Sagebrush Ecosystem Program
201 S. Roop Street, Suite 101
Carson City, Nevada 89701
Telephone (775) 684-8600
Facsimile (775) 684-8604

www.sagebrusheco.nv.gov

BRIAN SANDOVAL
Governor

Tim Rubald, Program Manager
John Copeland, Forestry/Wildland Fire
Melissa Faigeles, State Lands
Kelly McGowan, Agriculture
Lara Niell, Wildlife

STATE OF NEVADA
Sagebrush Ecosystem Program

SAGEBRUSH ECOSYSTEM COUNCIL
STAFF REPORT
MEETING DATE: May 13, 2014

DATE: May 2, 2014

TO: Sagebrush Ecosystem Council Members

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

THROUGH: Tim Rubald, Program Manager
Telephone: 775-684-8600, Email: timrubald@sagebrusheco.nv.gov

SUBJECT: Discussion and possible adoption of proposed revisions to sections of the 2012 State Plan, including: Predation; Wild Horse and Burro Management; Livestock Grazing; and The Conservation Credit System.

SUMMARY

The purpose of this item is to discuss and consider adoption of proposed revisions to sections of the State Plan, including: Predation; Wild Horse and Burro Management; Livestock Grazing; and The Conservation Credit System. The SEC first directed the SETT to update the State Plan and EIS Alternative at the April 22, 2013. Since that time, the SETT has been primarily focused on revising items necessary for inclusion in the BLM/USFS LUPA and FEIS. With that work accomplished, the primary focus has shifted to updating the State Plan, necessary to be complete by September 2014, when the USFWS begin their 12-month findings process for the listing decision. A timeline for accomplishing this work was approved by the SEC at the April 8, 2014 meeting

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.

July 30, 2013. The Council adopted the Sagebrush Ecosystem Strategic Detailed Timeline, which included revision of the State Plan/EIS Alternative.

February 13, 2014. The Council adopted the revised Livestock Grazing section of the State's EIS Alternative for submittal to the BLM/USFS and future incorporation into the State Plan.

February 24, 2014. The Council approved the Draft Versions 0.91 of the *Nevada Conservation Credit System (CCS) Manual* and *Sage-Grouse Habitat Quantification Tool (HQT) Scientific Methods Document*.

March 13, 2014. The Council adopted the revised Wild Horse and Burro section of the State's EIS Alternative for submittal to the BLM/USFS and future incorporation into the State Plan.

April 8, 2014. The Council approved a report on the timeline for revising the State Plan, which included consideration of the revised Predation; Wild Horse and Burro Management; Livestock Grazing; and Mitigation sections at the May Council meeting.

DISCUSSION

Item 8A: State Plan Section 7.3: Predation

In preparation for updating the Predation section of the State Plan, the SETT met with various scientific experts, resource managers, regulators, and other stakeholders to gather information on the best available science, current management practices, and ongoing research. The SETT met with and gathered information from USDA-APHIS-Wildlife Services, USGS, NDOW, NDA, NDOT, and NDEP. The SETT drafted an initial State Plan Predation section and met with the Science Work Group (SWG) on April 24, 2014 for input on the best available science. Revisions were made to the section based on their input.

The revised Predation section provides additional background information on sage-grouse predation issues. The section provides three focused objectives with associated management actions that address holistic predator management. This includes: reducing anthropogenic subsidies to ravens (the primary sage-grouse predator); improving habitat integrity to provide security to sage-grouse from predations; and prioritization of targeted lethal control efforts for ravens.

Item 8B: State Plan Section 7.4: Wild Horse and Burro Management

The SWG met on February 19, 2014 to discuss and develop additional concepts and more detailed guidance regarding Wild Horses and Burros management. Following that meeting, staff revised existing and incorporated additional goals, objectives, and management actions to incorporate concepts and best available science from the SWG meeting.

The primary differences between the EIS Alternative E section and the State Plan section is that the management actions are now attached to one or more of the three Goals and Objectives in the plan. The section also includes an introductory sub-section as well as some additional literature citing's. No substantive changes were made to any of the goals, objectives, or management actions from what the Council approved at their March 13, 2014 meeting.

Item 8C: State Plan Section 7.5: Livestock Grazing

SETT staff met with the SWG on two occasions to further develop an alternative for Livestock Grazing Goals, Objectives, and Management Actions. The SETT incorporated new and existing language for consideration of adoption by the SEC for inclusion into

the State's Alternative (E) within the BLM/USFS DEIS and future revision to Section 7.5 of the State Plan.

The primary difference between the EIS Alternative E section and the State Plan section is the inclusion of an introductory sub-section as well as some additional literature citing's. Staff also renamed the section "Livestock Grazing" as opposed to "Improper Livestock Grazing" to more accurately reflect the broader intent of the section. No substantive changes were made to any of the goals, objectives, or management actions from what the Council approved at their February 13, 2014 meeting.

Item 8D: State Plan Section 8.0: The Nevada Conservation Credit System (CCS)
The original Mitigation section of the 2012 State Plan, described compensatory mitigation in a very broad and general sense. With Environmental Incentives under contract, many of the concepts of the CCS have been fleshed out in greater detail. The revised section provides a general overview of the information in the Draft *Nevada CCS Manual* and *Sage-Grouse HQT Scientific Methods Document* as approved by the Council at the February 24, 2014 meeting. This will function as an executive summary for the CCS.

RECOMMENDATION

Staff recommends the SEC approves the proposed revisions to the Predation; Wild Horse and Burro Management; Livestock Grazing; and CCS sections of the State Plan or provides direction to the SETT on how to further revise the sections.

POSSIBLE MOTION

Should the SEC agree with the staff recommendation, a possible motion would be: "Motion to approve the proposed revisions to the Predation; Wild Horse and Burro Management; Livestock Grazing; and CCS sections of the State Plan."

or

"Motion to approve the proposed revisions to the Predation; Wild Horse and Burro Management; Livestock Grazing; and CCS sections of the State Plan, with additional amendments."

(The SEC may choose to approve the sections individually or collectively.)

Attachments:
1. Revised State Plan Section 7.3: Predation
2. Revised State Plan Section 7.4: Wild Horse and Burro Management
3. Revised State Plan Section 7.5: Livestock Grazing
4. Revised State Plan Section 8.0: Nevada Conservation Credit System

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7.3 Predation

Predation is a natural factor operating on all sage-grouse populations. Historically, given appropriate quality and quantity of habitat, sage-grouse populations have persisted despite naturally high levels of predation with which they evolved (Schroeder and Baydack 2001, Hagen 2011). Prey species have evolved ways to avoid predation such as coloration that conceals them, behavioral adaptations, and specialized reproductive strategies. Sage-grouse populations typically mitigate impacts of predation through cryptic nesting, increased chick production, re-nesting efforts, and response to annual habitat variation. When population levels become depressed below a particular threshold, quantity and quality of habitat is diminished, or predator populations increase above a particular threshold; the behaviors and life-history strategies of prey species may not be able to compensate for losses from predators depending on numerous factors influencing predator densities; including: predator search efficiency, prey switching, and food subsidies (Cote and Sutherland 1997, Schroeder and Baydack 2001, Hagen 2011).

Predator Species

Predators can affect sage-grouse during various life stages in three ways: 1) nesting success, 2) survival of chicks during the first few weeks after hatch, and 3) annual survival of breeding age birds (juveniles and adults) (Schroeder and Baydack 2001). Table 7-1 outlines potential predator species in Nevada that may influence each life stage based on observations.

Table 7-1 Potential Sage-grouse Predator Species in Nevada

	Life Stage		
Predator Species	**Nest**	**Chick**	**Juvenile and Adult**
American badger (*Taxidea taxis*)	X		X
Bobcat (*Lynx rufus*)	X		
Coyote (*Canus latrans*)	X		X
Fox (*Vulpes* spp.)	X		
Great Basin gopher snake (*Pituophis catenifer*)		X	
Raptors (*Buteo* spp., *Aquila* spp. *Circus* spp, etc.)			X
Common raven (*Corvus corax*)	X	X	
Weasels (*Mustela* spp.)	X	X	

(Connelly et al. 2004, Coates et al. 2008, Lockyer et al. 2013)

None of these predators depend on sage-grouse as their primary prey species. Many depend primarily on rodents or lagomorphs but will opportunistically consume sage-grouse, especially during specific life phases (e.g. badgers during the nesting season (Coates and Delehanty 2010).

The common raven (*Corvus corax*) is identified as the most frequent predator during nesting season in sage-grouse predator studies conducted recently in the Great Basin (Coates et al. 2008, Lockyer et al. 2013). Raven populations have increased over 200 percent from 1992 to 2012 in both the Great Basin and in Nevada, based upon USGS Breeding Bird Survey results (Sauer et al. 2014). Subsidized food

sources such as landfills and road kill; elevated nest platforms provided by transmission lines; and landscape alterations can increase raven populations (Boarman 2003, Boarman and Heinrich 1999, Webb et al. 2004). Raven abundance is often tied to habitat quality, particularly in areas where an interface exists between recently burned areas and unburned habitat (Howe et al. 2014, Coates et al., In Review). Raven control has been shown to be an effective, short-term, tool during the early nesting season to gain increased survival through the nesting and early brood life cycle stages (Coates et al. 2007) when ravens are the limiting factor affecting nest success.

Given that ravens have been found to be increasing across the West and juvenile survival is tied to anthropogenic subsidies (Webb et al. 2004), localized lethal efforts are not likely to be successful in reducing state-wide populations (Webb et al. 2004). Thus, effective raven management needs to also include efforts to reduce food, water, and nesting subsidies.

Current State Predation Management Efforts for Sage-grouse

The following presents information on the State of Nevada's current predator control efforts to benefit sage-grouse populations.

Predator control

NDOW is partnered with USDA-APHIS-Wildlife Services for predator control focusing on carnivores (primarily badgers and coyotes) and ravens. NDOW currently has a depredation permit from the FWS for 2,500 ravens. Much of the take under this permit is conducted using poisoned eggs (hard-boiled chicken eggs that contain DRC-1339, an avicide). Poisoned eggs are placed at specific leks for ravens as a means of limiting raven populations during the sage-grouse nesting season. (See Appendix XX for additional details regarding FWS depredation permits for ravens.)

Road kill removal

In cooperation with NDOT, county road crews, USFWS, and UNR, NDOW has hired wildlife technicians to remove road carrion from three treatment areas in northern Nevada, in and around priority sage-grouse nesting habitat.

Landfill management

NDOW is working in cooperation with city and county municipalities, private entities, and the USFWS in Humboldt, Eureka, and Lander Counties to improve waste stream policies to minimize access by predator species and to increase the frequency of food waste and dead animal pit burials.

Goals, Objectives, and Management Actions

Goal 1: Reduce sage-grouse mortality due to predation where predation mortality is likely additive or is a limiting factor influencing sage-grouse populations.

The following three objectives should be carried out concurrently as part of an integrated predator management plan.

The management actions identified under Objective 1.1 should be carried out at the state-wide level, or at a more localized, targeted scale, as appropriate.

Objective 1.1: Reduce anthropogenic subsidies to ravens, such as food sources (e.g. road kill, landfills), and nesting substrates (e.g. power lines), especially cognizant in landscapes with

heterogeneous land cover, such as burned and unburned areas.

Management Action 1.1.1*:* Coordinate with NDOT and local governments to identify high density road kill areas to focus interagency road kill removal efforts. Provide information to agency staff that explains the need for the effort and outlines disposal options and procedures.

Management Action 1.1.2*:* Work with city and county governments to develop and adopt procedures that minimize availability of refuse in the urban interface that acts as food and water sources for predators.

Management Action 1.1.3*:* At landfills and waste transfer facilities, work with Nevada Division of Environmental Protection and facility managers to develop and adopt procedures that eliminate food and water sources for predators.

Management Action 1.1.4*:* Work with livestock owners, land managers, and regulatory authorities to develop and implement effective methods to reduce or eliminate exposed animal carcasses or other livestock by-products that may provide a food subsidy for predators.

Management Action 1.1.5*:* Collaborate with and provide informational material to stakeholders, such as Nevada Association of Counties, League of Cities, sportsmen's groups, Nevada Cattlemen's Association, and the general public on raven subsidy issues; such as refuse in urban areas, livestock carcasses and by-products, and wildlife carcasses (coyote, squirrels, rabbits).

Management Action 1.1.6*:* Research and develop management techniques to limit or reduce the availability of water subsidies to ravens. This may be very challenging and will likely require new technologies and techniques given Nevada's arid environment, distance between natural water sources, and the need for anthropogenic watering sites accessible to both livestock and wildlife.

Management Action 1.1.7: Reduce and eliminate artificial hunting perches and nesting substrate for aerial predators (e.g., removal of fences and non-operational power lines installation of anti-perch devices on existing and new power lines).

Management Action 1.1.8: Encourage continued research in the development of more effective perching and nesting deterrent options.

Management Action 1.1.9: Monitor the effects of efforts to reduce anthropogenic subsidies on raven populations and adapt management accordingly.

Objectives 1.2 and 1.3 should be implemented in localized areas where predation has been identified as a limiting factor on sage-grouse population. Use the "Process to Prioritize Integrated Predator Management Projects" (See Appendix XX) before engaging in Objectives 1.2 and 1.3. .

Objective 1.2: Maintain or improve habitat integrity by increasing visual cover to reduce detection by predators or by reducing fragmentation to limit habitat for ravens.

Management Action 1.2.1: Maintain a mosaic of shrub cover conditions with ≥20% sagebrush cover and ≥30 percent total shrub cover in nesting habitat to provide increase cover for nesting and escape (Gregg et al. 1994, Coates and Delehanty 2010).

Management Action 1.2.2: Maintain residual grass cover in nesting habitat to provide increased cover for nesting and escape (Gregg et al. 1994, Gregg and Crawford 2009, Coates and Delehanty 2008). This factor is more important if shrub cover is low.

Management Action 1.2.3: Where appropriate, begin recovery of degraded sites that decrease edge of non-native annual grasses next to intact Core or Priority Management Areas and to reduce fragmentation.

Management Action 1.2.4: Minimize disturbance activities near leks during lek season (i.e., when males are inattentive and most vulnerable to predation) and near nest sites during nesting season that may result in adults flushing off nests or away from young. (In this instance, disturbance activities are anything that may cause birds to flush such as startling noise [explosions], road traffic, human presence, etc.). Use seasonal restrictions on activities, when appropriate, to minimize disturbances.

Objective 1.3: Conduct localized predator control, based on monitoring and adaptive management.

Management Action 1.3.1*:* From the outcome of the Process to Prioritize Integrated Predator Management Projects (see below), establish a predator control program based on biological assessments appropriate to local conditions. Conduct predator control to coincide with the life stage impacted by predation. Program development needs to include specific goals and objectives and identification of triggers or endpoints for management practices. Monitor pre- and post-treatment raven numbers and effects of predator control on sage-grouse vital rates and adapt control strategies accordingly.

Management Action 1.3.2: When conducting raven control programs using DRC-1339, the following points should be evaluated:

- The assumed ratio of number of ravens removed to baited eggs placed
- Need for pre-baiting to accustom ravens to their presence
- Length of time eggs should be left in the environment
- Spacing of egg and number of eggs placed together
- Consideration to implement treatment yearly, based on monitoring of raven population response
- Treatment should be conducted early in sage-grouse incubation period (within 40 days of first nest initiation for the season) to coincide with greatest raven predation period (Coates and Delehanty 2008, Lockyer 2013)

[[This management action will be further fleshed out to provide a “how-to” guide based on best available science. Still to be developed.]]

Management Action 1.3.3*:* Consider option to oil or addle eggs in nests of territorial ravens found on anthropogenic structures as part of raven control program, when appropriate.

Management Action 1.3.4: Document success through a rigorous monitoring, analysis, and reporting of population responses to control efforts. For raven control programs, if there is a demonstrated benefit to sage-grouse via scientifically valid documentation, submit a request to USFWS for increased allowable take of ravens, assuming personnel availability from NDOW and Wildlife Services to appropriately identify locations and conduct work.

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Appendix XX.

Cooperation of State and Federal Agencies for Depredation Permits for Common Raven

The USFWS can authorize depredation permits for the 'take' of common ravens, which are protected under the Migratory Bird Treaty Act. Currently in the State of Nevada, there are permits that authorize the 'take' of approximately 5,000 ravens annually, which constitutes five percent of the estimated 100,000 resident ravens (2003 estimate, Wildlife Services) in Nevada. NDOW is authorized to take 2,500 ravens; USDA-APHIS-Wildlife Services (WS) is authorized to take 1,500, and other private sources around 1,000. NDOW's permit is specifically authorized for the protection of sage-grouse and other game species. WS' permit is authorized for the protection of livestock. Other permits are authorized for the protection of property, public health and welfare (power companies, landfills, etc.). The most recent population estimate for Nevada is 190,000 ravens (2011 estimate, WS). This may potentially lead to an increase in permit allocations in the future if they can be justified

WS is a federal agency that works cooperatively with the Nevada Department of Agriculture's Division of Animal Industry. Its primary objective is to protect livestock and farming interests from damage caused by predators or other nuisance species. WS is authorized to perform their duties on federal land and may enter into agreements with state, tribal, county, or private landowners to conduct their business. Predator control is a major component of their duties.

Specific to ravens, WS certified applicators are the only ones authorized by the EPA to either apply or directly supervise those applying the avicide DRC-1339 to execute the federal depredation permit authorized by the USFWS for the taking of migratory birds.

Currently, WS and NDOW are working jointly to enhance sage-grouse recruitment rates, which can be affected by raven predation of sage-grouse eggs and chicks. NDOW designates priority areas for treatment and WS treats hard-boiled chicken eggs with DRC-1339 and places them within the priority areas. Monitoring and data collection is done by both agencies as well as other partners to inform future implementation of the program and determine the efficacy of the protocols used.

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Appendix XX

Process to Prioritize Integrated Predator Management Projects

The following frame work will be used to prioritize where Objective 1.1, 1.2, and 1.3 are implemented across the state.

Step 1: State level mapping for ravens and sage-grouse. This should be an ongoing process updated every few years.

a. Contract with USGS to conduct landscape level modeling to estimate location of high raven occupancy (following methods for Raven Selection Probability Function (RSPF) as described in Coates et al., In Review).
   If funding is not available to conduct modeling, regional biologists would submit areas of concern for evaluation.
b. Conduct modeling of sage-grouse nesting habitat [[Methods still to be determined]]
c. Intersect areas of raven concern with areas of sage-grouse nesting habitat. Select 5-15 sites to be evaluated at the site level.

Step 2: Site level analysis. This step should be conducted annually.

a. Conduct raven surveys at 5-15 sites identified during Step 1 following a selected raven survey protocol to determine raven densities.
b. Evaluate sage-grouse demographic data, as available, to determine if nest success if a limiting factor. Areas identified for potential raven removal should be prioritized for sage-grouse demographic data collection as feasible.
c. Use information from the above two steps to identify 2-5 project sites for Integrated Predator Management around the State. Sites that have identified nest success as limiting to the populations due to raven predation should be prioritized for treatment. Sites that have greater than 0.46 ravens per km^2 should be prioritized for treatment (Coates et al., In Review). Exact number of project locations should be determined by number of raven take permits available, funding for projects, and personnel to carry out work.

Once Prioritized Integrated Predator Management Project locations are identified, the following steps should be completed.

1. Develop Integrated Predator Management Program for each project location.
    a. Develop anthropogenic subsidies control plan for project location following recommendations in Objective 1.
    b. Develop habitat integrity improvement plan for project location recommendations in Objective 2.
    c. Develop predator control plan for project location following recommendations in Objective 3.
        i. Develop treatment regime for project area
            1. Determine/set parameters of predator control area (where damage is occurring)
            2. Determine/set parameters of predator control project timing (when resource is vulnerable)

3. Establish species to be targeted and methods/techniques which are acceptable
4. Determine what constitutes a "corrected" situation (when does project end, e.g. stop lethal control once raven density is below density thresholds)

ii. Establish predator monitoring regimes
1. Pre-treatment monitoring of predator numbers (frequency, number & type).
2. Treatment monitoring of predator numbers (frequency, number & type).
3. Post-treatment monitoring of predator numbers (frequency, number & type).

iii. Establish sage-grouse monitoring regimes
1. Monitor sage-grouse population trends to determine effectiveness of predator control practices.

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7.4 Wild Horses and Burros Management

The State of Nevada supports multiple uses on public lands and the responsible and active management of those land uses, including wild horses and burros, which are protected by the Wild Free-Roaming Horses and Burros Act (the Act) of 1971. While that Act protects them from harassment and unjustified removal or destruction, it also allows for the proper management of wild horse and burro populations within the Herd Management Areas (HMAs) on BLM land and Wild Horse and Burro Territories (WHBTs) on USFS land that are within Herd Areas (HAs). Proper management of herd populations serves to protect their health as well as that of the habitat they and other species rely upon. The Act acknowledges the need to maintain the wild horses and burros within established Appropriate Management Levels (AML). This State supports the Act as it was initially authorized and offers recommendations for alternative management actions necessary to attain and maintain herd sizes that promote the continued health and diversity among wild horses and burros and allows for a sustainable sagebrush ecosystem that is mutually beneficial to all land uses and users.

How HAs, HMAs, WHBTs, and AMLs are established

Under the Act, BLM and USFS are required to manage wild horses and burros only in HAs where they were found when the Act passed in 1971. Through land use planning, the BLM and USFS evaluated each HA to determine if it had adequate food, water, cover, and space to sustain healthy and diverse wild horse and burro populations over the long-term. The areas which met these criteria were then designated as HMAs and WHBTs (BLM 2013, BLM 2014).

BLM and USFS also evaluated each HMA to determine how much forage is available for use. The available forage is then allocated among wildlife, wild horses and burros and domestic livestock. The number of horses and burros which can graze without causing damage to the range is called the AML (BLM 2013, BLM 2014).

Current estimates of wild horses from the BLM and USFS are as follows:

- National: 37,300
- Nevada: 24,000-26,500
- National AML: 26,600
- Nevada AML: 12,688
- 84.3 percent of Nevada HMAs are at or exceed AML
- 70 of the 83 HMAs statewide are at or exceed AML
- 49 of the 62 HMAs overlapping sage-grouse habitat are at or exceed AML
- 10 of the 14 WHBTs overlapping sage-grouse habitat are at or exceed AML
- Nationally, over 50,000 horses are currently held in captivity in either short term holding facilities or long term private pastures (Shepherd 2014, BLM 2013)

Wild horses are capable of increasing their numbers by 18 percent to 25 percent annually, resulting in the doubling of wild horse populations about every 4 years (Wolfe et al. 1989; Garrott et al. 1991). Wild horses are a long-lived species with survival rates estimated between 80 and 97 percent (Wolfe et al. 1980; Eberhardt et al. 1982; Garrrott and Taylor 1990) and they are a non-self-regulating species. There are 62 HMAs and 14 WHBTs that overlap with sage-grouse habitat in Nevada (BLM 2013, BLM 2014).

While nationally more than 220,000 wild horses and burros have been adopted by private citizens since

the program began in 1971, the levels of adoption have decreased dramatically since 2007 (Shepherd, personal communication). In 2013 nationally there were 4,221 horses removed and 2,400 were either adopted or sold. In 2013 in Nevada there were 2,787 horses removed and 89 were adopted or sold (Shepherd 2014). In order to maintain current population levels in Nevada (most already near or exceeding the high range of AML), approximately 4,300 – 6,600 horses would need to be removed statewide.

The State of Nevada will work closely with federal agencies to develop new, and expand on existing strategies, policies, and best management practices to attain sustainable wild horse and burro populations within HMAs and WHBTs. The State of Nevada will also engage Congressional representatives and their staff to secure assistance in the implementation of the management activities authorized within the Act.

Goals, Objectives, and Management Actions

Goal 1: Support, promote, and facilitate full implementation of the Wild Free-Roaming Horses and Burros Act of 1971, as amended, including to preserve and maintain a thriving natural ecological balance and multiple-use relationship, without alternation of its implementation by subsequent Congresses or Presidential administrations.

Recognize that if action is not taken until herd health has become an issue, the range and water resources are likely to be in a highly degraded and potentially irreversible state. Non-active management (e.g. let nature take its course, wait until horse health or resource conditions are critical) is not acceptable management. Recognizing that non-management is not acceptable, avoid negative or potentially irreversible consequences that will occur within the SGMA due to non-active management. Use all tools available and actively manage wild horses and burros within HMAs and WHBTs.

Objective 1.1: Maintain healthy and diverse wild horse and burro populations in the State of Nevada in a manner that meets sage-grouse habitat objectives (see Table 4.1).

Management Action 1.1.1: Focus expenditures of appropriated funds on management of wild horses and burros on public lands over care in captivity.

Management Action 1.1.2: Even if current AML is not being exceeded, yet habitat within the SGMA continues to become degraded, at least partially due to wild horses or burros, established AMLs within the HMA or WHBT should be reduced through the NEPA process and monitored annually to help determine future management decisions. Unless already meeting the lowest established AML level, during periods of drought, AMLs should be reduced to a level that is consistent with maintaining sage-grouse habitat objectives (see Table 4.1).

Management Action 1.1.3: Methods that were used to initially establish AMLs should be reevaluated to determine if they are still sufficient to achieve sage-grouse habitat objectives (see Table 4.1).

Management Action 1.1.4: Use professionals (botanists, rangeland ecologists, wildlife biologists, hydrologists, etc.) from diverse backgrounds to conduct land health assessments,

proper functioning condition, site specific wild horse and burro grazing response indices assessments, and habitat objective assessments.

Management Action 1.1.5: When implementing management activities, water developments, or rangeland improvements for wild horses or burros, consider both direct and indirect effects on sage-grouse and use the applicable Site Specific Consultation Based Design Features (Design Features; see Appendix A) to minimize potential impacts or disturbances.

Management Action 1.1.6: In order to expedite recovery time and enhance restoration efforts following wildfire or sage-grouse habitat enhancement projects, consider a significant reduction and temporary removal or exclusion of all wild horses and burros within or from burned areas where HMAs and WHBT overlap with sage-grouse Core, Priority, and General Management Areas. Wild horse grazing behaviors and specialized physiological requirements make unmanaged grazing on recently burned/treated areas problematic for reestablishment of burned and/or seeded vegetation (Arnold and Dudzinski 1978, Rittenhouse et al. 1982, Duncan et al. 1990, Hanley 1982, Wagner 1983, Menard et al. 2002, Stoddart et al. 1975, Symanski1994).

Management Action 1.1.7: If current AML is being exceeded, consider emergency short-term measures to reduce or avoid degradation of sage-grouse habitat from HMAs or WHBT that are in excess of established AML levels within the SGMA.

Plan for and implement an immediate reduction in herd size to a level that would enable the area to recover to meet the habitat objectives in Table 4.1 and to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area. Consider lowering the AML levels to prevent future damage.

Management Action 1.1.8: If monitored sites are not meeting sage-grouse habitat objectives in Table 4.1, even if AML is being met, and it is determined that wild horses or burros are the primary causal factor, then implement protective measures as applicable in addressing similar emergencies (e.g. fire, flood, drought, etc.).

Consider exclusionary fencing of riparian or other mesic sites and implement water developments (following the Design Features as described in Appendix A) to ensure dispersal or avoidance of sites heavily impacted by wild horses (Feist 1971, Pellegrini 1971, Ganskopp and Vavra 1986, Naiman et al. 1992). A water source that meets the Design Features should be provided, as horses traditionally do not leave known water sources just because they are fenced.

Management Action 1.1.9: As climate data becomes available, adjust wild horse and burro and rangeland management practices to allow for Core, Priority, and General Management Areas to sustain or increase the sagebrush ecosystem resiliency and resistance.

Management Action 1.1.10: Collaborate with weather and climate professionals and agencies (UNR, DRI, NOAA, etc.) to proactively manage the rangelands resources and adjust, as necessary, the current wild horse and burro management policies. Ensure that sufficient ongoing public and political education is provided.

Objective 1.2: Evaluate conflicts with HMA designations in SGMAs and modify LUPs to avoid negative impacts on sage-grouse.

Management Action 1.2.1: Even if current AML is not being exceeded, yet habitat within the SGMA continues to become degraded, at least partially due to wild horses or burros, established AMLs within the HMA or WHBT should be reduced through the NEPA process and monitored annually to help determine future management decisions. Unless already meeting the lowest established AML level, during periods of drought, AMLs should be reduced to a level that is consistent with maintaining sage-grouse habitat objectives (see Table 4.1). *(same as Management Action 1.1.2)*

Management Action 1.2.2: Ensure that Herd Management Area Plans (HMAP) and WHBT plans are developed and/or amended within the Core, Priority, and General management areas, identified in the State's management areas map, taking into consideration the sage-grouse habitat objectives (see Table 4.1).

Management Action 1.2.3: Conduct herd management activities, as originally authorized, to avoid conflicts between the potential implementation of regulations within the Wild and Free Roaming Horses and Burros Act and the Endangered Species Act

Goal 2: As authorized in the Wild Free-Roaming Horses and Burros Act of 1971: Achieve and maintain wild horses and burros at or below established AMLs within the SGMA and mange for zero horse populations in non-designated areas within the SGMA to reduce impacts to sage-grouse habitat.

Objective 2.1: Meet established AMLs in all HMAs and WHBTs in Core, Priority, and General Management Areas within five years.

Management Action 2.1.1: Focus expenditures of appropriated funds on management of wild horses and burros on public lands over care in captivity. *(same as Management Action1.1.1)*

Management Action 2.1.2: Even if current AML is not being exceeded, yet habitat within the SGMA continues to become degraded, at least partially due to wild horses or burros, established AMLs within the HMA or WHBT should be reduced through the NEPA process and monitored annually to help determine future management decisions. Unless already meeting the lowest established AML level, during periods of drought, AMLs should be reduced to a level that is consistent with maintaining sage-grouse habitat objectives (see Table 4.1). *(same as Management Action 1.1.2)*

Management Action 2.1.3: Methods that were used to initially establish AMLs should be reevaluated to determine if they are still sufficient to achieve sage-grouse habitat objectives (see Table 4.1). (same as Management Action 1.1.3)

Management Action 2.1.4: Given their capability to increase their numbers by 18%-25% annually, resulting in the doubling in population every 4-5 years (Wolfe et al. 1989; Garrott et al. 1991), wild horse gathers should be conducted to attain the lowest levels of AML. This in combination with continued and expanded use and development of effective forms of population growth suppression techniques will enable AML to be maintained for longer periods and reduce the frequency of gathers and associated cost and effort.

Management Action 2.1.5: If current AML is being exceeded, consider emergency short-term measures to reduce or avoid degradation of sage-grouse habitat from HMAs or WHBT that are in excess of established AML levels within the SGMA.

Plan for and implement an immediate reduction in herd size to a level that would enable the area to recover to meet the habitat objectives in Table 4.1 and to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area. Consider lowering the AML levels to prevent future damage. *(same as Management Action 1.1.7)*

Management Action 2.1.6: Prioritize gathers for removal and/or population growth suppression techniques in HMAs, HAs, and WHBTs first within the State's Core Management Areas and then within the Priority and General Management Areas. Additional prioritization should be given for HMAs and WHBTs that are near AML or where a reduction would serve the most beneficial purpose. Proactively and adaptively manage herd sizes taking into consideration climate variability and other natural phenomena, similar to the restrictions placed on livestock managers.

Goal 3: Support and conduct science based research to more efficiently and effectively maintain AMLs in HMAs and WHBTs.

Objective 3.1: Implement more effective methods to conduct surveys and monitor wild horse and burro activities, populations, and responses to different herd management techniques.

Management Action 3.1.1: Work with professionals from other federal and state agencies, researchers at universities, and others to continue to develop, expand, and test more effective population growth suppression techniques, including contraception options.

Management Action 3.1.2: Implement a telemetry monitoring program for wild horses. Research regarding the direct interactions between, and in indirect effects of wild horses and sage-grouse is identified as a need and could further assist the agencies in the development of habitat selection maps (Beever and Aldridge et al. 2011) as well as offer a general understanding of the intensity, timing, and duration of use by wild horses within the SGMA.

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7.5 Livestock Grazing

Farming and ranching on private lands in unison with authorized livestock grazing on public lands has been a long standing arrangement for many private landowners in the State of Nevada. Historically, many homesteaders began to farm and ranch much of Nevada's riparian and mesic landscapes due to the availability of surface water or springs. Once developed, many of these mesic areas were expanded by the artificial spreading of water or irrigation. These larger, irrigation induced, privately owned meadows served to support many species of wildlife in addition to livestock. The meadows are not sufficient to support livestock year round. Today, by allowing for the authorized use of proper and targeted livestock grazing on public lands, private landowners and federal land managers can serve to protect or even benefit each other if managed properly (by reductions in fuels, targeted grazing of cheatgrass, etc.). The State of Nevada recognizes and supports this long standing beneficial relationship.

Livestock grazing (primarily sheep and cattle) has occurred on the Nevada landscape for over 170 years at varying levels. Many variables have contributed to the growth and reduction of the size and number of homesteads, as well as the number of livestock using the range, over the past century. While livestock grazing continues to be a highly contested use on public lands in the West, the State supports the proper management of livestock grazing on allotted public lands in Nevada. Davies et al. (2011, p. 2575) concluded based on literature review that "Though appropriately managed grazing is critical to protecting the sagebrush ecosystem, livestock grazing per se is not a stressor threatening the sustainability of the ecosystem. Thus, cessation of livestock grazing will not conserve the sagebrush ecosystem."

Dependent on many factors, livestock grazing can have a negative effect, a positive effect, or a neutral effect on sage-grouse habitat (Davies et al. 2009; Knopf 1996; Oakleaf 1971; Sjejcar et al. 2014; Whitehurst and Marlow 2013). If implemented appropriately, the recommended actions listed in this section will assist landowners and land managers in managing appropriately to avoid or minimize negative impacts to sage-grouse habitat due to livestock grazing. The actions should also help to maintain the existing resistance and resilience of sagebrush communites and to protect the future persistence and sustainability of the diversity of other sage-grouse habitat types within the sagebrush ecosystem for those who depend on it.

The State supports grazing practices that incorporate a high level of flexibility through adaptive management to achieve the overall management objectives agreed upond by the permittee and the land manager. The State will provide technical support to landowners through its combined resources and through partnerships with other governmental agencies and private industry. The State will continue to support the further understanding and development of rangeland management, resource conservation, rehabilitation, restoration, and protection that can be applied and supported, at least in part, by permittees and land managers.

The State encourages private landowners to develop and implement conservation plans that serve to maintain or strengthen financial viability that also work to conserve or protect the renewable natural resources of Nevada, including sage-grouse and other wildlife species habitat.

The State will continue to support current, and development of new, public outreach and educational programs that assist with the proper understanding and implementation of the actions listed below to acheive the goals and objectives within this plan.

The State will also work with federal land managers and livestock owners to develop acceptable

procedures to conduct consistent rangeland or resource monitoring with greater frequency. This should allow for greater flexibility in administering adaptive management decisions to acheive targeted goals and objectives.

The State encourages federal agencies to ensure that any loss of grazing allotment rights that were not directly attributable to the permittees actions or inactions are mitigated to attain a no-net-loss of AUMs.

Conservation Goal, Objective, and Management Actions

Goal 1: Ensure that existing grazing permits maintain or enhance sage-grouse habitat. Utilize livestock grazing when appropriate as a management tool to improve sage-grouse habitat quantity, quality, or to reduce wildfire threats. Based on a comprehensive understanding of seasonal sage-grouse habitat requirements, and in conjunction with the need for flexibility in livestock operations, make cooperative, timely, seasonal range management decisions to meet vegetation management objectives, including fuels reduction.

Objective 1.1: In sage-grouse habitat, manage for vegetation composition and structure that achieves sage-grouse seasonal habitat objectives (see Table 4.1), enhancing resilience and resistance based upon the ability of the ecological site to respond to management. This objective recognizes spatial and temporal variations across seral stages.

Management Action 1.1.1: Within sage-grouse habitat, incorporate sage-grouse habitat objectives (see Table 4.1) and management considerations into all BLM and Forest Service grazing allotments through allotment management plans (AMPs), multiple use decisions, or permit renewals and/or Forest Service Annual Operating Instructions.

Implement appropriate prescribed grazing conservation actions at scales sufficient to influence a positive population response in sage-grouse habitat, such as NRCS conservation Practice Standard 528 for prescribed grazing (NRCS 2011).

Management Action 1.1.2: In sage-grouse habitat, work cooperatively on integrated ranch planning within sage-grouse habitat so operations with deeded land, and BLM and/or Forest Service allotments, can be planned as single units, providing flexibility and adaptive management across all ownerships and not altering stocking rates on operations for progressive management decisions.

Management Action 1.1.3: Continue land health assessments on BLM public lands or other monitoring methods on Forest Service-administered lands in sage-grouse habitat to evaluate current conditions as compared to sage-grouse habitat objectives described in Table 4.1. Incorporate the results of BLM and Forest Service monitoring and land health assessments into future management applications to ensure progress toward meeting sage-grouse habitat objectives. Incorporate terms and conditions into grazing permits and adjust these as needed through monitoring and adaptive management to meet sage-grouse habitat objectives.

Management Action 1.1.4: Implement management actions (grazing decisions, Annual Operating Instructions [Forest Service only], AMP/Conservation Plan development, or other agreements) to modify grazing management to meet seasonal sage-grouse habitat objectives as

defined in Table 4.1 where current livestock grazing is identified as the causal factor of not meeting those objectives. Consider singly, or in combination, changes in:

1. Season, timing (duration) and/or rotation of use;
2. Distribution of livestock use;
3. Intensity of use;
4. Type of livestock (e.g., cattle, sheep, horses, llamas, alpacas and goats; Briske et al. 2011); and
5. Numbers/ AUMs of livestock and other ungulates (includes temporary nonrenewable use, and nonuse).

   Before imposing grazing restrictions or seeking changes in livestock stocking rates or seasons of permitted use, federal agencies in coordination with grazing permittees must identify and implement all economically and technically feasible livestock distribution, forage production enhancement, weed control programs, prescribed grazing systems, off-site water development by the water rights holder, shrub and pinyon/juniper control, livestock salting/supplementing plans, and establishment of riparian pastures and herding. (Eureka County Master Plan 2010)

Management Action 1.1.5: Grazing management strategies for riparian areas and wet meadows should, at a minimum, maintain or achieve riparian Proper Functioning Condition (PFC) and promote brood rearing/summer habitat objectives, as described in Table 4.1, within sage-grouse habitat. Within sage-grouse habitat, manage wet meadows to maintain a component of available perennial forbs with diverse species richness to facilitate brood rearing and stabilizing riparian species (Burton et al. 2011) near where water flows to achieve or maintain PFC. Use Ecological Site Descriptions (ESDs) or locally relevant information about soils, hydrology, soil moisture, and site potential to set realistic objectives and evaluate assessments and monitoring data (Swanson et al. 2006). Also conserve or enhance wet meadow complexes to maintain or increase amount of edge and cover near that edge to minimize elevated mortality during the late brood rearing period (Hagen et al. 2007; Kolada et al. 2009a; Atamian et al. 2010) as observed throughout the stream/watershed and not limited to only easily accessible sites. Some defined areas of concentrated livestock use may be necessary to protect and enhance the overall riparian area.

Management Action 1.1.6: Authorize new water development for diversion from spring or seep sources only when sage-grouse habitat would not be net negatively affected by the development. This includes developing new water sources for livestock as part of an AMP/conservation plan to improve sage-grouse habitat.

Management Action 1.1.7: Analyze springs, seeps and associated pipelines to find mutually beneficial enhancement opportunities for livestock and wildlife that restores functionality to riparian and mesic areas within sage-grouse habitat, and allow them to be developed.

Management Action 1.1.8: In sage-grouse habitat, encourage and allow vegetation treatments that conserve, enhance, or adaptively restore resilience and resistance over time. This includes adaptive management as part of an AMP/Conservation Plan to improve sage-grouse habitat.

Management Action 1.1.9: Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses that are in and adjacent to sage-grouse habitat to determine if additional efforts should be made to restore sagebrush or to improve habitat

quality for sage-grouse. If these seedings are part of an AMP/Conservation Plan or if they provide value in conserving, enhancing, or protecting the rest of the sage-grouse habitat, then no restoration may be necessary. Assess the compatibility of these seedings for sage-grouse habitat or as a component of a grazing system during the land health assessments (Davies et al. 2011), or other analyses such as the Humboldt-Toiyabe Resource Implementation Protocol for Rapid Assessment Matrices (USDAFS - HTNF 2007).

Management Action 1.1.10: In sage-grouse habitat, ensure that the design of any new structural range improvements and plan the location of supplements (salt or protein blocks) to enhance sage-grouse habitat or minimize impacts in order to meet sage-grouse objectives (see Table 4.1). Structural range improvements, in this context, include but are not limited to: cattle guards, fences, exclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments. Potential for invasive species establishment or their increase following construction must be considered in the project plan and then monitored, treated, and rehabilitated post-construction.

Management Action 1.1.11: Salting and supplemental feeding locations, temporary and/or mobile watering and new handling facilities (corrals, chutes, etc.) should be located at least 1/2-mile from riparian zones, springs, meadows, or 1 mile from active leks in sage-grouse habitat, unless the pasture is too small or another location offers equal or better habitat benefits. The distance should be based on local conditions.

Management Action 1.1.12: To reduce sage-grouse strikes and mortality, remove, modify or mark fences in high risk areas within sage-grouse habitat based on proximity to lek, lek size, and topography (Christiansen 2009; Stevens 2011). Consideration of the utility of the fence should also be taken into consideration to ensure that its removal does not promote degradation of the overall management for habitat or other objectives (Swanson et al. 2006).

Management Action 1.1.13: In sage-grouse habitat, monitor, treat and, if necessary, rehabilitate sites with invasive species associated with existing range improvements (Gelbard and Belnap 2003; Bergquist et al. 2007). State listed noxious weeds (NRS 555) should be given the highest priority. In general, monitor, map, treat (using IPM and associated tools), and rehabilitate sites that have invasive and noxious weed species, especially those associated with disturbance activities.

Management Action 1.1.14: All permit relinquishments should be voluntary. All options to allow responsible management of livestock grazing on an allotment should be considered before any voluntary withdrawal of a grazing permit is considered, in conformance with the multiple use sections of the Taylor Grazing Act.

Management Action 1.1.15: Prior to implementation, establish project monitoring sites where vegetation treatment is planned and monitor at least annually during the recovery period. To ensure effective recovery, monitoring should continue for a number of years immediately following the livestock exclusion period, depending on local site conditions.

Management Action 1.1.16: When conditions, i.e., climatic variations (such as drought) and wildfire, requiring unique or exceptional management, work to protect sage-grouse habitat on

a case by case basis and implement adaptive management to allow for vegetation recovery that meets resistance, resilience, and sage-grouse life cycle needs in sage-grouse habitat as needed on an individual allotment basis.

Management Action 1.1.17: During the annual grazing application, work with permittees to avoid consistent concentrated turn-out locations for livestock within approximately 3 miles of known lek areas during the March 1 to May 15 period. During the March 1 to May 15 period, avoid domestic sheep use, bedding areas, and herder camps within at least 1.24 miles (2 kilometers) of known lek locations. Utilize land features and roads on maps provided to the permittee to help demarcate livestock use avoidance areas. Require terms and conditions language for affected livestock grazing permits regarding livestock turnout locations during the lekking period. During the lekking period, use best management practices to avoid livestock aggregation around the lekking grounds.

Management Action 1.1.18: Strive to improve and maintain regular communication at the allotment level between land management agency and the permittee to encourage proper management techniques (see Appendix A – Site Specific Consultation Based Design Features). Land management agencies should coordinate with relevant state, local, and tribal government agencies and permittees to conduct regular trend monitoring at the allotment level. Encourage cooperative permittee monitoring, such as described in Perryman et al 2006.

Management Action 1.1.19: Promote and implement proper livestock grazing practices that promote the health of the perennial herbaceous vegetation component. Perennial grasses, especially, are strong competitors with cheatgrass (Booth et al. 2003; Chambers et al. 2007; Davies et al. 2008; Blank and Morgan 2012). Field research has demonstrated that moderate levels of livestock grazing can increase the resiliency of sagebrush communities, reduce the risk and severity of wildfire, and decrease the risk of exotic weed invasion (Davies et al. 2009 and Davies et al. 2010).

Management Action 1.1.20: Identify and apply appropriate habitat management (e.g. livestock management and vegetation treatments), and all predator control practices (e.g. control of artificial nest and roost sites, increased take, and decrease anthropogenic subsidies) that decrease the effectiveness of predators.

Management Action 1.1.21: To reduce the risk of fire and enhance restoration in large contiguous blocks of cheatgrass-dominated sagebrush or sage-grouse habitats that are next to highly flammable cheatgrass dominated lands, create local NEPA documented plans to use, e.g. dormant season temporary nonrenewable (TNR) AUM authorizations and stewardship contracted grazing to reduce fuels in areas dominated by invasive plants (Schmelzer et al., in press). Use adaptive management to allow the use of TNR during other seasons, if science emerges demonstrating effectiveness of such practices. Planning should be conducted on an allotment specific basis, and may be contained in allotment management plans (AMPs), multiple use decisions, or permit renewals.

Management Action 1.1.22: To aid in planning adaptive management for the purpose of maintaining health of important forage plants (perennials needed for resilience and resistance), cooperatively strategize how various areas in sage-grouse habitat allotments can be managed

differently each year to achieve positive grazing response index scores (Perryman et al 2006; Reed et al. 1999; Wyman et al. 2006; and USDA USFS 1996) and meet resource objectives.

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8.0 THE NEVADA CONSERVATION CREDIT SYSTEM

The Nevada Conservation Credit System (CCS)[1] is a pro-active solution that provides net conservation benefits for sage-grouse, while balancing the need for continued human activities vital to the Nevada economy and way of life. The CCS creates new incentives for private landowners and public land managers to preserve, enhance, restore, and reduce impacts to important habitat for the species.

The CCS is a market-based mechanism that quantifies conservation outcomes (credits) and impacts from anthropogenic disturbances (debits), defines standards for market transactions, and reports the overall progress from implementation of conservation actions throughout the sage-grouse range within Nevada. The CCS establishes the policy, operations, and tools necessary to facilitate effective and efficient conservation investments. The CCS is intended to provide regulatory certainty for industries by addressing compensatory mitigation needs whether or not the species is listed under the ESA.

Goal and Scope

The goal of the CCS is to achieve no net unmitigated loss of sage-grouse habitat due to anthropogenic disturbances with the Sage-grouse Management Area (SGMA; Figure XX), in order to stop the decline of sage-grouse populations. Proposed anthropogenic disturbances, as defined in Section 3.0 of this plan, must seek to avoid, minimize, and mitigate impacts to sage-grouse habitat. After all possibilities to avoid and minimize impacts to sage-grouse habitat have been exhausted, residual adverse impacts are required to be offset by mitigation requirements as determined through the CCS.

Anthropogenic disturbances occurring on BLM and USFS lands within the SGMA require consultation with the SETT. Private landowners are not required to mitigate anthropogenic disturbances on their land, but are welcome to voluntarily generate, sell, or purchase credits in the CCS. The CCS scope can be expanded in the future to support additional conservation needs or to include other states within the sage-grouse range.

Roles and Responsibilities

The *DCNR Division of State Lands*, holds ultimate authority over CCS design, operations, and management. The *SEC* oversees CCS operations and approves changes to the program. *The Administrator* manages the CCS's day-to-day operations, ongoing program improvements, facilitates transactions, and reports programmatic results. CCS operations are also informed by *Resource Managers* (e.g. BLM, NDOW, USFS, USFWS) and by a *Science Committee* to ensure it functions according to current laws, policies, and regulations and is consistent with the best available science.

Credit Developers are landowners, land managers, organizations, or agencies, that generate, register, or sell credits in the CCS. *Credit Buyers* are entities that purchase mitigation credits to offset impacts from anthropogenic disturbances or to meet other conservation objectives.

What are Credits and Debits?

Credits are the currency of the CCS. A credit represents a verified *"functional acre"* that meets the durability criteria defined by the CCS, such as committing to a Customized Management Plan that outlines actions to maintain habitat performance and to limit risks from future impact for the duration of the project. A functional acre is based on habitat quality ("function") relative to optimal conditions,

[1] For more information please refer to *The Nevada Conservation Credit System Manual* on the Sagebrush Ecosystem Program's Website: http://sagebrusheco.nv.gov/

and quantity (acres). This is determined through the Habitat Quantification Tool (HQT; see below).

Debits are similar to credits, but are the quantified and verified units of functional acres lost due to an anthropogenic disturbance.

Generating and Purchasing Credits

The steps for generating and purchasing credits are depicted below. Blue chevrons signify the steps undertaken to generate credits and green chevrons represent the purchase of credits.

Calculating Credits and Debits

Habitat Quantification Tool (HQT)[2]

The HQT is a method to estimate habitat quality and quantify debits and credits. The HQT uses a set of metrics, applied at multiple spatial scales, to evaluate vegetation and environmental conditions related to sage-grouse habitat quality and quantity. The HQT enables the CCS to create incentives to generate credits on the most beneficial locations for the sage-grouse, and to minimize impacts to existing high quality habitat.

The HQT is used to calculate scores for each type of seasonal habitat. Habitat condition is expressed in functional acres, relative to optimal conditions. The functional acre score is adjusted to account for indirect effects of the local area surrounding the site. Mitigation ratios are then applied.

Mitigation Ratios

Mitigation ratios incorporate biologically significant factors that cannot currently be incorporated into the HQT. They enable offset transactions to achieve a net benefit for the species by ensuring the functional acres of credit acquired is greater than the functional acres of debit. The mitigation ratios create incentives for avoidance of impacts and preservation, enhancement, and restoration of habitat in important areas. This includes avoiding and protecting seasonal habitats that are scarce for a particular population. Mitigation ratios are determined by the:

- Habitat Importance Factor: The value is influenced by the location of a credit or debit site in Core, Priority, or General Management Areas (Figure XX)
- Seasonal Habitat Scarcity Factor: This is determined by the portion of seasonal habitat type (nesting, late-brood rearing, and winter) impacted.

Debits are adjusted by its proximity to potential credit sites (Proximity Factor) to determine the credit obligation that must be purchased to offset a debit project. This incentivizes mitigation in close proximity to debit sites.

Regulatory Assurances

Verification

Credit and debit projects require verification to ensure that calculations represent a true and accurate account of on-the-ground implementation and habitat function and assurances that projects are maintained over time. *Third-party Verifiers*, trained and certified by the Administrator, conduct

[2] For more information please refer to *The Habitat Quantification Tool Scientific Methods Document* on the Sagebrush Ecosystem Program's Website: http://sagebrusheco.nv.gov/

independent checks using the HQT methods. *Credit Verification* is required before credit release and every fifth year. *Debit Verification* is required before the project begins, during project implementation, and when debits end or decrease. Periodic spot checks and audits are also required.

Reserve Account

The *Reserve Account* is a pool of credits, functioning like an insurance fund, that replace credits that are invalidated due to a force majeure event or competing land uses. A percentage of credits from each credit transaction are deposited into the reserve account. Factors that determine the Reserve Account contribution are: base contribution, probability of wildfire, and probability of competing land uses. In the case of unintentional credit reversal due to force majeure or competing land use events, the Administrator withdraws credits from the reserve account to cover the invalidated credits at no cost to the Credit Developer for a limited duration until the original credits are replaced.

Additionality and Stacking of Multiple Payments

Projects that generate credits must be additional to activities that would occur in the absence of the CCS. On private and public lands, a credit project is additional if the land manager is not already performing or planning to perform conservation actions using funding sources other than the CCS. *Stacking* allows a Credit Developer to receive multiple payments for conservation actions on the same area of land, but only receive credit for the additional conservation benefits.

Durability

The CCS uses *performance assurances* on private and public lands to ensure the durability of credits generated throughout the life of the credit project. Performance assurances are implemented through contract terms and financial instruments. The *durability of projects on public lands* is safeguarded using land protection mechanisms (e.g. right-of-ways), financial instruments (e.g. contract performance bonds) and the Reserve Account.

Additional Policy Considerations

The *Service Area*, the area in which credits can be exchanged, for the CCS is the SGMA.

Baseline is the starting point from which credits and debits are measured. Credits and debits represent the change from baseline that results from implementing a project. *Credit baseline* is a state-wide standard for each seasonal habitat type equivalent to the average habitat functionality. Project sites must be at the credit baseline, at a minimum to begin generating credits. *Debit baseline* is the pre-project habitat function value for each seasonal habitat type for a proposed debit project.

Credit release occurs when performance criteria milestones which increase habitat function are achieved on a credit site. Specific performance criteria are defined in each project's *Customized Management Plan*. Credit release can occur in single or multiple increments depending on credit project type; including: *preservation projects*, *enhancement projects*, and *restoration projects*.

The CCS requires that the *project life* of a credit project must be equal to or greater than the life of the debit project it is offsetting.

Credit variability may occur due to annual climatic or other natural conditions affecting habitat functionality. As a result, a *tolerance threshold* of 10% below habitat function is applied.

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