HUMBOLDT COUNTY COMMISSIONERS' OFFICE

September 23, 2019

Nora Rasure, Regional Forester, Intermountain Region; and,
Brian Ferebee, Regional Forester, Rocky Mountain Region
Serving as Responsible Officials for the Greater Sage-grouse Plan Amendments
USDA Forest Service, Attn: Objection Reviewing Officer
1400 Independence Ave. SW
EMC-PEEARS, Mailstop 1104
Washington, DC 20250

Also Submitted Electronically at:
https://cara.ecosystem-management.org/Public/CommentInput?project=52904

RE: Objection regarding the Greater Sage-Grouse Draft ROD and LMPA for NFS Land in Nevada

Dear Ms. Rasure and Mr. Ferebee,

Humboldt County, Nevada (County) would like to express appreciation for efforts the United States Forest Service (USFS) has taken to work with the County and other stakeholders during this Land Management Plan Amendment process for the Greater Sage-Grouse. The County plays a unique role in conservation and management of the Greater Sage-Grouse, and to that end, the County appreciates the USFS commitment to collaboration, coordination, and communication. Below Humboldt County presents its remaining concerns with the Greater Sage-Grouse ROD and LMPA for NFS Land in Nevada:

On July 27, 2018 the County submitted comments to U.S. Forest Service on the Greater Sage Grouse Proposed Land Management Plan Amendments (see attached). The County also worked with the Nevada Association of Counties to provide extensive comments to the Draft EIS and Administrative Draft and Final EIS documents. Finally, the County participated in a host of Cooperating Agency meetings throughout the collaborating process.

The County submits this letter in response to the USFS's Draft Record of Decision (ROD) and Land Plan Management Amendment (LMPA) for National Forest Service Land in Nevada on the Humboldt-Toiyabe National Forest released on August 2, 2019. The County is an authorized entity.

Protest Issue 1: Detrimental Noise Level Determination

Parts of the Plan Being Protested:

Greater Sage-grouse General
GRSG GEN-ST-009-Standard

Humboldt County's Interest in Filing this Objection:

Noise limitations on unauthorized activities, or activities pending authorizations can have significant impact on the ability of the County to provide administrative or emergency functions. For example, maintaining roads, or trails could result in temporary exceedance of this Standard.

Previous Documentation Addressing the Issue:

Both the County and NACO suggested a modification to the above-ambient noise threshold in its Document-Specific Comments to the Greater Sage Grouse Draft Record of Decision and Land Plan Management Amendment. Specifically, regarding Table 2-7, at page 2-23, NACO suggested that GRSG-GEN-ST-009-Standard be modified to read: "Do not authorize new surface disturbing and disruptive activities that **create permanent or long-term and sustained** detrimental noise levels..."

Why the County is Objecting to Director's Decision:

While the County appreciates the clear exception for previously authorized activities, it remains concerned about the impact the 10dBa threshold will have on the County's ability to expand or improve infrastructure, or conduct administrative functions, including any functions or services not yet authorized. Also, the County is concerned that no language is included to create exceptions for activities that have not been authorized but which nevertheless may be essential. Language similar to, or identical to the language of GRSG-LR-ST-15-Standard would be helpful here. For instance, language creating an exception for public health, public safety, re-authorizations or renewals, and routine administrative functions.

Protest Issue 2: Three Percent Anthropogenic Disturbance Cap/Application to BSU Boundaries:

Parts of the Plane Being Protested

Greater Sage-grouse General
GRSG-GEB-ST-005-Standard

Humboldt County's Interest in Filing this Objection:

This standard has the potential to impose significant restriction on routine county functions cannot be understated. Furthermore, the County seeks assurances that the anthropogenic disturbance cap standard is grounded in the best available science.

Previous Documentation Addressing the Issue:

The County and NACO requested that USFS provide further information as to how the standard was developed, and for documentation of the best available science that supports it. The DEIS Table 2-7 Proposed Action, pages 2-81 & 2-82, GRSG GEN-ST-005-Standard also failed to elaborate on the science supporting the 3% cap. Furthermore, THE COUNTY'S requested clarification as to how such a cap would be adjusted if BSU boundaries should change.

Why Humboldt County is Objecting to the Director's Decision

The LMPA cites several appendices and figures to help elucidate features of the 3% cap. However none of the figures referenced offer any clarification for the methodology, sources, studies, or science used for the 3% formulation. While the County does not doubt USFS considered available science in formulating the 3% disturbance cap, without reference to the material or methodology, it is difficult to determine whether it was the *best available* science. Furthermore, the County reiterates its concern over how the 3% cap would be adjusted if and when a BSU boundary changes. The County appreciates the exception for projects that may be approved because they result in a net conservation gain. The County also appreciates the exception for exceeding the 3% cap in existing designated utility corridors if the site specific NEOA analysis indicates a net conservation gain.

Protest Issue 3: Coordination and Consultation with Respective County

Parts of the Plan Being Protested:

Roads/Transportation
GRSG-RT-GL-072 Guideline to GRSG-RT-MA-077 Management Approach

Humboldt County's Interest in Filing this Objection:

Travel restrictions impact local communities by interfering with county obligations to provide regular and emergency services. These impacts include interference with road maintenance, provision of public safety services, impediments to landowner access to their private property, and prohibiting the travel of ranchers, hunters, recreationists, and exploration geologists.

Previous Documentation Addressing the Issue

See Page 6 of 8 in the attached comment letter. The County requested that language be added to the LMPA that requires consultation and coordination to be conducted with the respective county prior to any road closures or travel restrictions, and that any road closures, seasonal or otherwise, must be coordinated with the local government. Despite the County's proposed consultation and coordination requirement, the LMPA does not require the proposed coordination or consultation.

Why Humboldt County is Objecting to Director's Decision:

The Director's decision to approve the LMPA's standards, guidelines, and management approaches relating to Roads and Transportation will have a detrimental impact on affected the County's abilities to conduct routine administrative functions traditionally under the immediate control of counties, such as weed treatments, fuel reductions, grazing etc. Some USFS roads provide access to private lands and water rights.

GRSG-RT-ST-073-Standard in particular is both vague, and overbroad. For instance, it implicitly prohibits activities that would otherwise be permitted simply because of that activity's mere proximity to a lek. This standard makes it unclear as to whether minor and minimally disruptive activities that would comply with 3% disturbance cap, or be under the dBa threshold would be prohibited. If so, the rationale is unclear, and the USFS could prohibit even minor, minimally disruptive trail, or road maintenance during seasons in which such maintenance is a priority.

The County's request, that USFS consult and coordinate with counties when considering the closure of roads, seasonal or otherwise, represents a modest proposal.

Protest Issue 4: Priority for Native Species in Habitat Restoration

Parts of Plan Being Objected to:
Fuels Management:
GRSG-FM-GL-049-Guideline

Humboldt County's Interest in Filing this Objection:
Fire and invasive species continue to pose the highest threat to Sage-grouse and its habitat. The County continues to support the use of desirable non-native, non-invasive plants in combination with native species for habitat restoration, as native species are often expensive, difficult to obtain, and don't always compete will with invasive species. Counties bear the most immediate socio-economic impacts of rangeland fires in Nevada. Rangeland fires continue to profligate across the Great Basin as a result of, insufficient landscape restoration, proliferation of fire-conducive invasive species, and fire. For instance, cheatgrass thrives in disturbed areas (e.g. burned areas) and serves as prime fuel for rangeland fires creating a vicious cycle of cheat grass, fire, more cheatgrass and more fire.

Previous Documentation Addressing the Issue:
See cover letter and page 6 of 8 of the attached letter for the County's expression of support of use of desirable non-native species.

Why Humboldt County is Objecting to Director's Decision:
GRSG-FM-GL-049-Guideline barely limits the blanket preference for natives, if at all, by recommending their use "when available" or when "timely" reestablishment of native plant materials is "not likely to occur". The County believes that all tools (including desirable non-native plant species) need to be available to maintain ecological processes.

Native species are expensive, often difficult to obtain, and don't always compete well with non-desirable invasive species. Strict use of natives can limit the size and effectiveness of a habitat enhancement or restoration project. Desirable non-native species that are more readily available, more cost effective, more competitive with non-native annual grass species, and which provide a similar ecological functionality should also be encouraged for use. As before, the County suggests the USFS work with the Agricultural Resource Service's Great Basin Rangeland Research Center in Reno to identify science monitoring data to support this approach.

Conclusion

The County appreciate USFS's willingness to coordinate with individual counties, NACO, and affected stakeholders in the conservation of Greater Sage-grouse and its habitat. Thank you for incorporating many of the comments that Nevada's counties made throughout this process, and for your consideration of these few outstanding and important issues. If you have any questions, please do not hesitate to contact me.

Respectfully,

Dave Mendiola, County Manager (Lead Objector)
Humboldt County, Nevada
(775) 623-6300
dave.mendiola@hcnv.us

Cc: Nevada Association of Counties

Attachment: Humboldt County, Nevada Comments to the Department of Agriculture, Forest Service, Amendments to Land Management Plans for Greater Sage-Grouse Conservation, Corrected Supplemental Notice of Intent 83 Fed. Reg. 30909 (July 2, 2018) and Proposed Changes to the Greater Sage-Grouse Nevada Plan Amendment

Humboldt County
Board of Commissioners

County Administrator
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July 27, 2018

Sage-grouse Amendment Comment
USDA Forest Service Intermountain Region
Federal Building
324 25th Street
Ogden, UT 84401

Submitted via Public Participation Portal at:
https://cara.ecosystemmanagement.org/Public/ CommentInput?project=52904

And,

Via Email to: comments-intermtnregional-office@fs.fed.us

RE: Humboldt County, Nevada Comments to the Department of Agriculture, Forest Service, Amendments to Land Management Plans for Greater Sage-Grouse Conservation, Corrected Supplemental Notice of Intent 83 Fed. Reg. 30909 (July 2, 2018) and Proposed Changes to the Greater Sage-Grouse Nevada Plan Amendment

Dear Mr. Shivik,

Humboldt County, Nevada (the County) greatly appreciates the opportunity to provide comments to the above-referenced Supplemental Notice of Intent (NOI) and Proposed Changes to the Greater Sage-Grouse Nevada Plan Amendment. This comment letter is timely submitted, within the scoping period ending August 1, 2018.

The County has submitted information throughout the Greater Sage-grouse Plan Amendment Process finalized in 2015 at 80 Fed. Reg. 57633 (Sept. 24, 2015), and the cancelled Sagebrush Focal Area Mineral Withdrawal at 82 Fed. Reg. 47248 (Oct. 11, 2017). The information provided during those NEPA Processes are hereby incorporated by reference, as well as the County's previous scoping comments specific to this planning process at 82 Fed. Reg. 55346 (Nov. 21, 2017).

Public lands managed by the Forest Service are inextricably tied to the customs, culture and economy of the County. Humboldt County contains all of the approximately 280,000 acres of the Santa Rosa Ranger District within the larger Humboldt-Toiyabe National Forest. Much of

the Santa Rosa Ranger District contains mapped Greater Sage-grouse Habitat including: priority, general and other habitat, as well as designated Sagebrush Focal Areas (SFAs).

The County would like to remind the public land management agencies that wildfire and altered fire behavior / fire cycles due to annual invasive species such as cheatgrass remain the top threat to Sage-grouse in Nevada. This point has never been clearer than on the heels of the Martin Fire that burned over 435,000 acres in five days (223,000 acres on July 7 alone), including 433,000+ acres of mapped Sage-grouse habitat, much of which is in Humboldt County. While the fire was driven by a combination of topography and severe fire conditions, extremely high fine fuel loads (reported via Inciweb on July 7 as over 200% of normal cheatgrass) contributed to the rapid fire spread and ineffectiveness of traditional fire suppression techniques. This highlights the County's concern of over-regulation of livestock grazing and a continual reduction in grazing (as measured in Animal Unit Months, AUMs) since the 1970s, resulting in build-up of fine fuels, particularly in years with above average winter and spring precipitation. The inability of the Forest Service to respond in real-time to such fuel loads, and provide added flexibility and effectiveness for the most cost-effective pre-suppression tool (managed grazing), continues to concern the County. As such, the County urges the Forest Service to incorporate new management actions that allow increased grazing of fine fuels, particularly when fuel loading is high, as a means of wildfire pre-suppression. The County supports the implementation of any and all tools (Programmatic EIS Analysis, Allotment Management Plans, Temporary Non-Renewable Grazing Authorizations, Outcome Based Grazing, etc.) to ensure more effective use of grazing as a fuels reduction method. Until this happens, the County foresees similar outcomes to the Martin Fire. To that end, the County has attached an Article in Press titled *Viewpoint: An Alternative Management Paradigm for Plant Communities Affected by Invasive Annual Grass in the Intermountain West*. This article was developed by some of the most respected and experienced Range Management Professionals in the Great Basin, and the County fully supports their proposed 'Fuels Management Approach'.

Based on the indication in the NOI that the Forest Service may invite Cooperating Agencies to participate in its planning process, the County would formally request Cooperating Agency status. The County possesses specific and specialized knowledge and information regarding the Santa Rosa Ranger District which will be affected by the proposed changes to the Nevada Plan Amendment.

<u>The Following Comments are General Comments to the Supplemental NOI and Proposed Changes to the Greater Sage-Grouse Nevada Plan Amendment:</u>

The County supports the purpose of the proposed action to improve clarity, efficiency and implementation of the Forest Plan Amendments, including the Nevada Plan Amendment. The County also fully supports the intent to better align with State and BLM plans. In summary, the County generally supports:

- Elimination of Sagebrush Focal Areas (SFAs);
- Incorporation of State of Nevada-approved maps for habitat management areas, and clarification of the purpose and use of said maps;
- Removal of restrictions on livestock grazing;
- Further emphasis of invasive (plant) species management;
- Revision of the Adaptive Management Framework; and,
- Better alignment and clarification of compensatory mitigation standards.

The previous scoping letter, and the below comments more clearly articulate concerns and suggested changes regarding the above listed items.

The Following are Specific Comment to the Proposed Changes to the Greater Sage-Grouse Nevada Plan Amendment:

Page 1, Footnote 2: This footnote seems to be more pertinent to the Habitat Management Area Map Update process on Page 2. In regard to the determinations on unsuitable / non-habitat and the "ecological potential" to become habitat, who would make such a determination?

Page 2, Habitat Management Area Map Update Process: The County supports updating the mapping to reflect 2015 State-approved Habitat Management Areas, provided that it includes both the State's Sage-grouse Habitat Management Area (SGMA): the spatial extent of Sage-grouse management in Nevada (as defined by the State Plan, page 10) and the State's habitat management categories: priority, general and other. The County's support is also contingent upon the ability to update said maps and ground truth habitat, given that these maps are derived from models of habitat and Sage-grouse use where data is available.

GRSG-GEN-DC-002-Desired Condition: The County would appreciate a note that clarifies that county administrative activities, existing infrastructure, and emergency services, all qualify as "authorized uses" in both priority and general habitat.

GRSG-GEN-ST-005-Standard: The County has previously expressed concern regarding "net conservation gain" (see scoping comments). The County remains concerned in terms of how this standard is both applied and interpreted across projects in an equitable and consistent manner.

GRSG-GEN-ST-006-Standard and GRSG-GEN-GL-007 Guideline: The terms "active" and "pending" should be defined. Generally, throughout the document, any time a seasonal activity is noted (i.e. lek, breeding and nesting, winter, etc.) please reference the table that specifies dates for these activities.

GRSG-AM-ST-011 and 012 – Standard: See comments to Appendix C below.

GRSG-LR-SUA-ST-014-Standard: The County strongly supports exceptions 'iii' for public health and safety issues, as well as 'v' for routine administrative functions. However, there should be more clarity on who makes the determination as to when these standards are met. The County would suggest that the Forest Ranger may make the most sense in these instances as they are the closest manager to the local community that may be making such requests.

GRSG-LR-SUA-ST-015-Standard and GRSG-LR-SUA-ST-016-Standard: Will the same exceptions for public health and safety, as well as routine administrative functions, be applied to this standard? The County supports these same exceptions for these two standards as there may be situations where stipulations for needed land use may be required for the County to provide needed services. One example might be placement of new communication infrastructure that may not be conducive to location with existing infrastructure or rights-of-way.

GRSG-WS-ST-025-Standard and GRSG-WS-ST-026-Standard: Why are solar and wind energy developments treated differently (i.e. solar is not allowed in general habitat, yet wind is)? Are such developments allowable if they can meet the "net conservation gain" standard?

GRSG-GRSGH-O-029-Objective: The County can appreciate the Forest Service's caveat of 'subject to available resources and appropriations' for efforts to address invasive species. However, the County would urge prioritization of such projects since this issue, and its associated fire cycle, remains the greatest threat to Sage-grouse in Nevada.

GRSG-GRSGH-GL-034-Guideline: The County strongly objects to the preference for 'native' species in habitat restoration and enhancement efforts. Native species are expensive, often difficult to obtain, and don't always compete well with non-desirable invasive species. As such, use of native species can often limit the size and effectiveness of a habitat enhancement or restoration project. Desirable non-native species that are more readily available, more cost effective, more competitive with non-native annual grass species (medusahead and cheatgrass) and provide a similar ecological functionality should also be encouraged for use. The County suggests the Forest Service work with the Agricultural Resource Service's Great Basin Rangeland Research Center in Reno to identify science and monitoring data to support this approach.

GRSG-GRSGH-GL-036-Guideline: Any treatments involving water (i.e. springs and seeps) should be consistent with State Water Law. For instance, a fencing project may be completed to benefit vegetation, but it also may change use of the water source by livestock which could conflict with an existing water right. The County suggests adding a sentence to this guideline that would read, "Treatments should be consistent with State Water Law, and where appropriate, the Forest Service will work collaboratively with water right holders to implement such projects."

GRSG-GRSGH-GL-0XX-Guideline: The County strongly supports the approach of prioritizing invasive species treatments in priority habitats, as well as early detection and response. The

County would suggest adding a sentence that provides direction to Forest Service personnel to work with local government, weed districts and conservation districts to maximize such efforts and leverage funding opportunities.

GRSG-LG-GL-042 Guideline and Standard: The County agrees with deleting current Guideline GRSG-LG-GL-042 and the reference to grazing guidelines included in Table 3. The County doesn't believe such specific guidelines (such as stubble heights) belong in a Forest Management Plan as they are not developed based upon allotment-specific conditions. Such blanket guidelines could result in unwarranted restrictions on grazing and subsequent increases in fine fuel loads resulting in increased threat of wildfire and favorable conditions for invasive and noxious species.

The County also has concern with the proposed 50% riparian area and meadow utilization standard. Again, each utilization standard must be set on a site-by-site basis in collaboration between the range specialist and the grazing permittee to meet desired conditions or trends. In some meadow systems, production is so high that insufficient removal of biomass will restrict desirable plant growth and allow weedy species to invade. In other systems, reduced herbivory may be required for plants to reestablish root systems and carbohydrate reserves.

In lieu of the existing guideline and proposed standard, the County would advocate that the Forest Service utilize all available planning tools and mechanisms (Programmatic EIS, Allotment Management Plans, use of Temporary Non-renewable Grazing Authorizations, etc.) to work with individual grazing permittees to develop allotment-specific grazing systems that meets the terms and conditions of their permit, favorable trends towards desired Sage-grouse habitat, and flexibility to address excess fuels when present.

GRSG-LG-GL-043-Guideline: The County is adamantly opposed to allotment closures and forage reserves. Livestock grazing is important to the County's customs, culture and economy, and such actions are inconsistent with the County's Master Plan. In addition, such actions will result in accumulation of fine fuels and increased potential for catastrophic wildfire (i.e. the 400,000+ acre Martin Fire that is still burning). The County suggests adding a provision to this guideline for development of Allotment Management Plans (AMPs). When developed and planned correctly (between the grazing permittee and Forest Service Specialist) an AMP can provide a list of management actions and guidelines that improve range condition, grazing management and wildlife habitat. We believe working together to utilize livestock grazing as a tool for conserving and improving habitat is a more appropriate course of action than allotment closures and forage banks which will only aggravate current and future conditions.

GRSG-LG-GL-044-Guideline: The County is concerned that using the term "restricted" could have unintended consequences for its citizens. Depending on site conditions, it might not

always be possible, or necessary to stay 2.0 miles away from a lek. Thus, the County suggests replacing "restricted" with "avoided unless site-specific conditions dictate otherwise."

GRSG-FM-GL-052-Guideline: See comment for **GRSG-GRSGH-GL-034-Guideline** above. The County strongly supports use of desirable non-native species that provide a similar functionality as native species yet are often more cost effective and readily available.

Wild Horse and Burro: The County strongly supports and appreciates the Desired Condition, Standards, and Guidelines included in this section. Over-grazing by wild horses is a major concern in Humboldt County and will continue to be problematic to Sage-grouse habitat until herds are consistently managed within appropriate management levels.

GRSG-RT-GL-087-Guideline: Any road closures, seasonal or otherwise must be coordinated with the local government. Many Forest Service roads provide access to private lands (including water rights) or are critical for administrative functions and important land uses (i.e. grazing, weed treatments, fuels reduction, etc.). As such, the County requests adding a sentence here that the County would be consulted and coordinated with prior to any road closures or travel restrictions. Also, exceptions should be provided to allow for County emergency services and administrative functions.

GRSG-P-DC-XX-Desired Condition: The County fully supports and appreciates this addition to coordinate with other agencies to 'minimize impacts from predators' particularly where habitat has been diminished due to events such as wildfire.

Appendix A – Seasonal Habitat Preferences: The County appreciates and supports the clarification that "These values are not desired conditions as defined at 36 CFR 219.7, but conditions for which sage-grouse select during seasonal use periods." The County also supports the ability to update tables based on new and regionally-specific information. The County believes a map showing the referenced Ecoregions would be helpful for context. Finally, the County strongly supports utilization of information developed by the Natural Resource Conservation Service (NRCS) and College of Agriculture, Biotechnology and Natural Resources (CABNR) at the University of Nevada, Reno (UNR) including, but not limited to: Ecological Site Descriptions, Disturbance Response Groups, State-and-Transitions Models to determine site specific objectives based on the current ecological state of the given site.

Appendix B – Mitigation Strategy: The County presents the following points and questions regarding the proposed mitigation strategy:

- The County fully supports the application of the mitigation hierarchy: avoid, minimize and mitigate. This approach is consistent with federal regulation, as well as the State Plan.

- Paragraph 2 on Page 42 is very nebulous, particularly the following exerpt, *...the Forest Service would require and ensure mitigation, subject to valid existing rights and federal regulations governing the authorization...* It is unclear to the County, and other stakeholders, what this means in terms of which "authorizations" or land use activities would and would not be required to mitigate. This issue should be clarified, perhaps with a table that clearly describes which authorizations would be required to mitigate and which would not.
- The County agrees that a common, standard method should be used to determine impacts and commensurate mitigation.
- The County is unclear as to how options (bullets) 2 and 3 under *Compensatory Mitigation* Options would be implemented and determined for mitigation. More detail would be appreciated.
- The County has previously expressed concern with the "Net Conservation Gain" standard. While the County appreciates the Forest Service including a definition of "Net Conservation," this term is still nebulous in terms of determining how this standard would be met. The definition should be updated to better define how the standard would be determined when using the State HQT and CCS (i.e. a functional acre equivalent between impacts and mitigation). Further, there needs to be more definition in terms of how this standard would be determined if not using the State's mitigation system. Finally, there needs to be a better explanation of how the Forest Service can meet this standard for authorizations that don't contain regulations that provide an allowance for mitigation.

Appendix C – Adaptive Management Plan for Nevada: The County presents the following points regarding the proposed Adaptive Management Plan for Nevada:

- The County believes the proposed Adaptive Management Plan for Nevada is a vast improvement over the current Adaptive Management Plan, which the County feels is not Adaptive Management.
- The County suggests a stronger emphasis of inclusion of local partners (County government, conservation districts, NGOs and affected land users) for any casual factor analysis, Adaptive Management process and/or planning effort.
- The County agrees that a causal factor analysis should be completed before implementation of any additional land use regulations or restrictions.
- The County also questions the use of "Habitat Soft and Hard Triggers" that are included in the Plan and suggests removal of these triggers unless a more robust, scientific justification can be provided for their use. At this time, the County feels there is not a consistent, dependable system for determining when an area has hit a trigger, which is unacceptable due to the possibility of these triggers heavily affecting our citizens' customs, culture and economy.

Once again, the County appreciates the opportunity to provide these comments. If you have any questions, please do not hesitate to contact Dave Mendiola, County Manager via email at dave.mendiola@hcnv.us or by phone at (775) 623-6300.

Respectfully Submitted,

Jim French, Vice-Chairman
Humboldt County Board of Commissioners

Attachment: *Viewpoint: An Alternative Management Paradigm for Plant Communities Affected by Invasive Annual Grass in the Intermountain West*

cc: Governor Brian Sandoval
Nevada Association of Counties
Nevada Sagebrush Ecosystem Program
Bill Dunkelberger, Forest Supervisor, Humboldt-Toiyabe National Forest
Joe Garrotto, District Ranger, Santa Rosa Ranger District

Viewpoint: An Alternative Management Paradigm for Plant Communities Affected by Invasive Annual Grass in the Intermountain West

By Barry L. Perryman, Brad W. Schultz, J. Kent McAdoo, R.L. Alverts, Juan C. Cervantes, Stephen Foster, Gary McCuin, and Sherman Swanson

On the Ground

- Over 400,000 km2 of the Intermountain West is colonized by cheatgrass and other annual grasses.
- Planning and management actions designed to foster perennial grass health throughout the region have never addressed how annual grasses would respond.
- For decades, the most significant landscape-level management approach toward invasive annual grasses has been to complain.
- We now know how to begin the process of taking the Intermountain West back from the domination of invasive annual grasses: through the management of standing dead litter.
- Sustaining perennial bunchgrasses at landscape scales will require an integrated ecological approach to fuels management.

Keywords: Bromus tectorum, Intermountain West, Great Basin, fuels management, invasive annuals, remnant perennial grasses.

Rangelands xx(x):1–6
doi 10.1016/j.rala.2018.03.004

Nineteenth-century explorers Jedediah Smith,[1] Peter Skene Ogden,[2] and James H. Simpson[3] travelled across the Great Basin between 1820 and 1860. They encountered and described a number of geographic, fluvial, riparian, human, wildlife, and vegetation features present throughout the region. They did not record/report any annual grasses that ecologists currently consider invasive, nonindigenous species in what is now Nevada and Utah. Nonindigenous annual grasses may have certainly been present in California by that time, but their impactful migration eastward was still decades away. Moreover, phytogeographers generally agree that the native floristic composition of the Intermountain Region is essentially the same today as at the beginning of the Pleistocene[4–6] (with the notable exception of single-leaf pinyon pine [*Pinus monophylla* Torr. & Frém]).[7] However, internal migration and changes in abundance of species have occurred, with respect to elevation, latitude and longitude, in response to climatic changes during glacial–interglacial periods.[8–10] The current suite of native species is the same suite of species that Smith, Ogden, and Simpson saw on their expeditions, although changes in abundance are probable.

Fire intervals during and just prior to European expeditions into the area were a product of vegetation characteristics influenced by Little Ice Age weather patterns,[11] uncontrolled grazing from native herbivores (including many species of small mammals and insects), and wildfire from both human and nonhuman ignitions.[12] In addition to grazing species such as jackrabbits and pronghorn antelope, bison were widespread in the Great Basin (probably as sink populations) until just before Europeans entered the region,[13] and abundant in eastern Idaho and eastern Oregon from the beginning of the Pleistocene until historic times.[14–16]

Fire intervals in the sagebrush steppe portions of the Great Basin have been estimated, where tree-ring data were in proximity to mountain big sagebrush (*Artemisia tridentata* ssp. vaseyana [Rydb.] Beetle) communities, to be between 6 to 60 years, and these plant communities were neither fuel or ignition limited.[12] Wyoming big sagebrush (*Artemisia tridentata* Nutt. ssp. *wyomingensis* Beetle & Young) and low sagebrush (*Artemisia arbuscula* Nutt.) communities had less frequent disturbance events and slower recovery rates than mountain big sagebrush communities,[17] with fire return intervals in Wyoming big sagebrush communities reported to be from 100 to 240 years.[18] Ignition by indigenous peoples as

well as lightning both played a significant role in shaping the species composition (and their relative abundance) of some Great Basin ecological sites. However, the processes that sorted out native species compositions occurred prior to the advent of the annual grass invasion that began around 120 years ago.

Perryman et al. coined the phrase *pristine-management-paradigm* to describe the widely held concept that ecological systems are static entities that can be held in a static condition if they are literally protected from burning, grazing, and other disturbances.[19] The authors argued it was impossible to achieve societal objectives today based on landscape conditions that were present in 1800 A.D. Others have also stated that returning ecosystems to historical or pre-Euro-American settlement conditions by reintroducing historical disturbance may be detrimental or impractical.[20] Processes that created the landscape conditions of 1800 A.D. or any other previous time period have changed or been altered making their replication impossible. For example: Little Ice Age weather conditions have ended; uncontrolled grazing by wild ungulates presumably influenced by codependent predators is no longer possible or desirable; widespread burning by Native Americans is no longer practiced; and annual grasses have colonized many sagebrush and salt desert shrub communities, permanently altering plant community compositions. We believe that objectives for ecosystem management should instead focus upon specific measurable goals that society has determined are valuable under current ecological conditions (e.g., soil stability, biodiversity, wildlife habitat, forage production, etc.). Today's landscapes are not those described by Smith, Ogden, and Simpson. With over 400,000 km^2 colonized by cheatgrass (*Bromus tectorum* L.) and other annual grasses,[21] we believe it is time to declare: The *pristine-management-paradigm* has failed. Continued, wholesale application of this concept is misguided.

Management Practices of the Past

Although a healthy, resilient perennial grass understory is likely the single most important long-term assurance against invasive annual grass dominance, rangeland ecologists and managers have long applied science-based management practices that exclude consideration of the biology, ecology, and probable management effects these grazing systems would have on the non-native annual grass component of modern landscapes. For instance, the two major grazing systems employed in the Great Basin are deferred-rotation and rest-rotation. Both focus on meeting the physiological needs of grazed perennial grasses,[22,23] but their implementation throughout the region failed to address how annual grasses would respond. Authorized grazing of animal unit months (AUM) on public lands in the Great Basin focuses on allotment carrying capacities provided by only native perennial species (CFR 4110.2–2 Specifying grazing preference). Non-native annual grasses generally are not recognized, authorized, allocated, or normally considered in the development of district wide or allotment management plans. In fact, almost all management planning efforts and implementations are designed to manage perennial grass or palatable shrub species. The allocation of forage derived from annual grasses requires a separate Record of Decision based on an Environmental Assessment (CFR 4130.6–2 Nonrenewable grazing permits and leases) and is seldom granted.

Fuel breaks have received considerable attention for several decades, for reducing fire risks in and around annual grass-dominated plant communities. At best, this management tool, especially when applied as a stand-alone action, is only a stopgap measure to postpone the fire effects of annual grasses near areas still dominated by desired native species. All the while, annual grasses have become the ecologically dominant life form on upwards of 20,000 km^2 in the Great Basin.[24]

Over the past decade or so, a related movement toward an ecologically based weed management approach has spawned the development of potential new tools for the management of invasive annual grasses. Scientists are currently developing delivery methods for newly identified biological control agents. Undoubtedly, these tools will find useful and appropriate applications for yet undetermined situations and scales. The precise combination of chemical fallow and seeding with both native and non-native, deep-rooted perennial grasses and half-shrubs like forage kochia (*Bassia prostrata* L.) has provided success on many ecological sites and topographic settings, but only for a relatively small percentage of the entire affected area.[25] Likewise, grazing cheatgrass in the fall and early winter months, when perennial grasses are dormant, has demonstrated that managed livestock grazing can reduce carryover fuels going into the next year's fire season, while simultaneously reducing the ability of cheatgrass to dominate areas with a remnant perennial grass component (Figs. 1 and 2).[26,27] Managing cheatgrass with dormant season grazing has been successful on demonstration projects at a scale of thousands of acres in southeastern Oregon, on winter dominated precipitation sites (W. Dragt, B. Wilber, and S. Davies, personal communication, August, 2017).

Figure 1. A mixed annual-perennial grass seeding during spring of 2009 that was fall grazed for 3 consecutive years (2006–2008), Gund Ranch, Nevada.

Figure 2. A mixed annual-perennial grass seeding during spring of 2009 with no fall grazing for 3 consecutive years (2006–2008), Gund Ranch, Nevada.

Cheatgrass and medusahead (*Taeniatherum caput-medusae* [L.] Nevski) require standing dead litter or thatch to maintain their ability to establish and dominate perennial grasses.[28,29] The specific epithet, *tectorum*, is a form of *tectum*, the Latin word for roof. Specifically, *Bromus tectorum* means *brome of the roof*. In Europe, where cheatgrass was first identified and named, its major recognized habitat was in the decaying straw of thatched roofs.[30] Removal of the standing dead litter in the fall before cheatgrass begins to germinate establish reduces "safe sites"[31] conducive for growth and establishment (Fig. 3). This knowledge is not new, being first identified by Evans and Young almost 50 years ago.[28,32] Yet, the value of reducing dead litter as a tool to manage annual grasses has been unrecognized or ignored for decades.

A New Paradigm

Given the advances and successes in the management tools available, the rangeland ecology and management community needs to recognize that annual invasive grasses must be managed as a permanent component of the Great Basin and Intermountain West. For the past 50 years, perhaps longer, most of our collective management objectives, goals, and practices have focused on only the perennial grass component, or toward palatable shrubs in the case of salt desert shrub communities. Rest-rotation and deferred rotation grazing systems (and their various combinations) focus management on the perennial grass component of the plant community while ignoring the annual grasses. Both grazing systems actually favor the proliferation and dominance of annual invasive grasses, especially on warmer and drier sites,[33] by essentially maximizing the standing dead biomass left at the end of the traditional grazing season.[26,27] The antigrazing sentiment[34] that led to a general reduction of annual and temporary grazing authorizations over the past several decades has also played a significant role in annual grass proliferation by providing an increase in safe sites for annual grass establishment, as well as creating larger, more contiguous fuel loads. Through our management activities that foster standing dead litter, we have inadvertently exacerbated invasive annual grass expansion in the Great Basin and Intermountain West. Most standing litter eventually becomes surface litter, creating the "safe site" for the germination of seed from annual grasses. Research-based science has been applied toward the management of perennial grasses on many landscapes,[35] but not toward the ecologically dominant annual grasses that often occur with remnant populations of native perennial species.

The first step for dealing with this issue is recognition of the almost ubiquitous presence of invasive annual grasses across the Intermountain West, particularly at lower and drier elevations. Cheatgrass, medusahead, and North Africa grass (*Ventenata dubia* [Leers] Coss.; a relative newcomer) are here to stay. Not only are annual grasses present, they have become one of, if not the primary driver of the ecological changes occurring in many lower elevation big sagebrush and salt desert shrub communities. It is time that scientists, managers, and policy makers begin to develop and implement research,

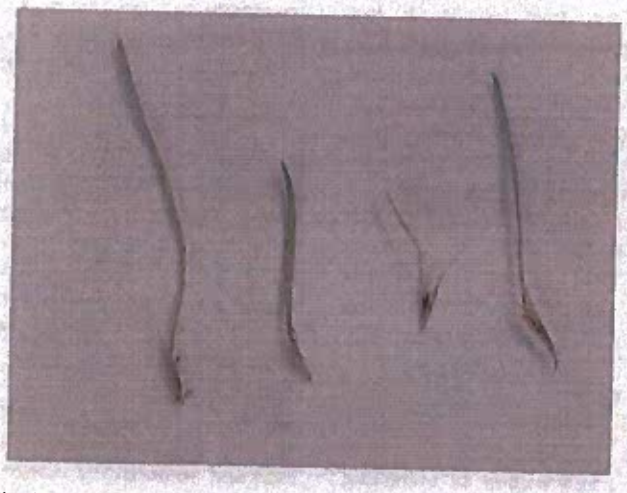

Figure 3. Cheatgrass seedlings extracted from standing litter safe sites in fall 2017, Imlay, Nevada.

planning objectives, policies, and management actions that allow and provide for the active landscape-scale management of annual grasses, instead of continuously lamenting of being their victim. We must admit that many of the shrub dominated communities in the Great Basin and Intermountain West now have diminished perennial grass understories, and have become mixed communities of annual and perennial grasses. They should be recognized and managed first and foremost as annual grasslands, just as the California annual grasslands have been recognized for decades, despite many having some perennial grasses in the plant community. Manage the ecologically dominant annual grasses (the target species) first, while also developing strategies that minimize or eliminate harm to the nontarget remnant perennial species.

Reassessing Fire Disturbance

Fire is not a new disturbance process in sagebrush ecosystems.[12,36] However, fire characteristics have gradually changed over the past five decades. Rangeland fires today reburn areas more frequently, are larger, and have greater intensity than in the recent past.[36] A gradual warming since the close of the Little Ice Age, combined with uninformed legacy grazing practices conducted nearly a century or more ago (and quickly discontinued in many areas), and the introduction and proliferation of invasive annual grasses have resulted in a net loss of sagebrush and salt desert shrub habitats, as well as perennial bunchgrasses. The loss of perennial bunchgrasses increases the likelihood of annual grass invasion and eventual dominance.[37–39]

The dominance of invasive annual grasses in sagebrush rangelands can also be attributed in part to increased mortality of bunchgrasses due to alterations in fire characteristics.[40,41] Perennial bunchgrasses evolved with fire,[17] but the presence of invasive annual grasses has changed fuel characteristics and increased fire frequency on many sagebrush and salt desert rangelands.[36] Perennial bunchgrasses are more susceptible to fire mortality when left ungrazed because litter accumulates near growing points, which facilitates greater temperatures and longer heat residence times that weaken or kill perennating buds and root crowns.[20] Greater perennial bunchgrass mortality with each fire, which occurs ever more frequently, decreases both the resistance of perennial plant communities to invasion by annual grasses and their resilience after disturbance. Fire frequencies shorter than the pre-Euro-American pattern, combined with abundant annual grasses, creates a positive feedback cycle detrimental to perennial bunchgrasses and nonsprouting shrubs.[42]

The Logical Alternative: A Fuels Management Approach

Maintaining and eventually increasing perennial bunchgrasses in fire-dominated annual-grass landscapes will require breaking (lengthening) the fire cycle. To sustain perennial bunchgrasses at landscape scales will require an integrated ecological approach to fuels management. Among the tools used will be direct chemical control, chemical fallow, large scale reseeding, the creation of greenstrips and other mechanical fuel breaks, surfactant seed coating technology, microbiological controls like the fungi *Pyrenophora semeniperda* ([Brittlebank and Adam] Shoem.), and the tool with the most upside potential, targeted or objective-based livestock grazing, particularly during the late summer to early winter dormant period. Fall or dormant-season grazing has high potential for numerous reasons. The infrastructure at a landscape scale is largely in place in many (but not all) locations and is relatively stable from year to year. Dormant season grazing does not depend on the vagaries of public funding and can cover very large acreages in a variety of different configurations. Given flexibility of application by federal agencies, fall/winter grazing not only reduces annual grass carryover fuel loads, but may also initiate positive changes in the annual-perennial grass dominance ratio (Figs. 1 and 2).[26] Intense dormant-season grazing, compared with spring (growing season) grazing, provides more reasonable logistics, and also has much less potential to adversely affect desired perennial species, while increasing the removal of standing and surface fuels. Grazing practices in general affect fuel characteristics, which changes the nature of wildfires: reducing flame height, flame depth, rate of spread, and the size of area burned, while increasing fuel moisture content.[40,41] These fuel characteristics are the primary factors driving not only ignition potential, but also fire timing, severity, continuity, and size. Common sense dictates that fires generally burn hotter, longer, and leave fewer unburned islands when fuel moisture is lower and fuel loads and continuities are greater. These hazardous conditions occur when livestock grazing is reduced or excluded from most or all of the landscapes ecologically dominated by annual grasses.

Changing the current management paradigm on landscapes where annual grasses are the ecologically dominant lifeform requires acknowledging that past approaches have completely failed in some situations and at best maintained the status quo in others. Managing these landscapes requires a new direction, an alternative approach with new purposes and objectives. Fire is an almost universally accepted threat, and is recognized by many as the greatest threat to the more arid sagebrush and salt desert shrub ecosystems. It seems logical to offer a fuels management approach as an alternative to the failed paradigm.

The ecological goal of the new fuels management paradigm is essentially the same: achieving and sustaining plant communities ecologically dominated by perennial species, especially the bunchgrasses that may competitively exclude invasive annual species. Achievement of this goal will require different strategies and associated objectives that focus equally across time (but not necessarily in the same year or decade) on both the annual and perennial components of the landscape. Managing fuels as the priority instead of incidentally will require authorizing AUMs for annual grasses, not just the perennial components in grazing allotments. We propose that a logical starting point is the consideration of fuels and potential fire proximity to priority wildlife habitats and wildland-urban interface areas. This approach will require

cooperation among professionals with backgrounds in rangeland ecology and management, wildlife, archeology, fire planning, and probably other disciplines for specific situations, to identify, quantify, and prioritize areas where fuels management practices can be implemented with the greatest probability for success. Current management paradigm practices were often implemented for rational reasons (improve the perennial herbaceous plant community) but failed to fully understand and/or include the ecology of the invasive annual component. The result is an unacceptable large-scale ecological situation for almost all users of sagebrush and salt desert rangelands. For landscapes where annual grasses are the ecologically dominant lifeform, a step in the right direction would be to address both the annual and perennial grass components (i.e., regularly hurt the annuals and benefit the perennials) simultaneously, with all situationally available tools.[43] This approach requires the recognition and management of mixed annual-perennial grass understories for what they are, but also for what we want them to be in the future. This approach only makes ecological sense.

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