Sagebrush Ecosystem Council Meeting

Findings and Improvement Recommendations Report 2017/2018

Thursday, February 8th, 2017

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Findings and Improvements 2017/2018

February

1. Allow Term Credits to Offset Permanent Impacts (Cont'd from December)
4. Reclassify Powerline Subtypes to Incorporate New Research
5. Create New Anthropogenic Disturbance Subtypes to Categorize Ancillary Features
6. Conifer Removal

Additional Improvement

7. Alternate Methods to More Efficiently Analyze Debit Projects within the CCS

Finding 1

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.
- 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 1

Allow Term Credits to Offset Permanent Impacts

- 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.
  - Example: 20 Permanent Debits x Multiplier of 12 = 240 Term Debits
  - Example: 20 Permanent Debits x Multiplier of 3 = 60 Term Debits
  - Example: 20 Permanent Debits x Multiplier of 5 = 100 Term Debits

Improvement Recommendation 1

- The SETT would require credit buyers to research the availability of permanent credits prior to considering the multiplier.

- The SETT will work with specific credit developers to explain the potential benefits of permanent credit development.

Improvement Recommendation 1

- Multiplier of 12, which would be equivocal to the State of Nevada's definition of perpetuity of 365 years.

- Multiplier of 3, which refers to a historic American common law of a 99-year lease.

- 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.

Improvement Recommendation 1: Rationale

- The cost to the credit developer to monitor, maintain, and manage a small number of permanent credits in actual perpetuity is costly.

- 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. This may create situations where it may not be financially reasonable or create an incentive for the credit developer to sell permanent credits.

- Mixing permanent credits alongside temporary credits on a credit developer's property would likely to be difficult to manage over time and may reduce the ability to market the remaining pockets of available temporary credits.

Improvement Recommendation 1: Rationale

- Nevada has a prohibition against perpetuities, however perpetuities in Nevada are further described by NRS 111.1031 that defines a Wait and See period up to 365 years for vested interests, which relates to a multiplier of 12.

- 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 relates to 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. In 2003 (Reed et al.), PVAs were used to estimate MVPs for 102 species worldwide, and MVPs were defined 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.

Finding 4

- Scientific research is lacking on differences in indirect impacts between various powerline structural types on sage-grouse populations, which creates difficulty in defining subtypes of this anthropogenic disturbance. Recently acquired data on raven nesting frequency along distribution lines justifies additional classification and clarification of powerline subtypes within the CCS.

- Powerlines were split into two subtypes during the 2016 improvements report due to differences in opportunities for raven nesting.

Improvement Recommendation 4

Reclassify Powerline Subtypes to Incorporate New Research

- The SETT recommends three phase distribution lines with single cross arm be classified in the 25% Weight, 6km Distance Powerline category

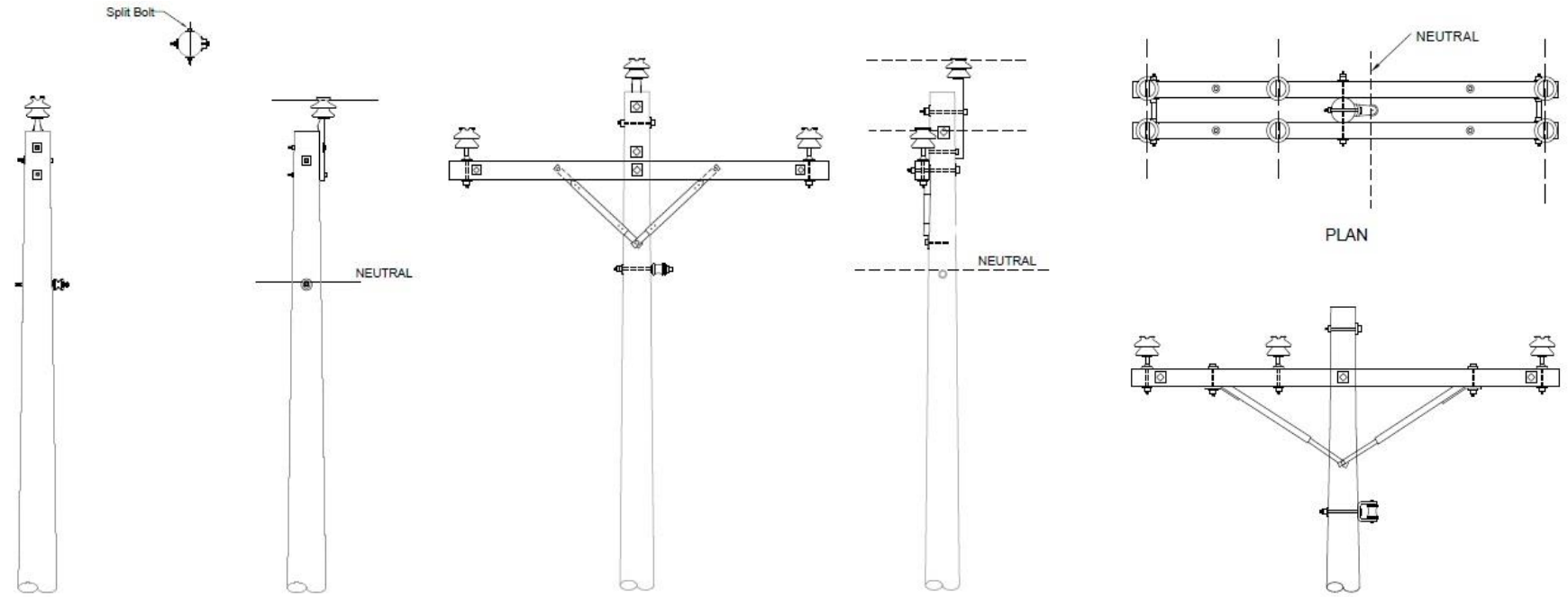
- The SETT recommends that Powerline Subtypes be redefined from “Monopole” to “Single Phase” and “Transmission – Distribution” to “Three Phase”

Improvement Recommendation 4

- The User's Guide and HQT Document would be updated to include the revised subtypes and descriptions

TYPE	SUBTYPE	TYPE CODE†	SUBTYPE CODE†	WEIGHT (%)	DISTANCE (Meters)	DEFINITION
Powerlines	**Three Phase**	**Powerlines**	**Three_Phase**	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.
	Single Phase	**Powerlines**	**Single_Phase**	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

Improvement Recommendation 4



A) Single Phase Tangent

B) Three Phase Single Arm Tangent

C) Three Phase Double Arm Tangent

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.

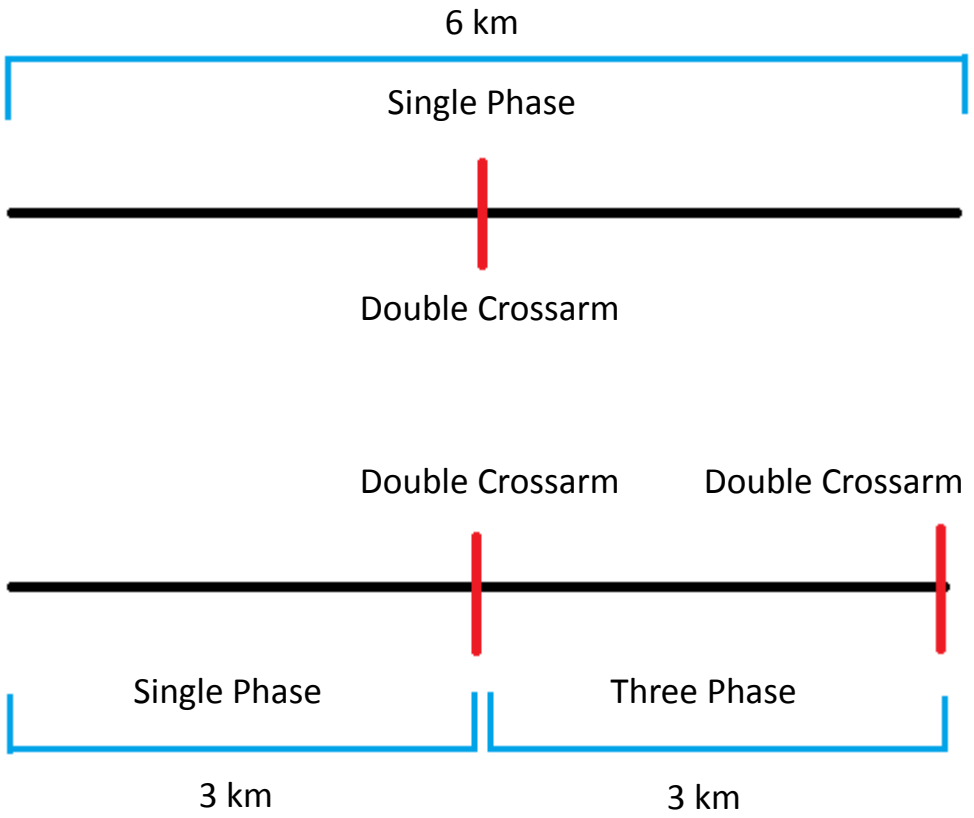
Improvement Recommendation 4

- If available, the local Nevada Rural Electric Association through the SETT can provide a layer of single and three phase distribution lines within the analysis

- The single and three phase classifications are to be used ‘as is’ unless further investigation and documentation of single crossarm structures exist within three phase lines

- In order to classify single crossarm three phase line within Single Phase subtype, the following conditions must be met:
  - At least 3km of continuous line consisting of single crossarm structures
    - Corresponds with the most of anthropogenic impact calculated within ~3km of the curve
  - No more than one double crossarm structure within 6km of continuous line
    - Example: Two double crossarms within 6km will be classified as three phase

Improvement Recommendation 4



Improvement Recommendation 4: Rationale

- Wells Rural Electric Association Data
  - Compiled raptor/raven nest data within 1,123 miles of single and three phase distribution lines

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	45.9

210% increase in frequency of nests on three phase compared to single phase

Improvement Recommendation 4: Rationale

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

158% increase in frequency of nests on double cross arm three phase compared to single cross arm three phase poles

Finding 5

Anthropogenic disturbance categories do not differentiate ancillary features from their associated primary anthropogenic features; however, they result in significant increases in 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 5

- The SETT recommends that ancillary features be classified to half the weight and distance of their associated anthropogenic disturbance features.

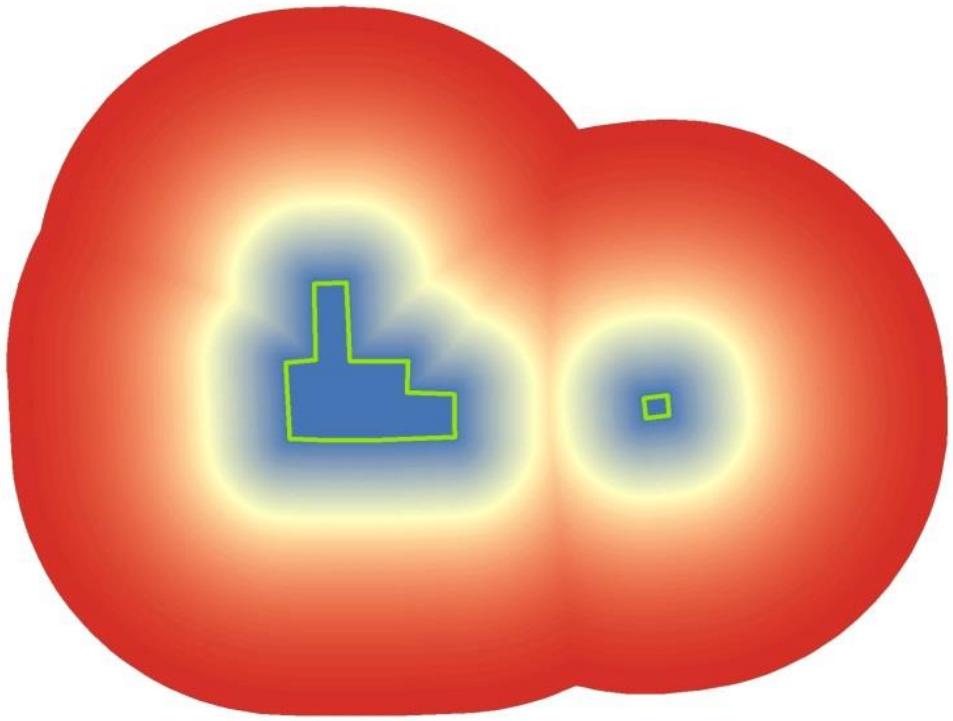
- Categories
  - Large Active Mine Ancillary
  - Small Active Mine Ancillary
  - Geothermal Ancillary

- Possible ancillary features:
  - Rapid infiltration basins
  - Other pond types
  - Pipelines
  - Production/ventilation shafts
  - Quarries
  - Other structures approved by Administrator on individual project basis

- The Administrator will be involved in the planning process to encourage co-location and ensure a feature's proposed location is warranted in order to be classified as ancillary, which will include consultation with and agreement among the project proponent and authorizing land management agencies

Improvement Recommendation 5: Rationale

- Lack of scientific data on ancillary features
- Need to develop consistent approach
- In addition to applying a more appropriate indirect impact associated with ancillary features, this recommendation will
  - Reduce the indirect impact area that requires field sampling
  - Increase efficiency
  - Reduce time, effort, costs during field sampling



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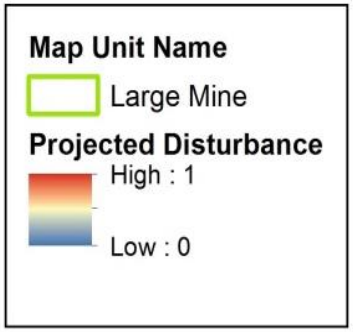

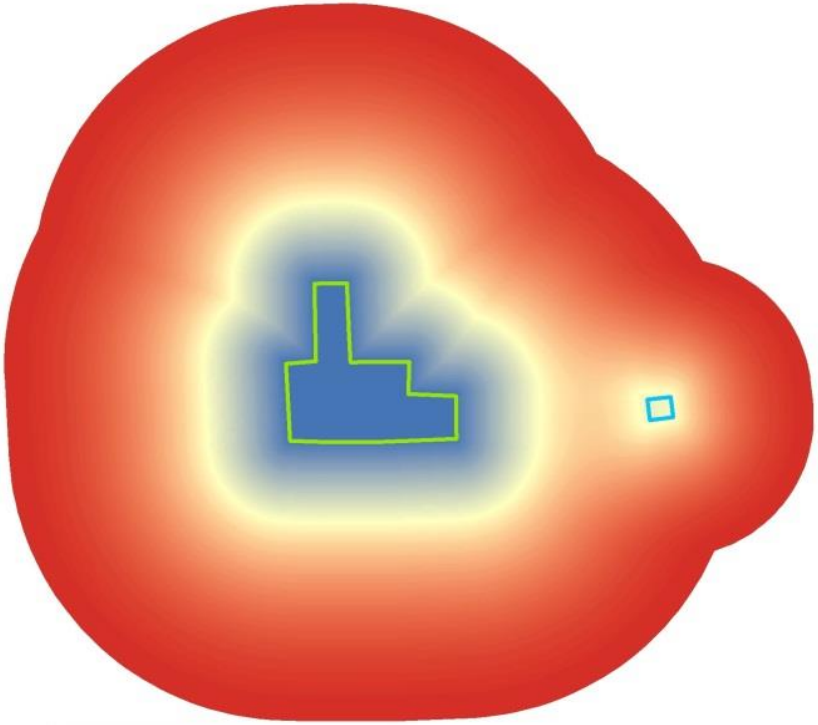

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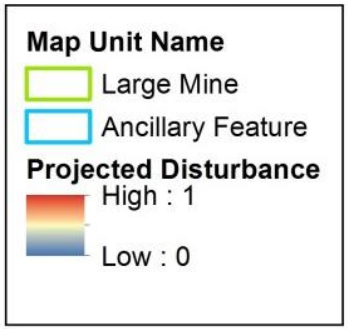


The difference in project area and anthropogenic impact between: A) Large active mine representing both footprints and B) Large active mine and ancillary feature. Both features are 4 km from the primary disturbance footprint. Figure A generated 11,807 debits over 61,274 acres and Figure B generated 9,273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

Improvement Recommendation 5: Rationale

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	Acres	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%

Finding 6

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 6

- Where PJ removal will benefit GRSG, we recommend the following to calculate credits for immediate uplift to GRSG where PJ is eliminated.
  - Multiplying the local-scale habitat quality by 1.2 for map units where Phase 1 PJ (1-10% cover) is removed.
  - Multiplying the local-scale habitat quality 1.5 for map units where Phase 2 PJ (10-20% cover) is removed.

Improvement Recommendation 6

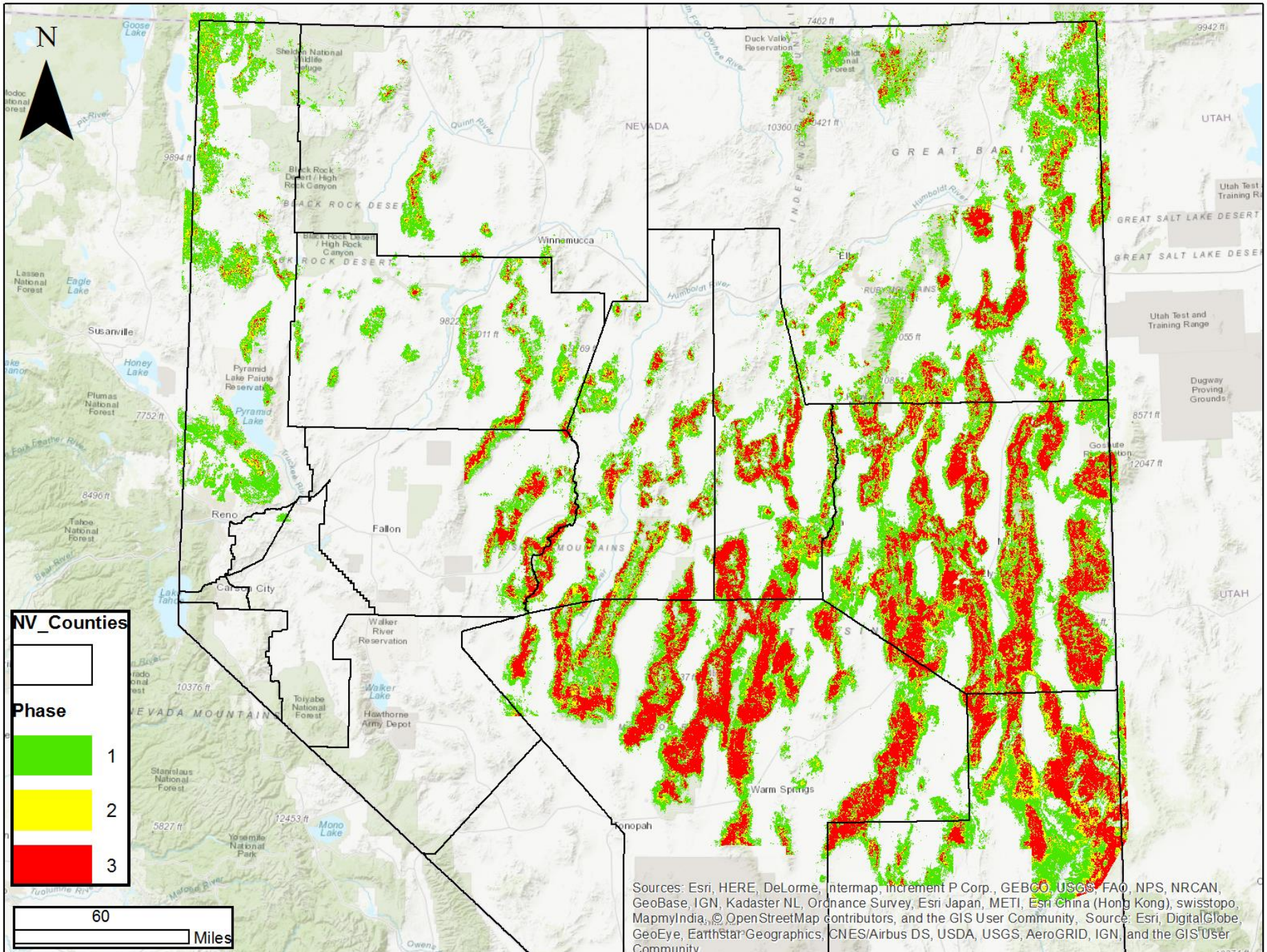
- The data collected using the HQT will establish the current condition.

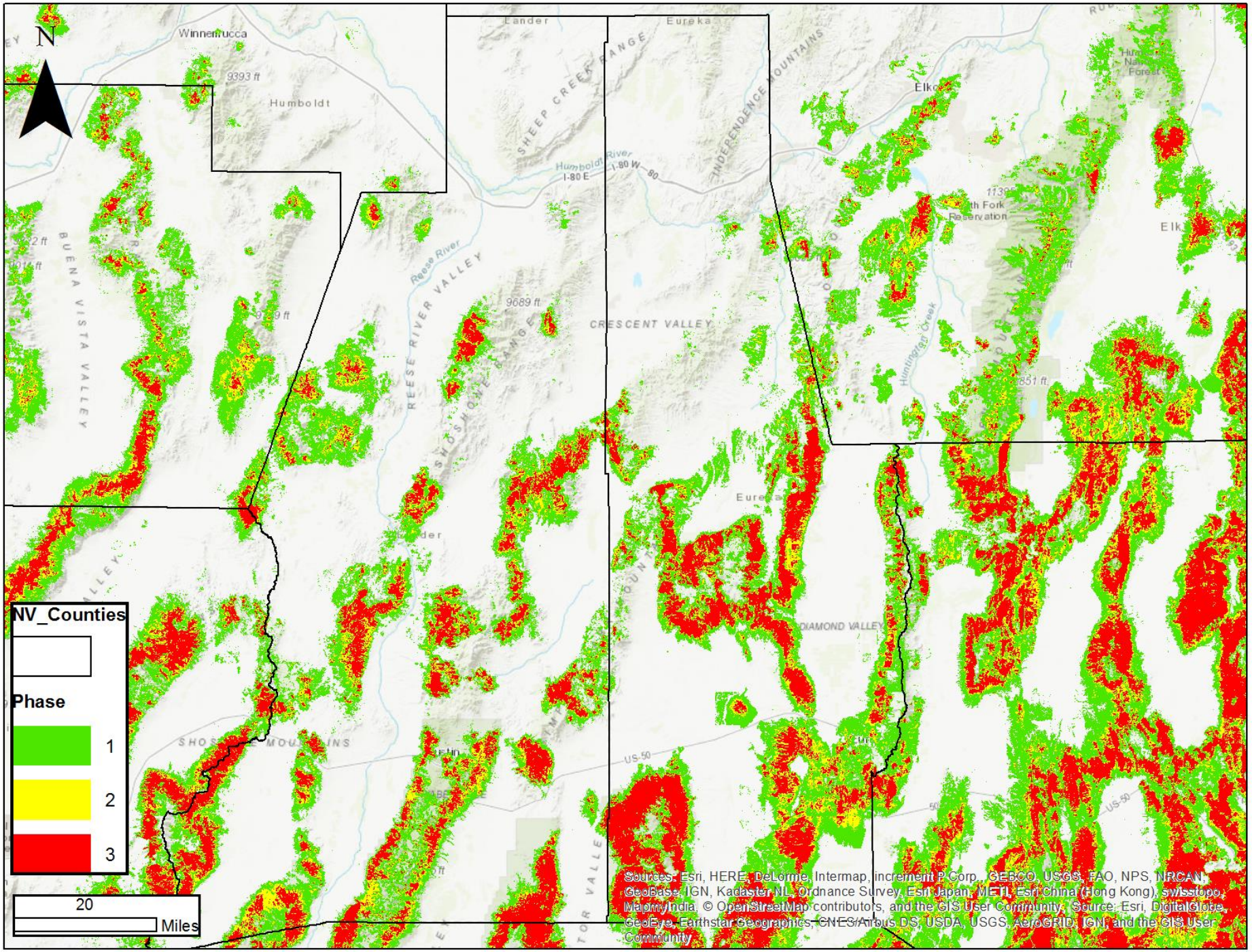
- Verification will occur every fifth year. Monitoring efforts to confirm that no trees are present will be required after removal and for the duration of the project.

Improvement Recommendation 6

- Map units will be delineated as usual for each project except that the conifer map units will be determined in the conifer layer map in ArcGIS.
- Phase 1 map units found to not meet an average conifer cover threshold of 1.0% will be treated as typical maintenance associated with credit projects and will not be eligible for uplift credits from conifer removal.

A previous version of the following map was approved at the last SEC meeting; but the map was reconstructed to display a finer scale of conifer cover for this application. For consistency within the CCS, the SETT recommends this map be adopted for Improvement 2.


N
NV_Counties
Phase
1
2
3
60
Miles
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
NEVADA
UTAH
Winnemucca
Fallon
Reno
Carson City
Susanville
Warm Springs
Tonopah
Duck Valley Reservation
Utah Test and Training Range
Dugway Proving Grounds
Pyramid Lake Paiute Reservation
Walker River Reservation
Toiyabe National Forest
Hawthorne Army Depot
Sheldon National Wildlife Refuge
Black Rock Desert / High Rock Canyon
Lassen National Forest
Plumas National Forest
Tahoe National Forest
Stanislaus National Forest
Yosemite National Park
Humboldt River
Quinn River
Pit River
Truckee River
Carson River
Walker Lake
Pyramid Lake
Honey Lake
Eagle Lake
Goose Lake
Mono Lake
GREAT SALT LAKE DESERT


N
Winnemucca
Lander
Eureka
Elko
Humboldt
9393 ft
SHEEP CREEK RANGE
INDEPENDENCE MOUNTAINS
Humboldt River
I-80 E
I-80 W
BUENA VISTA VALLEY
REESE RIVER VALLEY
Reese River
9689 ft
CRESCENT VALLEY
SHOSHONE RANGE
Huntington Creek
DIAMOND VALLEY
US-50
NV_Counties
Phase
1
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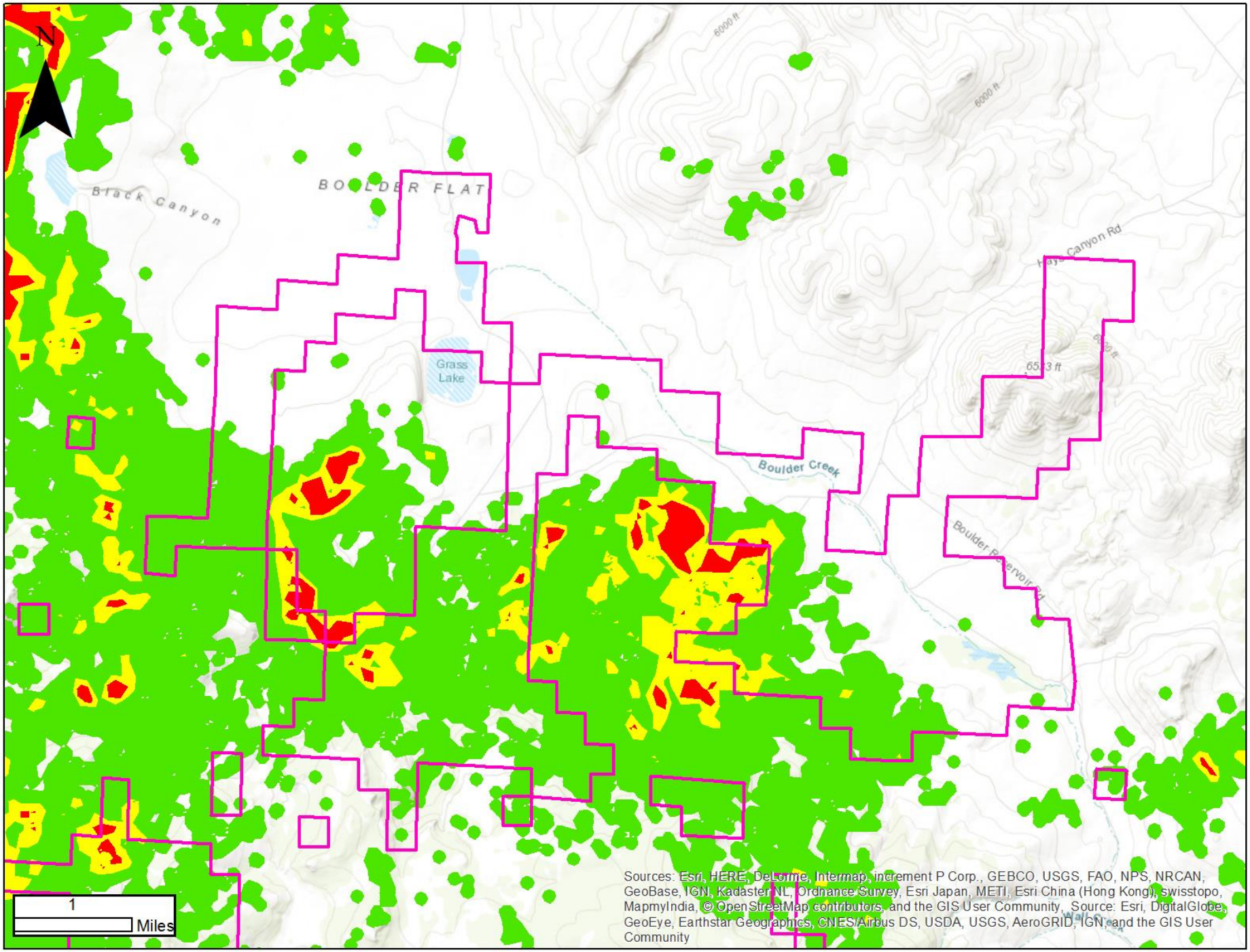
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


N
BOULDER FLAT
Black Canyon
Grass Lake
Boulder Creek
Hays Canyon Rd
6000 ft
6553 ft
1
Miles
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Improvement Recommendation 6

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

- Existing onsite high-quality GRSG habitat, and a good understory, viable seed nearby, or a plan to ensure post-removal habitat improvement.
- Immediate adjacency to open, tree-less, high quality GRSG habitat.
- Removal is proposed at locations and siting likely to benefit GRSG.
- Relatively minimal risks of invasion of cheatgrass and/or other annual grasses in the area.

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.

Improvement Recommendation 6: Rationale

- GRSG tend to see immediate benefit when conifer removal is conducted in close proximity to GRSG populations (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, which generates a 20% increase in local-scale habitat quality.
- Probability of GRSG nest success has been found to decrease with increasing PJ cover class (Sandford et al. 2017). Modeling revealed potential GRSG benefits from PJ removal are highest where denser PJ cover is treated near leks (Farzan et al. 2015).

Improvement Recommendation 6: Rationale

- Phase 1 PJ is used by GRSG with increased predation; yet Phase 2 conifer is avoided (Coates et al. 2017). When Phase 2 is cut, the significant, unquantifiable, added benefits of reclaiming unused habitat and stopping conversion to Phase 3 are realized.
- HSI values within Phase 2 are 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 codominance of trees and shrubs, credit yields will tend to be lower in Phase 2.
- A higher multiplier was necessary to award for the added benefits to GRSG when Phase 2 is removed and incentivize projects to also feature Phase 2, where it benefits GRSG. The SETT decided on a 1.5 multiplier for Phase 2.

Improvement Recommendation 6: Further Rationale

Table 1. 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. A 10% reserve account contribution has been factored in. 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

Additional Improvement Finding 7

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.

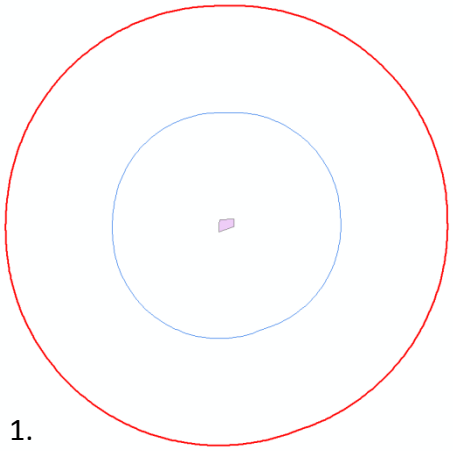
- The SETT explored ways to streamline Habitat Quantification efforts within the sampling design. After exploring many options, the SETT determined that there was too much variation and uncertainty in the outcomes.

Additional Improvement Finding 7

Previously Analyzed Alternatives:

<u>Monitoring a pre-determined portion of the sampling area and using the HSI to quantify the remaining portion.</u>

1. Using the HSI for the entirety of the project, with no field sampling.
2. Choosing a definite boundary to sample (2-3 km around the area of direct disturbance).
3. Calculating the areas of greatest impacts from the disturbance, and requiring field sampling within those areas.



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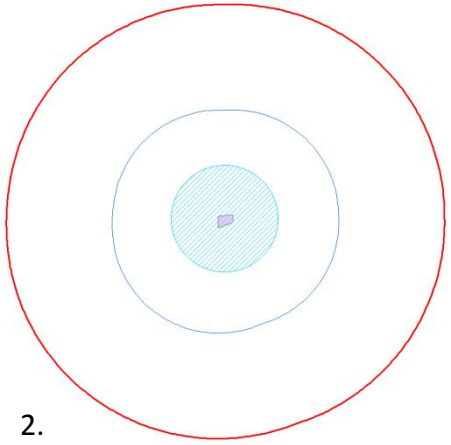

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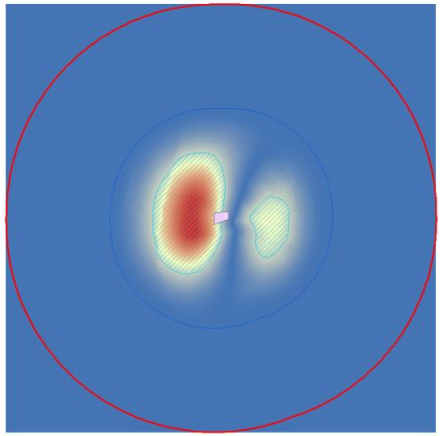

3.

Additional Improvement Finding 7

Downsides

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

New Alternative Improvement 7

Debit Site-Screening Tool

- 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 (Minimization).

- The purpose of this tool is to:
  - 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.
  - Establish the site-scale habitat function as 100% in order to achieve the most conservative debit estimate possible in absence of collecting field data.

New Alternative Improvement 7: Rationale

- 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.
  - 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.

- This 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.

New Alternative Improvement 7: Rationale

- 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 using 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.

Scenario	Debits With Field Sampling	Debits Using HSI	Debits with 100% Habitat Function	Increase over Field Sampling Example	% Increase over Field Sampling Example
1	8260	7176	13072	4812	58.26%
2	3248	5730	9423	6175	190.12%
3	211	241	378	167	79.15%
4	3960	6206	8047	4087	103.21%
5	3292	3916	5841	2549	77.43%