# State of Nevada
# Conservation Credit System

## 2015 Findings & Improvement Recommendations Report

**November 20, 2015**

# 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.


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# INTRODUCTION

Key to the continual improvement of the Nevada Conservation Credit System (Credit System) is the adoption of well-supported improvements to the Credit System. Well-supported improvements depend on a process that identifies findings from the operation of the Credit System, new science, and well-vetted recommendations to improve the Credit System. Such improvements ensure Credit System policies, procedures, and tools continue to support achievement of the Credit System's goal - for impacts to greater sage-grouse habitats from anthropogenic disturbances to be offset through restoration, enhancement, and protection that results in a net benefit for sage-grouse habitats in the State of Nevada.

On December 4th, 2014, the Credit System Oversight Committee - the Sagebrush Ecosystem Council (SEC) - adopted version 1.0 of the Credit System Manual and Habitate Quantification Tool (HQT) Methods Document. During this meeting and in the months following, the SEC and other stakeholders identified several elements of the Creidt System to further evalutate, and directed the Credit System Administrator - the Nevada Sagebrush Ecosystem Technical Team (SETT) - to identify and develop improvement recommendations for SEC review.

## Annual Process

Each year the 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 also 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 this annual *Findings & Improvement Recommendations Report* to enable the SEC to make informed decisions and valuable improvements to the Credit System.

The process for compiling 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 this year, 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.

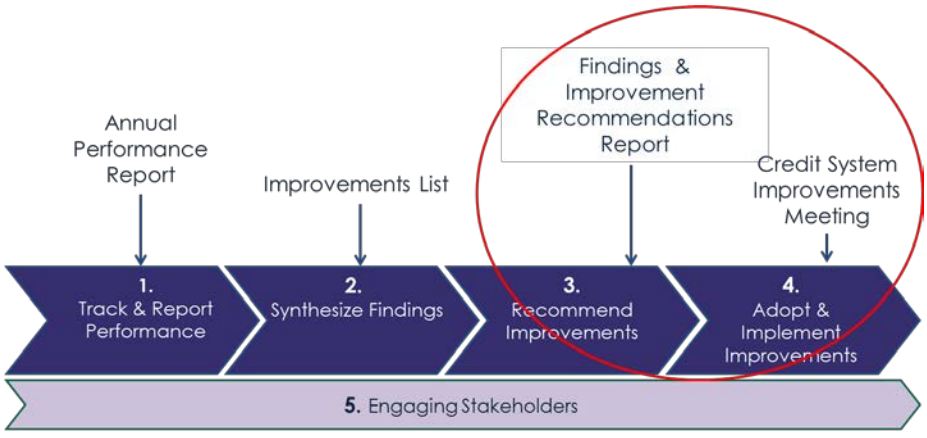


Figure 1: Credit System continual improvement process

## Report Structure

The organization of this report is as follows:

**Part I: Findings**
The findings herein represent the broadest level of synthesis completed by the SETT and reflect information deemed most important to Credit System management and implementation. Findings are categorized as either: Operational Findings or Research & Monitoring Findings.

**Part II: Improvement Recommendations**
This section is a distillation of actionable recommendations proposed by the SETT to improve the Credit System, ranging from management strategies and policies to operational procedures and tools. The SETT creates the improvement recommendations based on review of new science, stakeholder feedback, and direct learning over the past year.

Improvement recommendations are grouped into three categories of significance - Major Significance, Moderate Significance or Minor Significance - based on the magnitude of change to the Credit System associated with implementation of the improvement.

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# PART I: FINDINGS

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

The findings are categorized as either: "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 - especially from published articles, or drawn from the results of monitoring data.

## 2015 Summary Findings

| | |
|---|---|
| **Operational Findings** | |
| F1. | The implementation of pilot projects in 2015 increased the understanding of how the Credit System assesses credit and debit projects, and improved the User's Guide, Calculator, forms and templates |
| F2. | The calculation of credits and debits is overly conservative because conservative assumptions influenced several elements of the HQT and Manual |
| F3. | A protocol for verification of habitat condition should be streamlined to control cost while fulfilling the purpose of verification |
| **Research & Monitoring Findings** | |
| F4. | The permissible windows for field data collection produced inadequate results, and are inconsistent with the time period during which data were collected in the studies supporting the scoring curves |
| F5. | Several desktop analysis and field data collection methods should be improved to reflect the intent defined in the HQT Methods Document, to be consistently be applied by different users, and to reduce the time required to implement the methods |
| F6. | Certain weights and distances used to measure indirect effects of anthropogenic disturbances should be revised based on further assessment of existing scientific studies, new data from scientific studies and applying indirect effects to pilot projects |

# OPERATIONAL FINDINGS

## F1. The implementation of pilot projects in 2015 increased the understanding of how the Credit System assesses credit and debit projects, and improved the User's Guide, Calculator, forms and templates

- The Boies Ranch pilot credit project was implemented by the SETT. See the 2-page case study available on the Credit System website for a summary of the project. This pilot project provided the opportunity to estimate credits for a real habitat improvement project using the HQT and real field data. It also provided the opportunity to test and collect feedback from a landowner on all forms and templates used in the process of generating credits: Credit Site Validation Checklist, Management Plan, and Participant Contract.
- Several potential credit and debit pilot projects were assessed by the SETT, which provided the opportunity to test different elements of the Credit System. The HQT User's Guide was thoroughly tested, which resulted in several improvements to the User's Guide. In addition, all forms and templates used to facilitate generation, acquisition and transfer of credits were tested and revised.
- There are no specific improvement recommendations related to this finding at this time. This finding helped identify the need for several improvement recommendations provided in this report and several improvements already made to the User's Guide, calculator, forms and template.

## F2. The calculation of credits and debits is overly conservative because conservative assumptions influenced several elements of the HQT and Manual

- The aggregate effect of multiple conservative assumptions made during the development of the Credit System resulted in overly conservative credit awards and credit obligations for pilot credit and debit projects, respectively.
- The SETT identified several elements of the HQT and Manual influenced by conservative assumptions, including the inability to generate credits on land outside of the credit developer's control while accounting for all indirect effects in the calculation of debits, and habitat importance mitigation ratio that impose significantly greater mitigation relative to the impacts being offset.
- The SETT defined potential improvements, and re-assessed the pilot projects using the proposed improvements to confirm the net change in the calculation of both credits and debits. The potential improvements are described in Part II: Improvement Recommendations section later in this report.
- Improvement recommendations I1, I4, I5, and I8 provide resolution to this finding.

## F3. A protocol for verification of habitat condition should be streamlined to control cost while fulfilling the purpose of verification

- A verification protocol should be developed to more clearly describe the process of verification. The verification protocol will inform a better understanding of the resources required to complete a verification, and will allow Credit Developers and Buyers to better understand what to expect.
- During development of the verification protocol, we will seek to reduce duplication of effort and increase efficiency to the extent possible.
- There are no improvement recommendations related to this finding at this time. A verification protocol is planned to be developed in 2016.

# RESEARCH & MONITORING FINDINGS

## F4. The permissible windows for field data collection produced inadequate results, and are inconsistent with the time period during which data were collected in the studies supporting the scoring curves

- A field visit to a field test site in August during the current permissible window for late brood-rearing data collection (July through September 15th) was unsuccessful due to desiccation of forbs at the site.
- A single window to collect data during peak growing season would be consistent with when data was collected for studies supporting the scoring curves for all three seasons.
- Allowing all field data to be collected during a single visit will decrease costs to use the HQT.
- Improvement recommendation I10 provides resolution to this finding.

## F5. Several desktop analysis and field data collection methods should be improved to reflect the intent defined in the HQT Methods Document, to be consistently be applied by different users, and reduce the time required to implement the methods

- Anthropogenic disturbance types and subtypes need to be better defined. A more accurate dataset for identifying existing roads was identified for use in the calculation of existing anthropogenic disturbance. This dataset also contains road classifications that more closely match the classifications used in the HQT.
- The Resistance & Resilience scorecard, used to calculate the Resistance & Resilience reserve account contribution, needs to be customized to be more straightforward and intuitive to apply within the Credit System. The Ability to Control Wildfire scorecard was defined in section 2.4.3 Reserve Account Contribution of the Manual, but was not available as of January 2015.
- Several editorial and operational step improvements in the User's Guide were identified.
- The methods need to be refined for limiting seasonal habitat as they were found to be ineffective with the intent.
- The HQT version 1.0 did not specifically address noxious weeds in Daubenmire plots. Clarification to the text is necessary to clarify the intent that noxious weeds would not be counted as beneficial to sage-grouse.
- Improvement recommendations I6, I7 and I11 provide resolution to this findings.

## F6. Certain weights and distances used to measure indirect effects of anthropogenic disturbances should be revised based on further assessment of existing scientific studies, new data from scientific studies and applying indirect effects to pilot projects

- Evidence indicates that impacts on sage-grouse from tall structures such as powerlines and other human infrastructure is due to predation from ravens and level of impact is relative to raven abundance (Bui et al. 2010, Coates and Delehanty 2010, Dinkins et al. 2012, Coates et al. 2014, Gibson et al. In review). Single communication towers provide less "habitat" for ravens relative to continuous towers associated with a powerline, therefore a single communication tower has less of an indirect effect than continuous towers.
- In the past year, the results of the sage-grouse study relative to the development of the Falcon to Gonder transmission line (FG) in Eureka County, NV has been synthesized (Gibson et al In Review). This is the only study on sage-grouse to focus exclusively on power lines and no previous study that has assessed impacts of powerlines has controlled for confounding effects of environmental variability. The conclusions of this study tie an increase in ravens in the study area as causal factor related to avoidance of powerlines and decreased sage-grouse vital rates in the study area.
- Experience applying indirect effects and further defining anthropogenic disturbance types and subtypes to pilot projects supports additional revisions to disturbance weights and distances.
- Improvement recommendation I9 provides resolution to this finding.

Part II: Improvement RecommendationS

This section is a distillation of recommended improvements to the Credit System proposed by the SETT. The SETT presents these recommendations to the SEC for discussion and approval.

**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. The SETT uses the list to define work plan priorities with the SEC each year.

Improvement recommendations are grouped into three categories of significance - Major Significance, Moderate Significance or Minor Significance - based on the magnitude of change to the Credit System associated with implementation of the improvement. The following are descriptions of each category of significance:

- **Major Significance.** Improvements that will effect the goal or scope of the Credit System, related policies and plans, state or federal agency partnerships, administrative responsibilities or administrative liability. Major improvement recommendations must be individually discussed and adopted or declined by the SEC. Following any further approval process mandated by state laws and regulations, they are implemented by the SETT.

- **Moderate Significance.** Improvements that will have a meaningful impact on credits and debits generated from future credit and debit projects, respectively, or program operations. Moderate improvement recommendations are presented as a package for adoption because several moderate improvement recommendations are related to other moderate improvement recommendations. Members of the SEC should review each individual moderate improvement recommendation and discuss individual improvement recommendations of concern at the annual Credit System Improvement Meeting. However, note that adopting or modifying one moderate improvement may effects other moderate improvements, and thus may require the SETT to bring a revised package of moderate improvement recommendations back to the SEC at a later meeting after redoing the analysis that informed each moderate improvement recommendation in the current package.

- **Minor Significance.** Improvements that have minimal impact to Credit System operations and paticipants. Minor improvement recommendations are expected to be adopted as a package without discussion, but are documented to ensure all improvements to the Credit system are explicit and transparent.

Within each category the recommendation includes:

- Title of improvement
- Summary of improvement
- Specific improvement recommendation
- Reason for improvement
- Rationale supporting recommendation details

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

## Summary of Improvement Recommendations

| | RECOMMENDATION |
|---|---|
| | **Major Significance** |
| | None recommended at this time |
| | **Moderate Significance** |
| **I1.** | Revise the Management Importance Factor values to prioritize high importance management areas while not impose inappropriately greater mitigation relative to the impacts being offset |
| **I2.** | Replace Limiting Seasonal Habitat Mitigation Ratio Factor with a Meadow Habitat Power Factor |
| **I3.** | Include the Biological Significant Unit as an additional Proximity Ratio category to incentivize mitigation within the regional population when mitigation is not available within the specific population impacted |
| **I4.** | Revise Proximity Ratio values to incentivize mitigation in close proximity to impacts while not imposing inappropriately greater mitigation when local credit supply is not available |
| **I5.** | Award credits for the indirect benefits generated on land outside of the credit developer's control from removal of existing anthropogenic features |
| **I6.** | Revise the scorecard used to determine the resistance and resilience of a credit site, and then a portion of the site's contribution to the Reserve Account, to streamline use of the scorecard within the Credit System |
| **I7.** | Use proposed Ability to Control Wildfire scorecard to determine a portion of a credit site's contribution to the Reserve Account |
| **I8.** | Replace the Reserve Account contribution percentages for the Probability of Adverse Effects from Wildfire factors with a matrix that includes contribution percentages for both factors, and provide rebate for implementing wildfire risk recommendations |
| **I9.** | Revise the weights and distances used to measure the indirect effects from anthropogenic features based on review of literature and pilot testing |
| | **Minor Significance** |
| **I10.** | Revise permissible windows for collecting field data so that field data can be collected during a single timeframe (peak of the growing season) for all habitat types |
| **I11.** | Incorporate editorial corrections and improvements to Manual and HQT Methods Documents that increase the understandability and clarify the original intent of the documents |
| **I12.** | Use proposed forms and templates developed in order to facilitate generation, acquisition and transfer of credits |

# MAJOR SIGNIFICANCE

None for approval at this time.

# MODERATE SIGNIFICANCE

## I1. Revise the Management Importance Factor values to prioritize high importance management areas while not imposing inappropriately greater mitigation relative to the impacts being offset

**Summary:** We recommend revising Management Category Importance Factor values for debit and credit projects so that they continue to incentivize restoration, enhancement, and protection, and support avoidance and minimization of high value habitat but do not impose inappropriately greater mitigation relative to the impacts being offset. Through pilot testing the Credit System, we believe the Management Category Importance Factor values should be revised to the recommended values to more appropriately determine mitigation requirements, continue to incentivize desired behavior by credit developers and buyers, and ensure net conservation benefit.

**Specific Improvement Recommendation:** The recommended Management Category Importance Factor values for debit and credit projects are provided in the tables below. See Manual version 1.08, section 2.2.2, for text edits to reflect this recommendation in the introduction of the Management Category Importance Factor section.

Table 1: Debit Site Management Category Importance Factor Values

| Category | Factor Value |
|---|---|
| Core | 1.25 |
| Priority | 1.15 |
| General | 1.05 |

Table 2: Credit Site Management Category Importance Factor Values

| Category | Factor Value |
|---|---|
| Core | 1.2 |
| Priority | 1.1 |
| General | 1.0 |

**Reason for Improvement:** The current management category importance factor for debit projects in Core Management Areas is 2.0, while for credit projects in Core Management Areas the credit calculation is only adjusted by a factor of 1.1. A one hundred percent increase in debit calculations, while only a ten percent increase for credit projects in comparable Core Management Areas results in a significant disparity between credits needed to offset a debit project and the credits that can be generated from a credit project in Core Management Area. This significant disparity will likely result in the inability to generate credits to offset debits.

**Rationale Supporting Recommendation Details:** The proposed revision to the credit and debit site Management Category Importance Factor values aim to incentivize enhancement and protection of, and minimization of impacts to Priority and Core Management Category habitat. A 10% difference between General and Priority Management Categories, and Priority and Core Management Categories will result in a 10% increase in the cost of mitigation for impacts to each superseding Management Category, which is significant enough for a Buyer to invest meaningful resources to avoid and minimize impacts to Priority and Core Management Categories through redesigning the project.

The Management Category Importance Factor contributes to the Credit System ensuring net conservation gain for impacts from anthropogenic disturbances. The proposed revisions will allow the Management Category Importance Factor to continue to contribute to the net conservation gain achieved by the Credit System by applying a factor value for debit projects that is five percent greater than the factor value applied to credit projects for the same Management Category. The five percent difference is sufficient due to the many other elements of the Credit System that contribute to ensuring net conservation gain for impacts from anthropogenic disturbances. In addition, the CCS allows for mitigation in General Management Areas, which the BLM and USFS LUPA does not.

## I2. Replace Limiting Seasonal Habitat Mitigation Ratio Factor with a Meadow Habitat Power Factor

**Summary:** We recommend replacing the Limiting Seasonal Habitat Mitigation Ratio Factor with a Meadow Habitat Power Factor because the limiting seasonal habitat measurement method previously defined could not be applied effectively, yet it is critical that the immense value of meadow habitat is incorporated into the calculation of credits and debits.

**Specific Improvement Recommendation:** This recommendation requires changes to the Manual and the HQT Methods Document. The new proposed Meadow Habitat Power Factor subsection of the Manual and Meadow Habitat section of the HQT Methods Document is below. The Meadow Habitat Power Factor will be added to the Management Category Importance Factor Value to determine the overall credit or debit mitigation ratio, as the Limiting Seasonal Habitat Factor Value was previously. See Manual version 1.08, section 2.2.2, and HQT Methods Document version 1.08, section 3.2.2, for the complete recommended adjustments to the Mitigation and Proximity Ratios section of the Manual and the new Meadow Habitat section of the HQT Methods Document, respectively.

### Manual section

#### Meadow Habitat Power Factor

Meadows are rare in occurrence throughout the sagebrush ecosystem landscape in Nevada. Yet, meadow habitat is crucial for sage-grouse to fulfill their late brood-rearing life cycle requirements, so the absence of meadows across a greater landscape can make the surrounding upland habitats unsuitable for sage-grouse without this crucial component. Also, meadow habitats are disproportionately important for sage-grouse life cycle requirements because they are typically small in acreage, however they result in relatively smaller functional acre scores due to their limited area in comparison to upland habitats. In order to more appropriately incorporate the immense value of meadow habitat into the calculation of credits and debits, a power factor is applied to all map units made up of meadow habitat. See *Section 3.2.2: Meadow Habitat* in the *HQT Scientific Methods Document* for additional information.

The meadow habitat power factor value from Table 7 is incorporated in the mitigation ratio for each map unit designated as meadow habitat.

Table 7: Meadow Habitat Power Factor Values

| Category | Factor Value |
|---|---|
| Meadow | 8.0 |

### HQT section

#### 3.2.2 MEADOW HABITAT

Sage-grouse typically move between different seasonal habitat types (breeding, late brood-rearing, winter) in order to meet resource requirements during different phases of their life cycle. If one or more of these habitat types is impacted to the point that it can no longer support the corresponding life cycle phase, then the entire area is potentially no longer suitable for sage-

grouse. However, information is currently lacking on how much of a particular seasonal habitat type is required to fulfill the corresponding life cycle phase and how to quantify when a particular seasonal habitat type is limiting sage-grouse populations.

Meadows are rare in occurrence throughout the sagebrush ecosystem landscape in Nevada. Yet, meadow habitat is crucial for sage-grouse to fulfill their late brood-rearing life cycle requirements, so the absence of meadows across a greater landscape can make the surrounding upland habitats unsuitable for sage-grouse without this crucial component. Also, meadow habitats are disproportionately important for sage-grouse life cycle requirements because they are typically small in acreage, however they result in a relatively smaller functional acre scores due to their limited area in comparison to uplands habitats. Map units designated as meadow habitat should be prioritized for conservation efforts.

**Reason for Improvement:** The Credit System originally proposed to quantify how limiting a seasonal habitat type by evaluating its proportion of occurrence within an 18km analysis area around each map unit for a credit or debit project. This method was defined before the seasonal habitat maps were published by the USGS. After receiving the draft seasonal habitat maps, the method was tested using pilot projects and discovered that maps are too coarse for the proposed method, and thus the limiting habitat factor was not triggered for the pilot projects, even for areas that were predicated to have limiting seasonal habitat. In addition, the method defined previously provided perverse incentives to develop in areas of large contiguous areas of habitat.

**Rationale Supporting Recommendation Details:** A pro forma analysis using pilot project data was used to determine the proposed factor value of eight.

## I3. Include the Biological Significant Unit as an additional Proximity Ratio category to incentivize mitigation within the regional population when mitigation is not available within the specific population impacted

**Summary:** We recommend including the Biological Significant Unit (BSU) as an additional Proximity Ratio category to incentivize mitigation within the regional population when mitigation is not available within the specific population impacted.

**Specific Improvement Recommendation:** The recommendation is to include an additional category to the Proximity Ratios table provided below in recommendation I4, see the second category from the bottom for the BSUs. The BSUs are also illustrated in the map below. See Manual version 1.08, section 2.2.2, for text edits to reflect this recommendation in the introduction of the Proximity Ratio section.

**Reason for Improvement:** Mitigating for impacts within the regional population is more valuable than within the WAFWA Management Zone when mitigation within the specific population is not possible.

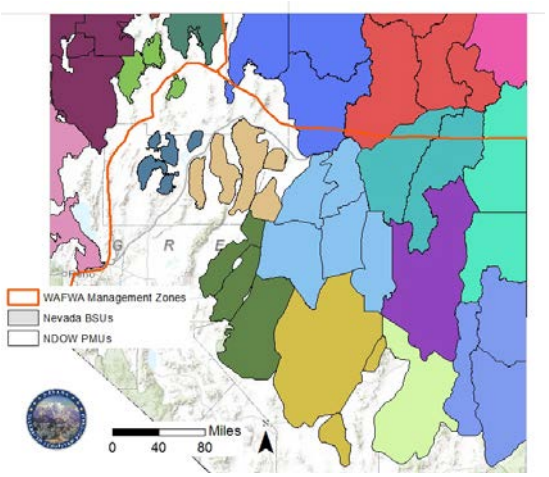


Figure 12: Map of Nevada Biological Significant Units

Therefore, this new incentive to mitigation for impacts within the regional population is recommended.

**Rational Supporting Recommendation Details:** The BSU map is used for several purposes by several agencies, and therefore is expected to be maintained over time. The specific Proximity Ratio value is recommended in improvement I7 below.

## I4. Revise Proximity Ratio values to incentivize mitigation in close proximity to impacts while not imposing inappropriately greater mitigation when local credit supply is not available

**Summary:** We recommend revising Proximity Ratios so that debit projects are incentivized to offset their credit obligation in close proximity to the debit project while not requiring significantly greater mitigation relative to the impact when local credit supply is not available.

**Specific Improvement Recommendation:** The recommended Proximity Ratios are provided in the table below. The Proximity Ratios previously ranged from 1.00 for mitigation within the same PMU to 1.50 for mitigation in a different WAFWA Management Zone. See Manual version 1.08, section 2.2.2, for the recommended revisions in the table below within the Proximity Ratios section.

Table 3: Proximity Ratio Values

| CATEGORY | FACTOR VALUE |
|---|---|
| No population connection between credit and debit sites (different WAFWA Management Zone) | 1.15 |
| Credit and debit sites connected through population dispersal (same WAFWA Management Zone) | 1.10 |
| Credit and debit sites located within a regional population (same BSU, even if in different WAFWA Management Zones) | 1.05 |
| Credit and debit sites located within a single population (same PMU, even if in different WAFWA Management Zones) | 1.00 |

**Reason for Improvement:** Currently the Proximity Ratios require 20-50% more credits to be acquired to offset debits if credits cannot be acquired in the same PMU, BSU or WAFWA Zone. After estimating credits and debits generated from a range of potential credit and debit projects, and the cost to generate credits, it is expected that the current ratios provide much larger incentives than necessary to encourage acquisition of credits within the same PMU, BSU or WAFWA Zone.

**Rationale Supporting Recommendation Details:** The proposed revision to the Proximity Ratio factor values aim to incentivize mitigation in close proximity of the debit project. A 5% increase in cost of mitigation should be significant enough for a Buyer to invest meaningful resources to secure credits in close proximity of the debit project, even for a debit project that marginally impacts greater sage-grouse habitat.

## I5. Award credits for the indirect benefits generated on land outside of the credit developer's control from removal of existing anthropogenic features

**Summary:** We recommend allowing credit developers to generate credits from the indirect benefits generated on land outside of the credit developer's control from removal of certain existing anthropogenic features. However, due to the reduced liability for credit developers and increased risk of credit invalidation, there are several recommended stipulations for credits generated on land outside of the credit developer's control.

**Specific Improvement Recommendation:** This recommendation requires the expansion of section "2.3.2 Credit Project Management Action Types" to define how the project area is defined for credit projects, including several recommended stipulations related to generating credits on land outside the credit developer's control. The new text in the expanded section "2.3.2 Credit Project Area and Management Action Types" of the Manual, including the recommended stipulations, is below. See section 2.3.2 for the project area description in version 1.08 of the Manual, for the new section and the following sections for additional clarity provided for the stipulations related to this recommendation: 2.3.3, 2.4.1, 2.4.2, 2.4.3, 2.4.5, and 2.4.6.

### 2.3.2 CREDIT PROJECT AREA AND MANAGEMENT ACTION TYPES

The area of a credit project may be made up of

a) the land that the credit developer commits to actively managing over the term of the project and thus is included in the management plan and participant contract, and/or
b) the land outside of the credit developer's control that is indirectly benefited from removal of certain anthropogenic features as part of the credit project.

The land outside of the credit developer's control and indirectly benefited from removal of certain anthropogenic features is optional, and requires the following stipulations which are further described in other sections

- The credit developer must commit to actively managing all private land within the indirect effect area that is owned by the credit developer.
- The Reserve Account contribution must be calculated based on an assessment of the entire area indirectly benefited from the project, and will be tripled for every credit generated outside of credit project boundaries.
- Credit baseline habitat function must be calculated using a full HQT assessment for every accessible acre. Where access is not possible, the HSI will be used in place of the site-scale vegetation score. The Habitat Suitability Index (HSI) score, as measured by the HQT as part of the local-scale habitat function calculation, is used as a proxy for the site-scale habitat function for the inaccessible areas. The HSI is spatially explicit and easily available for any site within SGMA.
- The term of the credits generated on land outside of the credit developer's control is equal to the term of the credits generated on land under the credit developer's control and actively managed by the credit developer. If there is no land under the credit developer's control and actively managed as part of the project, then the term of the credits generated on land outside of the credit developer's control can be no longer than 50 years.
- If there is no land under the credit developer's control and actively managed as part of the project, a management plan, participant contract, financial assurances and ongoing verification will not be required.

**Reason for Improvement:** Habitat fragmentation is one of the primary threats to greater sage-grouse, and removal of existing anthropogenic features will reduce fragmentation across the range of sage-grouse in Nevada. However, currently credits can only be generated for direct and indirect benefits generated from a credit project within the land that the credit developer commits to actively manage over the term of the credit. The indirect benefits on land outside of the credit developer's control from removing certain existing anthropogenic features can be significant, but currently it is difficult for credit developers to meet ownership and stewardship requirements for the entire indirect benefit area. Thus we believe it is important to provide a way for credit developers to generate credits on land outside of the credit developer's control in order to encourage this conservation measure.

In addition, the impact of the indirect effects of new anthropogenic features are incorporated in the calculation of debits for a debit project. Therefore, incorporating all indirect benefits in the calculation of

credits from removal of an existing anthropogenic feature will improve the calculation of net benefit when a debit project is offset by the removal of an existing anthropogenic feature.

**Rationale Supporting Recommendation Details:** Credits generated outside of credit project boundaries are fundamentally different than typical Credit System credits because they are not backed by a participant contract and management plan. Credit Developers who generate this type of credit will not have to fund financial assurances and will have no liability for the ongoing maintenance of those credits, and there is some risk that those credits will degrade over time. Thus, we expect that there will be two potential consequences from this:

1) Some fraction of the total credits generated outside of credit project boundaries will degrade or be invalidated during the project life.
2) The cost to create credits with no liability or ongoing management may be substantially less than the cost to create more traditional credits.

Tripling the reserve account contribution will account for both the increased risk from degradation of site-scale habitat quality and from potential impact from a development project. Especially on public lands or private lands outside of the Credit Developer's control, the risk of credit degradation for credits generated outside of credit project boundaries is not substantially different than the risk of creating more traditional credits, because in many instances the Credit Developer does not control the subsurface rights. The risk of site-scale habitat quality degradation is more significant, but is not expected to be substantial. Therefore, a tripling of the reserve account contribution should be sufficient to cover any increase in risk from these factors.

A risk not accounted for in the reserve account is the risk of 'double counting' credits. When a credit is sold on acreage that is not under the management and control of the Credit Developer, there is a risk that the land owner or manager of that land will decide to participate in the Credit System at a later date, or that those lands are already enrolled in the Credit System. Those credits would then be 'double counted'. At this time, it is very difficult to quantify this risk, as we do not know the likelihood that landowner and managers will participate in the Credit System. Given this uncertainty, we propose to flag this concern for the Administrator to consider on a project-by-project basis.

## I6. Revise the scorecard used to determine the resistance and resilience of a credit site, and then a portion of the site's contribution to the Reserve Account, to streamline use of the scorecard within the Credit System

**Summary:** We recommend revising the Score Sheet for Rating Resilience to Disturbance, Resistance to Annual Invasive Grasses, and the Suitability of an Ecological Site or Type for Treatment (Miller et al. 2014) so that it is more straightforward and intuitive to apply within the Credit System. The revisions include revising the format so that a score is calculated for each map unit, and removing the assessment of treatment severity parameters that are not relevant for how the scorecard is applied within the Credit System.

**Specific Improvement Recommendation:** The revised scorecard is provided below. The adopted scorecard will be incorporated into the User's Guide. See Manual version 1.08, section 2.4.3, for text edits to reflect this recommendation in the Resilience & Resistance subsection.

| Project Name | | Ecological Site Name and Number | | | | | |
|---|---|---|---|---|---|---|---|
| **Predominant Soil** | | | **MAP UNIT SCORE** | | | | |
| **% of Project Area** | | | **(Enter Map Unit Number)** | | | | |
| **SITE CHARACTERISTICS** | **DESCRIPTION OF SCORES** | | | | | | |
| Temperature (Soil temperature regime + Species or subspecies of sagebrush) | | | | | | | |
| Soil temperature regime | 1=hot-mesic; 2=warm-mesic; 3=cool-mesic or cool-cryic; 4=warm frigid; 5=cool-frigid; 6=warm-cryic | | | | | | |
| Species or subspecies of sagebrush | 1=Wyoming, low, black, or Lahontan; 2=basin, Bonneville, or xeric, 3=mountain | | | | | | |
| A. Temperature Score Subtotal | | | | | | | |
| Moisture (Precipitation = Soil Texture = Soil Depth) | | | | | | | |
| Precipitation in inches (in) | 1= <10; 2= 10-12; 3= 12-14; 4= >14 | | | | | | |
| Soil texture | 1=clay, sand, or silt; 2=silty, sandy, or clay loam; 3=loam | | | | | | |
| Soil depth in inches (in) | 0= very shallow (<10); 1= shallow (10-20); 3= moderately deep to deep | | | | | | |
| B. Moisture Score Subtotal | | | | | | | |
| Vegetation (Plant groups modified by soil depth) | | | | | | | |
| Plant Groups<br><br>Deep-rooted perennial grasses (DRPR) potentially dominant in shallow to deep soils >10 in. | 0=DRPG and POSE scarce to severely depleted (DRPG < 2-3/$m^2$) and less than 5% foliar cover<br><br>3= DRPG on soils >10 in. scarce, but POSE of PF >50% foliar cover | | | | | | |

**Reason for Improvement:** The Score Sheet for Rating Resilience to Disturbance, Resistance to Annual Invasive Grasses, and the Suitability of an Ecological Site or Type for Treatment (Miller et al. 2014) includes parameters to assess treatment severity, which is not relevant to how the scorecard is applied within the Credit System, and does not include fields to easily associate each score card to the appropriate map unit evaluated.

**Rationale Supporting Recommendation Details:** Removal of irrelevant parameters to assess treatment severity and inclusion of fields to associate the scorecard to the appropriate map unit directly address the reason for improvement.

## I7. Use proposed Ability to Control Wildfire scorecard to determine a portion of a credit site's contribution to the Reserve Account

**Summary:** We recommend using the proposed Ability to Control Wildfire scorecard below to determine a portion of a credit site's contribution to the Reserve Account. The Ability to Control Wildfire is described in Manual version 1.0 as an important factor, one of two, in determining the risk of a credit project failing due to wildfire, and thus should determine a portion of a credit site's contribution to the Reserve Account to ensure there are always more credits than debits in the Credit System. The proposed Ability to Control Wildfire scorecard below was developed by the SETT with consultation by fire professionals from the Nevada Division of Forestry.

**Specific Improvement Recommendation:** The proposed scorecard is provided below and evaluates common risk factors that either hinder or improve the ability of firefighting resources to control a wildfire under typical summer weather conditions (e.g. fuels, topography, ease of access, and distance from initial attack fire-fighting resources). It is followed by a list of the variables evaluated with a description of each. The adopted scorecard and associated field guide will be incorporated into the User's Guide. See Manual version 1.08, section 2.4.3, for text edits to reflect this recommendation in the Ability to Control Wildfire subsection.

| **Project Name:** | | **Date:** | |
|---|---|---|---|
| **SITE CHARACTERISTICS** | **SITE CONDITION (select one)** | | **SITE SCORE** |
| **Vegetation/Fuel Type/Ignition Risk** | | | |
| **Dominant fuel type in project area**<br><br>(Fire Behavior Fuel Models based on USDA Forest Service Gen. Tech. Rep. RMRS-GTR-153. 2005) | Irrigated pasture (NB3) = **0**<br>Riparian wet meadow(GR3) = **1**<br>Perennial Grass (GR1, GR2) = **3**<br>Shrub (SH1, SH2) = **5**<br>Grass/Shrub (GS1, GS2) = **7**<br>Heavy Shrub/Grass (SH5, SH7) = **8**<br>Pinyon/Juniper (TU4) =**10** | | |
| **Dominant fuel type adjacent to the project area** (w/in 1 mile) | Irrigated (NB3)/Riparian(GR3) = **0**<br>Perennial Grass (GR1, GR2) = **1**<br>Shrub (SH1, SH2) = **5**<br>Shrub/Grass (GS1, GS2) = **7**<br>Heavy Shrub/Grass (SH5, SH7) = **8**<br>Pinyon/Juniper (TU4) = **10** | | |
| **Invasive Annual Grass Cover**<br><br>(Based on HQT field data) | 0% = **0**<br><br>1-5% = **5**<br><br>>5% = **10** | | |
| **Vegetation Condition Class VCC** (departure from historic conditions-LANDFIRE Map) | Low = **1;**<br><br>Moderate = **2**<br><br>High = **3** | | |
| **Topography/ Access/ Response Time** | | | |
| Average percent slope in project area (GIS) | 0-10% = **1** | | |

| | | |
|---|---|---|
| | 11-25% = **3**<br><br>greater than 25% = **5** | |
| Access to project area for suppression resources | paved road = **1**<br><br>improved dirt road = **2**<br><br>unimproved two-track = **4**<br><br>hike or aircraft = **5** | |
| Response Time of Fire Suppression Resources for Initial Attack | Less than 1 hour = **1**<br><br>1-2 hours = **3**<br><br>greater than 2 hours = **5** | |
| Average aspect of project site (GIS) | N,NE = **1**<br><br>NW, E = **2**<br><br>W. SE = **3**<br><br>S, SW, Flat = **4** | |
| Road Distance to Available Water Sources | <1 mile = **0**<br><br>1 to 3 miles = **3**<br><br>>3 miles = **5** | |
| | **T O T A L :** | |
| **ABILITY TO CONTROL WILDFIRE SCORE (circle one)** **<20 = High; 21-35 = Moderate; >35 = Low** | | |

Fire behavior and fire effects are driven in part by fuel type and fuel load. The fuel types used in the Sage Grouse Management Area in Nevada have been categorized into 13 *fuel models* grouped by their potential for similar fire behavior (Scott and Burgan 2005[1]). The variables evaluated for the wildfire risk scorecard include the following.

DOMINANT FUEL TYPES

Irrigated pasture (NB3) - maintained in non-burnable condition.

Riparian meadow (GR3): Coarse grass-herbs, average fuel depth 2 feet. Spread rate high, flame length. moderate.

Perennial grass (GR1, GR2): Grass is short, patchy, and possibly grazed. Average fuel depth 1 foot. Spread rate moderate to high; flame length low to moderate.

Shrub (SH1, SH2): Shrubs cover at least 50 percent of the site; fuel depth about 1-foot. Grass is sparse or nonexistent. Spread rate low; flame length low.

[1] Scott, Joe H. and Robert E. Burgan. 2005. Standard Fire Behavior Fuel Models: A Comprehensive Set For Use with Rothermel's Surface Fire Spread Model. USDA Forest Service Rocky Mtn Research Station Gen Tech Rpt. RMRS-GTR-153.

Shrub/Grass (GS1, GS2): Mixture of grass and shrub; up to 50 percent shrub coverage. Shrubs are 1-3 feet high. Spread rate is moderate to high. Flame length is low to moderate.

Heavy Shrub/Grass (SH5, SH7): Shrubs cover at least 50 percent of the site; grass is sparse or nonexistent. Shrub depth 4-6 feet. Spread rate very high; flame length very high.

Pinyon/juniper (TU4): Grass or shrubs mixed with litter from canopy. Fuel depth is short conifer trees with grass understory. Spread rate moderate; flame length moderate.

INVASIVE ANNUAL GRASS COVER

Cheatgrass and other invasive annuals are fine fuels that are easily ignited and can significantly increase the rate of spread of fire, especially under wind-driven conditions. The potential annual grass fuel load varies each year greatly depending primarily upon winter and spring precipitation. In wet years, the cheatgrass fuel bed can be continuous and fuel depth greater than 1 foot. Cheatgrass cover is estimated in Daubenmire plots as part of the Habitat Quantification Tool field method.

TOPOGRAPHY, ACCESS, RESPONSE TIME

The ultimate outcome of a wildfire will be significantly influenced by the success of an initial attack operation. Access and response time are integral factors affecting successful initial attack in wildlands. Often times, the ability to effectively stop a wildfire during the initial attack depends on how quickly firefighting resources can reach the fire based on distance and road conditions. Location of water resources will affect how efficient the first crew is at attacking the fire.

If a fire escapes initial attack, suppression strategies are implemented based upon predicted fire behavior. Topography, slope and aspect, contribute to fire behavior and suppression strategies. Fire burns faster uphill than on level ground or down slope. Fire spread is further exacerbated by preheated fuel conditions ahead of the flame front based upon radiant heat and/or sun exposure that increase susceptibility for wind borne embers to create spot fires outside of the fire perimeter.

FUEL MODIFICATION

Pre-suppression measures taken to modify the fuel load, fuel continuity, and fuel bed can have significant effects on reducing potential hazardous wildfire behavior and enhancing wildfire suppression. Fuel reduction and pre-suppression treatments must be carefully planned and maintained to be effective.

Fuelbreak – A natural or a human-made area where material capable of allowing a wildfire to spread does not exist or has been cleared, modified, or treated to significantly reduce the rate of spread and the intensity of an advancing wildfire, and creates an area in which fire suppression operations may more safely occur.

Green strip – A strip or mosaic pattern of land planted with fire-resistant vegetation to retard the spread of wildfires.

The assessment also evaluates the effectiveness of existing fire suppression features on the landscape, as well as the effectiveness of fire suppression features implemented as part of the credit project.

Scores will range between 5 and 57. A score **Less than 20 = Low risk ; 21-35 = Moderate Risk; greater than 35 =High Risk.**

## I8. Replace the Reserve Account contribution percentages for the Probability of Adverse Effects from Wildfire factors with a matrix that includes contribution percentages for both factors, and provide rebate for implementing wildfire risk recommendations

**Summary:** We recommend replacing the tables containing Reserve Account contribution percentages for the Resilience & Resistance and Ability to Control Wildfire factors with a matrix that includes contribution percentages depending on the scores of both factors. The contribution percentages for the Ability to Control Wildfire factor are not defined in Manual version 1.0 because the scorecard was not previously available, and a single matrix will simplify the calculation of the Reserve Account contribution percentage for the Probability of Adverse Effects from Wildfire. In addition, we recommend a rebate of credits from the Reserve account for implementing wildfire risk reduction recommendations in order to incentivize implementation of wildfire risk reduction recommendations.

**Specific Improvement Recommendation:** The proposed matrix for determining the Reserve Account contribution percentage for the Probability of Adverse Effects from Wildfire is provided below, as well as the proposed description of the rebate for implementing wildfire risk reduction recommendations. See Manual version 1.08, section 2.4.3, for text edits to reflect this recommendation in the Probability of Adverse Effects from Wildfire subsection.

| | | Ability to Control Wildfire Score | | |
|---|---|---|---|---|
| | | High | Moderate | Low |
| Resistance and Resilience Score | High | 1% | 2% | 3% |
| | Moderate | 2% | 3% | 4% |
| | Low | 3% | 4% | 5% |
| | Very Low | 4% | 5% | 6% |

### Possible Rebate of Credits from the Reserve Account

As an incentive for credit developers to reduce the risk of credit invalidation from wildfire, a reserve account rebate of up to 2% of the total project credits is available to the Credit Developer if the Credit Developer provides proof that the credit project has been included in a formal wildfire risk assessment (state, federal, local level) and wildfire risk reduction recommendations have been implemented. If the original Reserve Account contribution for the Probability of Adverse Effects is 1%, then the maximum potential rebate is 1%. The rebate program is only available within the first five years following transfer of the credits to a Credit Buyer.

**Reason for Improvement:** Version 1.0 of the Manual defined the Ability to Control Wildfire factor for determining the Reserve Account contribution for a credit project but did not define contribution percentages because the scorecard was not previously available. Thus, the Reserve Account contribution for the Ability to Control Wildfire needs to be incorporated into the Manual.

**Rationale Supporting Recommendation Details:** Estimating the risk of credit sites failing is very difficult so the contribution percentages are based on best professional judgement of the SETT, and will need to be evaluated regularly to ensure the Reserve Account can cover credits invalidated by wildfire over time. The rebate is proposed because the implementation of wildfire risk reduction recommendations is not expected to change the Reserve Account contribution enough to motivate the implementation of wildfire risk reduction recommendations alone.

## 19. Revise the weights and distances used to measure the indirect effects from anthropogenic features based on review of literature and pilot testing

**Summary:** We recommend revising the weights and distances for specific disturbance types in order to reflect additional review of scientific literature, and results of pilot testing credit and debit projects.

**Specific Improvement Recommendation:** The revised weights and distances recommended are highlighted orange in the table below, and the current weight or distance is noted to the right of the revised weight or distance. See HQT Methods Document version 1.08, section 3.3.1 for the updated table and Appendix D for revised synthesis of literature supporting for these revisions.

| DISTURBANCE TYPE | SUBTYPE* | WEIGHT (%) | DISTANCE (Kilometers) | |
|---|---|---|---|---|
| **Towers (cell, etc.)** | n/a | 25% | 3 km | Distance currently 6 km |
| **Power Lines** | n/a | 50% | 6 km | Weight currently 25% |
| **Mines** | Active – Large (≥ 60 acres) | 100% | 6 km | |
| | Active - Med or small (< 60 acres) | 50% | 3 km | Weight currently 100% |
| | Inactive – Large (≥ 60 acres) | 25% | 1 km | Weight currently 50% |
| | Inactive - Med or small (< 60 acres) | 10% | 1 km | |
| **Oil & Gas Wells** | Producing | 100% | 3 km | |
| | Non-producing | 0% | 0 km | |
| **Urban, Suburban & Ex-urban Development** | Med-High | 100% | 6 km | |
| | Low | 50% | 3 km | Weight currently 75% |
| **Roads** | Interstate/4-lane | 100% | 6 km | |
| | 2-lane Paved & High-use Improved Gravel | 50% | 3 km | Weight currently 100% |
| | Low-use Improved Gravel | 25% | 1 km | |
| **Renewable** | Solar | 25% | 1 km | |
| | Geothermal | 100% | 6 km | |
| | Wind | 25% | 6 km | |

**Reason for Improvement:** The indirect effect weights, distances and curve shape have an enormous effect on the calculation of credits and debits. The SETT evaluated the outcome of applying initial indirect effect weights, distances and curve shape during pilot testing of credit and debit projects, and determined that on average the initial weights and distances generated conservative estimates of indirect effects. The SETT then reviewed scientific literature and evaluated pilot testing results to define the revised weights and distances recommended.

**Rationale Supporting Recommendation Details:** The scientific literature on indirect effects of anthropogenic disturbances provides a wide range of understanding that is often not directly translatable to the concept of "function" and does not provide all attributes (weights, distance and curve shape) used by the method in the Credit System to evaluate indirect effects. Therefore, the use of scientific literature in the determination of indirect effect weights and distances requires significant understanding of sage-grouse biology, the method used by the Credit System to evaluate indirect effects, and professional judgement.

A summary of the additional review of scientific literature that influenced revisions to weights and distances are as follows:

**Communication Towers:** More evidence indicates that impacts on sage-grouse from tall structures such as powerlines and other human infrastructure is due to predation from ravens and the level of impact is relative to raven abundance (Bui et al. 2010, Coates and Delehanty 2010, Dinkins et al. 2012, Coates et al. 2014, Gibson et al. In review). Because single communication towers can provide less "habitat" for ravens relative to continuous towers associated with a powerline, the weights and distances were decreased to levels below that of the estimates for powerlines (see discussion below on powerlines). There is some evidence for impacts to demographic rates due to towers (Johnson et al. 2011 and studies mentioned below based on ravens) so this is set 25% weight at 3000m. (Note Johnson et al. 2010 showed negative lek trend out to about 5km, figure 17.20).

**Powerlines:** In the past year, the results of the sage-grouse study relative to the development of the Falcon to Gonder transmission line (FG) in Eureka County, NV has been synthesized (Gibson et al In Review). This is the only study on sage-grouse to focus exclusively on power lines and no previous study that has assessed impacts of powerlines has controlled for confounding effects of environmental variability. The conclusions of this study tie an increase in ravens in the study area as causal factor related to avoidance of powerlines and decreased sage-grouse vital rates in the study area.

1. Nesting propensity – distance from powerline not influenced. However, probabilities of re-nesting (conditioned on initial failure) were highest closest to the FG line (decreasing out to 10 km)
2. Nest selection – Controlled for confounding variables at the Landscape and Local scale, probability of nest selection increases out past 10 km. 50% more likely to nest 10km from power line, than under the power line. This is very sensitive to raven abundance – more ravens, greater impact.
3. Nest survival – Nests within 9.2 km of FG had reduce probabilities of hatching (quadratic effect). 8% nest success at the line, 15% at 10 km. This is very sensitive to raven abundance – more ravens, greater impact.
4. Use as brood rearing habitat – probability of use increases as a site is further from powerlines for early broods. Effect on early brood rearing dissipates at about 10-12 km (Fig 12) quadratic effect.
5. Brood survival – early brood survival is low regardless of distance when raven abundance is high. Early brood survival is correlated to distance when raven abundance is low or average, out to 8-9km. substantial effect.
6. Female adult survival – weak quadratic effect increase over distance. Possibly linked to reduced survival due to multiple nesting attempts (increases out past 15km).
7. Male lek fidelity – weak quadratic effect for males on leks closer to transmission line were more likely to move to a different lek than males from leks farther from transmission lines. (Declines to about 7km, and then lose confidence due to sample size)
8. Leks more distant from powerline had higher population growth rates. This is similarly shown relative to raven abundance.
9. Final tables showing that most vital rates show negative quadratic affect to powerlines

Biggest driving factor behind the effects of powerlines is raven abundance. In years with more ravens (increased over time), the response was stronger. This study shows conclusive effects out to 10 km at the population level due to the FG power line and that raven population is driving factor.

Because the above study shows a strong effect on nesting and chick vital rates, and subsequent population level effect, and these are the demographic rates that are shown in other studies (e.g., Coates and Delehanty 2010, Dinkins et al. 2012) and studies that show relative increase in raven populations associated with transmission lines (e.g., Coates et al. 2014, Dinkins et al. 2014), the weight was increased to 50. Distance is set to 6000m based on Manier et al. 2014, Gibson et al. In Review, Coates et al 2014.

Other features: Active mines – small and medium; Inactive mines – large; Urban – low development; Roads – 2-lane paved and high use improved gravel. The weights for these anthropogenic feature types were decreased based on the relative size and assumed level of impact.

# MINOR SIGNIFICANCE

## I10. Revise permissible windows for collecting field data so that field data can be collected during a single timeframe for all habitat types

**Summary:** We recommend revising the permissible windows for field data collection from two (April 1 to June 15 for Breeding, and July 1 to September 15 for Late brood-rearing) to one permissible window (April 15 to June 30). Shrub data may still be collected during anytime of the year.

**Specific Improvement Recommendation:** The recommended change to field data collection is described in the revised text for section 2.2.1 of the Manual below.

### Field Data Collection Timing

Site-scale vegetation measurements required by the HQT must be collected during specific times of the year to accurately measure the function of breeding, late brood-rearing, and winter habitat. These vegetation measurements are primarily related to sagebrush, forbs and grasses. The forbs and grasses necessary to sustain greater sage-grouse differ in availability throughout the year. To ensure accurate quantification of the functionality for each seasonal habitat on a site, field work for the collection of forbs and grasses needs to occur during the peak of the vegetation growing season in northern Nevada.

#### Permissible Window

Vegetation sampling of sage-grouse habitat attributes will be conducted during the peak of the growing season. The peak of the growing season on northern Nevada rangeland generally occurs between **April 15th and June 30th**. These dates may vary slightly annually due to temperature and precipitation. The peak of the growing season varies between sites based upon elevation, latitude, and winter and spring precipitation. Credit Developers, Credit Buyers, and Verifiers must take annual and site variations into account when approximating the peak of the growing season within the permissible window for a particular site. Some indicators of peak growing season can be described when the culms of cool season grasses have fully elongated and seed heads have emerged (not necessarily seed ripe) and the preponderance of forb species are between early bloom and seed set phenological stages. Credit Developers and Credit Buyers must collect data during the permissible window in order for functional acre scores to be official and approved by the Administrator, however shrub data may be collected during any time of year.

**Reason for Improvement:** Vegetation sampling and species identification are traditionally conducted at the proper time of year when plants are both evident and identifiable. This proposal will put the HQT more in line with standard and scientifically accepted data collection processes and will provide more accurate measurements of herbaceous vegetation. As an added benefit, this will greatly expedite credit and debit determinations.

**Rationale Supporting Recommendation Details:** The SETT conducted vegetation sampling for estimating site-scale attributes during the two permissible windows specified in Version 1.0 of the Manual in 2015. The SETT concluded that vegetation data collected during the late brood-rearing permissible window was inaccurate for estimating forb cover and number of forbs present because

senescence and dormancy of the plants. In addition, the main research used to derive the site-scale scoring curves for late brood-rearing forb canopy cover and species richness were based off the work of Casazza et al. 2011 and Lockyer et al. 2015. The new proposed permissible window coincides with the timing of field data collection in these studies, so a separate window for late brood-rearing data collection was determined to be unnecessary.

### I11. Incorporate editorial corrections and improvements to Manual and HQT Methods Documents that increase the understandability and clarify the original intent of the documents

**Summary:** We recommend incorporating editorial corrections and improvements identified by the SETT and other stakeholders in order to increase the understandability and clarify the original intent of the concepts in the Manual and HQT Methods Document. The editorial corrections and improvements do not change the meaning of the documents, and are similar to the editorial corrections and improvements integrated into version 1.0 of the Manual and HQT Methods Document after the December 4th, 2015 SEC meeting per the SEC's approval.

**Specific Improvement Recommendations:** All editorial corrections and improvements received by the SETT were considered, including suggested edits from Sherm Swanson (SEP Council Member), Lee Corum (US Fish and Wildlife Service), and Theodore Roosevelt Conservation Partnership.

**Reason for Improvement:** Increase understandability and clarify the original intent of the concepts in the Manual and HQT Methods Document.

**Rational Supporting Recommendation Details:** Not applicable for this recommendation. Editorial corrections and improvements resolved existing issues with the language and format of the documents.

### I12. Use proposed forms and templates developed in order to facilitate generation, acquisition and transfer of credits

**Summary:** We recommend using the proposed forms and templates developed in order to facilitate generation, acquisition and transfer of credits. The forms and templates were tested using pilot projects and then revised based on that experience. The forms and templates are currently or will be available on the Credit System website shortly.

**Specific Improvement Recommendations:** The following forms and templates defined in the Manual were developed in 2015: Credit Validation Checklist, Notice of Validation Letter, Management Plan, Participant Contract, Credit Obligation Form, Credit Purchase Agreement and Credit Transfer Form. All of the forms and templates developed were tested using pilot projects and then revised based on that experience. The forms and templates are currently or will be available on the Credit System website shortly.

**Reason for Improvement:** The forms and templates were defined in the Manual to ensure the Administrator obtains the information needed to make decisions, and track credits and debits. In addition, the forms and templates reduce the effort required of credit developers and buyers to provide information to the Administrator.

**Rational Supporting Recommendation Details:** The forms and templates developed were informed by forms and templates used by existing mitigation programs, permitting processes and public conservation investment programs. The forms and templates will be revised over time as they are used and improvements are identified.