



Sagebrush Ecosystem Program

Findings and Improvement Recommendations

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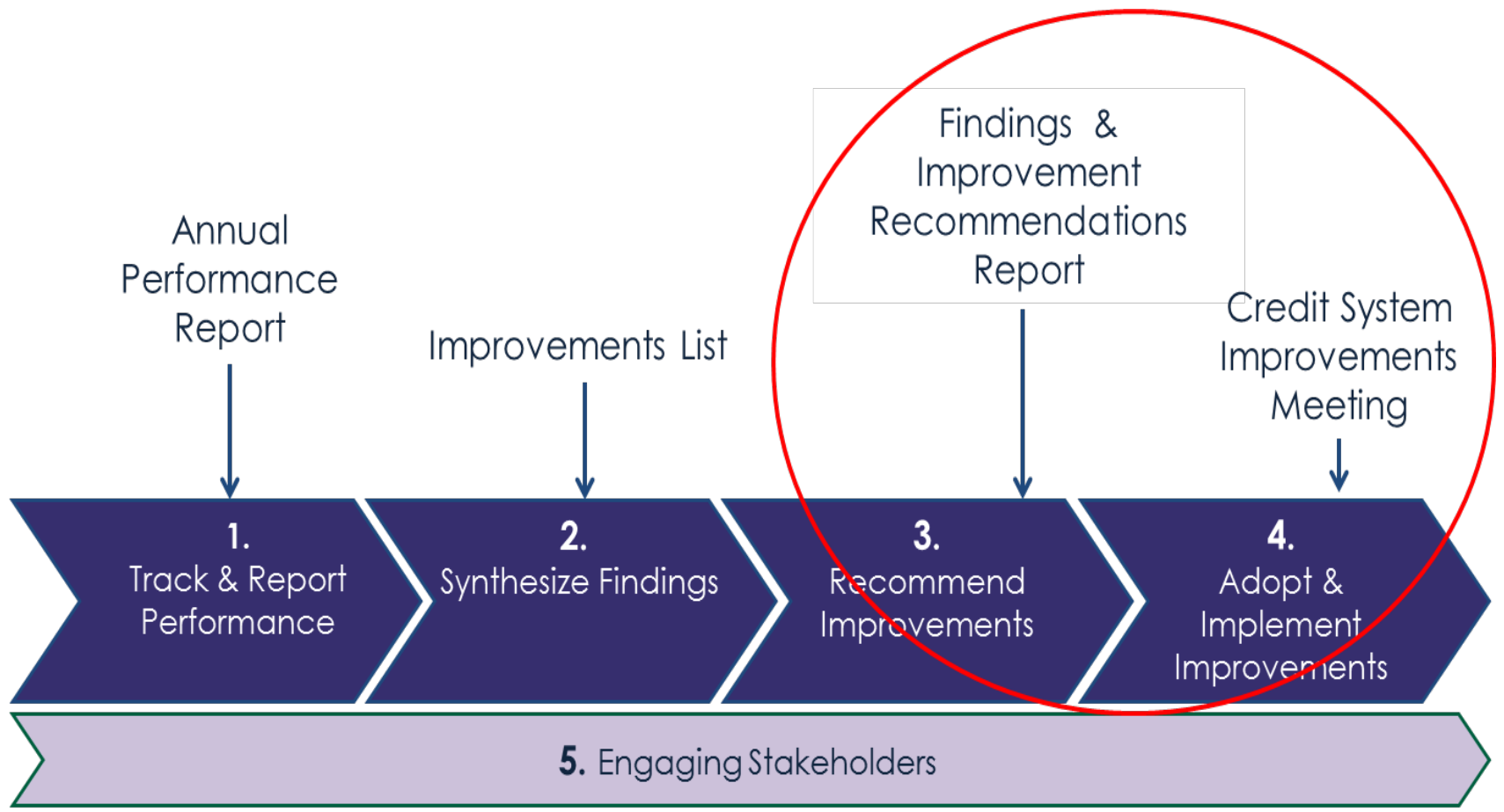


Outline

- Review of Continual Improvement Process
- Timeline
- Introduction to Findings F14 and F15
- Review Major Improvement Recommendations I.1, I.3 and I.4
 - HSI
 - Anthropogenic disturbances
- Project Scenarios and Net Ramifications
- Conclusion



Continual Improvement Process





Timeline of Activities

December 9th, 2016: Meeting with agency staff (NDOW, USFWS, BLM, and SETT) discuss potential adjustments to address minimization and avoidance, consideration of variances, accounting for P/J, indirect disturbance, distances, and weights associated with debit generation within the CCS.

January 6th, 2017: Meeting with TRG (NDOW, USFS, UNR, USFWS, USGS, and SETT) to discuss the CCS Improvement Recommendations.

January 26th, 2017: SETT introduced Findings and Improvement Recommendations Draft Report. All final recommendations were approved and draft recommendation are listed as an Action item for the upcoming SEC meeting.

February 17th, 2017: SETT met with TRG (NDOW, UNR, certified Verifiers) to discuss the streamlining the field sampling effort.



Findings

Improvement Recommendations Under Development



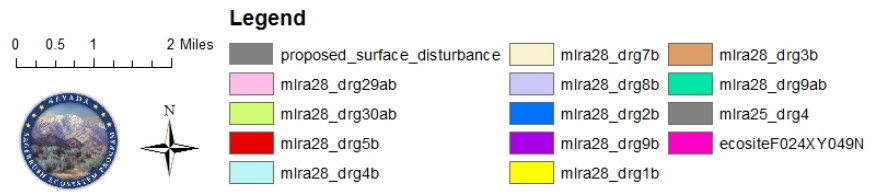
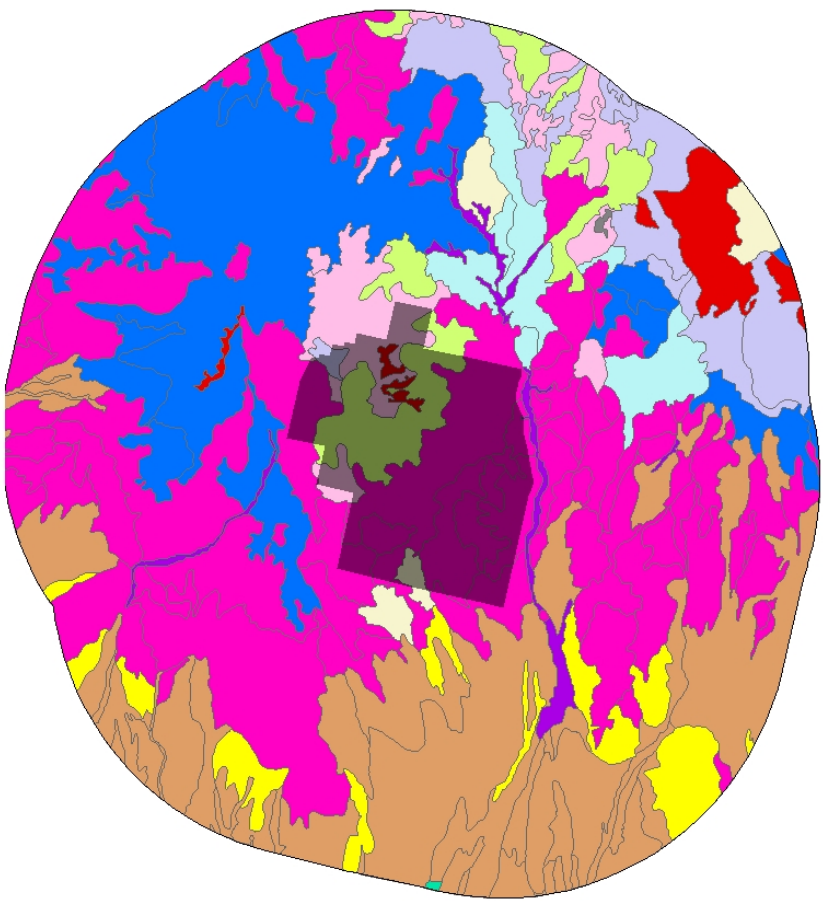
Research and Monitoring Finding: F14

- The current methods for data collection on debit sites requires an extensive area (up to 8km surrounding the site) where vegetative field data collection is required. Alternative methods could reduce the need to survey the entire area and thereby increase efficiencies and reduce costs.



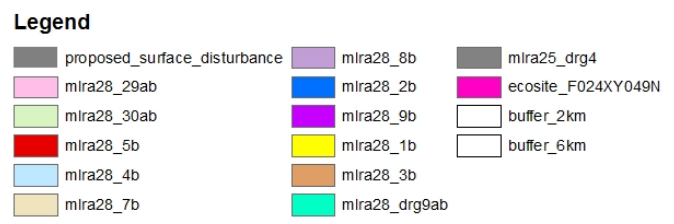
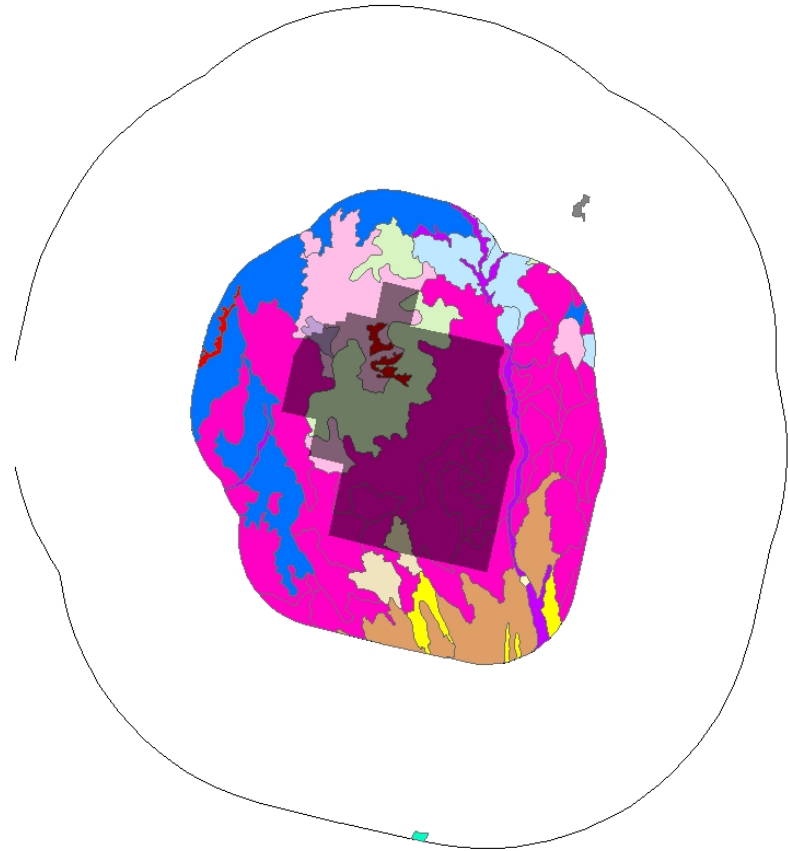
Example

- DRGs scale up ecological sites (based on soil mapping, plant ecology, etc.) based on their response to natural and human caused disturbances.
- Creates an objective, standardized, and repeatable sample design for Verifiers.
- TRG suggested using Disturbance Response Groups (DRGs) as a possible method to delineate Map Units.





Potential Improvement Recommendations



- Reduce the field sampling area to approximately 1/3 of total debit project area.
- Sample each map unit and extrapolate data to same map units in debit project area. Map units that do not occur within the interior debit project area must be sampled.
- Recommend establishing transects at maximum and minimum distance from a navigable road.
- Establish processes for excluding non-habitat within the debit project area (ex. Phase II and III P-J or cheatgrass monocultures).

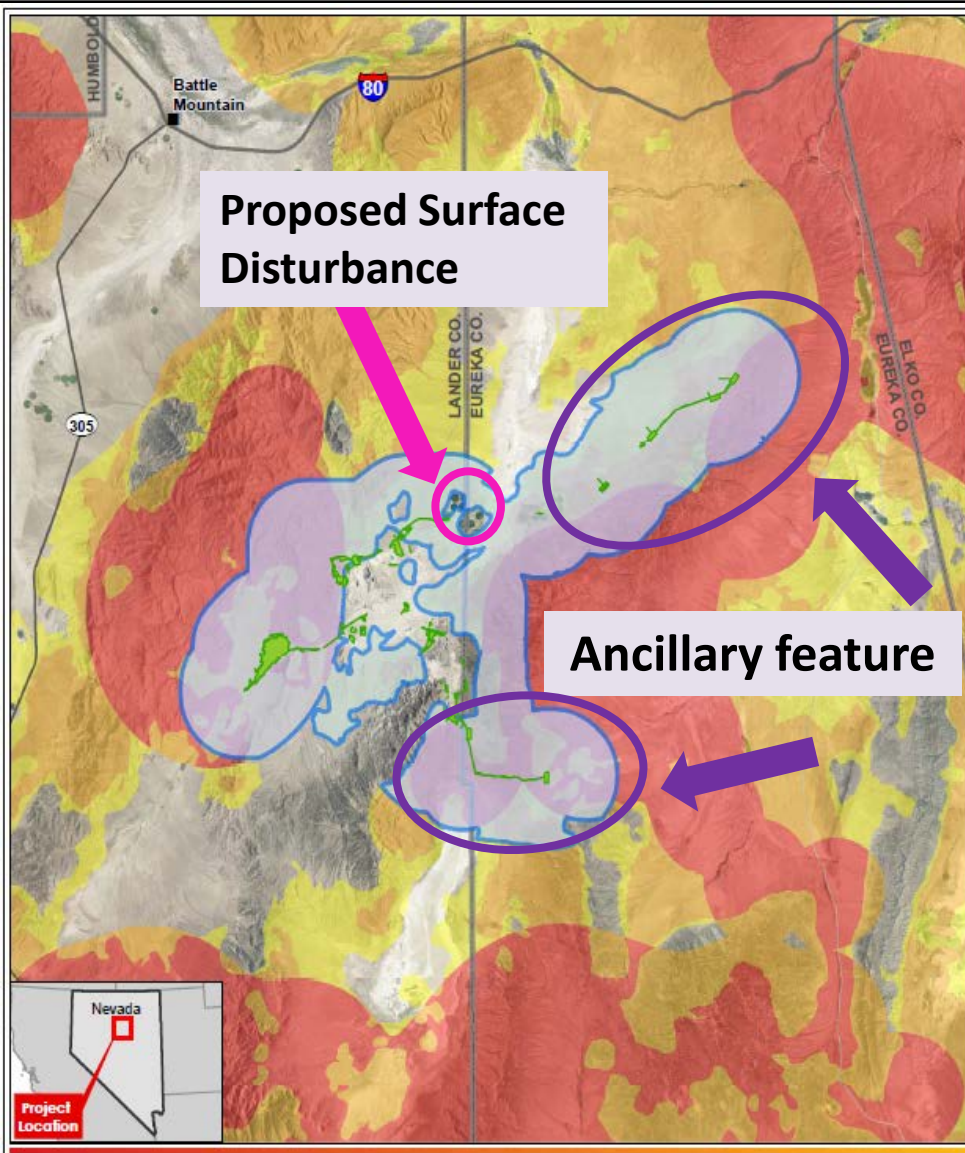


Research and Monitoring Finding: F15

- Anthropogenic disturbance categories do not differentiate ancillary anthropogenic features, which can result in overestimating indirect effects of minor anthropogenic features.



Mine Example: 6km



- Lumping anthropogenic disturbances into broad categories may not be representative of the actual impacts and at times may result in an overestimate of the indirect impacts of those anthropogenic features by a significant margin.
- We intend to define a process to assess these anthropogenic disturbance categories over time and incorporate them into the CCS.



Major Significance

Improvement Recommendation

I.1



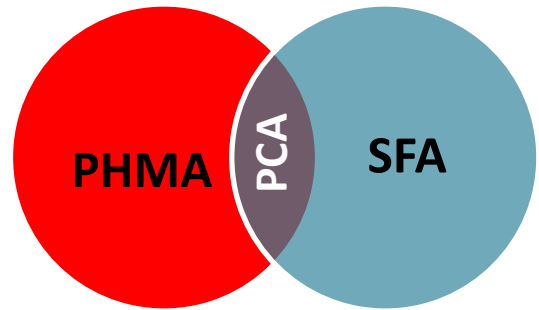
Improvement Recommendation: I.1

- Designate Preferred Conservation Areas (PCAs) and revise the Proximity Ratio in order to incentivize enhancement and protection of both GRSG populations in close proximity to the debit project and GRSG strongholds in the State.
 - **No Operational Finding** is associated with this recommendation.
 - However, PCAs identified by the Sagebrush Ecosystem Program (SEP) in 2014 as a mechanism to incentivize enhancement and protection of landscape-scale habitat priorities.



Priority Conservation Areas (PCAs)

- Updated definition:
 - PCA = where PHMA and SFA overlap



- PCA: 2.1 million acres
- Changes:
 - Only include SFA that is also classified as PHMA
 - About 25% of SFA in Nevada is NOT PHMA and is now excluded (blue polygon) from the PCA





Major Significance

Improvement Recommendation

I.4

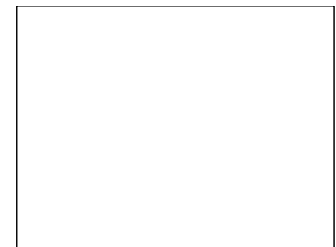
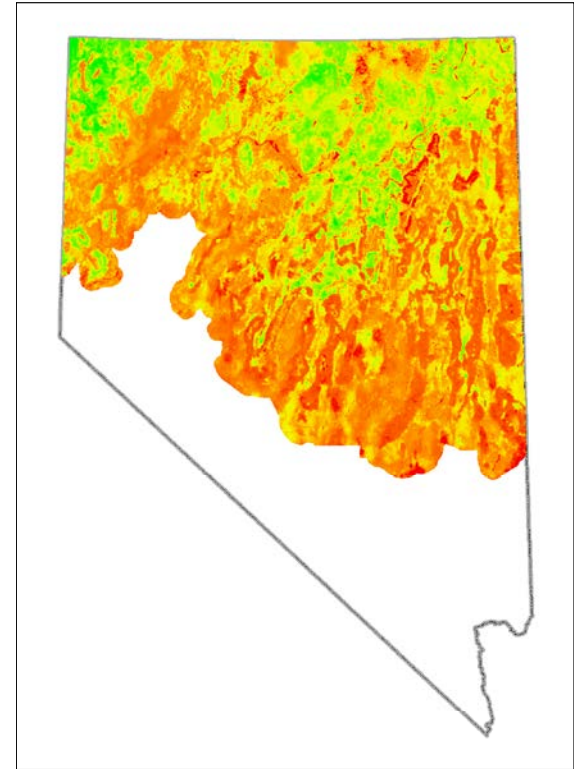
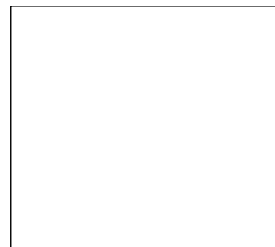
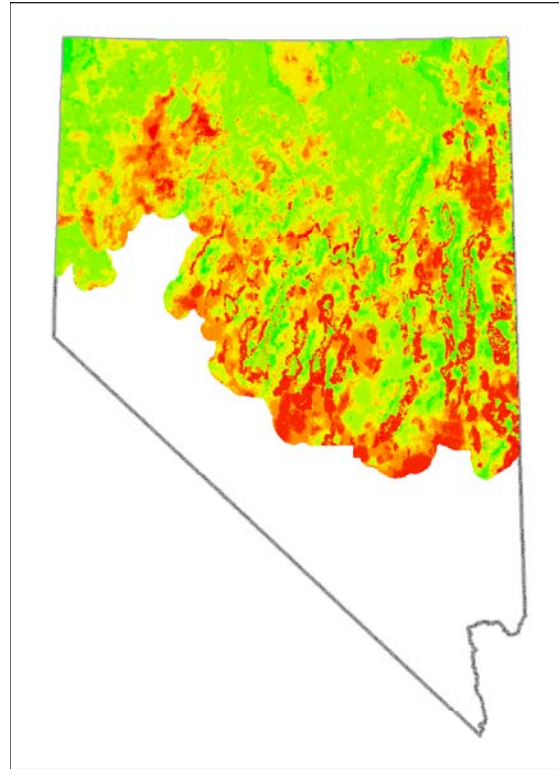
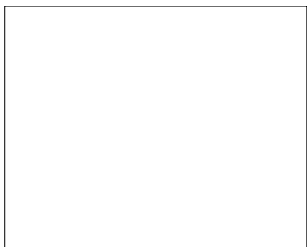
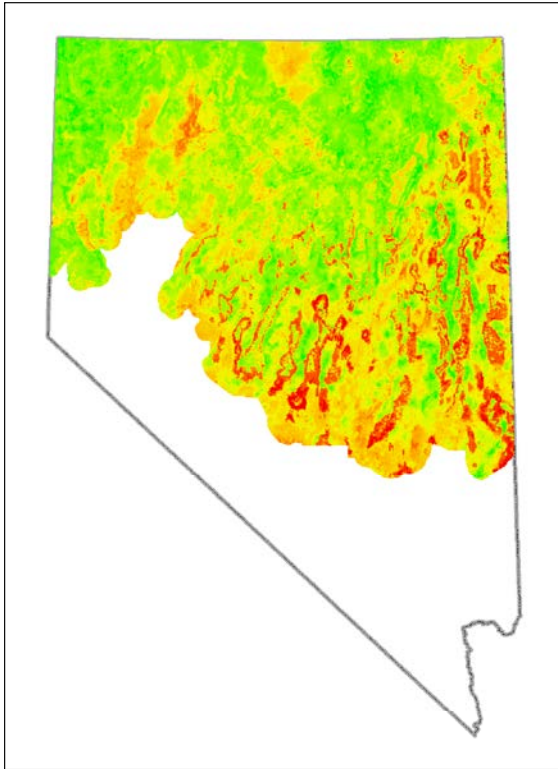


Research and Monitoring Finding: F10 & F11

- The method for incorporating the HSI into assessment of local-scale habitat function by the HQT does not accurately reflect local-scale habitat quality.
- The effects of the presence of conifer and the removal of conifer are not adequately captured by the current HQT framework.



Current HSI Overview



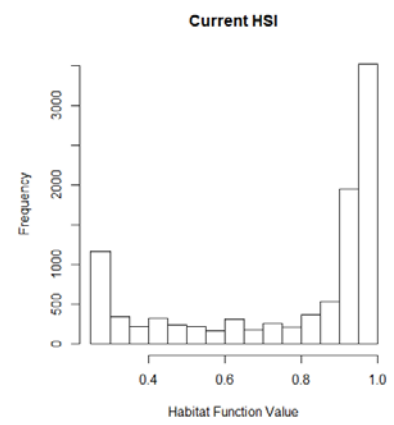
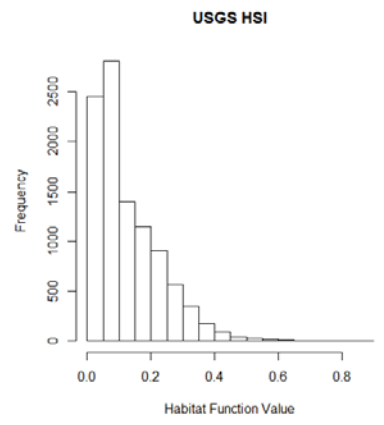


Current HSI Overview

Annual Composite HSI

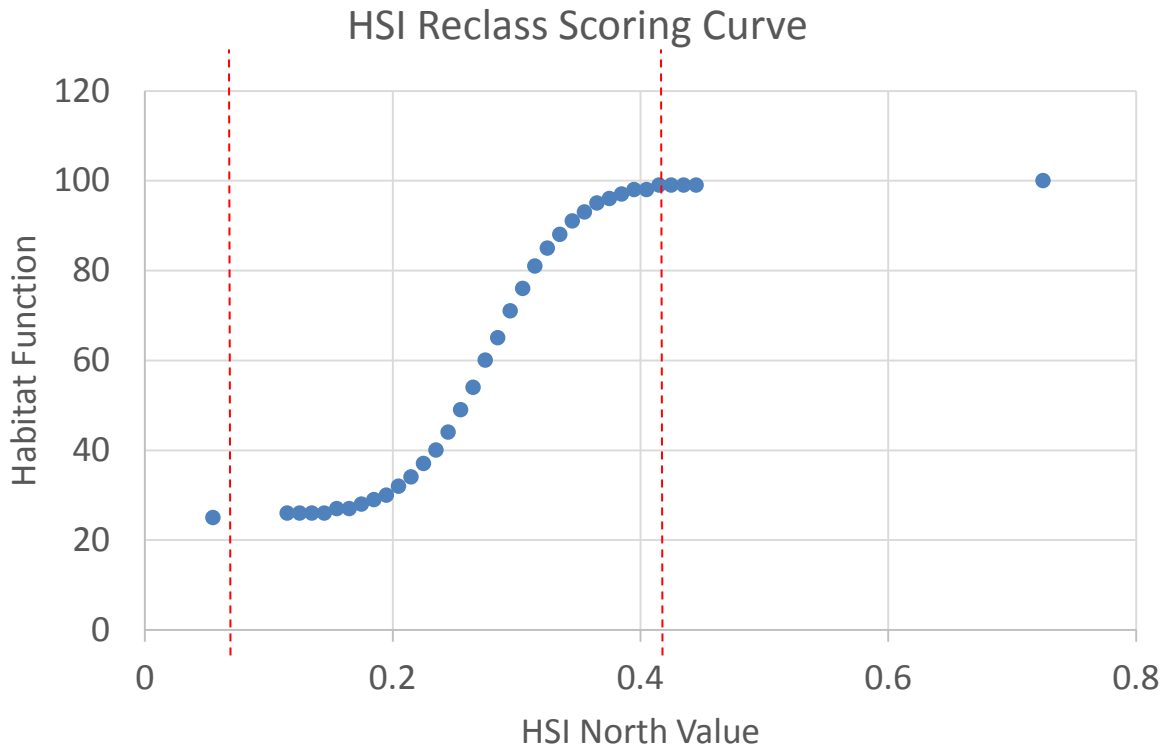


HSI Reclass





Current HSI Overview

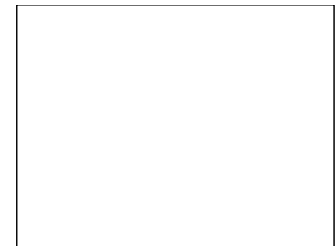
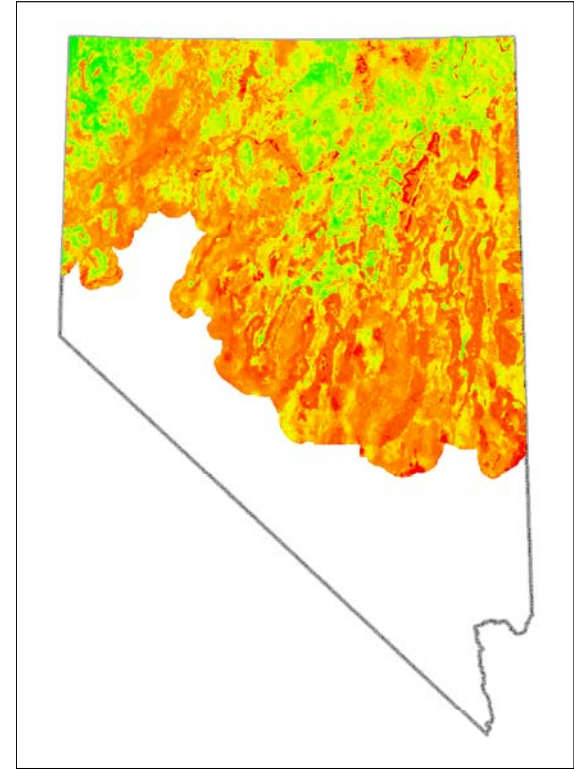
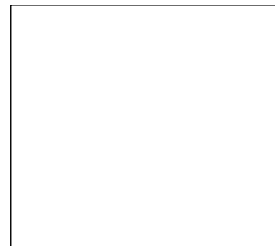
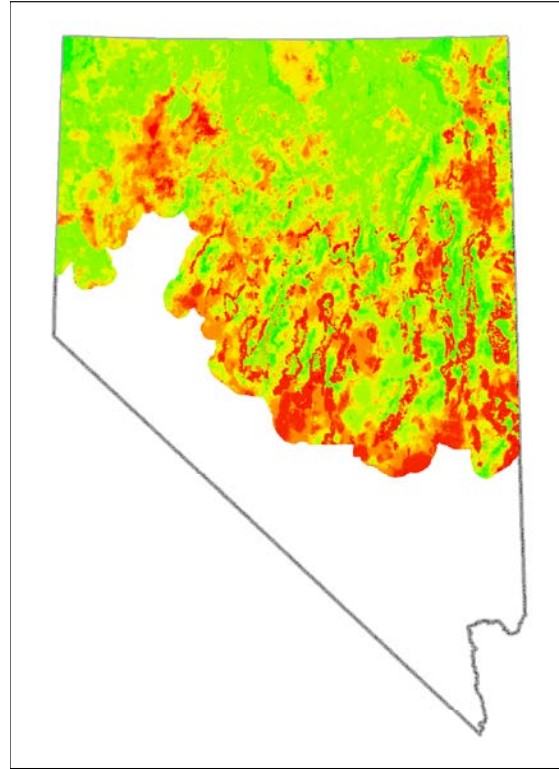
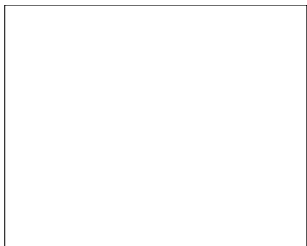
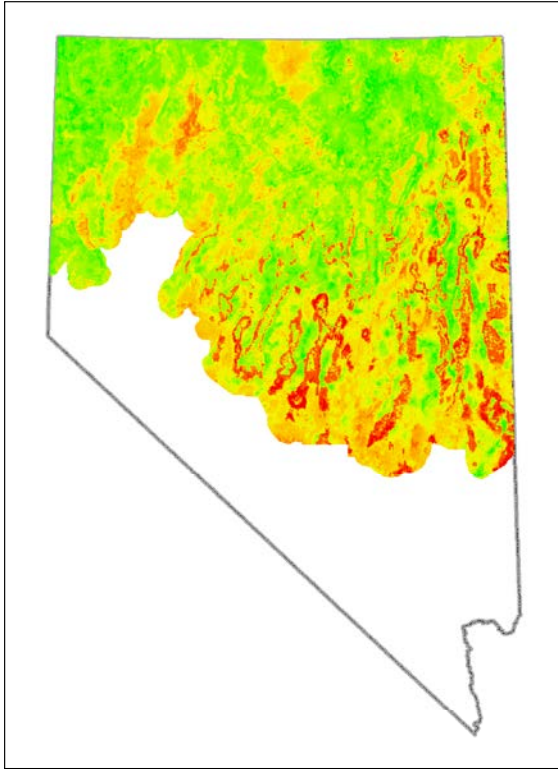


--- +/- 1.5 SD from Mean

| FROM_ | TO | OUT |
|-------|------|-----|
| 0 | 0.11 | 25 |
| 0.11 | 0.12 | 26 |
| 0.12 | 0.13 | 26 |
| 0.13 | 0.14 | 26 |
| 0.14 | 0.15 | 26 |
| 0.15 | 0.16 | 27 |
| 0.16 | 0.17 | 27 |
| 0.17 | 0.18 | 28 |
| 0.18 | 0.19 | 29 |
| 0.19 | 0.2 | 30 |
| 0.2 | 0.21 | 32 |
| 0.21 | 0.22 | 34 |
| 0.22 | 0.23 | 37 |
| 0.23 | 0.24 | 40 |
| 0.24 | 0.25 | 44 |
| 0.25 | 0.26 | 49 |
| 0.26 | 0.27 | 54 |
| 0.27 | 0.28 | 60 |
| 0.28 | 0.29 | 65 |
| 0.29 | 0.3 | 71 |
| 0.3 | 0.31 | 76 |
| 0.31 | 0.32 | 81 |
| 0.32 | 0.33 | 85 |
| 0.33 | 0.34 | 88 |
| 0.34 | 0.35 | 91 |
| 0.35 | 0.36 | 93 |
| 0.36 | 0.37 | 95 |
| 0.37 | 0.38 | 96 |
| 0.38 | 0.39 | 97 |
| 0.39 | 0.4 | 98 |
| 0.4 | 0.41 | 98 |
| 0.41 | 0.42 | 99 |
| 0.42 | 0.43 | 99 |
| 0.43 | 0.44 | 99 |
| 0.44 | 0.45 | 99 |
| 0.45 | 1 | 100 |



Improvement Recommendation I.4





Improvement Recommendation I.4

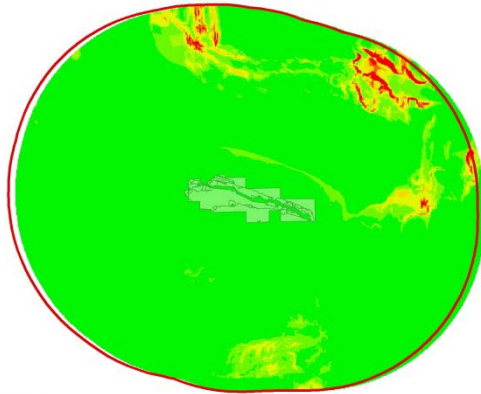
- Improvement Recommendation
 - Process
 - Scenarios: Real and hypothetical credit and debit projects
 - TRG/USGS collaboration & feedback
 - Method
 - Use the spring, summer, and winter seasonal HSI maps in place of the reclassified annual composite HSI map.
 - No scaling or reclassification applied to seasonal maps
 - Results
 - Credit Projects: Cottonwood and Coleman
 - Debit Projects : Gold Bar, Gold Rock, hypothetical scenarios



Improvement Recommendation I.4

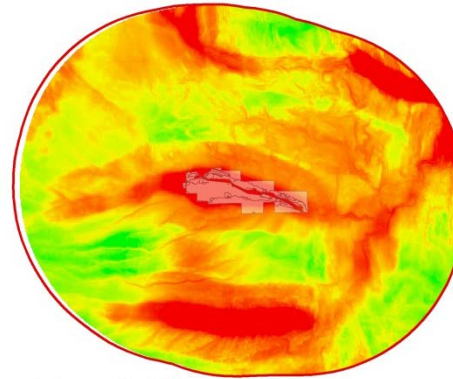
Example: Cottonwood Credit Project

742 Credits

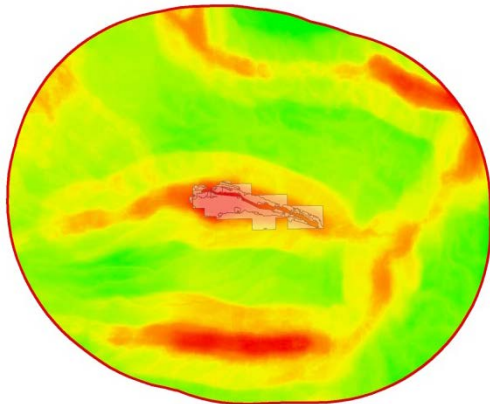


HSI_Reclass
Value
High : 1
Low : 0.75

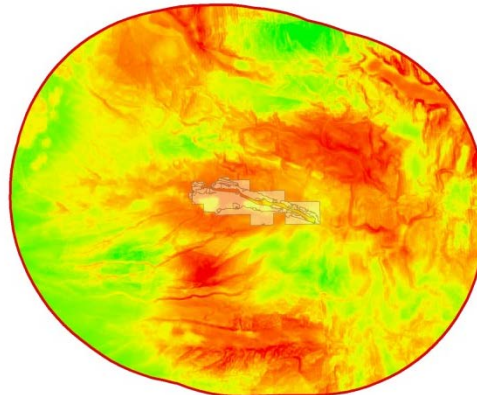
231 Credits
-68% Change



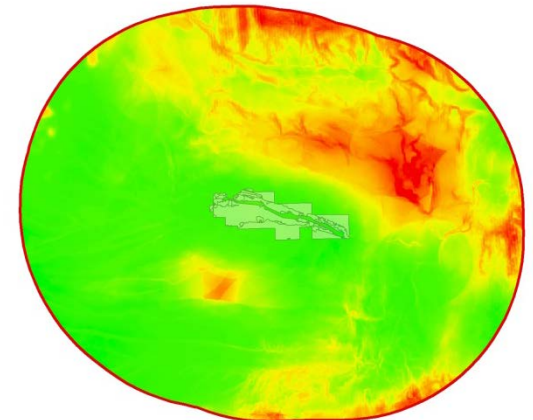
Annual_Composite_HSI
Value
High : 1.55379
Low : 0.279003



Current_Winter_HSI
Value
High : 0.676162
Low : 0.0102608



Current_Spring_HSI
Value
High : 0.846294
Low : 0.407286



Current_Summer_HSI
Value
High : 0.813825
Low : 0.493393

578 Credits
-22% Change



Improvement Recommendation 1.3



Research and Monitoring Finding: F12

- The current sigmoidal shape of the distance decay curves used to assess the indirect effects from anthropogenic features is not supported by the best available science.
- Available scientific data reflect a more rapid reduction of indirect effects from the disturbance than what is represented by the current distance decay curve shape.



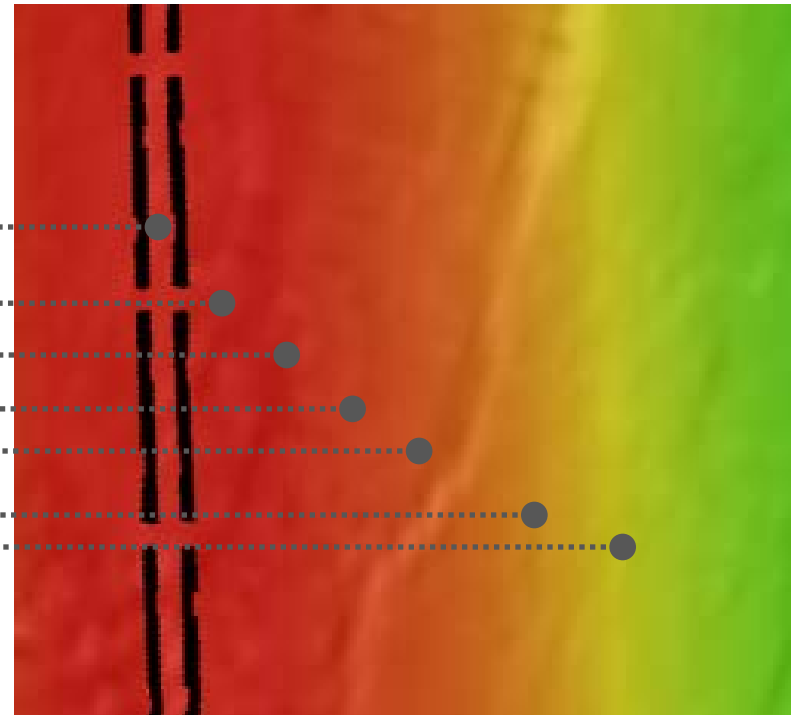
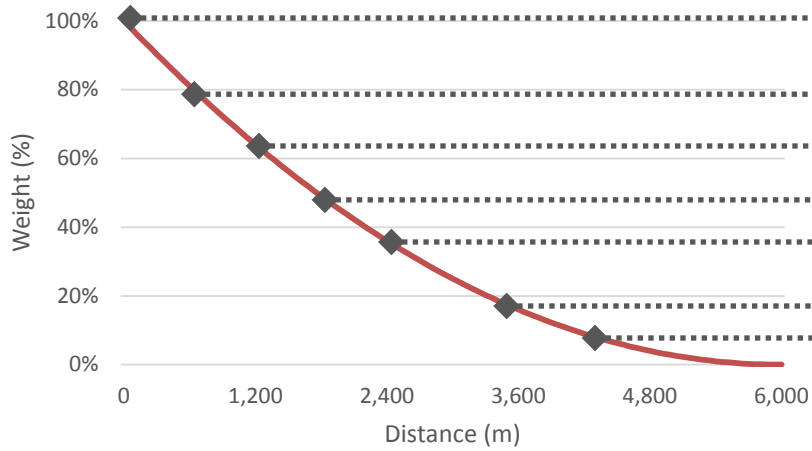
Improvement Recommendation: I.3

- Revise the shape of the distance decay curves used to assess indirect effects from anthropogenic features from a sigmoidal curve to an exponential decay curve, and increase the distance decay curve weights and distances for towers and powerlines.
- Scientific data indicates a more rapid reduction of indirect effects from the edge of anthropogenic features than represented by the current distance decay curve shape.



Anthropogenic Disturbance

Distance-Decay Curves





Anthropogenic Disturbance

- Proposed curve & weights/distances

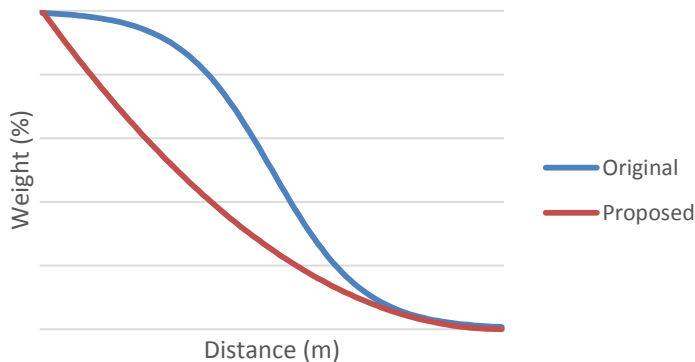
- Process:

- Scientific data
- TRG consultation
- Agency input
- Scenarios

- Methods:

- Curve shape: Sigmoidal → Exponential Decay
- Powerlines: Increased weight/distance

Distance-Decay Curves



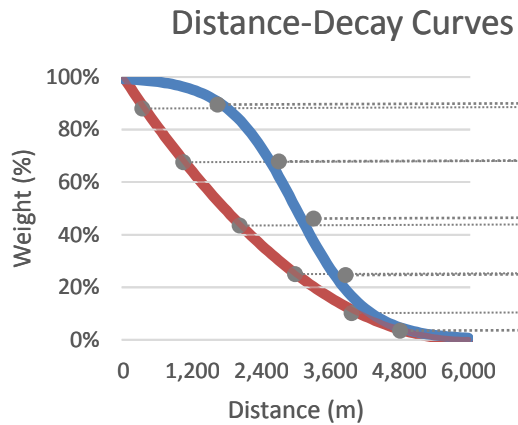
| DISTURBANCE TYPE | WEIGHT (%) | DISTANCE (Kilometers) |
|---------------------|------------|-----------------------|
| Towers (cell, etc.) | 75% (25%) | 8 km (6 km) |
| Power Lines | 75% (25%) | 8 km (6 km) |



Anthropogenic Disturbance

Current Distance-Decay Curve (Sigmoidal Shape)

Proposed Distance-Decay Curve (Exponential Decay Shape)





Net Ramifications

– Results:

- Scenarios with proposed HSI and anthropogenic disturbance improvements
- Debit project average % change: -50% (-21% - -61%)
- Credit project average % change: -5% (-45% - 35%)

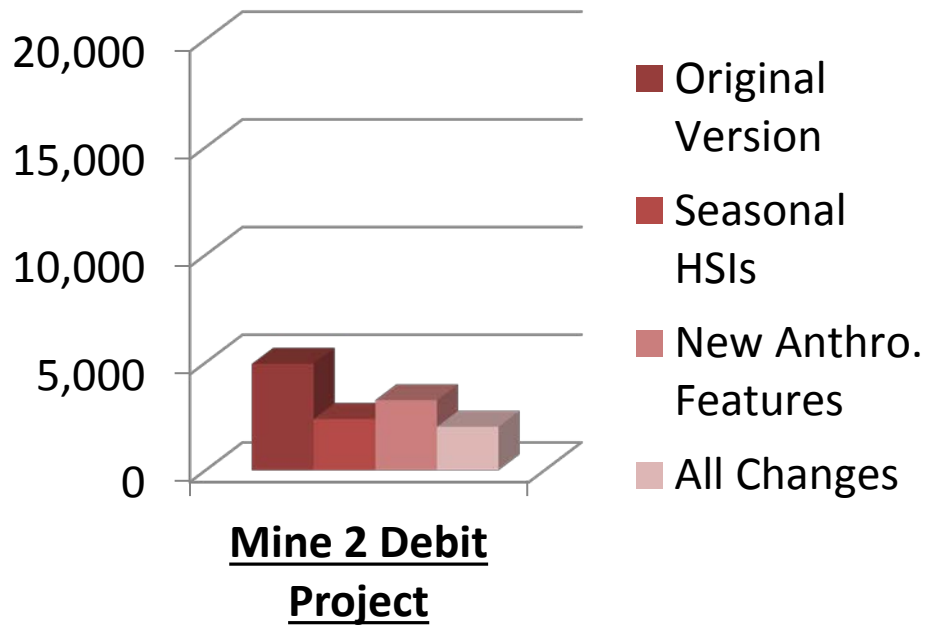
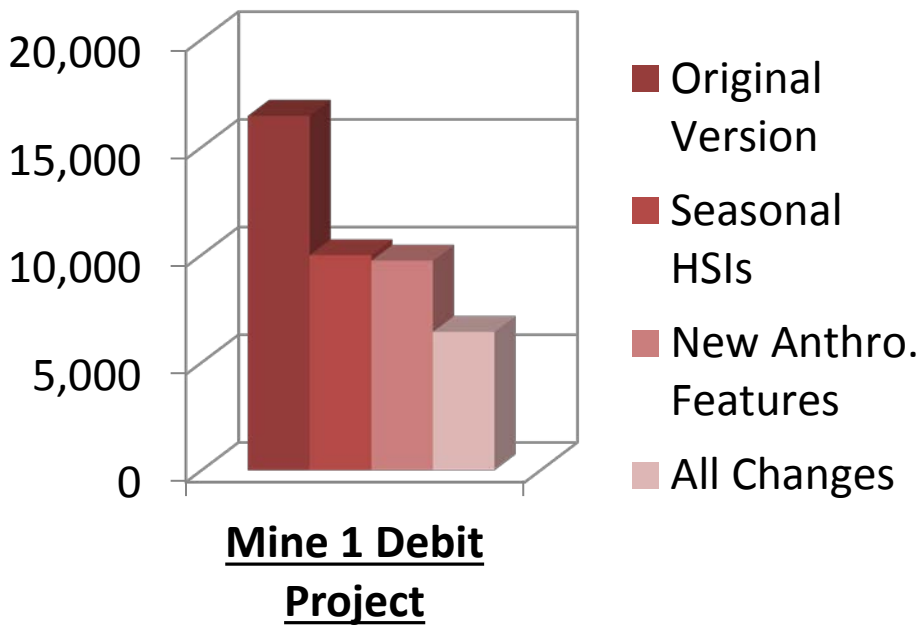
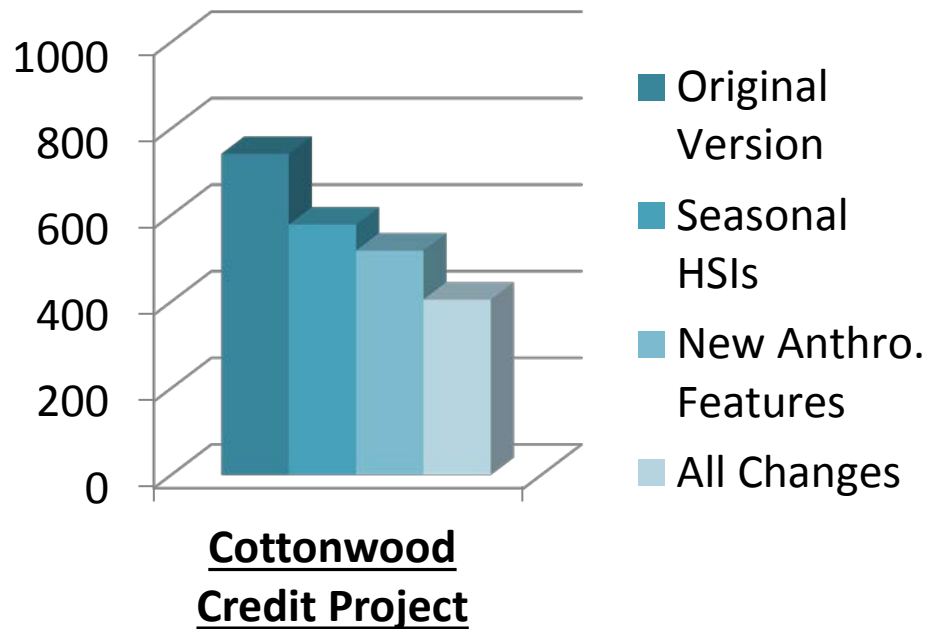
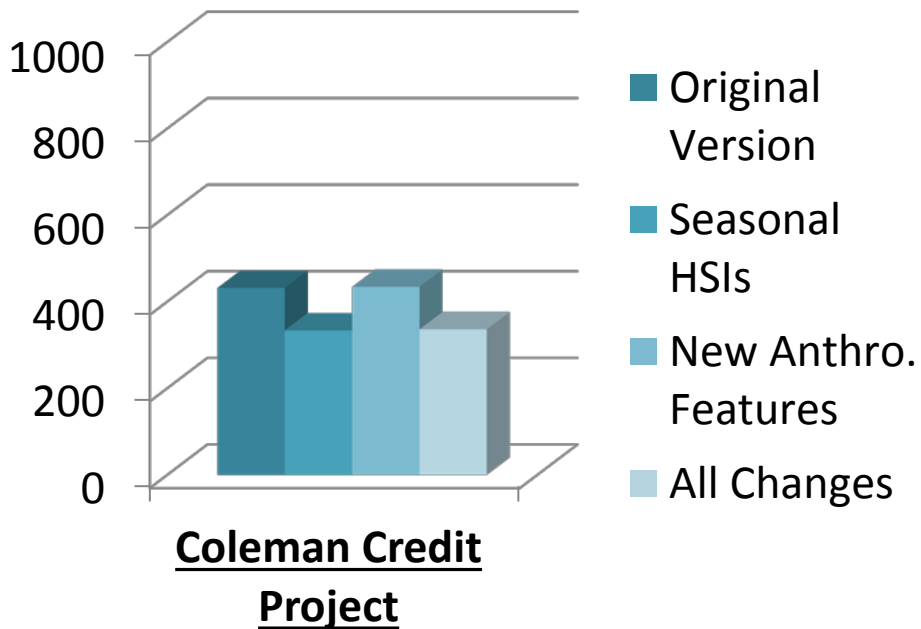
– Implications:

- Project-specific variation
 - Conifer, existing disturbance, disturbance type, habitat quality, etc.



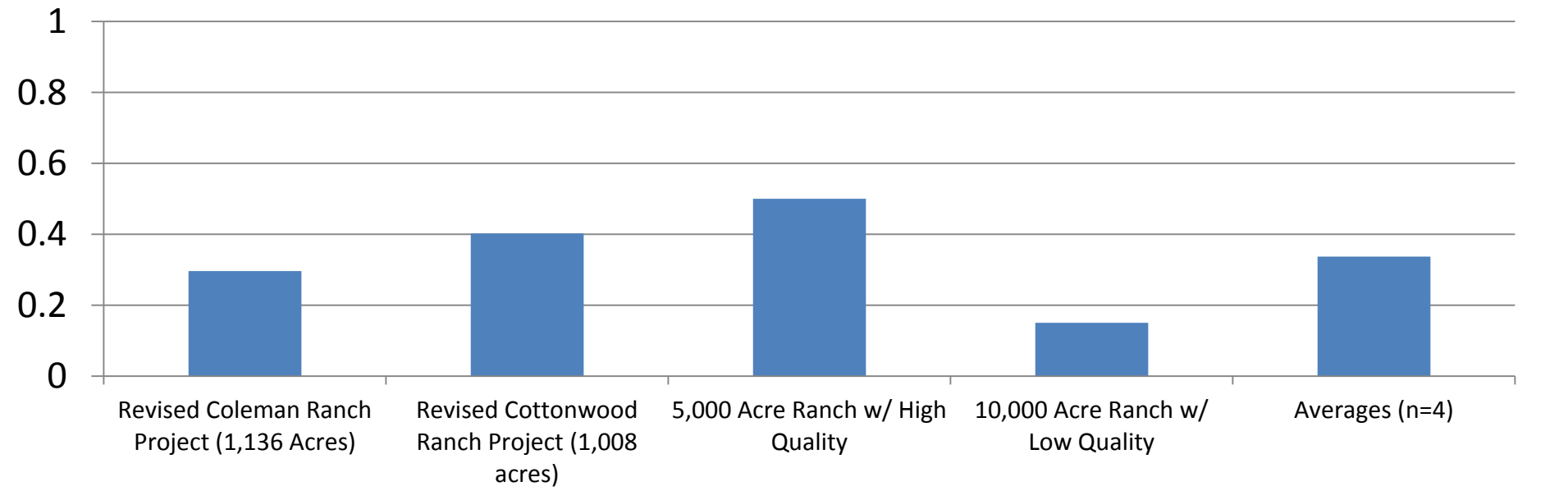
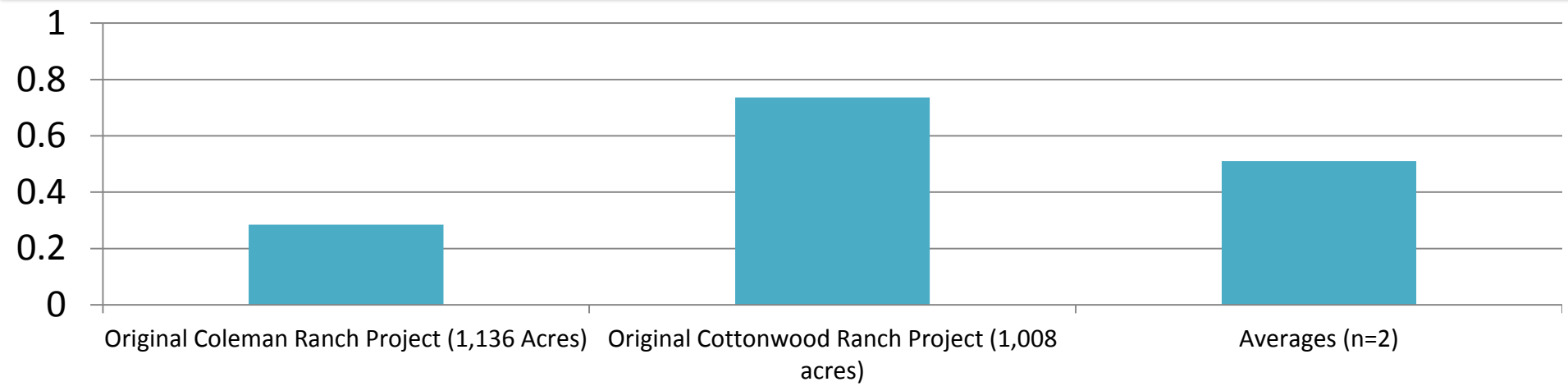
Comparing Original and New Credit/Debit Estimates

| | Original Credit/Debit Estimate | Percent Change w/ Seasonal HSIs | Percent Change w/ New Anthro. Features | New Credit/Debit Estimate | Overall Percent Change |
|---------------------------------------|--------------------------------|---------------------------------|--|---------------------------|------------------------|
| <u>Coleman</u> | 432 | -23% | 0% | 336 | -23% |
| <u>Cottonwood</u> | 742 | -22% | -30% | 405 | -45% |
| <u>Mine 1</u> | 16,454 | -39% | -41% | 6,419 | -61% |
| <u>Mine 2</u> | 4,939 | -52% | -34% | 2,014 | -59% |
| <u>Hypothetical Mine</u> | 5,606 | -32% | -46% | 2,389 | -57% |
| <u>Hypothetical Power Line</u> | 9,690 | -48% | 42% | 7,678 | -21% |



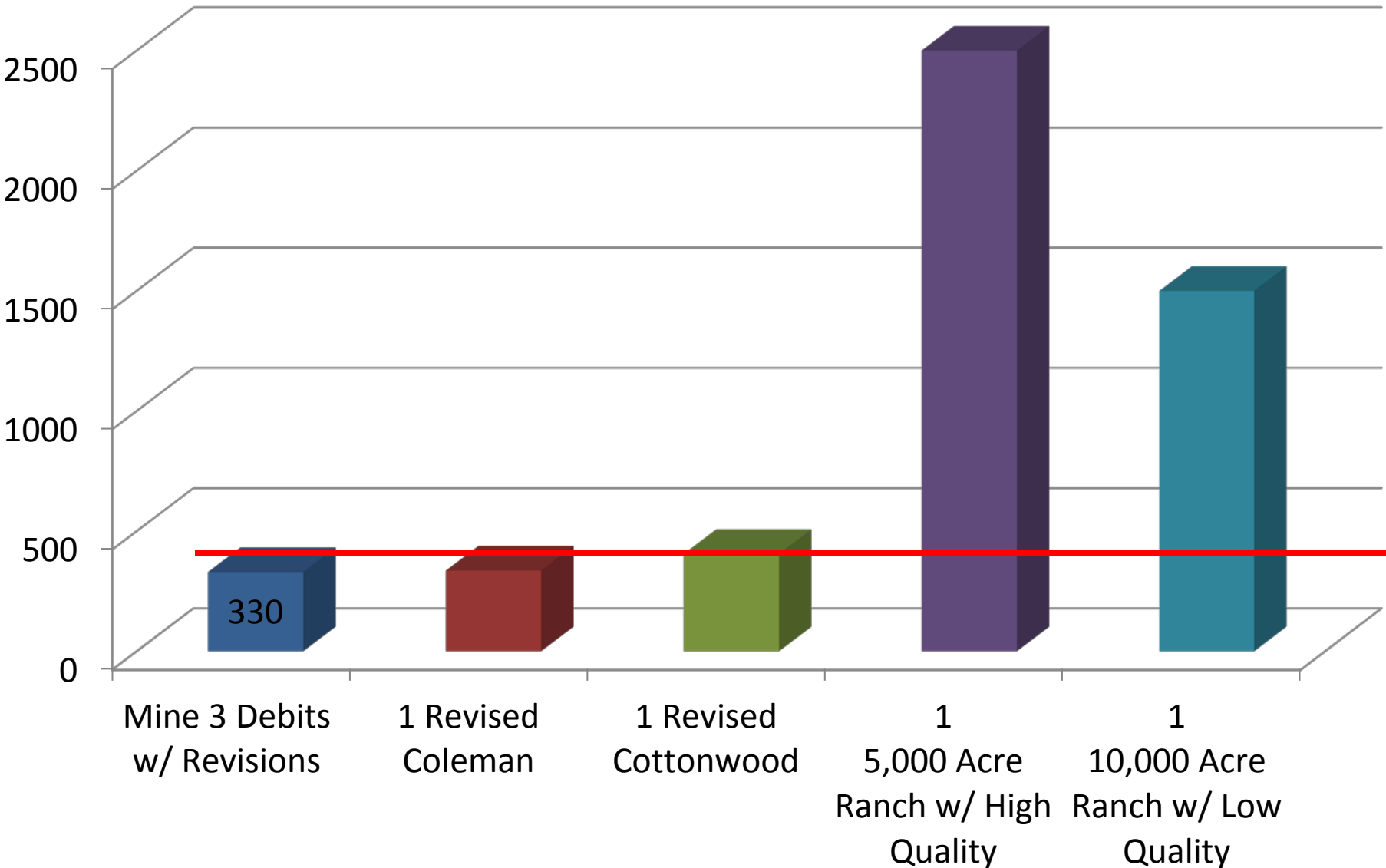


Comparisons of Credits Generated per Acre





Mine 3 Credit Obligation Examples





How does this compare to traditional ratio offsets?

