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STATE OF NEVADA
Sagebrush Ecosystem Program

SAGEBRUSH ECOSYSTEM COUNCIL
STAFF REPORT
MEETING DATE: December 18, 2013

DATE: December 13, 2013

TO: Sagebrush Ecosystem Council Members

FROM: Sagebrush Ecosystem Technical Team
Telephone: 775-684-8600,

THROUGH: Tim Rubald, Program Manager, State Lands,
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SUBJECT: Recommendation of Habitat Objectives to be included in the State Plan

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SUMMARY

This item presents the concept of habitat objectives and a proposed section to be added to the State Plan that presents habitat objectives specific to Nevada to be used in management of sage-grouse habitat within the state. The technical aspects of the new section have been reviewed by the Science Work Group.

PREVIOUS ACTION

March 27, 2013. The Council directed the SETT to meet with USFWS and NDOW staffs to discuss the USFWS comments on the Nevada State Plan and report back to the Council.

April 22, 2013. The Council directed the SETT to further develop the Nevada State Plan and the EIS Alternative to incorporate the concerns expressed by the USFWS.

DISCUSSION

Habitat objectives do not define what is and is not habitat. Instead, habitat objectives summarize the composition, structure and other components that would identify "ideal" habitat. What does the habitat need to be in order to provide the best chance of success for sage grouse in terms of selection and fitness?

Determination of habitat objectives for sage-grouse habitat in Nevada is a valuable management tool as it establishes consistent guidelines to manage sage-grouse habitat. Establishing habitat objectives will provide some additional specificity that the State Plan needs, as identified by the USFWS and the BLM. The 2012 State Plan does not currently outline habitat objectives for sage-grouse in Nevada.

The BLM and USFS invited the SETT to provide review on the habitat objectives that are included in the northern California/Nevada sub-regional EIS. An interagency team developed these objectives for the BLM for inclusion in the sub-regional EIS. The team included representatives from USGS, USFWS, BLM, USFS, and NDOW. The team started with the Connelly et al 2000 guidelines and revised them as appropriate to meet the current understanding of habitat requirements in Nevada. The USGS was primarily responsible for much of the synthesis and in translating the complex habitat relationships and sage-grouse responses into the habitat objectives which are thus summarized and can be applied on the ground.

The BLM, USFS and SETT agree that the BLM, USFS and the State should be consistent in habitat objectives so that management is consistent across agency jurisdiction. To this end, the SETT, BLM and USFS took the proposed objectives to the December 5, 2013 Science Work Group meeting for additional review. The SWG generally agreed with the objectives put forward, but provided feedback on refinements to objectives for "All life stages", regarding tall structures, as well as additional points of clarification.

As the concept of habitat objectives is new to the State Plan, the SETT has outlined this section as a draft Section 4.0 (See Attachment 1). The changes recommended by the SWG have been partially incorporated in Table 4-1 that is presented in Attachment 1. The BLM and USFS are currently working to further incorporate changes. The SETT will bring any revisions to Table 4-1 to the Council for further approval.

Section 4.0 would be a new section - not replacing any existing sections. Subsequent sections would be renumbered. As the SETT continues to refine the 2012 State Plan, it will be reviewed for consistency with the habitat objectives and references to the habitat objectives will be included as needed.

FISCAL IMPACT

There is no fiscal impact at this time.

RECOMMENDATION

Staff recommends that the 2012 State Plan be revised to include habitat objectives as presented in the new draft Section 4.0 Habitat Objectives (Attachment 1).

POSSIBLE MOTION

Should the Council agree with the staff recommendations, possible motions would be:

> "Motion to approve the proposed addition of Section 4.0 Habitat Objectives to the 2012 State Plan."
> or
> "Motion to approve the proposed additions of Section 4.0 to the 2012 State Plan on condition of specific revisions."

Attachments:

1: Section 4.0: Habitat Objectives for Greater Sage-grouse in Nevada *and* Appendix B: Development Process and Justification for Habitat Objectives for Greater Sage-grouse in Nevada

Literature Cited

Connelly, J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. 2000. Guidelines to manage sage-grouse populations and their habitats. Wildlife Society Bulletin 28:967-985.

ln:TR

Attachment 1: Proposed Addition of "Section 4.0 Habitat Objectives for Greater Sage-grouse Habitat in Nevada" to the 2012 State Plan

4.0 Habitat Objectives for Greater Sage-grouse in Nevada

The purpose of the habitat objectives for sage-grouse is to describe what is generally considered to be the highest quality seasonal habitat for greater sage-grouse, specific to Nevada. The objectives do not outline what is and what is not habitat, but depict the characteristics of seasonal habitats that sage-grouse in Nevada are using most successfully, based on research in Nevada. The objectives are appropriate at the site-scale and do not address landscape-scale patterns and characteristics.

The State of Nevada will work to maintain and manage sage-grouse habitat to meet these objectives across the sagebrush ecosystem in the state. The habitat objectives will be used to evaluate management actions that are proposed in sage-grouse habitat to ensure that 1) habitat conditions are maintained if currently meeting objectives, or 2) habitat conditions move toward these objectives if the current conditions do not meet these objectives. All proposed sage-grouse habitat mitigation, restoration, reclamation, or enhancement projects will incorporate these characteristics as project habitat objectives and will be the basis for determining success of these projects through long-term monitoring and adaptive management. When habitat within the state is identified as not meeting these objectives, the State will work with land managers to recommend adjustments in management to work towards these objectives, including an assessment of the causal factors. The proposed habitat objectives themselves are not regulatory, but are intended to help guide planning and adaptive management.

These objectives were developed by a team consisting of representatives from the USFWS, NDOW, USFS, USGS and BLM. The team reviewed and the Connelly et al. (2000) guidelines adding considerable detail and making adjustments based on regionally and locally derived data and analysis by the USGS. The State of Nevada's Science Work Group also reviewed these objectives before they were included in the State Plan. These habitat objectives are specific to Nevada and based on research conducted within the State. Additional information on the development of these objectives in provided in Appendix B.

The State of Nevada recognizes that a resilient and resistant sagebrush ecosystem should be heterogeneous across the landscape and that achievement of these objectives resulting in a large-scale homogenous landscape is not desirable within the State of Nevada. These objectives are intended to be used as guidelines at the site-level and do not apply as objectives at the landscape-level.

Table 4-1. Habitat Objectives for Greater Sage-Grouse

Life Requisite	Habitat Indicator	Objective	Citations
GENERAL			
All life stages	Rangeland Health Indicator Assessment	Meeting all standards[1]	
LEK			
Cover	Availability of sagebrush cover	Has adjacent sagebrush cover	Connelly et al. 2000 Blomberg et al. 2012
Security	Proximity of trees > 1 meter above shrub canopy	Within 1.86 miles (3 km):	Connelly et al. 2000 (modified)

Life Requisite	Habitat Indicator	Objective	Citations
		• none within line of sight of the lek	
	Tree cover	Within 1.86 miles (3 km): • <3.5% conifer land cover	
NESTING			
Cover	Sagebrush canopy cover (%)	≥20	Kolada et al. 2009a Kolada et al. 2009b
	Sagebrush species present	Includes *Artemesia tridentata* subspecies	Coates et al. 2011 Kolada et al. 2009a Kolada et al. 2009b
	Residual and live perennial grass cover (%)	≥10 if shrub cover <25[2]	Coates et al. 2011 Coates and Delehanty 2010
	Annual grass (%)	<5	Blomberg et al. 2012
	Total shrub cover (%)	≥30	Coates and Delehanty 2010 Kolada et al. 2009a Lockyer et al. In review
	Conifer encroachment (%)	<5	Casazza et al. 2011 Coates et al. In prep (A)
Security	Proximity of tall structures	None within 3 miles (5km)	Coates et al. 2011
BROOD-REARING/SUMMER			
Cover	Sagebrush canopy cover (%)	≥10	Connelly et al. 2000
Cover and Food	Perennial forb canopy cover (%)	>5 arid >15 mesic	Casazza et al. 2011 Lockyer et al. In review
Food	Riparian Areas/Meadows	Manage for PFC	
	Perennial forb availability (riparian areas/meadows)	≥ 5 plant species present[3]	Casazza et al. 2011
Security	Conifer encroachment (%)	<3 phase I (>0% to <25% cover) No phase II (25 – 50% cover) No phase III (>50% cover) within 0.53-mile (850-meter) buffer of microhabitat plot	Casazza et al. 2011 Coates et al. In prep (A)
	Riparian Area/Meadow Interspersion with adjacent sagebrush	Perimeter to area ratio of 0.15 within 522-foot (159-meter) buffer of the microhabitat plot	Casazza et al. 2011
WINTER			
Cover and Food	Sagebrush canopy cover (%)	≥10	Connelly et al. 2000
	Sagebrush height in centimeters(cm)	≥25	Connelly et al. 2000
	Conifer encroachment (%)	<5 phase I (>0% to <25% cover)	Coates et al. In prep (A) Coates et al. In prep (B)

Life Requisite	Habitat Indicator	Objective	Citations
		No phase II (25 – 50% cover) No phase III (>50% cover) within 0.53-mile (850-meter) buffer of microhabitat plot	
	Sagebrush extent (%)	>85% sagebrush land cover within 0.53-mile (850-meter) buffer of the microhabitat plot	Coates et al. In prep (B)
	Sagebrush species comp (%)	*A. t. tridentata* sites >50% *A. arbuscula* sites >25% *A. t. vaseyana* sites >25%	Coates et al. In prep (B)

[1]Upland standards are based on indicators for canopy and ground cover, including litter, live vegetation, and rock, appropriate to the ecological potential of the site. The Rangeland Health Indicator Assessment is already implemented on BLM lands. The assessment process will not trigger specific land use decisions, but instead will provide information to determine if further action is necessary.

[2]Assumes upland rangeland health standards are being met.

[3]Standard considered in addition to PFC. Measured ESD/Daubenmire (25cm x 50cm frame). Includes all mesic plant species, not only perennial forbs.

Appendix B

Development Process and Justification for Habitat Objectives for Greater Sage-grouse in Nevada

Greater Sage-Grouse Proposed Habitat Objectives

Questions and Answers

1. How were the Proposed Habitat Objectives for GRSG developed?

   The proposed habitat objectives are a synthesis of existing data across the state of Nevada and portions of the Bi-State in California. The U.S. Geological Survey was primarily responsible for much of the synthesis and in translating often complex habitat relationships and GRSG responses into the proposed habitat objectives which could be summarized and applied on the ground. A team consisting of representatives from the U.S. Fish and Wildlife Service, BLM, Nevada Department of Wildlife, and U.S. Forest Service reviewed the Connelly et al. 2000 guidelines and also reviewed a bibliography of Nevada-based research made available by the U.S. Geological Survey. The team then went through each Connelly et al. 2000 guideline and reviewed it with respect to localized data. The Connelly et al. 2000 guidelines remained as a default unless refined by new information.

2. Why are the Proposed Habitat Objectives for GRSG different from Connelly et al. 2000 guidelines?

   The Connelly et al. 2000 guidelines were a strong synthesis of research until that time. The guidelines themselves suggest that studies which define GRSG habitat on a more region-specific basis should be used where supported by research. These proposed habitat objectives respond to more localized data than the Connelly et al. 2000 guidelines, which relied heavily on data from the eastern half of the range of GRSG where a perennial grass component is more dominant, and where large-scale ecological changes such as invasive grasses and conifer encroachment are largely absent. The proposed habitat objectives reflect those differences.

3. What are the differences between the Proposed Habitat Objectives for GRSG and Connelly et al. 2000 guidelines?

   While numerous differences exist, they are driven primarily by three elements: 1) the reduced role of perennial grasses for nest concealment as revealed by many nesting habitat studies throughout Nevada; 2) the increased habitat fragmentation and degradation as a result of invasive grasses and conifer encroachment; and 3) the elevated importance of late-summer brood-rearing habitats in the lower precipitation zones of Nevada. The proposed habitat objectives also reflect recent research into more complex aspects of habitat juxtaposition, such as the interspersion of meadow habitat with adjacent sagebrush cover, and the attempt to quantify other scale-dependent relationships such as the degree of conifer encroachment.

4. Are the Proposed Habitat Objectives for GRSG supported by science?

   The proposed habitat objectives are supported by numerous studies throughout Nevada from the Bi-State area in southwestern Nevada and California through the Elko District into northeastern Nevada. Much of the synthesis of research which resulted in these proposed habitat objectives for GRSG was conducted by the U.S. Geological Survey.

5. Are the Proposed Habitat Objectives for GRSG consistent with the BLM National Technical Team report (NTT)?

The NTT report suggests the use of local and state seasonal GRSG habitat objectives when they are available and references the habitat recommendations from Connelly et al. 2000 if they are not.

6. What is the rationale for eliminating the residual cover standard (7 in/18cm) from GRSG nesting habitat?

Localized data indicate that sagebrush canopy cover was the primary indicator of nesting success within Nevada. Research indicates that the primary deterrent to successful nesting was predation, specifically by common ravens, an aerial predator. Thus, the research demonstrated that overhead concealment was the primary indicator of nesting success and that the lateral concealment component of perennial grasses drove nesting success only when sagebrush canopy was deficient.

7. What is the difference between tall trees and powerlines?

These differ in degree of impact. Generally, powerlines are larger and have much greater visibility. They contribute to fragmentation and provide potential predators with larger scale, more pervasive access to habitats.

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Table 4-1. Habitat Objectives for Greater Sage-Grouse

Life Requisite	Habitat Indicator	Objective	Notes	Remarks
GENERAL				
All life stages	Rangeland Health Indicator Assessment	Meeting all standards[1]		1
LEK				
Cover	Availability of sagebrush cover	Has adjacent sagebrush cover	Connelly et al. 2000 Blomberg et al. 2012	2
Security	Proximity of trees > 1 meter above shrub canopy	Within 1.86 miles (3 km): • none within line of sight of the lek	Connelly et al. 2000 (modified)	3
	Tree cover	Within 1.86 miles (3 km): • <3.5% conifer land cover		
NESTING				
Cover	Sagebrush canopy cover (%)	≥20	Kolada et al. 2009a Kolada et al. 2009b	5
	Sagebrush species present	Includes *Artemesia tridentata* subspecies	Coates et al. 2011 Kolada et al. 2009a Kolada et al. 2009b	6
	Residual and live perennial grass cover (%)	≥10 if shrub cover <25[2]	Coates et al. 2011 Coates and Delehanty 2010	7
	Annual grass (%)	<5	Blomberg et al. 2012	8
	Total shrub cover (%)	≥30	Coates and Delehanty 2010 Kolada et al. 2009a Lockyer et al. In review	9
	Conifer encroachment (%)	<5	Casazza et al. 2011 Coates et al. In prep (A)	10
Security	Proximity of tall structures	None within 3 miles (5km)	Coates et al. 2011	4
BROOD-REARING/SUMMER				
Cover	Sagebrush canopy cover (%)	≥10	Connelly et al. 2000	11
Cover and Food	Perennial forb canopy cover (%)	≥5 arid ≥15 mesic	Casazza et al. 2011 Lockyer et al. In review	12
Food	Riparian Areas/Meadows	Manage for PFC		13
	Perennial forb availability (riparian areas/meadows)	≥ 5 plant species present[3]	Casazza et al. 2011	14
Security	Conifer encroachment (%)	<3 phase I (>0% to <25% cover) No phase II (25 – 50% cover) No phase III (>50% cover) within 0.53-mile (850-meter) buffer of microhabitat plot	Casazza et al. 2011 Coates et al. In prep (A)	15
	Riparian Area/Meadow	Perimeter to area ratio	Casazza et al. 2011	16

Life Requisite	Habitat Indicator	Objective	Notes	Remarks
	Interspersion with adjacent sagebrush	of 0.15 within 522-foot (159-meter) buffer of the microhabitat plot		
WINTER				
Cover and Food	Sagebrush canopy cover (%)	≥10	Connelly et al. 2000	17
	Sagebrush height in centimeters(cm)	≥25	Connelly et al. 2000	18
	Conifer encroachment (%)	<5 phase I (>0% to <25% cover) No phase II (25 – 50% cover) No phase III (>50% cover) within 0.53-mile (850-meter) buffer of microhabitat plot	Coates et al. In prep (A) Coates et al. In prep (B)	19
	Sagebrush extent (%)	>85% sagebrush land cover within 0.53-mile (850-meter) buffer of the microhabitat plot	Coates et al. In prep (B)	20
	Sagebrush species comp (%)	*A. t. tridentata* sites >50% *A. arbuscula* sites >25% *A. t. vaseyana* sites >25%	Coates et al. In prep (B)	21

[1]Upland standards are based on indicators for canopy and ground cover, including litter, live vegetation, and rock, appropriate to the ecological potential of the site. The Rangeland Health Indicator Assessment is already implemented on BLM lands. The assessment process will not trigger specific land use decisions, but instead will provide information to determine if further action is necessary.

[2]Assumes upland rangeland health standards are being met.

[3]Standard considered in addition to PFC. Measured ESD/Daubenmire (25cm x 50cm frame). Includes all mesic plant species, not only perennial forbs.

Remarks

1. This objective was added to respond to the elimination of a grass requirement for nesting Greater Sage-Grouse (GRSG) habitat where sagebrush canopy is greater or equal to 25 percent, as explained in 7 below. With this general standard in place, it is assumed that the ecological site potential is not overlooked (i.e., that ground cover, including litter, live vegetation and rock, appropriate to the ecological site potential are included). During the process of conducting an allotment evaluation, one would not consider GRSG habitat objectives to be met when grass cover consistent with the upland Rangeland Health Indicator Standard was absent.
2. Leks are typically open areas where GRSG want to maximize their visibility during display. Thus, there are no vegetation parameters identified for leks. Connelly et al. (2000) identifies leks as the approximate center of nesting activities (i.e. within various buffer widths), particularly for non-migratory populations. Blomberg (2012) demonstrated higher nesting success where leks are surrounded with sagebrush as compared to those surrounded by exotic species such as cheatgrass.

Adjacent sagebrush also provides escape cover in the vicinity of a lek. The availability of sagebrush cover near leks is of demonstrated importance.

3. Studies have shown that GRSG avoid areas where tall trees/structures are present; a conditioned response to the use of these structures by perching raptors and their subsequent predation and or harassment of GRSG. Connelly et al. (2000) establishes a guideline of 3 kilometers for "powerlines or other tall structures". Subsequent research and published guidelines indicate that this may be sufficient for tall trees (Phase 2 and 3 juniper [tree stages where the understory is degraded or even absent]), but that the effect of powerlines extends to 5 kilometers.
4. See 3.
5. Previous guidelines described a range of sagebrush canopy from 15-25 percent and an accompanying standard for perennial grass cover. The guideline was supported by a synthesis of data from the eastern half of GRSG range. Data specific to Nevada and the Bi-State population in California indicate that GRSG are selecting the highest sagebrush canopy available on the landscape and that nesting success is directly linked to sagebrush canopy. The selection is indicated by the predominance of raven predation as opposed to ground predators such as badgers, ground squirrels, etc. Ravens are targeting GRSG nests based on observations of GRSG movements to and from the nesting areas. The more aerial concealment available the better nesting success.
6. Presence of sagebrush species in nesting habitat was an active variable in all studies of GRSG nesting.
7. As noted in 5, above, and as provisioned by 1above, perennial grass cover did not contribute to nesting success in dense sagebrush stands selected for nesting. Where sagebrush canopy cover declined below 25 percent, perennial grasses began to show a direct effect on nesting success. It should be noted that nesting success in instances of lower sagebrush canopy closure was always lower than in habitats with lower canopy cover and higher perennial grass cover. Perennial grass cover is a positive indicator of nesting success but does not improve nesting success as well as high brush canopy.
8. Annual grass in nesting habitat always exerts a negative impact to nest success. It provides neither a cover nor a food component for GRSG. It is also a vector for fire increasing the loss of good nesting habitat.
9. Where sagebrush canopy cover is high, other brush species play a positive role. Total canopy cover of all species is a positive attribute for nest success. The highest densities of total shrub cover yields highest nesting success.
10. This standard reflects the direct negative correlation between conifer encroachment and nesting success.
11. Immediately upon leaving the nest, cover requirements are secondary to a viable food resource for brood survival. Sagebrush remains important as a cover component, but is greatly reduced from that required for nesting.
12. With an emphasis of food resources in brood-rearing habitat, a well-represented forb component is the primary habitat component affecting brood persistence in both upland/arid and mesic settings. Data indicate that there is a direct correlation between the number of forb species present and GRSG persistence.
13. While there are specific variables for wetland and riparian habitat suitability for GRSG (e.g., perennial forb diversity) riparian and wetland functionality must be in place. The habitat must have the ability to store water in sufficient quantity to stimulate and maintain productivity. Additionally, grazing utilization must be maintained at levels to promote both functionality and species diversity. Proper

Functioning Condition (PFC) as an objective is considered a minimum standard. The primary standard for brood persistence is noted in 14 below.

14. Forb diversity is a direct measure of riparian and meadow productivity and has been directly linked to brood persistence. A study by Cassazza (2011) indicates that the presence of 5 forb species on mesic sites is a threshold for maximizing brood persistence. Sites with a lower number of species present yielded lower persistence for GRSG while sites with higher forb diversity were only marginally more productive. Forb species diversity tends to provide a more persistent food resource throughout the brood-rearing period. It is suspected that overgrazed systems are likely to fall below this diversity standard, and that completely ungrazed systems will likewise fall below the standard over time as well. Riparian and meadow systems are regarded as a focal point for establishing appropriate grazing levels with respect to GRSG persistence. Methodologies for managing grazing intensities and for measuring riparian and meadow system responses are key.
15. Numerous studies (Casazza et al. 2011; Coates et al. In prep A) indicate that conifer (juniper or pinyon) presence in the vicinity of any GRSG seasonal range is always negative, and that GRSG tolerance for trees is very low. Conifer affects GRSG habitat in two ways: 1) it provides a perching substrate for raptors and, 2) over time, as conifer encroachment moves from Phase I to III it reduces and eventually eliminates favorable shrub, grass, and forb components from the habitat. Studies by Casazza et al. (2011) and Coates et al. (In prep A) indicate only a slight tolerance of Phase I (bush stage where other habitat components remain unaffected) and no tolerance for Phase II and III at the scales noted.
16. This objective highlights the type of meadow system selected by GRSG. The interface between the sagebrush and meadow edge is the most highly forb-productive area for GRSG, and provides immediate available escape cover. Thus, smaller meadow systems with a high rate of interspersion with adjacent sagebrush habitats is preferred, as opposed to larger, open riparian and meadow systems, including agricultural lands. This objective and objective 13 combined gives a complete picture of late-summer brood-rearing scenarios for GRSG and indicate both type and quality of vegetation required along with the challenge of managing those dispersed, small-scale spring and seep meadows which dot the landscape.
17. As with brood-rearing habitat, sagebrush canopy cover is of reduced importance as compared to sagebrush presence and availability. Again, food availability is the primary variable in winter habitat. Sagebrush height, allowing access to the resource in harsh winter conditions, is of importance.
18. See 17.
19. See 15.
20. Connelly et al. (2000) guidelines had previously expressed this percentage at 80, but did not specify the scale for measurement. Subsequent data (Coates et al., In prep B) refine the guidelines and apply it at the scale at which GRSG are exercising habitat selection.
21. This objective highlights species diversity as an influence in current data. Species diversity provides varying scenarios for GRSG survival under varying seasonal conditions.

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