necessary in sagebrush habitats to allay the inherent spatial and temporal risk associated with habitat restoration and enhancement projects, the difference between net conservation gain and no net loss is insignificant compared to other concerns linked to current approaches to compensatory mitigation. I am far more concerned that a fundamental understanding of mitigation, regardless of the standard adopted, seems to be lacking.

Because there is a finite amount of land that can support sagebrush and sage-grouse, mitigation in the context of offsetting residual impacts can only be realized directly from restoration or enhancement of habitat. These sorts of habitat improvements result in "lift," or an increase in the biological carrying capacity[15] of targeted habitats. Offsetting residual impacts requires that the lift resulting from compensatory mitigation meets (no net loss) or exceeds (net conservation gain) the decrease in biological carrying capacity resulting from the impact being mitigated through both space and time. Preservation in-

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11 Crist et al. 2017; http://www.bioone.org/doi/pdf/10.1650/CONDOR-16-60.1

12 See Manier et al. 2014; https://doi.org/10.3133/ofr20141239

13 E.g., https://www.fs.fed.us/emc/nepa/FSMitigationPolicy.htm

14 It is worth noting that Instructional Memorandum (IM) 2018-026 (https://www.blm.gov/policy/im-2018-026) undermined the 2015 prioritization mandate on most federally-owned sage-grouse habitats

15 E.g., Coates et al. 2016; https://doi.org/10.1073/pnas.1606898113

and-of itself does not contribute to lift, but instead is an important tool for ensuring durability[16] of compensatory mitigation projects where the resources being preserved contribute significantly to ecological sustainability of habitats in a region. In situations where preservation is used to protect high value habitats, net conservation gain or no net loss is not realized directly (i.e., is not quantified as the projected change in condition assuming the site was impacted), but is realized as a reduction in compensatory mitigation required to achieve either of these standards in the region of interest. For example, if a conservation easement is used to protect an area from energy development, the value to conservation is not quantified as the change assuming the area was developed; the value is realized from the fact that the area was preserved and therefore does not need to be mitigated.

Regardless of the mitigation standard being adhered to by the USFS, rigorous and repeatable scientific approaches must be used to quantify impact (i.e., debits) and *actual* gain (i.e., credits established from the actual lift in carrying capacity) as changes from baseline environmental conditions. Only by strictly adhering to the straightforward idea that debits must be fully offset by credits through both space and time can we be relatively certain that offset has actually occurred. This assurance requires a scientifically-valid approach to mitigation that expressly takes into account the uncertainty inherent in habitat enhancement and restoration efforts. It is critical that the USFS establishes and follows mitigation approaches where it can be empirically demonstrated that anthropogenic impacts to sage-grouse and their habitats have at a minimum been effectively, sustainably and entirely offset.

Conclusion

The USFS suggests that aligning their management approaches with state plans will benefit sage-grouse conservation at landscape scales. The reverse is actually the case. Effective management of sage-grouse requires local, regional and range-wide perspectives.[17] [18] [19] The 2019 changes to Federal approaches to managing sage-grouse habitats are undermining the broader perspectives, and the science suggests that this narrowing of management focus through space and time could result in the ineffective management of the landscapes required to conserve sage-grouse populations. The science and declines in populations and habitats suggest that our focus should instead be on building from the preservation foundation provided in the 2015 plans to realize the enhancement and restoration of sagebrush habitats in general across the range of the species. Taking the opposite approach by failing to address large-scale population dynamics and habitat restoration will likely lead to the continued overall loss of sagebrush habitat quantity and quality resulting in sage-grouse population declines.

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[16] Compensatory mitigation measures are "durable" when the effectiveness of the measures is sustained for the duration of the unavoidable direct and indirect impacts.

[17] Edmunds, D. R., C. L. Aldridge, M. S. O'Donnell, and A. P. Monroe. 2017. Greater sage-grouse population trends across Wyoming. Journal of Wildlife Management 82:397-412.

[18] Coates, P. S., B. G. Prochazka, M. A. Ricca, B. J. Halstead, M. L. Casazza, E. J. Blomberg, B. E. Brussee, L. Wiechman, J. Tebbenkamp, S. C. Gardner, and K. P. Reese. 2018. The relative importance of intrinsic and extrinsic drivers to population growth vary among local population of Greater Sage-Grouse: an integrated population modeling approach. The Auk 135:240-261.

[19] O'Donnell et al. 2019; https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/ecs2.2872