State of Nevada Conservation Credit System

2017/2018 Findings & Improvement Recommendations Report

March 13, 2018

STATE OF NEVADA
CONSERVATION CREDIT SYSTEM

The *Findings & Improvement Recommendations Report* is an annual product of the Nevada Conservation Credit System. The Sagebrush Ecosystem Technical Team of the Nevada Division of State Land's Sagebrush Ecosystem Program produces the report.

For information and questions about the Nevada Conservation Credit System, please contact:

Kelly McGowan
Program Manager
Nevada Sagebrush Ecosystem Program
(775) 684-8600
kmcgowan@sagebrusheco.nv.gov

INTRODUCTION

Key to the long-term success of the Nevada Conservation Credit System (Credit System) is the adoption of well-supported improvements to the Credit System. Improvements ensure Credit System policies, procedures, and tools continue to support achievement of the Credit System's goal: for impacts from anthropogenic disturbances to be offset through restoration, enhancement, and protection that results in net conservation gain for sage-grouse habitat in the State of Nevada. Well-supported improvements depend on: (1) a process that identifies findings from both the operation of the Credit System and new science, and (2) thoroughly analyzed and documented recommendations that stakeholders can review before adoption.

This report contains improvement recommendations for the Credit System Oversight Committee - the Sagebrush Ecosystem Council (SEC) - to consider as part of the 2017 continual improvement process. The findings and improvement recommendations described in this report were identified and formatted through the annual process outlined below. The initial version, version 1.0, of the Credit System Manual and Habitat Quantification Tool (HQT) Methods Document were adopted by the SEC in December 2014. In December 2015, the SEC adopted 11, described in the *2015 Credit System Findings & Improvement Recommendations Report*, which were implemented in version 1.1 of the Credit System Manual and HQT Methods Document. In 2016, the SEC adopted 14 additional improvements, described in the *2016 Credit System Findings & Improvement Recommendations Report*, which were implemented in version 1.3 of the Credit System Manual, HQT, and other program documents.

Annual Process

Each year the Sagebrush Ecosystem Technical Team (SETT) synthesizes findings related to Credit System operations, achievements and challenges, along with any new science relevant to the Credit System. This process of synthesizing findings enables the SETT to identify implementation and policy issues, opportunities for program improvement, and emerging information needs. The SETT develops improvement recommendations for the Credit System that are based on the findings and are considered for adoption by the SEC at the annual *Credit System Improvement Meeting* each December. The findings and improvement recommendations are documented in an annual *Findings & Improvement Recommendations Report* to enable the SEC to make informed decisions and valuable improvements to the Credit System.

The process for producing this report is summarized in Section 3.3: Adaptively Managing the Credit System in the Credit System Manual. During the implementation of the first continual improvement cycle in 2015, the SETT defined a slightly revised five-step annual process, which is illustrated in Figure 1 below. The red circle indicates the steps in the continual improvement cycle during which this report is produced and the SEC considers adoption of the improvement recommendations in this report.

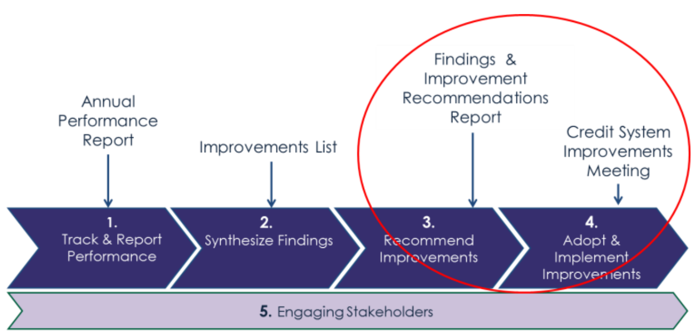

Figure 1: Credit System continual improvement process

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2017/2018 DRAFT FINDINGS AND IMPROVEMENT RECOMMENDATIONS

Findings

This section contains a synthesis of key findings identified by the SETT, many of which are directly relevant to potential or recommended improvements to the Credit System. Findings not directly linked to improvement recommendations either support existing policy, require actions beyond the SETT's purview, are not currently actionable due to incomplete information, or lack of implementation resources.

The findings are categorized as "Operational Findings" or "Research & Monitoring Findings." Operational findings are derived from stakeholder feedback and from on-the-ground learning associated with testing and implementation of Credit System policies, procedures and tools. Research and monitoring findings are associated with new science or drawn from the results of monitoring data.

Improvements List

All potential Credit System improvements are captured in the *Credit System Improvements List*. The SETT uses the list to track and respond to stakeholder feedback – including suggested Credit System improvements and new findings – in an organized and transparent manner. It is also used to define work plan priorities with the SEC each year.

Improvement Recommendations

This section is a distillation of recommended improvements to the Credit System proposed by the SETT ranging from management strategies and policies to operational procedures and tools. Included are improvements that will affect the goal or scope of the Credit System, related policies and plans, state or federal agency partnerships, administrative responsibilities, or administrative liability, or improvements that will have a meaningful impact on credits and debits generated from future projects, or a meaningful impact on program operations. The SETT creates the improvement recommendations based on the findings and thorough analysis of potential improvements identified. The SETT presents these recommendations to the SEC for discussion and approval.

Within each category, the recommendation includes:

- Summary of improvement
- Specific improvement recommendation
- Rationale to support recommendation details

Potential improvements that the SETT does not currently recommend implementing, or that are not yet completely developed and ready for adoption, are tracked in the *Improvements List*.

Each finding and recommendation are summarized in the table below and detailed hereafter.

Approved Findings and Improvements Recommendations

1 **Finding**: Permanent credits in some circumstances may not be a feasible option for either the credit developer or credit buyer.

Improvement: The SETT recommends that a multiplier be an option to allow the conversion of the permanent credit obligation into term credits that are likely to be readily available.

2 **Finding**: Some map units within debit project areas hold extremely low to no habitat value for sage-grouse (e.g. cheatgrass monocultures, phase III conifer). These areas can be identified prior to field data collection and excluded from the HQT analysis when calculating Debits. This will reduce the cost of assessing Debits by reducing the cost of field data collection efforts.

Improvement: We recommend that cheatgrass monocultures and phase III pinyon and juniper (PJ) as identified and mapped, be removed from the analysis area on debit projects when calculating habitat function.

3 **Finding**: Removal of anthropogenic disturbances is described within the CCS Manual as a means to generate credits, but reduced durability is a concern when removal occurs on public lands' rights-of-way without a commitment to monitor and maintain habitat as part of a project.

Improvement: The SETT recommends a contribution of 3 times the standard reserve account contribution based on the current CCS protocols for calculating a project's reserve contribution

4 **Finding**: Powerlines are currently categorized by two subtypes because scientific research is lacking on differences in indirect impacts between various powerline structural types on sage-grouse populations. However, recently acquired data on raven nesting frequency along distribution lines justifies additional classification and clarification of powerline subtypes within the CCS.

Improvement: The SETT recommends that three phase distribution lines with a single cross arm be classified in the Monopole subtype (25% weight, 6km) instead of the Transmission - Distribution subtype (75% weight, 6km) due to their similar impact on nesting frequency of ravens. The SETT also recommends that the Monopole and Transmission – Distribution subtypes be renamed as Single Phase and Three Phase, respectively.

5 **Finding**: Anthropogenic disturbance categories do not differentiate ancillary features from their associated primary anthropogenic features; however, they result in inflated debit estimates and their indirect effects should be more appropriately calculated.

Improvement: The SETT recommends that ancillary features be assigned half the weight and distance of their associated primary anthropogenic disturbance features.

6 **Finding**: The methods initially established to quantify the impacts of conifer removal and the credits awarded from the implementation of such actions are no longer viable due to recent changes in the CCS.

Improvement: The SETT recommends a multiplier of 1.2 be applied to Phase I conifer and a multiplier of 1.5 be applied to Phase II conifer to quantify immediate uplift for conifer removal credit projects.

Approved Findings and Improvements Recommendations (continued)

7 **Finding**: For debit projects, the HQT analyzes an area up to 6km from the surface disturbance when calculating effects of direct and indirect impacts on sage-grouse habitat. This creates a very large project area in which field data collection is required, which can result in increased time, effort, and costs associated with quantifying debits.

Improvement: Utilize a site-screening tool to aid in minimization and avoidance during the planning process of a debit project, and if a debit project proponent decides not to run field data, the SETT recommends assigning 100% site-scale habitat function to the area that should have been surveyed.

APPROVED FINDINGS AND IMPROVEMENTS

1 – ALLOW TERM CREDITS TO OFFSET PERMANENT IMPACTS USING A 4:1 RATIO

Finding

Permanent credits in some circumstances may not be a feasible option for either the credit developer or credit buyer.

- Only a small portion of debits generated from each debit project is expected to be needed to offset with permanent credits.
- The cost of financial assurances is significantly higher for permanent credits than temporary credits, and financial assurances are estimated to be up to half of the cost to generate credits.
- Credit developers are unlikely to be interested in generating both temporary and permanent credits from the same credit project.
- Credit developers are unlikely to sell or transfer permanent credits without clear understanding of the demand.

Improvement Recommendation

Summary

Credit developers may not be willing to sell or transfer permanent credits due to the small quantity that may be needed during a transaction. The SETT recommends using a multiplier to convert permanent debits into term debits. The SETT will encourage sale of permanent debits as the primary option; however, if situations arise where permanent debits are not currently available; the CCS will allow permanent impacts to be offset by term credits using a 4:1 ratio.

Specific Improvement Recommendation

In situations where a debit producer is not willing to buy permanent credits or when none are available, the SETT recommends using a multiplier of 4 that would be applied towards permanent debits. This will allow the conversion of the permanent credit obligation into term credits that are likely to be readily available. The SETT will require credit buyers to research the availability of permanent credits within the system prior to considering using the multiplier.

The CCS Manual has been updated to reflect the approved recommendation (Appendix A: Changes to the CCS Manual, Habitat Quantification Tool, and Automated User's Guide Documents).

Rationale Supporting Recommendation Details

The SETT has explored multiple options relating to the multiplier (additional description and detail below). The initial recommendation was to use a multiplier of 12, which would be equivocal to the State of Nevada's definition of perpetuity of 365 years. Additional options are a multiplier of 3, which refers to a historic American common law of a 99-year lease; or a multiplier of 4, 5, or 6 to coincide 40 generations, which has been used in past applications to assess the Minimum Viable Populations using Population Viability Analyses.

Due to the difficulty of the SETT's ability to justify a specific multiplier using available science, the SEC suggested using a multiplier of 4 based on the 100 year average lifespan of sagebrush combined with a 21 year rule against perpetuities within Nevada. This concept translates to 121 years, which is equivalent to a multiplier of 4 when using a term period of 30 years.

The cost to the credit developer to monitor, maintain, and manage a small number of permanent credits is extremely costly and is likely to result in the credit developer setting a very high price that may be viewed as unreasonable to a credit buyer. In addition to selling few permanent credits, the amount of credits sold may only be a portion of the credit project area, creating a potential situation where the credit developer would need to manage a smaller portion of their project while the remaining project area credits may be sold for a single term or not sold at all. This may create situations where it may not be financially reasonable or create an incentive for the credit developer to sell permanent credits.

Perpetuities in Nevada are described by NRS 111.1031, which defines perpetuity as 365 years. A multiplier of 12 applied to 30 year term credits would roughly equate to the 365 years.

In America, several states require that a 99-year lease will always be the longest possible contract for a lease of real estate by statute. This would allow the SETT to use a 3 times multiplier.

Minimum Viable Populations (MVPs) and Population Viability Analyses (PVAs) are tools that can be used to predict population persistence over a defined time period. The reliability of PVAs depends greatly on the population data going into the models, therefore its statistical significance can vary greatly. Factors such as demographic and environmental stochasticity creates variation in the ability to predict population persistence, which only increases in variability the longer the model simulations are run. In a study by Reed et al. (2003), PVAs were used to estimate MVPs for 102 species worldwide, and they defined a MVP as one with a 99% probability of persistence for 40 generations. Forty generations with the average life span of 3-5 years of a sage-grouse, results in about 120-200 years, or using a multiplier of 4-6.

Reference

Reed, D.H., O'Grady, J.J., Brook, B.W., Ballou, J.D., and Frankham, R. 2003. Estimates of minimum viable population sizes for vertebrates and factors influencing those estimates. Biological Conservation. 113:23-34.

2 – IDENTIFY AND ELIMINATE HABITAT OF DE MINIMIS QUALITY FROM FIELD DATA COLLECTION FOR DEBIT PROJECTS

Finding

Some map units within debit project areas hold extremely low to no habitat value for sage-grouse (e.g. cheatgrass monocultures, phase III conifer). These areas can be identified prior to field data collection and excluded from the HQT analysis when calculating Debits. This will reduce the cost of assessing Debits by reducing the cost of field data collection efforts.

- For debit projects, some areas captured within the project area may be disturbed (e.g. cheatgrass monoculture post-wildfire) and calculate 0% habitat function.
- Areas that hold no sage-grouse habitat value in most situations calculate zero habitat function; however, there are instances where some habitat types (e.g. phase III conifer) may calculate function if some shrubs or other herbaceous vegetation are present.
- Due to the large extent of many debit projects, the area where field data collection is required can be tens of thousands of acres, which increases staff time and costs to complete field efforts.
- Several categories have been identified that should be removed from the debit project area assessment if certain criteria are met; guidance including maps of phase III conifer and annual grass composition will be used to help identify these areas.

Improvement Recommendation

Summary

There are several habitat types that may be included in debit project areas that will yield very low or 0% habitat function for sage-grouse, including phase III conifer and cheatgrass monocultures. These areas should be excluded from the HQT analysis when calculating debits. The SETT recommends using conifer and annual herbaceous canopy cover data layers developed by USGS, reclassified by the SETT, to use as boundaries to remove from current debit project areas.

Specific Improvement Recommendation

The SETT recommends that cheatgrass monocultures and phase III pinyon and juniper (PJ) as identified and mapped, be removed from the analysis area on debit projects when calculating habitat function.

Debit projects quantify habitat function that currently exists and can be thought of as a snapshot of current conditions. The SETT recommends identifying and removing those areas that calculate 0% habitat function from the project area map units to streamline data collection efforts. The SETT recognizes that some areas of high cheatgrass but low shrub cover are may not represent lost habitat and could be rehabilitated at some point in the future; however, when analyzing current conditions to assess credit obligation for debit projects, the current conditions are what the project proponent will be responsible for. As such, if the HQT will result in 0% habitat function for particular characteristics, they should be excluded from the project.

In addition to using the annual herbaceous layer to identify areas of cheatgrass, photo points will be required to visually assess that the area is predominantly cheatgrass before removal from the project area. These areas can be initially outlined using the annual herbaceous cover map provided in the Nevada Data Package, however this is to help identify potential areas that will result in zero habitat function and must be verified in the field to confirm it meets criteria. For areas identified as having greater than 35% cheatgrass, the map unit may be expanded and altered based on the site visit. The layer the SETT created is relatively conservative to ensure areas that may be under 30% cheatgrass are not excluded from the HQT. However, altering or expanding the boundaries is possible if adequate supporting documentation is provided and approved by the SETT.

The exception to removing phase III conifer or cheatgrass map units will be in situations where these areas occur within 1 km of a lek. Areas near active leks will still be included within the HQT analysis regardless of habitat quality. The SETT will provide adjusted phase III conifer or cheatgrass layers to verifiers when using the HQT.

The CCS User's Guide has been updated to reflect the approved recommendation (Appendix A: Changes to the CCS Manual, Habitat Quantification Tool, and Automated User's Guide Documents).

Rationale Supporting Recommendation Details

Phase III PJ is defined as having greater than 20% canopy cover based on sage-grouse avoidance and survival (Coates et al. 2017c) and encroachment classification described by Falkowski and Evans (2012). The remote sensing techniques used to classify conifer cover in the USGS conifer cover map did not detect characteristics such as understory vegetation, tree age, etc. that are also used in determining pinyon and juniper phase or encroachment (Coates et al. 2017b), so the CCS conifer phases were defined using the USGS classification. The SETT has created a GIS polygon shapefile of phase III PJ that can be used to clip phase III out of the debit project area as non-habitat. The data were derived using the USGS 1m scale conifer cover classifications that were aggregated to 30m raster cells (Coates et al. 2017a). We reclassified the final USGS 30m conifer canopy cover raster file using a circular moving window neighborhood analysis with a 440m radius. During the HSI modeling process, three spatial scales were analyzed to identify the most appropriate scale for how each land cover variable, including PJ, affected sage-grouse selection or avoidance. The three spatial scales used represent the minimum (167.9m), average (439.5m), and maximum (1,451.7m) daily distance traveled by sage-grouse in the study. Of the sub-regions used in the analysis that incorporated PJ as a land cover variable, the 439.5m spatial scale was the top model in 11 of 16 sub-regions across Nevada. On average, the 440m spatial scale was the best predictor of how PJ influences sage-grouse habitat selection when developing the HSI. Therefore, we selected the average daily distance rounded to 440m to use as the spatial extent to categorize PJ phases, which best represents the biological impact to sage-grouse populations.

The literature widely supports avoidance of PJ by sage-grouse (Freese 2009; Doherty 2008; Casazza et al. 2011; Baurch-Mordo et al. 2013). Female sage-grouse avoided PJ when canopy cover was greater than 3% within 800m of nest sites and tended to nest where trees were clustered compared to dispersed (Severson et al. 2017). Recent research has also indicated that sage-grouse experience higher mortality associated with Phase I PJ (Prochazka et al. 2017) and show strong avoidance of phase II and III PJ (Coates et al. 2017c). While sage-grouse may occasionally use greater than 10% canopy cover in phase II and III, it is very uncommon and strongly avoided; with every 1% increase in canopy cover in phase II and III, there was a 35% reduction in probability of selection (Coates et al. 2017c).

The SETT also created GIS polygon shapefiles of annual herbaceous canopy cover greater than 35% from USGS (Boyte and Wylie 2017). In the CCS, a map unit has zero habitat function when annual grass exceeds 30%. Therefore, we reclassified the USGS annual herbaceous layer to identify areas containing greater than 35% cover, to allow for a 5% standard error buffer.

The literature also indicates sage-grouse avoidance of cheatgrass. One study in Nevada showed that sage-grouse selected nest sites containing an average of 7% cheatgrass cover compared to 13.3% cover at random locations (Lockyer 2012). Sage-grouse nesting habitat selection has also been shown to be negatively correlated with the abundance of cheatgrass in Wyoming (Kirol et al. 2012). Nesting and brood-rearing microhabitat data from 16 study sites across Nevada and California during 2009–2016 also demonstrated that sage-grouse generally avoided cheatgrass where it exceeded 5% cover in unburned habitats (Coates et al. 2017a). The effect was much stronger in previously burned habitats where annual grasses were more prevalent; sage-grouse avoided areas with greater than 10% cheatgrass cover and used sites averaging 7.5% cover. At larger spatial scales, annual grass cover analyzed near leks averaged 2.2% within a 5km buffer, and inactive leks contained almost 5 times more cheatgrass (Knick et al. 2013).

In their current condition, phase III PJ and cheatgrass dominated landscapes have little to no sage-grouse habitat value. Naturally occurring phase III PJ woodlands lack a sufficient sagebrush understory and pose a significant threat from predators and are generally considered to have no habitat value. There may be exceptions where corridors within phase III PJ are identified for removal treatments in order to improve connectivity between existing sage-grouse habitat. Cheatgrass monocultures, while not sage-grouse habitat in their existing condition, could be rehabilitated and restored to habitat in the future but from the HQT perspective these areas will not calculate habitat function for sage-grouse.

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3 – REMOVAL OF ANTHROPOGENIC DISTURBANCES SHOULD REQUIRE AN INCREASED RESERVE ACCOUNT CONTRIBUTION

Finding

Removal of anthropogenic disturbances is described within the CCS Manual as a means to generate credits, but reduced durability is a concern when removal occurs on public lands' rights-of-way without a commitment to monitor and maintain habitat as part of a project.

Improvement Recommendation

Summary

The removal of anthropogenic disturbances that negatively impact GRSG has been anticipated since the conception of the CCS as a method to generate credits. Due to a lack of commitment to monitor and maintain existing habitat conditions, durability assurances are compromised when removal occurs on public lands' rights-of-way.

The verifiers will conduct a desktop analysis to ensure accurate calculations are made based on the uplift created by the removal of the disturbance. This eliminates the need for the full HQT process because field data collection is not required for this type of credit generation.

Specific Improvement Recommendation

The SETT recommends a contribution of 3 times the standard reserve account contribution based on the current CCS protocols for calculating a project's reserve contribution. These increased reserve account contributions are necessary due to the lack of the project's requirement for monitoring, maintenance, management, and securing financial assurances to conduct these activities when credits are generated in this way.

The CCS Manual has been updated to reflect the approved recommendation (Appendix A: Changes to the CCS Manual, Habitat Quantification Tool, and Automated User's Guide Documents).

Rationale Supporting Recommendation Details

The risk of loss due to natural events, man-made disturbances and the lack of financial assurances to address those potential losses would create an unmitigated burden to the existing reserve account credits.

4 – RECLASSIFY POWERLINE SUBTYPES TO INCORPORATE NEW RESEARCH

Finding

Power lines are currently categorized by two subtypes because scientific research is lacking on differences in indirect impacts between various powerline structural types on sage-grouse populations. However, recently acquired data on raven nesting frequency along distribution lines justifies additional classification and clarification of powerline subtypes within the CCS.

Improvement Recommendation

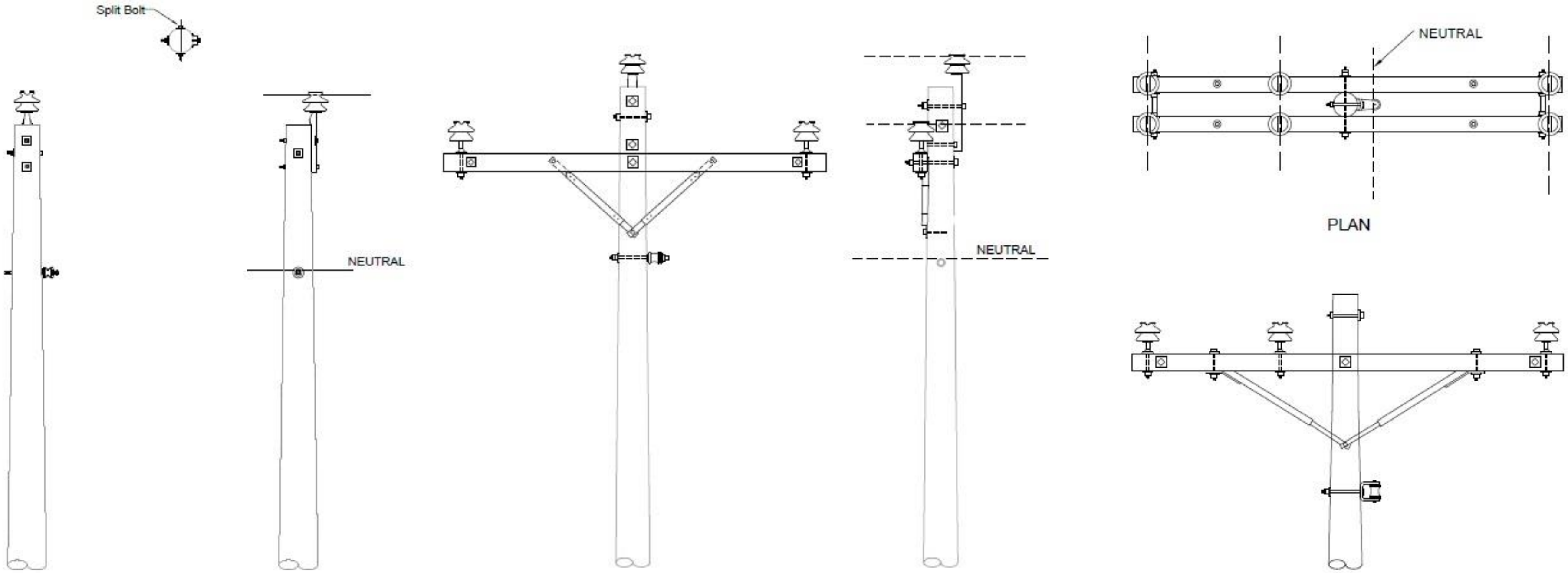
Summary

Assign single cross arm poles the same weight and distance classification as the Monopole subtype, instead of the classification for Transmission – Distribution subtype; rename Monopole subtype as Nest Facilitating and Transmission – Distribution subtype as Non-Nest Facilitating.

Specific Improvement Recommendation

The SETT recommends that three phase distribution lines with a single cross arm be classified in the Monopole subtype (25% weight, 6km) instead of the Transmission - Distribution subtype (75% weight, 6km) due to their similar impact on nesting frequency of ravens. The SETT also recommends that the Monopole and Transmission – Distribution subtypes be renamed as Nest Facilitating and Non-Nest Facilitating, respectively, to more accurately describe the structural design effects on nesting ravens.

A typical single phase distribution line is defined by having a tangent pole with two lines; a typical three phase distribution line is defined by having four lines and a variety of cross arm (e.g. single or double) structures (Figure 1). If a three phase line has a single or no cross arms, it can be defined as a Non-Nest Facilitating subtype for the purpose of determining indirect impacts. When available, data received from the Nevada Rural Electric Association (NREA) can be used to classify powerline subtypes. If data are not available from the NREA, field verifiers should use the above definitions to classify powerline subtypes.



A) Single Phase Tangent B) Three Phase Single Arm Tangent C) Three Phase Double Arm Tangent

Figure 2. Images of common distribution lines found within the Nevada Rural Electric Association: (A) single phase, (B) three phase single cross arm, and (C) three phase double cross arm structures. Figure 1 will be added to the User's Guide.

The CCS Manual and the Habitat Quantification Tool Document have been updated to reflect the approved recommendation (Appendix A: Changes to the CCS Manual, Habitat Quantification Tool, and Automated User's Guide Documents).

TYPE	SUBTYPE	TYPE CODE†	SUBTYPE CODE†	WEIGHT (%)	DISTANCE (Meters)	DEFINITION
Powerlines*	**Nest Facilitating**	**Powerlines**	**Nest_Facilitating**	75%	6,000 m	Major and minor electrical power transmission and distribution lines with **multiple** cross members, supporting arms, etc. Do not include buried transmission lines.
	Non-Nest Facilitating	**Powerlines**	**Non_Nest_Facilitating**	25%	6,000 m	Distribution lines with no (tangent pole) **or single** cross members, supporting arms, etc. or of a construction that would not support raven nesting opportunities

Rationale Supporting Recommendation Details

Recently acquired data from Wells Rural Electric Association (WREA) has provided data to allow further categorization of powerline subtypes. WREA data included nest observations associated with pole types (e.g. single pole, one cross arm, double cross arm, single or three phase, etc). The SETT was able to compile average number of nests per km of line within the WREA service area. WREA services 1,123 miles of single and three phase line and recorded 236 nests on those lines. An analysis of nests per structure type resulted in 11.2 nests per 100 miles of line for single phase and 34.7 nests per 100 miles of line for three phase, which is a 210% increase in frequency of nests on three phase compared to single phase (Table 1) Single phase lines are all single poles with no cross arms (excluding transformers associated with single phase). These data support the two current powerline subtype classifications of the Monopole and Transmission – Distribution subtypes.

Table 1. Total number of nests, miles of line, and nests per 100 miles of line associated with single and three phase distribution lines in the WREA.

Pole Type	Total Nests	Total Miles of Line	Nest per 100 Miles
Single Phase	73	653	11.2
Three Phase	163	470	34.7
Total	236	1,123	21.0

When three phase lines were further divided by structure type, there were differences among cross arm types. Single cross arm poles had a total of 9.6 nests per 100 miles of line and double cross arm poles had 24.7 nests per 100 miles of line (Table 2). Single cross arm poles actually had a lower nesting frequency than single phase; however, all of single phase includes transformers, which attract nesting raptors and ravens. The double cross arm design had a 158% increase in nesting frequency compared to the single cross arm structure. These data show there are differences when analyzing structure type among distribution power lines and should be reflected in our anthropogenic disturbance type and subtype classifications.

Table 2. Total number of nests and nests per 100 miles of line associated with the structure (single vs double cross arm) of three phase distribution lines in the WREA.

Pole Type	Total Nests	Nests per 100 Miles
Single Phase	73	11.2
Three Phase Single Crossarm	45	9.6
Three Phase Double Crossarm	116	24.7

5 – CREATE NEW ANTHROPOGENIC DISTURBANCE SUBTYPES TO CATEGORIZE ANCILLARY FEATURES

Finding

Anthropogenic disturbance categories do not differentiate ancillary features from their associated primary anthropogenic features; however, they result in inflated debit estimates and their indirect effects should be more appropriately calculated.

- Lumping all associated anthropogenic disturbances related to the primary disturbance may not appropriately represent or may overestimate the indirect impacts of the debit project.
- Lumping anthropogenic disturbances can also increase the project area when a feature is located far from the primary disturbance footprint, which may not be a fair representation of the indirect effects associated with the ancillary feature.

Improvement Recommendation

Summary

Assign half the weight and distance of the primary anthropogenic disturbance to associated ancillary features. For example, ancillary features associated with a large mining operation, which would normally receive 100% weight and 6km distance, would receive a 50% weight and 3km distance when calculating anthropogenic disturbance.

Specific Improvement Recommendation

For this improvement, ancillary features are defined as those features that are associated with the primary disturbance, but due to reduced noise, distance, and activity associated with the feature are expected to have less indirect impact to sage-grouse.

The SETT recommends that ancillary features be assigned half the weight and distance of their associated primary anthropogenic disturbance features. The ancillary feature subtypes that the SETT concluded should be considered include: Large Active Mine Ancillary, Small Active Mine Ancillary, and Geothermal Ancillary. The following is not an exhaustive list of ancillary features that this improvement will be applied to, and other features that may warrant ancillary classification may be requested to receive this classification: ponds (e.g. rapid infiltration basins), production shafts, quarries, pipelines, and other structures as approved. All ancillary features must be approved by the CCS Administrator (hereafter Administrator) to ensure the level of activity, noise, etc., associated with the disturbance is appropriate to be considered ancillary. The Administrator would be involved in the planning process to ensure the feature's location is appropriate and warranted in order to be classified as ancillary. Co-location of disturbances is always strongly preferred in order to minimize direct and indirect impacts, and prior to being considered ancillary the Project Proponent, Authorizing Land Management Agency, and Administrator must mutually agree that co-location is not feasible.

The CCS Habitat Quantification Tool and the CCS User's Guide Document have been updated to reflect the approved recommendations (Appendix A: Changes to the CCS Manual, Habitat Quantification Tool, and

Automated User's Guide Documents).

Rationale Supporting Recommendation Details

To develop a consistent approach to assign weights and distances to ancillary features, the SETT selected a standard 50% reduction of the primary anthropogenic feature impact to appropriately reflect the reduction in indirect effects from the ancillary feature. Ancillary features are going to vary in type, size, and impact, and in the majority of situations there is no science addressing the impacts of specific ancillary features. However, the SETT recognizes that ancillary features located away from the primary disturbance likely have less indirect impacts (real and perceived threats) to sage-grouse.

The SETT ran scenarios to analyze the effects of varying the weight and distance of the ancillary feature and distance away from the primary disturbance. Using a large active mine as an example, Table 3 provides scenarios with features categorized as either large active mine or ancillary and at a specified distance to compare debits generated. These scenarios display the difference in debit generation at varying distances from a large active mine and whether the feature is classified as large active mine or ancillary using a 50% weight and 3km distance. As the ancillary feature becomes further from the primary disturbance footprint, the reduction in debit calculation becomes more significant and the total project area decreases with a smaller buffer associated with the ancillary feature. Figure 1 illustrates the difference in project area comparing a large active mine with a mine feature and ancillary feature 4km from the primary disturbance footprint.

Table 3. Debits generated when comparing a separate surface disturbance footprint as the full impact of a large mine (100% weight, 6km) to half the weight and distance of the same disturbance categorized as an ancillary feature (50% weight, 3km).

Scenario	Weight	Distance	Project Analysis Area	Debits	% Change in Debits	% Change in Project Area
Mine Feature						
Mine w/Feature 1km away	100%	6km	52,007	9,657		
Mine w/Feature 2km away	100%	6km	54,900	10,667		
Mine w/Feature 4km away	100%	6km	61,274	11,807		
Ancillary Feature						
Mine w/Ancillary 1km away	50%	3km	47,861	8,935	-8%	-9%
Mine w/Ancillary 2km away	50%	3km	47,861	8,941	-19%	-15%
Mine w/Ancillary 4km away	50%	3km	49,764	9,273	-27%	-23%

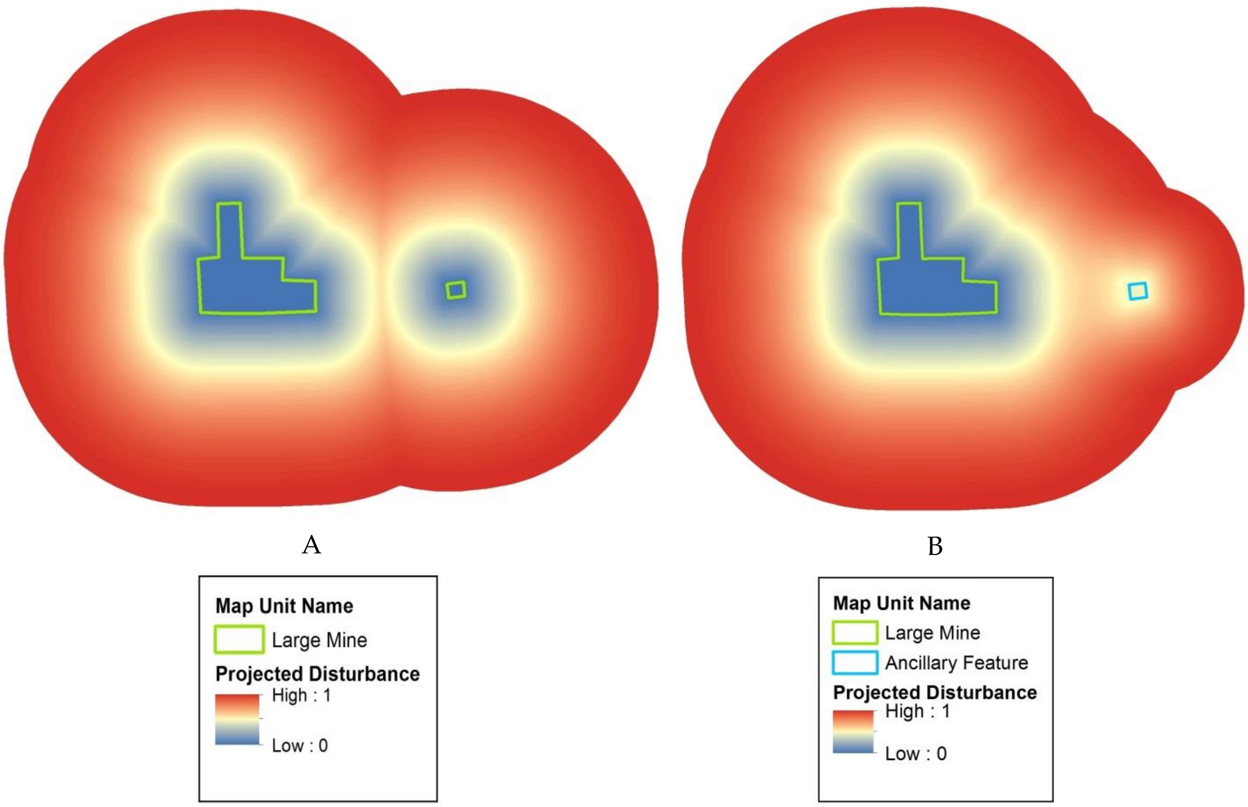


Figure 3. The difference in project area and anthropogenic impact between: A) Large active mine representing both footprints and B) Large active mine and ancillary feature. Both features are 4 km from the primary disturbance footprint. Figure A generated 11,807 debits over 61,274 acres and Figure B generated 9,273 debits over 49,764 acres.

6 – CONIFER REMOVAL

Finding

The methods initially established to quantify the impacts of conifer removal and the credits awarded from the implementation of such actions are no longer viable due to recent changes in the CCS.

Improvement Recommendation

Summary

The SETT recommends a new process to quantify credits from conifer removal where situations are beneficial to GRSG. For credit projects that remove conifer cover, the local-scale habitat quality will be multiplied by 1.2 for map units in Phase 1 pinyon-juniper (1-10% cover) and multiplied by 1.5 for map units in Phase 2 pinyon-juniper (10-20% cover) to calculate credits for immediate uplift to GRSG where pinyon-juniper is totally eliminated. When included as part of credit projects, map units with these phases of pinyon-juniper will in the majority of circumstances require complete removal. Areas with greater than 20% cover where high quality understory vegetation remains can also be characterized as Phase 2 conifer.

Specific Improvement Recommendation

The SETT recommends the following process to quantify uplift credits from conifer removal projects per map unit. The process hinges upon the current local scale habitat function having a multiplier applied based on the phase of conifer removed to determine the immediate uplift credits available from complete removal. Phase 1 map units will be characterized as 1-10% cover and Phase 2 as 10-20% cover. When included as part of credit projects, map units with these phases of pinyon-juniper will now require complete removal in the majority of circumstances. Due to the gradient of positive impacts from conifer removal efforts on GRSG across the phases of conifer, the following multipliers are recommended: 1.2 for Phase 1 map units and 1.5 for Phase 2 removal map units. Multipliers will be applied to the local-scale habitat quality for each map unit.

The data collected using the HQT will establish the current condition from which all future habitat uplift credits will be calculated. Similar to all private land credit projects, verification will occur every fifth year. A monitoring effort to confirm that no trees are present will be required after removal and will occur every ten years. Map units will be delineated in a manner consistent with other CCS projects according to ecological sites and homogenous vegetation for each project except that the conifer map units will be determined in the conifer layer map in ArcGIS. Areas with greater than 20% cover where high quality understory vegetation remains can also be characterized as Phase 2 conifer if the Administrator confirms an exception is warranted. After delineation of map units, Phase 1 map units found to not meet an average conifer cover threshold of 1.0% will be treated as preservation and maintenance and will not be eligible for uplift credits from the removal of conifers.

A previous version of the map below was approved at the last SEC meeting; however, the map was reconstructed to display a finer scale of conifer cover for this application. In order to be consistent in its application, the SETT recommended that this new map be adopted for Improvement 2.

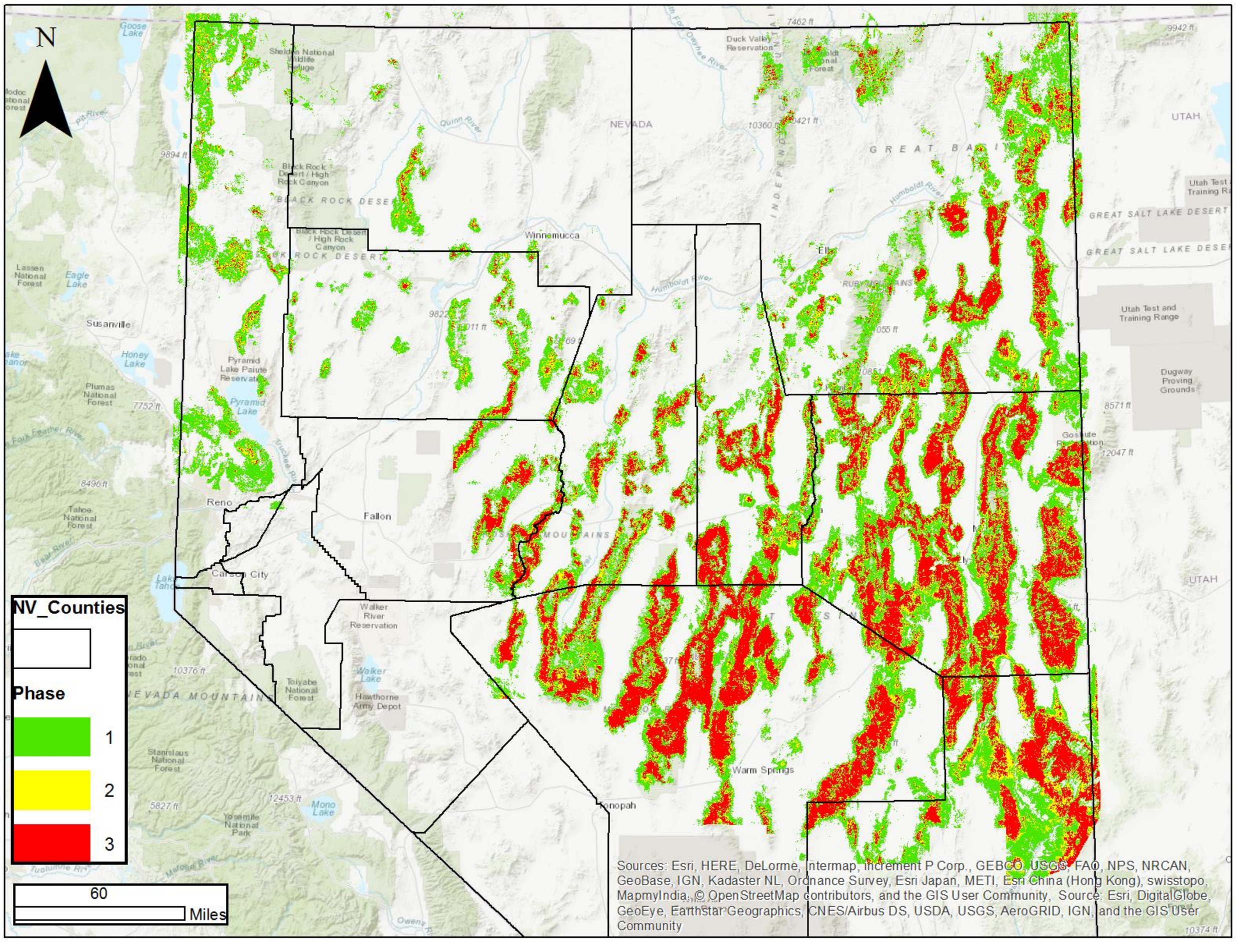


Figure 4. The map above shows the conifer layers featuring Phase 1 (0-10% canopy cover), Phase 2 (10-20%), and Phase 3 (>20%) within greater sage-grouse habitat in the State of Nevada to be used by the SETT. Phase 1 conifer is most prevalent and should make up for the majority of conifer removal conducted within the CCS.

Examples of some of the preferred project conditions the Administrator will analyze are described below; however, site-specific conditions for proposed projects will be quite variable.

- Existing onsite high-quality GRSG habitat, and an adequate understory, viable seed sources in close proximity, or a plan to ensure post-removal habitat improvement.
- Immediate adjacency to open, tree-less, high quality GRSG habitat.
- Removal is proposed at scales likely to benefit GRSG.
- Relatively minimal risks of invasion of cheatgrass and/or other annual grasses in the area (e.g., not dominated by low elevation, south-facing slopes, adjacent to significant vectors for invasive plants, etc.).

Proposed projects meeting these and other qualifying conditions are likely to be accepted. The Administrator reserves the right to reject proposed projects; but will use all available tools to determine credit eligibility.

Conifer removal actions conducted prior to enrollment in the CCS will not be eligible for immediate uplift credits quantified through the use of multipliers. If enrolled in the CCS, and Federal funds are used for the conifer removal, projects will not be eligible for immediate uplift credits associated with that removal. When enrolled in the CCS, these projects will still require continual removal of conifer saplings as part of project maintenance regardless of timing or source of funding.

The CCS Manual, Habitat Quantification Tool Document, and User's Guide have been updated to reflect the approved recommendation (Appendix A: Changes to the CCS Manual, Habitat Quantification Tool, and Automated User's Guide Documents).

Rationale Supporting Recommendation Details

The SETT recommends the use of multipliers to determine the immediate uplift to GRSG from conifer removal for several reasons:

- GRSG tend to see immediate benefit when conifer removal is conducted in close proximity to GRSG populations likely through the removal of predator perches and perceived threats, increased forage, and increased connections to mesic areas, leading to greater overall utility from GRSG (Sandford et al. 2017).
- Phase 1 removal in Oregon resulted in a 19% increase in nest survival of GRSG compared to control sites (Severson et al. 2017). This was the basis of the Phase 1 multiplier of 1.2.
- GRSG probability of nest success has been found to decrease with each increasing conifer cover class (Sandford et al. 2017). Modeling efforts revealed potential sage-grouse benefits from conifer removal are highest where denser conifer cover is treated in close proximity to lek locations (Farzan et al. 2015).
- Phase 1 conifer is still utilized by GRSG yet with increased predation; however, Phase 2 conifer is avoided by most GRSG (Coates et al. 2017). As a result, one would assume survivorship increases when Phase 1 is cut, yet when Phase 2 is cut, the significant, yet unquantifiable, added benefits of reclaiming currently unused habitat and stopping conversion into Phase 3 woodland are realized. This nearly irreversible conversion from Phase 2 to Phase 3 occurs at a rate of more than 100,000 acres of lost GRSG habitat per year in the Great Basin (Miller et al. 2008).
- HSI values within Phase 2 are approximately 10% lower on average than in Phase 1. Combined with the likelihood that on-site measurements from Phase 2 map units would likely reveal reduced habitat quality due to a likely measurable codominance of trees and shrubs, credit yields will tend to be lower in these areas than in Phase 1. With all this in mind, a higher multiplier was necessary to award for the added benefits to GRSG when Phase 2 is removed and provide sufficient incentive to ensure projects feature multiple conifer cover classes, where it makes sense for GRSG habitat improvement. The SETT decided on a 1.5 multiplier for Phase 2.

Further rationale is provided in the following table, in which the SETT used upland (non-meadow) map units and field data from existing credit projects. It assumes Phase 1 or Phase 2 conifer has been removed, applies the multipliers to determine the uplift credits, and removes a relevant reserve account contribution.

Table 4. Upland (non-meadow) map units with field data collected from real credit projects were used to test the multipliers to assess how many uplift credits would be awarded per acre on average for Phase 1 and Phase 2 conifer removal projects. Phase 1 conifer removal scenarios are shown in light green and Phase 2 conifer scenarios are displayed in dark green. Most of these areas lacked conifer, which, if present, would have likely reduced credit yields within at least Phase 2 habitats.

Map Unit	Acres	Sellable Preservation Credits	Sellable Preservation Credits per Acre	Uplift Credits After Multiplier (1.2x)	Sellable Uplift Credits per Acre (1.2x)	Uplift Credits After Multiplier (1.5x)	Sellable Uplift Credits per Acre (1.5x)
1	344	112	0.32	63.8	0.19	124.2	0.36
2	602	148	0.25	42.7	0.07	106.6	0.18
3	50	15	0.30	6.6	0.13	13.9	0.28
4	796	45	0.06	41.3	0.05	101.7	0.13
5	80	11	0.14	4.7	0.06	11.5	0.14
6	380	38	0.10	38.2	0.10	30.1	0.08
7	417	137	0.33	44.3	0.11	110.8	0.27
8	15	2	0.13	0.9	0.06	2.4	0.16
9	5	2	0.39	0.6	0.11	1.4	0.30
10	13	6	0.44	1.7	0.13	4.4	0.33
Average			0.24		0.10		0.22

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7 – ALTERNATE METHODS TO MORE EFFICIENTLY ANALYZE DEBIT PROJECTS WITHIN THE CCS

Finding

For debit projects, the HQT analyzes an area up to 6km from the surface disturbance when calculating effects of direct and indirect impacts on sage-grouse habitat. This creates a very large project area in which field data collection is required, which can result in increased time, effort, and costs associated with quantifying debits.

The SETT explored ways to streamline Habitat Quantification efforts within the sampling design. After exploring many options, the SETT determined that there was too much variation and uncertainty in the outcomes. The methods the SETT explored, as well as the reasoning behind our decision to not continue with this improvement, are listed below.

1. Monitoring a pre-determined portion of the sampling area and using the HSI to quantify the remaining portion.
   A. Using the HSI for the entirety of the project, with no field sampling.
   B. Choosing a definite boundary to sample (2-3 km around the area of direct disturbance).
   C. Calculating the areas of greatest impacts from the disturbance, and requiring field sampling within those areas.

   Downsides
   - Large inconsistencies in debits calculated.
   - Significant inconsistencies in mitigation obligations.
   - Challenges in standard application of the potential alternative methods.
   - Would weaken the integrity of the CCS by the difference in sampling requirements between the debit projects and the credit projects.

Improvement Recommendation

Summary

Utilize a site-screening tool to aid in minimization and avoidance during the planning process of a debit project, and if a debit project proponent decides not to run field data, to assign 100% site-scale habitat function to the area that should have been surveyed.

Specific Improvement Recommendation

The SETT is currently developing a debit site-screening tool to enhance the ability of a project proponent to examine meaningful impact reductions pre-project.

The purpose of this tool is to:

1) Allow debit project proponents to estimate debit obligations and cost-effective opportunities to reduce obligations by rapidly evaluating different locations and configurations for debit projects without having to invest significant time or financial resources into the CCS.

2) Establish the site-scale habitat function as 100% in order to achieve the most conservative debit

estimate possible in absence of collecting field data.

Debit project proponents will be more likely to use and support the Credit System if they are able to evaluate the ramifications of participation without large investments in consultant time and field data collection. Currently, debit project proponents are likely to require the services of a certified verifier to evaluate a project's potential credit obligation. As well, they must collect field data at the appropriate time of season before the HQT can produce a debit amount for the project. By creating a tool that provides estimates more quickly, debit project proponents will be enabled to evaluate their CCS credit obligation in advance and can properly plan for their mitigation strategy. This may guide their decision to participate in the CCS as a means to adequately satisfy their mitigation. Additionally, this tool will allow debit project proponents to compare different project configuration scenarios at a very low cost and better plan projects that minimize impacts to sage-grouse, thus reducing their mitigation obligation and cost.

If a project proponent prefers to not complete field sampling, site-scale habitat function of 100% will be assigned within the debit site-screening tool which will allow for the most conservative debit calculation. If this option is preferred over utilizing the complete HQT, it would create a systematic and consistent approach to calculating credit obligation for debit projects that would always yield a higher debit estimate than if field data were collected.

The CCS Manual, Habitat Quantification Tool Document, and User's Guide have been updated to reflect the approved recommendation (Appendix A: Changes to the CCS Manual, Habitat Quantification Tool, and Automated User's Guide Documents).

APPENDIX A: CHANGES TO THE CCS MANUAL, HABITAT QUANTIFICATION TOOL, AND AUTOMATED USER'S GUIDE DOCUMENTS

	CCS Manual	CCS Habitat Quantification Tool	CCS User's Guide- Automated
1. Allow Term Credits to Offset Permanent Impacts Using a 4:1 Ratio	Section 2.5.4, p 54. *Debit Project Duration*		
2. Identify and Eliminate Habitat of De Minimis Quality from Field Data Collection for Debit Projects			Appendix 2, p 49. *Guidance for Delineating Map Units* Appendix 6, p 57. *Data Descriptions*
3. Removal of Anthropogenic Disturbances Should Require an Increased Reserve Account Contribution	Section 2.4.3, p 46. *Reserve Account Contribution*		

	CCS Manual	CCS Habitat Quantification Tool	CCS User's Guide- Automated
4. Reclassify Powerline Subtypes to Incorporate New Research		Section 3.3.1, p 23-24. *Table 2: Anthropogenic Features Considered by the Credit System with Assigned Weights and Distances* Appendix D, p 79-81. *Sage Grouse Response to Anthropogenic Disturbance Literature Review*	Table 1, p 8-9. *Anthropogenic Features Considered in the Nevada Conservation Credit System*
5. Create New Anthropogenic Disturbance Subtypes to Categorize Ancillary Features		Section 3.3.1, p 23. *Table 2: Anthropogenic Features Considered by the Credit System with Assigned Weights and Distances*	Table 1, p 8-9. *Anthropogenic Features Considered in the Nevada Conservation Credit System*

	CCS Manual	CCS Habitat Quantification Tool	CCS User's Guide- Automated
6. Conifer Removal	Section 2.2.2, p 28. *Mitigation and Proximity Ratios* Section 2.3.2, p 36. *Credit Project and Management Action Types* Section 2.4.5, p 49. *Credit Site Verification*	New Section: Section 3.2.3, p 20. *Conifer Removal*	Section C3, p 22-23. *Divide Map_Units Layer into Discrete Map Units & Populate Attribute Table* Section C11, p 29. *Add the exported data to the Credit Project Calculator* Appendix 2, p 49-51. *Guidance for Delineating Map Units* Appendix 6, p 57. *Data Descriptions*
7. Alternate Methods to More Efficiently Analyze Debit Projects within the CCS	Section 2.5.5, p 56. *Calculating Debit Baseline Habitat Function* Section 2.5.6, p 57. *Debit Site Verification*	New Section: Section 3.4.5.3, p 39. *An Option for Debit Projects to Forego Onsite Sampling by Assuming Maximum Site-Scale Function*	Section D12, p 19. *Add the Exported Data to the Debit Project Calculator* Section F13 Input Data into Credit or Debit Project Calculator, p 59. *Input Data into Credit or Debit Project Calculator*