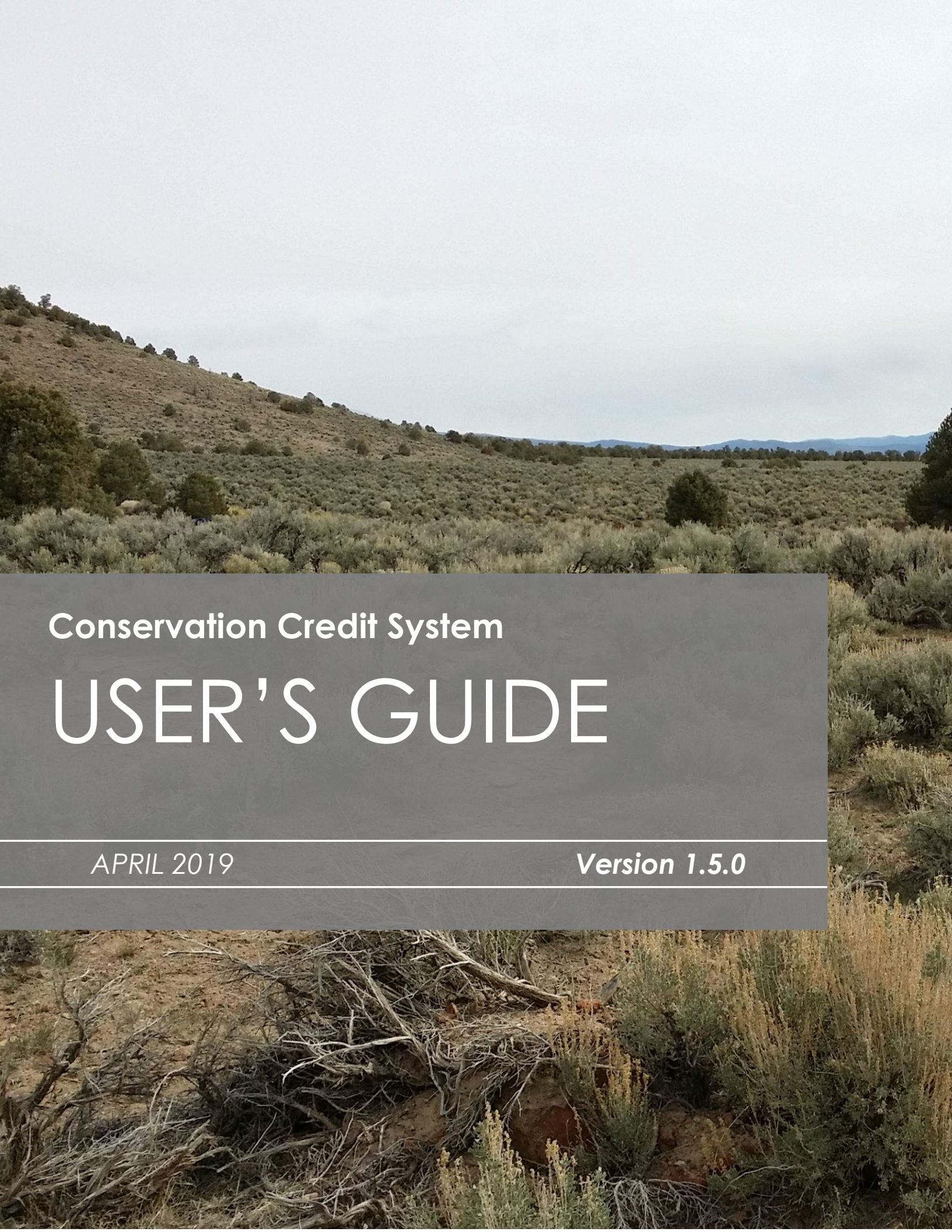

## Conservation Credit System

# USER'S GUIDE

*APRIL 2019* ***Version 1.5.0***

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# INTRODUCTION

The User's Guide describes the detailed steps necessary to calculate credits and credit obligations for credit and debit sites, respectively, for the Nevada Conservation Credit System.

## USER REQUIREMENTS

The User's Guide is intended for use by the Credit System Administrator, Technical Support Providers and Verifiers to calculate credits and credit obligations. Evaluating credit or debit projects requires moderate GIS capabilities. Completing field data collection requires substantial knowledge of sage-grouse biology and extensive experience with field data collection methods, including identification of Great Basin plant species. In addition, there are specific software requirements (as defined at the beginning of each section), including an ESRI ArcGIS license with the Spatial Analyst extension and Microsoft Excel 2007 or later.

## HOW TO USE THE USER'S GUIDE

The User's Guide is organized into three major steps summarized below. All steps should be executed in sequence listed—unless the user has extensive experience and a deep understanding of the steps—in order to ensure accurate calculation of credits and credit obligations and take advantage of efficiencies built into the design of the User's Guide.

1. **Desktop Analysis:** The pre-field Desktop Analysis should be completed first, because a) the Desktop Analysis informs the sampling protocol used in the field analysis, and b) the Desktop Analysis pre-screens credit project sites to ensure that they meet the credit site eligibility requirements (see the Credit System Manual for more on credit site eligibility) before investing significantly more resources to collect field data. The Desktop Analysis should be re-run after field data have been collected and all aspects of the analysis have been finalized and verified, such as the map units and the anthropogenic features. Useful information related to the Desktop Analysis is included in appendices to this User's Guide—please review these appendices carefully if you are unfamiliar with the Desktop Analysis.
2. **Field Data Collections Method:** The Field Data Collection Method can be conducted after the Desktop Analysis. Map units and transect locations may need to be revised during the field visit, which would require portions of the Desktop Analysis to be rerun.
3. **Credit/Credit Obligation Calculation:** The complete Credit/Credit Obligation calculation can only be performed after completing both the Desktop Analysis and Field Data Collection Methods. It is possible to generate some partial estimates of the credit/credit obligation calculation that may be of interest in particular situations (e.g., projected local-scale function, site-scale habitat function) once required data for those elements are available.

# 1. **Desktop** Analysis

# DESKTOP ANALYSIS

## TOOLS REQUIRED

In order to complete the Desktop Analysis, the following tools are required:

- ArcMap (ESRI) version 10.1 or later—Basic (ArcView) license or better required
  - Spatial Analyst extension license
- Python 2.7.2 or later (automatically installed with ArcMap)
- Microsoft Excel (2007 or higher)
- Credit or Debit Project Calculator Version 1.4
- Management Plan and Validation Checklist (credit projects only)
- *Recommended:* Nevada Conservation Credit System Manual and HQT Scientific Methods Document for reference

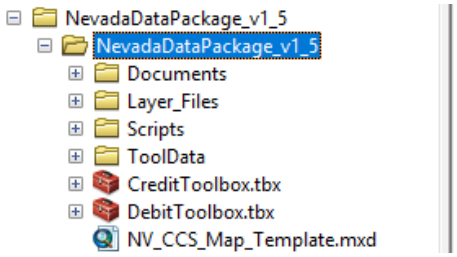
## DATA REQUIRED

The following data should be acquired before beginning the Desktop Analysis:

1. Download and extract the compressed file **NevadaDataPackage_v1_5.zip** to a location on the computer's hard drive. We recommend saving the Nevada Data Package locally, as opposed to an external server, to improve processing time. The Nevada Data Package is available at: https://dcnrftp.ndep.nv.gov.

   Username: SET_public
   Password: SET@1234

   The contents should appear as shown here:




2. Download supplemental data sources:
   - **Synth Map 2008 (or most recent version)**: Use as a supplemental data source for delineating map units. Available at http://heritage.nv.gov/node/164. Download the 'Map High Resolution' and unzip the folder to the desired location. Add the layer file (.lyr) and set the data source as the shapefile (.shp).
   - **Sage-grouse Initiative (SGI) Mesic Resources Maps:** Use the SGI mesic resources maps for delineating meadows. To access the Mesic Resources Layer on ArcGIS:
     - Install this ArcServer: click the Add Data button> from the look in menu navigate to GIS Server (toward the bottom)> Add WMTS Server> Enter http://map.sagegrouseinitiative.com/wmts.xml into the internet server box> Ok.
     - Use the data from the above server: click the Add Data button> navigate to GIS Servers> WMTSGate on map.sagegrouseinitiative.com> Mesic Resources – Persistence.
     - Further information can be found at https://map.sagegrouseinitiative.com.

- **SSURGO (Soil Survey Geographic Database)**: Use the web soil survey data to assist with delineating map units based on ecological site descriptions. Available at http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Download soils data either by navigating to appropriate county and select the most appropriate soils survey based on description or by defining area of interest (AOI) and downloading data for the AOI (Area of Interest).
- **USGS Topographic Maps**: Use for assistance delineating map units. In ArcMap, go to File> 'Add data from ArcGIS Online'. Search for USA Topo. Click "Add" for most recent version. Also available at http://nationalmap.gov/ustopo/.

3. Acquire field data sheets and guidance for the scorecards, located in the Appendices.
4. Acquire the **Proposed Surface Disturbance** or **Credit Project Boundary** shapefile or feature class. This is the area that is being proposed as the debit or credit project and should be provided by the project proponent. If the proposed surface disturbance or credit project boundary shapefile or feature class is not provided, follow the steps below to create it. Ensure you have sufficient information to accurately digitize this layer.
    a. For credit projects:
        i. Create a new feature class, type— "Polygon Features". Name this file **Credit_Project_Boundary**.
        ii. Start an editing session by right-clicking on the layer in the Table of Contents, clicking 'Edit Features', then 'Start Editing'.
        iii. Digitize the area of land on which credits can be generated. For example, areas not designated within management categories are to be excluded as well as lands not eligible to be included in the project. Be sure to save edits and stop editing when done.
    b. For debit projects:
        i. Proceed with the Desktop Analysis, a template feature class will be created for you.
5. You will need to acquire the **Dist_Lek** layer from the Nevada Department of Wildlife by submitting a Data Request Form, available from the NDOW website at http://www.ndow.org/Nevada_Wildlife/Maps_and_Data/Data/. You will be prompted to request this information during the Desktop Analysis and a required shapefile will be generated for you. For Debit projects, see step D6 for more information. For Credit projects, see step C6.
6. Transect locations will be provided by the SETT for credit and debit projects. For Debit projects, see step D12 for more information. For Credit projects, see step C10.

## ANTHROPOGENIC FEATURES EVALUATED DURING THE DESKTOP ANALYSIS

Table 1 contains the codes and indirect effect weights and distances of anthropogenic features. This table is referenced throughout the Desktop Analysis to evaluate impacts from existing and proposed anthropogenic features. It is provided here for quick reference.

Table 1. Anthropogenic Features Considered in the Nevada Conservation Credit System

| TYPE | SUBTYPE | TYPE CODE[†] | SUBTYPE CODE[†] | WEIGHT (%) | DISTANCE (Meters) |
|---|---|---|---|---|---|
| **Towers** | Communications | **Towers** | **Communications** | 75% | 6,000 m |
| | Meteorological | **Towers** | **Meteorological** | 75% | 6,000 m |
| **Powerlines[1]** | Nest Facilitating | **Powerlines** | **Nest_Facilitating** | 75% | 6,000 m |
| | Non-Nest Facilitating | **Powerlines** | **Non_Nest_Facilitating** | 25% | 6,000 m |
| **Mines** | Active – Large | **Mines** | **Active_Large** | 100% | 6,000 m |
| | Active – Med or Small | **Mines** | **Active_Small** | 100% | 3,000 m |
| | Inactive – Large | **Mines** | **Inactive_Large** | 50% | 1,000 m |
| | Inactive – Med or Small | **Mines** | **Inactive_Small** | 10% | 1,000 m |
| | Ancillary – Large | **Mines** | **Active_Large_Ancillary** | 50% | 3000 m |
| | Ancillary – Med or Small | **Mines** | **Active_Small_Ancillary** | 50% | 1500 m |
| **Oil & Gas Wells** | Producing | **Oil_Gas** | **Producing** | 100% | 3,000 m |
| | Inactive | **Oil_Gas** | **Inactive** | 0% | 0 m |
| **Urban, Suburban, Ex-Urban Development[2]** | Med – High | **Urban** | **High** | 100% | 6,000 m |
| | Low | **Urban** | **Low** | 75% | 3,000 m |
| **Roads** | Interstate | **Roads** | **Interstate** | 100% | 6,000 m |
| | High Use – Paved or Improved; Commercial | **Roads** | **High_Use** | 100% | 3,000 m |
| | Low Use – Improved; Local | **Roads** | **Low_Use** | 25% | 1,000 m |
| **Renewable** | Geothermal | **Renewable** | **Geothermal** | 100% | 6,000 m |
| | Ancillary – Geothermal | **Renewable** | **Geothermal_Ancillary** | 50% | 3,000 m |

| | | | | | |
|---|---|---|---|---|---|
| | Solar | **Renewable** | **Solar** | 25% | 1,000 m |
| | Wind | **Renewable** | **Wind** | 25% | 6,000 m |
| **Linear Rights of Way** | LROW – High | **LROW** | **LROW_High** | 50% | 1,000 m |
| | LROW –Low | **LROW** | **LROW_Low** | 25% | 500 m |

[1]The project proponent may request to review and adjust the weight and distance criteria based upon powerline height, construction, perch deterrents or other site-specific factors. Any requests must be submitted to the Administrator and approved by the Scientific Committee.

[2]The Urban Low classification includes landfills.

[t] When digitizing anthropogenic features or categorizing proposed surface disturbance, the Type and Subtype attributes must be exactly the same as the Type and Subtype codes provided in this table, including capitalization. To aid in digitization, editing templates have been provided.

# DEBIT PROJECTS: GUIDANCE FOR COMPLETING THE DESKTOP ANALYSIS

This section describes the process required to assess a debit project. Only a Desktop Certified Verifier should run these tools. Tools provided in the Debit Toolbox are intended to facilitate the assessment of debit projects. User input is required. Please read each step carefully. User tips are provided for each step, some of which may be required to successfully complete the step in certain circumstances. We recommend reviewing this guide in its entirety before starting.

Each tool will add one or more feature classes to the default file geodatabase. Subsequent tools require these feature classes in order to run. Do not modify or rename these feature classes. Only outputs that are added to the Table of Contents and map display should be edited.

If you have already delineated map units and/or current anthropogenic features, you will be able to use those layers in this process. You do not need to re-create those layers. If you have already delineated map units, instructions will be provided in step D9. If you have already digitized current anthropogenic features, instructions will be provided in step D7.

For a description of the tools and the calculations the automated tools are completing, refer to Appendix 4. Debit Tool Overview.

## D1. Create project folder, project geodatabase, and map document

**D1.1** In ArcCatalog, create a new folder for the project. Name this folder following the convention ProjectName_YYYYMMDD.

**D1.2** Within the folder, create a new File Geodatabase (.gdb) by right-clicking on the folder and selecting 'New' > 'File Geodatabase'. Give it the same name as the project folder.

**D1.3** Open **NV_CCS_Map_Template** (.mxd), located in the Nevada Data Package, and save a copy of the map document within the project folder. Give it the same name as the project folder.

**D1.4** If necessary, add the Debit Toolbox to ArcToolbox by right-clicking on the parent ArcToolbox ( ) in the ArcToolbox window and selecting 'Add Toolbox'. Navigate to the Toolbox saved in the Nevada Data Package (see Data Required Section) and click 'Open'. The toolbox should now be available in the list of toolboxes. When working from **The Nevada CCS Map Template**, all toolboxes should already be available.

**D1.5** In ArcMap, open the Catalog window ( ), navigate to the new geodatabase, right click on it and select 'Make Default Database'.

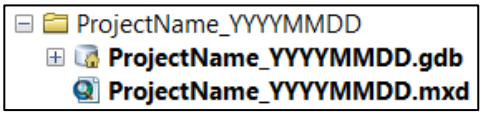



Figure 1: Structure of the project folder

You will submit this Project Folder as a zipped folder (.zip) to the Credit System Administrator along with the Project Calculator.

### Tips

- When creating folder names and file names, use only letters, numbers, and underscores. Do not use other characters. Do not start file names with a number. Some tools will not run properly if there are periods, hyphens, or other symbols in the folder or file names.

## D2. Run Debit Tool 1

[ArcToolbox > DebitTools > Debit Tool 1]

- **Project Geodatabase** = the unique project geodatabase for this project.
- **Proposed Surface Disturbance** = a shapefile or feature class of the area of the proposed surface disturbance. If no feature class or shapefile is provided, a template will be created for you.
- **Debit Project will remove or modify existing anthropogenic features? (optional)** = *check* if the debit project proposes to remove or mitigate existing anthropogenic features. DO NOT check this box if the project is expanding or upgrading an existing feature--only check this box when the project will remove or mitigate the impact of an existing anthropogenic feature.
- **Anthropogenic features to be removed or modified (optional)** = Provide a shapefile or feature class that outlies the specific anthropogenic features to be modified or removed. If no shapefile is provided, a template will be created for you. If the project is expanding or upgrading an existing feature, leave this blank.

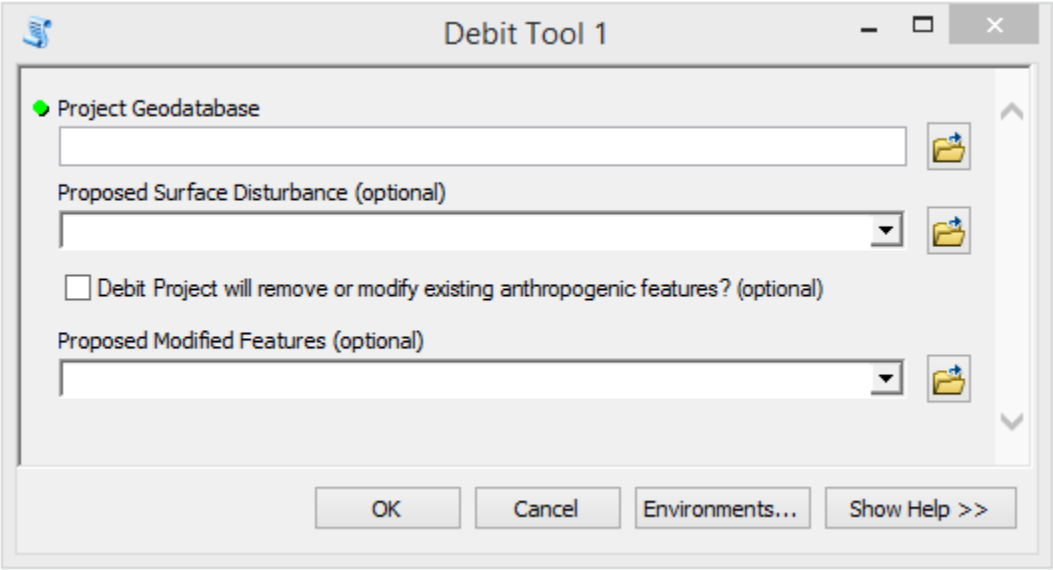



Figure 2. Debit Tool 1 interface

## Tips

- If the **Proposed_Surface_Disturbance** provided by the project proponent is represented by multiple shapefiles, use the Merge tool to merge the shapefiles into a single feature class.

  [ArcToolbox> Data Management> General> Merge]
  - Input Datasets = All shapefiles representing the **Proposed_Surface_Disturbance,**
  - Output Dataset = **Proposed_Surface_Disturbance,**
  - Field Map = *leave as default*.

- Overlapping polygons must be removed from the **Proposed_Surface_Disturbance** layer provided by the project proponent before running Debit Tool 1. Use the Intersect tool to determine if the layer contains overlapping polygons.

  [ArcTools> Analysis> Overlay> Intersect]
  - Input Features = **Proposed_Surface_Disturbance**
  - Output Feature Class = *append* **'_Merged'** *to feature class name*

- Join Attributes = ALL,
- XY Tolerance = *blank*,
- Output Type = INPUT.

- If the Proposed_Surface_Disturbance comprises multiple disturbance types and subtypes (Table 1) or different term limits (temporary or permanent), represent each as a separate polygon. To efficiently split polygons, use the Cut Polygon tool (  ) in the Editor toolbar.
- If overlapping polygons are present, remove any areas of overlap: In an editing session, select an overlapping polygon. Select the Clip tool in the Editor toolbar (Editor> Clip). A dialog box will pop up. Leave the Buffer Distance = 0.0 and select 'Discard the area that intersects', then click OK. Any polygon portions overlapping the selected polygons will be deleted. Repeat for all overlapping polygons. Consult the project proponent if unsure about how to categorize overlapping areas.

## D3. Categorize the Type & Subtype of the Proposed_Surface_Disturbance_Debits layer

**D3.1** In the Table of Contents window, right-click on the **Proposed_Surface_Disturbance_Debit**s layer and open the attribute table.

**D3.2** Start an editing session by right-clicking on the **Proposed_Surface_Distubance_Debits** layer in the Table of Contents and selecting 'Edit Features > Start Editing'.

**D3.3** If a shapefile or feature class was provided, review the features and edit as needed. If not, digitize the outer extent of all proposed anthropogenic features. Ensure that the outer extents of all proposed anthropogenic features are digitized correctly and all pre-populated data is accurate.

**D3.4** Populate the 'Type' and 'Subtype' fields for each feature based on the descriptions in Table 1 (see Appendix 1 for definitions). The 'Proposed Surface Disturbance' file provided by the project proponent will likely contain field codes analogous to the 'Type' and 'Subtype' fields populated with information from Table 1. Work with the project proponent to re-categorize the layer using those field codes if necessary.

**D3.5** Populate the 'Surface_Disturbance' field for each feature based on the type of surface disturbance permitted for that feature. Refer to field code definitions below.

i. **Term_Reclaimed**: a feature permitted for a limited term disturbance (i.e., not perpetual) that will be reclaimed at the end of the project permit.

ii. **Term_Retired**: a feature permitted for a limited term disturbance that will NOT be reclaimed at the end of the project permit (e.g., a mine pit).

iii. **Term_Reclassified**: a feature permitted for a limited term disturbance that will be reclassified to another disturbance type at the end of the permit term (e.g., a High Use haul road that will remain for local traffic following disturbance as a Low Use road).

iv. **Permanent**: a feature permitted for disturbance in perpetuity (e.g. a new High Use road).

**D3.6** For surface disturbance classified as 'Term_Reclassified', populate the 'Reclassified_Subtype' field with the Subtype of the feature planned after the permit expires (see Table 1). For all other features, leave this field blank.

**D3.7** Save the edits and stop editing when done.

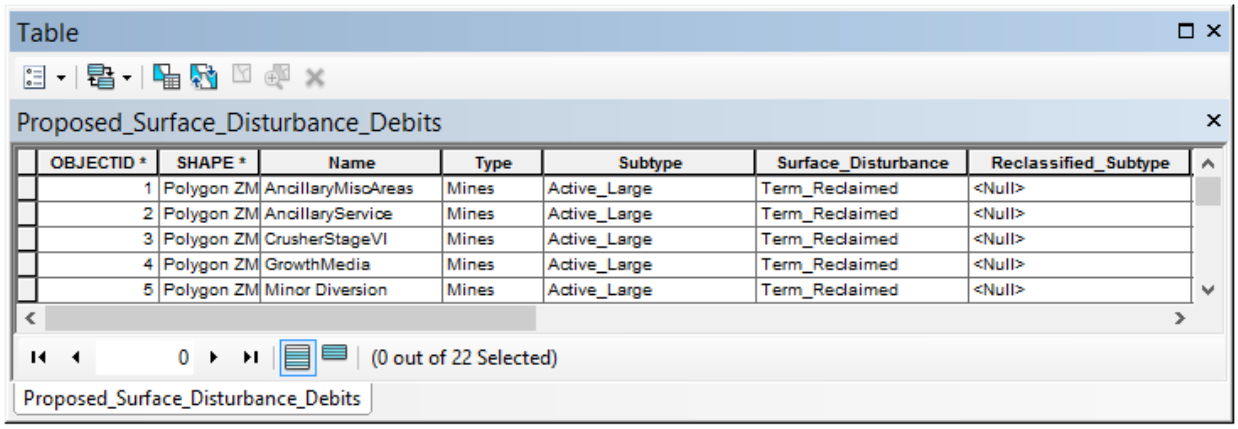



Figure 3: Example Completed Attribute Table for 'Proposed_Surface_Disturbance_Debits' Layer

### Tips

- For debit projects with multiple debit terms, consult with the Credit System Administrator to estimate the credit obligation at each phase of the project.

## D4. OPTIONAL - Identify and delineate anthropogenic features proposed for modification or removal

For debit projects that will remove or modify existing anthropogenic features, digitize and/or populate the attribute table with the 'Type' and 'Subtype' of the anthropogenic features to be removed or modified.

**D4.1** In the Table of Contents window, right-click on the **Proposed_Modified_Features** layer and open the attribute table.

**D4.2** Start an editing session by right-clicking on the **Proposed_Modified_Features** layer in the Table of Contents and selecting 'Edit Features > Start Editing'.

**D4.3** Review any features that are already delineated and edit as needed. Ensure that the outer extents of all anthropogenic features proposed for modification are digitized correctly. Delineate additional features as needed.

**D4.4** Populate the 'Type' and 'Subtype' fields for each entry. Be sure to save edits and stop editing when done. The 'Type' and 'Subtype' provided here should reflect the current 'Type' and 'Subtype' of the feature, NOT the 'Type' and 'Subtype' after modification.

## D5. Run Debit Tool 2

[ArcToolbox > DebitTools > Debit Tool 2]

- **Proposed_Surface_Disturbance_Debits** = the **Proposed_Surface_Disturbance_Debits** layer edited in step D3. Ensure the attribute table has been populated appropriately.
- **Proposed Modified Features (optional) =** the feature class containing the anthropogenic features proposed for modification or removal, if applicable. Ensure the 'Type' and 'Subtype' fields in the attribute table have been populated with the current (not proposed/modified) anthropogenic type and subtype.
- **Project Folder** = the unique folder for this project. A copy of the **Debit_Project_Area** will be saved as a shapefile to this folder. Provide this layer as the 'Project Extent' to NDOW to request the **Dist_Lek** layer.

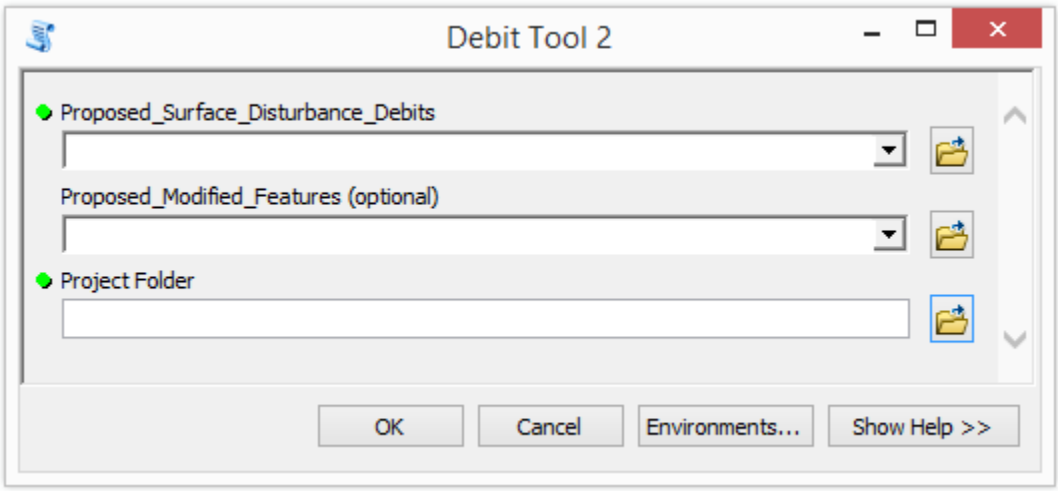



Figure 4. Debit Tool 2 interface

## D6. Acquire the Dist_Lek layer from the Nevada Department of Wildlife (NDOW)

**D6.1** Submit a Data Request Form, available from the NDOW website at http://www.ndow.org/Nevada_Wildlife/Maps_and_Data/Data/.

**D6.2** Provide the **Debit_Project_Area** shapefile as the 'Project Extent'. The **Debit_Project_Area** shapefile is saved in the project folder. Clarify that you are requesting the **Dist_Lek** layer for the purpose of assessing a Debit project site for the Conservation Credit System.

## D7. Identify and delineate anthropogenic features

Review each layer in the Anthro_Feature feature group that was created in Debit Tool 2 as a starting point to help identify and delineate anthropogenic features that exist within the extent of the Analysis_Area. These layers are named 'Anthro_*feature type*_Clip' in the project .gdb, where *feature type* refers to a specific anthropogenic Subtype (e.g. Mines – Large, Active). A combination of these layers, aerial imagery, and knowledge of the site should be used to identify existing anthropogenic features within the extent of the Analysis_Area layer. Also see the additional guidance provided in Appendix 1.

If you have already digitized anthropogenic features and all features have been merged into a single feature class, skip this step and provide that feature class or shapefile as the 'Current_Anthro_Features' parameter in Debit Tool 3. Ensure the 'Type' and 'Subtype' fields in the attribute table are populated with the correct codes found in Table 1. Note that some Subtype codes have changed for anthropogenic features listed in Table 1 in v1.4 of the HQT.

For each anthropogenic feature layer in the Anthro_Feature feature group of the map document that requires modification, edit as follows:

**D7.1** Right click on the layer in the Table of Contents, click 'Edit Features', then click 'Start Editing'. Using editing tools, modify and/or create features as needed.

**D7.2** Open the attribute table and populate the 'Type' and 'Subtype' fields for each entry. Use the 'Type Code' and 'Subtype Code' for each attribute as provided in Table 1. Be sure to save edits and stop editing when done.

### Tips

- Do not change the names of the '**Anthro_*feature type*_Clip**' feature classes in the project's geodatabase. If existing anthropogenic features of a specific type are digitized in a layer other

than the '**Anthro_*_feature type_*_Clip**' layer created by Debit Tool 2, copy and paste those features into the appropriate '**Anthro_*_feature type_*_Clip**' layer.

- Click the Edit tool ( ) on the Editor toolbar
- Click the feature you want to copy. Hold down SHIFT while clicking features to select additional features.
- Click the Copy button ( ) on the Standard toolbar.
- Click the Paste button ( ) on the Standard toolbar.
- Click the '**Anthro_*_feature type_*_Clip**' layer in which to store the pasted feature.
- Click OK. The feature is pasted into the appropriate layer.

- Use the Data Driven Pages feature in ArcGIS to check your work before moving on:
  - Create a grid index to facilitate review of aerial imagery at approximately 1:3,000 scale.

[ArcToolbox> Cartography Tools> Data Driven Pages> Grid Index Features]

- Output Feature Class = a new layer named **GridIndexFeatures**
- Input Features = **Analysis_Area**
- Generate Polygon Grid that intersects input feature layers or datasets = *checked*
- Use Page Unit and Scale = *unchecked*
- Polygon Width = 1000 (in meters)
- Polygon Height = 1000 (in meters)
- *All other fields = blank*

  - Add the Data Driven Pages toolbar (Customize >Toolbars >Data Driven Pages), then set up data driven pages by clicking the Data Driven Page Setup icon ( ) and selecting **GridIndexFeatures** as the Layer. Leave all other options unchanged and click 'OK'.
  - Flip through every page using the next page icon ( ) for a thorough review.

## D8. Run Debit Tool 3

[ArcToolbox > DebitTools > Debit Tool 3]

- **Analysis_Area** = the **Analysis_Area** layer created by Debit Tool 2. This layer MUST be located within the project's unique geodatabase
- **Dist_Lek** = the **Dist_Lek** layer provided by NDOW. This layer should be scaled from 0 - 1 (or within that range) and have the same extent as the **Analysis_Area**. See step D6.
- **Current_Anthro_Features** (optional) = leave blank, unless existing anthropogenic features were not delineated within each '**Anthro_*_feature type_*_Clip**' layer in step D7, in which provide the feature class or shapefile in which anthropogenic features were delineated. Ensure that the provided layer has a 'Type' and 'Subtype' field in the attribute table, and that the Type and Subtype are categorized according to the 'Type Code' and 'Subtype Code' provided in Table 1.

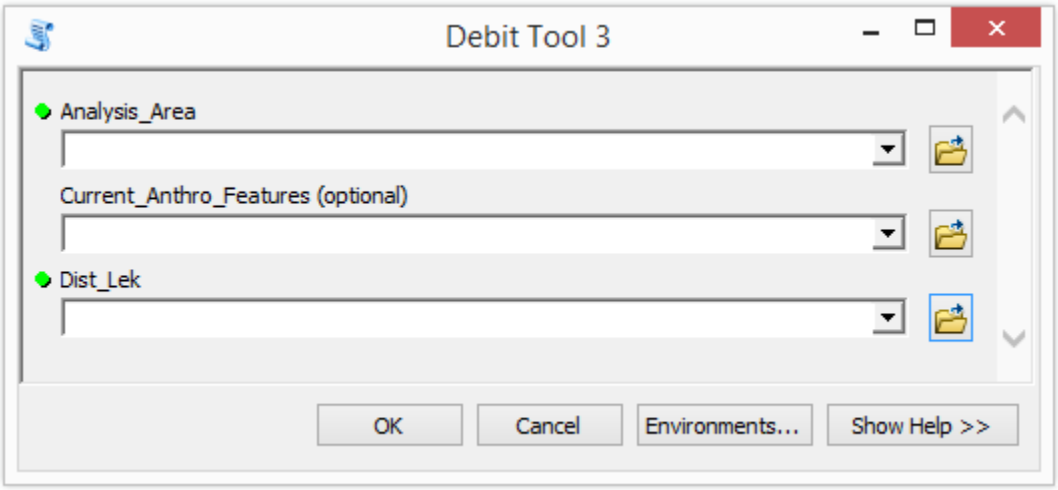



Figure 5: Debit Tool 3 interface

### Tips

- After running Debit Tool 3, a raster layer named **Debit_Project_Impact** has been added to the map document illustrating where the debit project has the most impact on greater sage-grouse habitat. To reduce debits, consider modifying the debit project design to avoid areas of high impact. Re-run the Desktop Analysis to evaluate changes to the project design. You may want to create a new geodatabase so as not to have the original results overwritten.

## D9. Divide Map_Units layer into discrete map units & populate attribute table

If you have already digitized map units, use the Intersect tool [ArcToolbox> Analysis> Overlay> Intersect] to combine the **Map_Units** layer created by Debit Tool 3 and your previously created layer. Under Table Options, uncheck 'Show Field Aliases'. Review the instructions below to ensure the attribute table is populated correctly (ensure you are editing the correct field based on its field name, not alias). In step D10, provided the feature layer created as the 'Map_Units' parameter. Note this layer MUST be located within the project's geodatabase.

**D9.1** Open the attribute table of the **Map_Units** layer.

**D9.2** Start an editing session by right-clicking on the layer in the Table of Contents, clicking 'Edit Features', then 'Start Editing'.

**D9.3** Using the Cut Polygon tool ( ) in the Editor Toolbar, delineate map units in the **Map_Units** layer. See Appendix 2. Guidance for Delineating Map Units for detailed information. You may also use any other geoprocessing tools you desire to create map units. When running Debit Tool 4, provide the final feature class as the **Map_Units** layer. This layer does not need to be named 'Map_Units'.

**D9.4** Name map units numerically and record the name in the 'Map_Unit_ID' field. Map units that appear to be very similar, but not adjacent to each other, can receive the same numerical name and be considered a single map unit. In the field, a visual walk-through should confirm this is the case.

**D9.5** Name each map unit by providing a short description, typically associated with the major vegetation type, in the 'Map_Unit_Name' field. *Important: Ensure that each map unit name associated with a unique map unit is identical.*

**D9.6** For any map units that are meadows, populate the 'Meadow' attribute with 'Altered' or 'Unaltered'. For all other map units, populate the 'Meadow' attribute with 'No_Meadow'.

- Unaltered meadows are defined at naturally occurring wetland complexes, dominated by wetland vegetation and soils (e.g. stringer meadows, springs, seeps) where the hydrology has been minimally altered or is currently not being managed.
- Altered meadows are defined as receiving either controlled irrigation, where the hydrology is currently being altered or managed (e.g. diversions, spreaders), or where the landscape is being functionally altered.

**D9.7** Optional – Capture additional information related to each map unit in the 'Notes' field. The Notes field does not need to be identical for each unique map unit ID. The 'Notes' field for each map unit will be concatenated when dissolving the Map_Units features by Map_Unit_ID. The concatenated notes will be truncated if greater than 255 characters in length.

**D9.8** Save the edits and stop editing when done.

Table

Map_Units

| OBJECTID * | SHAPE * | Conifer_Phase | PJ | BROTEC | Disturbance_Type | SHAPE_Length | SHAPE_Area | Map_Unit_ID | Map_Unit_Name | Meadow | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Polygon ZM | | N/A | N/A | Direct_Term_Reclaimed | 60333.956634 | 6066883.602301 | 2 | Big Sagebrush | No Meadow | <Null> |
| 3 | Polygon ZM | | N/A | N/A | Direct_Term_Reclassified | 1321.205099 | 14267.672283 | 3 | Low Sagebrush | No Meadow | <Null> |
| 4 | Polygon ZM | | N/A | N/A | Direct_Term_Retired | 4140.895599 | 262128.115187 | 4 | Mountain Mahoga | No Meadow | <Null> |
| 5 | Polygon ZM | Phase I | True | True | Indirect | 476667.766388 | 71460836.65821 | 5 | Phase I PJ | No Meadow | <Null> |
| 6 | Polygon ZM | Phase I | True | True | Direct_Term_Reclaimed | 69945.576095 | 4441127.652139 | 6 | Phase I PJ | No Meadow | <Null> |

6 (0 out of 11 Selected)

Map_Units

Figure 6: Example completed map unit attribute table

## Tips

- Before beginning to delineate map units, we recommend referencing the DRG layer and grouping the ecological sites into the identified DRG groups that are listed in the attribute table. Use supplemental data sources identified in the *Data Required* section for assistance in meadow delineation and other unique features.
- Useful information about stratification has been developed by the US Department of Agriculture (Herrick et al., 2009, Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems, Chapter 2 – "Stratify Land into Monitoring Units", page 131).
- Map units should always be confirmed in the field.
- Ensure snapping is enabled (add the Snapping Toolbar if necessary). Also ensure 'Snap to Sketch' is enabled once in your editing session, this will allow you to create map units that are fully contained within one other map unit.
- Meadows should be digitized as distinct map units. Meadows are important resources for sage-grouse and so take care in identifying and delineating all meadows within the project area.

## D10. Run Debit Tool 4

[ArcToolbox > DebitTools > Debit Tool 4]

- **Map Units** = the feature class or shapefile containing the delineated map units, most often the **Map_Units** layer. The provided feature class MUST be located within the project's unique geodatabase.
- **Project Folder** = the unique folder for this project. Excel files containing the outputs from this process will be saved to this folder.
- **Project Name** = a unique name which will be included in the output file name, if desired.

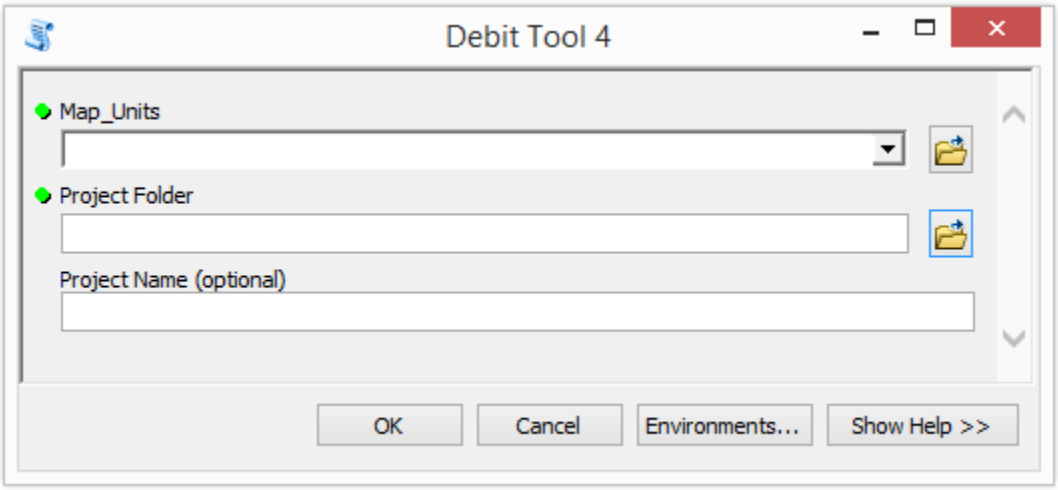



Figure 7: Debit Tool 4 interface

### Tips

- If a feature class named **Map_Units_Dissolve** already exists in the project geodatabase (which may be the case if you did not follow these steps but delineated map units through a separate process), that feature class will be overwritten by Debit Tool 4. You may either change that layer's name (we recommend **Map_Units_Copy**) or save a copy outside of the project geodatabase if overwriting that layer is not desired.

## D11. Specify number of transects for each map unit

**D11.1** Open the attribute table of the **Map_Units_Dissolve** layer.

**D11.2** Populate the 'Transects' field for each map unit with the number of transects to be sampled (the SETT recommends populating the Transects field with 3 times the number of transects as recommended to have sufficient back up transects) within each map unit according to the necessary sampling intensity (see Appendix 3. Recommended Transects Per Map Unit). For the map unit associated with existing surface disturbance, and any other map units where field data will not be collected, input '0'.

**D11.3** Save edits and stop editing when done.

### Tips

- A number of transects should only be specified for map units that will be sampled in the field. For map units where field data will not be collected, input '0' in the 'Transects' field.

## D12. Acquire an approved Transects layer from the SETT

**D12.1** Provide the **Map_Units_Dissolve** shapefile to the SETT with the Transect attribute populated. SETT will generate spatially balanced transects pre-screened for hazards including steep slopes for each project.

## D13. Run Debit Tool 5

[ArcToolbox > DebitTools > DebitTool_5]

- **Map_Units_Dissolve** = the Map_Units_Dissolve layer created by Debit Tool 4. Ensure the 'Transects' field of the attribute table has been populated appropriately (if Transects have not been generated through a separate process).
- **Transects** = A point shapefile or feature class that represents transect locations.
- **Project_Folder =** The unique folder for this project. An Excel file with transect locations and bearings will be saved here.
  **Project_Name** (optional) = Provide a unique name which will be included in the output file name, if desired.

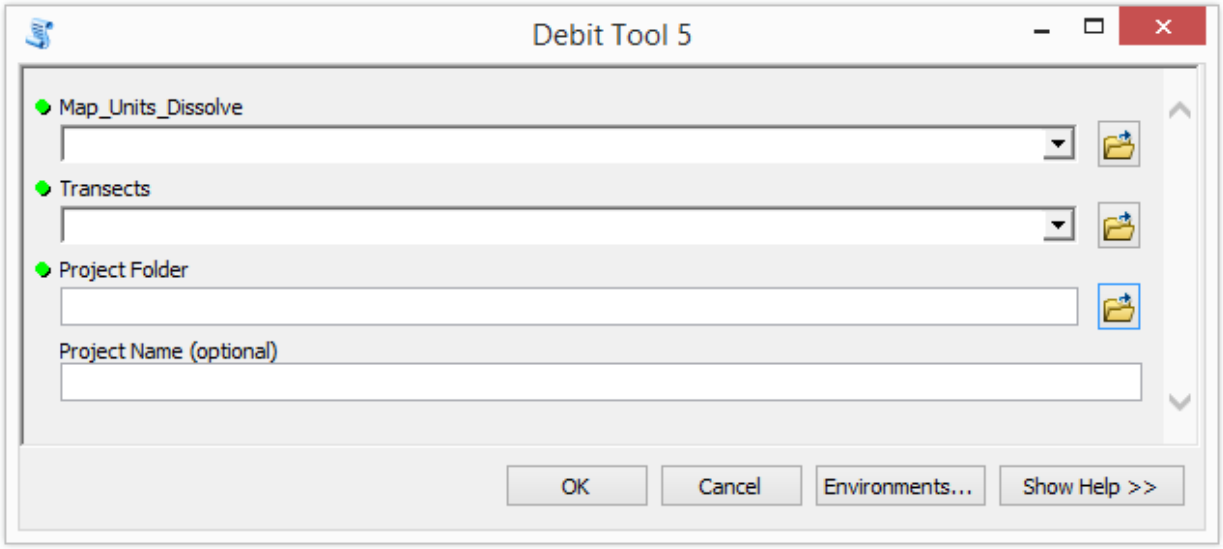



Figure 8: Debit Tool 5 interface

## D14. Add the exported data to the Debit Project Calculator

**D14.1** Open the project folder to find exported data tables as Excel files.

**D14.2** Copy the relevant columns from the tables and Paste Values into the corresponding worksheets and columns in the Project calculator. Strict copy and paste can lead to cell formatting changes. See Figure 9 for a list of data generated during the Desktop Analysis that must be inputted into the Project HQT Calculator.

| | EXPORT TABLE | CALCULATOR WORKSHEET |
|---|---|---|
| ☐ | **Map_Units_Dissolve** | 1.1 Enter Map Unit Data |
| ☐ | **Current_Mgmt_Cat** | 1.3 Enter Mgmt Cats Data |
| ☐ | **Current_WMZ** | 1.3 Enter Mgmt Cats Data |
| ☐ | **Current_PMU** | 1.3 Enter Mgmt Cats Data |
| ☐ | **Current_Precip** | 1.3 Enter Mgmt Cats Data |
| ☐ | **Transects_SpatialJoin** | 1.2 Enter Transects Data |

Figure 9: Export Tables generated and corresponding Calculator worksheet

## Tips

- The Calculator includes more detailed instructions for how to input data from each field datasheet. See rows 1 and 2 in the relevant worksheet in the Calculator.
- After receiving Transect locations from the SETT, you are ready to complete Section 2. *Field Data Collection Method*. The field crew will confirm the boundaries of map units, add or remove transect locations, and confirm the location of anthropogenic features. When field work is complete, make any necessary revisions to the **Map_Units_Dissolve** layer, **Transects** layer, and **Current_Anthro_Features** layer.
- If the field crews recommend changes to the **Map_Units_Dissolve** layer, **Transects** layer, and **Current_Anthro_Features** layer, make necessary revisions and redo steps D8, D10, D13 and D14. Specify the updated **Map_Units_Dissolve** layer for the Map_Units parameter in Debit Tool 3 and updated **Current_Anthro_Features** layer for the Current_Anthro_Features parameters in Debit Tool 4.
- If the Credit Buyer has decided to use 100% site scale function in lieu of field sampling, change the "Current Average Seasonal HSI" for Spring, Summer, and Winter to 100% in Sheet '1.1 Enter Map Unit Data' in the Debit Project Calculator.

# CREDIT PROJECTS: GUIDANCE FOR COMPLETING THE DESKTOP ANALYSIS

This section describes the process required to assess credit projects. Only a Desktop Certified Verifier should run these tools. Tools provided in the Credit Toolbox are intended to facilitate the assessment of credit projects. User input is required. Please read each step carefully. User tips are provided for each step, some of which may be required to successfully complete the step in certain circumstances. We recommend reviewing this guide in its entirety before starting.

Each tool will add one or more feature classes to the default file geodatabase. Subsequent tools require these feature classes in order to run. Do not modify or rename these feature classes. Only outputs that are added to the Table of Contents and map display should be edited.

If you have already delineated map units and anthropogenic features, you will be able to use those layers in this process. You do not need to recreate those layers. If you have already delineated map units, instructions will be provided in step C2. If you have already digitized existing anthropogenic features, instructions will be provided in step C7.

For a description of the tools and the calculations the automated tools are completing, refer to Appendix 5. Credit Tool Overview.

## C1. Create project folder, project geodatabase, and map document

**C1.1** In ArcCatalog, create a new folder for the project. Name this folder following the convention **ProjectName_YYYYMMDD.**

**C1.2** Within the folder, create a new File Geodatabase (.gdb) by right-clicking on the folder and selecting 'New' > 'File Geodatabase'. Give it the same name as the project folder.

**C1.3** Open **NV_CCS_Map_Template** (.mxd), located in the Nevada Data Package, and save a copy of the map document within the project folder. Give it the same name as the project folder.

**C1.4** If necessary, add the Credit Toolbox to ArcToolbox by right-clicking on the parent ArcToolbox ( ) in the ArcToolbox window and selecting 'Add Toolbox'. Navigate to the Toolbox saved in the Nevada Data Package (see Data Required Section) and click 'Open'. The toolbox should now be available in the list of toolboxes. When working from The Nevada CCS Map Template, all toolboxes should already be available.

**C1.5** In ArcMap, open the Catalog window ( ), navigate to the new geodatabase, right click on it and select 'Make Default Database'.

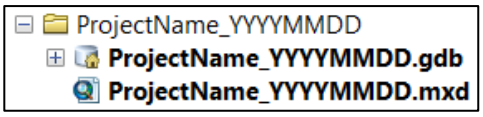



Figure 10: Structure of the project folder

You will submit this Project Folder as a zipped folder (.zip) to the Credit System Administrator along with the Project Calculator.

### Tips

- When creating folder names and file names, use only letters, numbers, and underscores. Do not use other characters. Do not start file names with a number. Some tools will not run properly if there are periods, hyphens, or other symbols in the folder or file names.

## C2. Run Credit Tool 1

If you have already delineated map units, provide that feature class or shapefile as the 'Credit_Project_Boundary' parameter in Credit Tool 1. Review step C3 to ensure map units were delineated correctly and, after running Credit Tool 1, populate the attribute table appropriately.

[ArcToolbox > CreditTools > Credit Tool 1]

- **Project Geodatabase** = the unique project geodatabase for this project.
- **Credit_Project_Boundary** (optional) = the area that is being proposed as the credit project, provided by the project proponent. If no shapefile was provided, see step 4 in the *Data Required* section to create this layer. If the credit project proponent does not own or control any land related to the project, leave blank. This parameter is only optional if the credit project proposes to remove or modify existing anthropogenic features and the project proponent does not own or control any land within the area of indirect benefits.
- **Credit Project will remove or modify existing anthropogenic features?** (optional) = *check* if the project proposes to remove or modify existing anthropogenic features.
- **Proposed Modified Features** (optional) = provide a shapefile or feature class that outlines the specific anthropogenic features to be modified or removed. If no shapefile is provided, a template feature class will be generated for you, provided the box described above is checked.

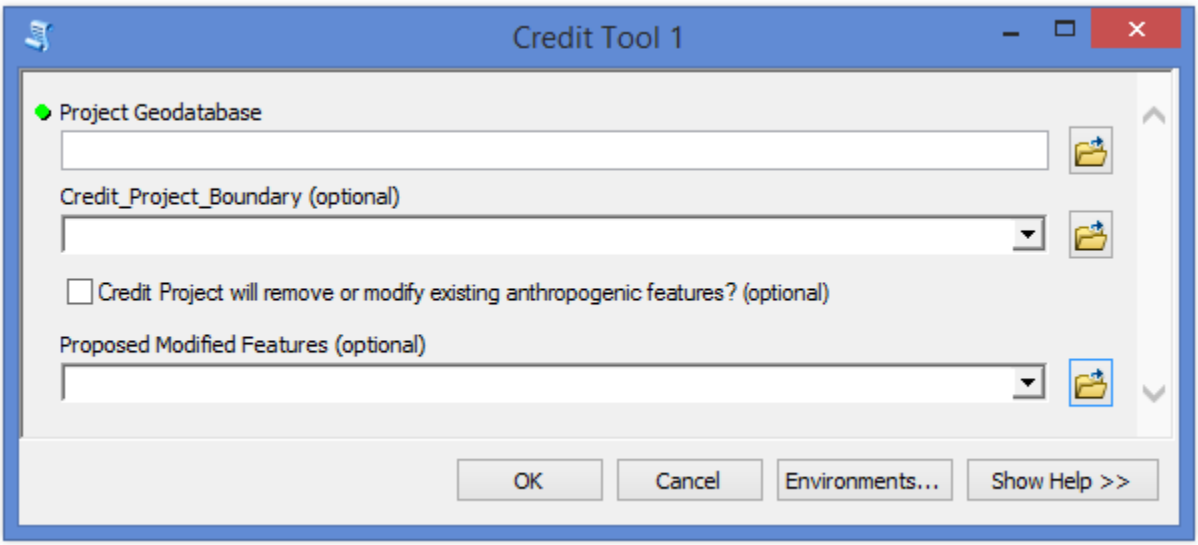



Figure 11: Credit Tool 1 interface

### Tips

- If the **Credit_Project_Boundary** provided by the project proponent is represented by multiple shapefiles, use the Merge tool to merge the shapefiles into a single feature class.

  [ArcToolbox> Data Management> General> Merge]

  - Input Datasets = All shapefiles representing the **Credit_Project_Boundary,**
  - Output Dataset = *append* **'_Merged'** *to feature class name*,
  - Field Map = *leave as default*.

- Overlapping polygons must be removed from the **Credit_Project_Boundary** layer provided by the project proponent before running Credit Tool 1. Use the Intersect tool to determine if the layer contains overlapping polygons.

[ArcTools> Analysis> Overlay> Intersect]

- Input Features = **Credit_Project_Boundary**
- Output Feature Class = *append* **'_Merged'** *to feature class name*
- Join Attributes = ALL,
- XY Tolerance = *blank*,
- Output Type = INPUT.
- If overlapping polygons are present, remove any areas of overlap: In an editing session, select an overlapping polygon. Select the Clip tool in the Editor toolbar (Editor> Clip). A dialog box will pop up. Leave the Buffer Distance = 0.0 and select 'Discard the area that intersects', then click OK. Any polygon portions overlapping the selected polygons will be deleted. Repeat for all overlapping polygons. Consult the project proponent if unsure about how to categorize overlapping areas.

- The box for the *Credit Project will remove or modify existing anthropogenic features?* MUST be checked if the project proposes to modify or remove existing anthropogenic features, even if a shapefile is provided for the Proposed Surface Disturbance parameter.

## C3. Divide Map_Units layer into discrete map units & populate attribute table

**C3.1** Open the attribute table of the **Map_Units** layer.

**C3.2** Start an editing session by right-clicking on the layer in the Table of Contents, clicking 'Edit Features', then 'Start Editing'.

**C3.3** Using the Cut Polygon tool (  ) in the Editor Toolbar, delineate map units in the **Map_Units** layer. See Appendix 2. Guidance for Delineating Map Units for detailed information. You may also use any other geoprocessing tools you desire to create map units. When running Credit Tool 2, provide the final feature class as the **Map_Units** layer. This layer does not need to be named 'Map_Units'.

**C3.4** Name map units numerically and record the name in the 'Map_Unit_ID' field. Map units that appear to be very similar, but not adjacent to each other, can receive the same numerical name and be considered a single map unit. In the field, a visual walk-through should confirm this is the case.

**C3.5** Name each map unit by providing a short description, typically associated with the major vegetation type, in the 'Map_Unit_Name' field.

**C3.6** For any map units that are meadows, populate the 'Meadow' attribute with 'Altered' or 'Unaltered'. For all other map units, populate the 'Meadow' attribute with 'No_Meadow'.

- Unaltered meadows are defined at naturally occurring wetland complexes, dominated by wetland vegetation and soils (e.g. stringer meadows, springs, seeps) where the hydrology has been minimally altered or is currently not being managed.
- Altered meadows are defined as receiving either controlled irrigation, where the hydrology is currently being altered or managed (e.g. diversions, spreaders), or where the landscape is being functionally altered.

**C3.7** Optional – Capture additional information related to each map unit in the 'Notes' field. The 'Notes' field does not need to be identical for each unique map unit ID. The 'Notes' field for each map unit will be concatenated when dissolving the Map_Units features by Map_Unit_ID. The concatenated notes will be truncated if greater than 255 characters in length.

**C3.8** For projects proposing to remove conifer cover, the PJ_Phases shapefile will be used to automatically identify areas of Phase I and II conifer to delineate as separate map units.

- These Phase I and II layers should be ground-truthed and modified as needed. The conifer layers occasionally pick up Mountain Mahogany, and thick tree-like riparian shrubs. If a PJ layer needs to be modified, work closely with the SETT to receive an updated PJ_Phases and PJ_Uplift layers that are required to calculate uplift from conifer removal.

**C3.9** Save the edits and stop editing when done.

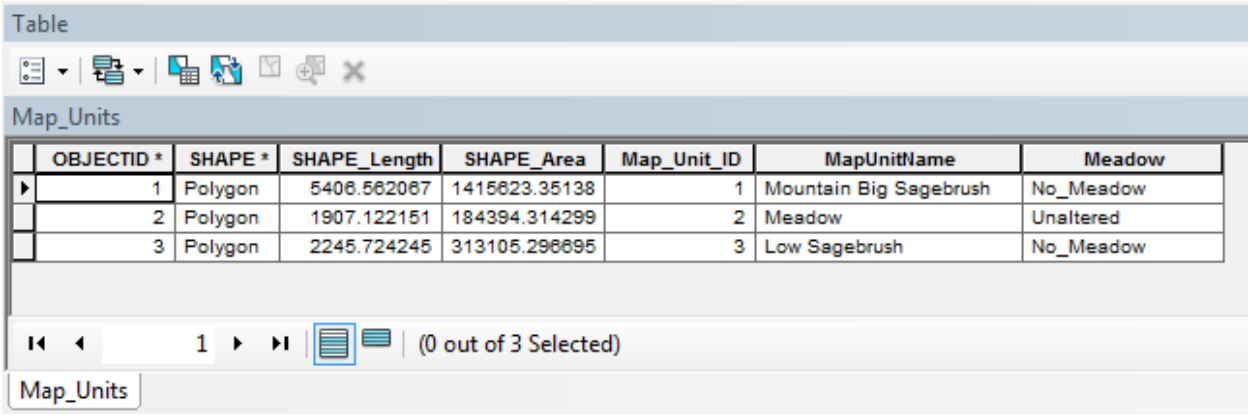



Figure 12: Example completed Map_Unit attribute table

## Tips

- Before beginning to delineate map units, we recommend referencing the DRG layer and grouping the ecological sites into the identified DRG groups that are listed in the attribute table. Use supplemental data sources identified in the *Data Required* section for assistance in meadow delineation and other unique features.
- Useful information about stratification has been developed by the US Department of Agriculture (Herrick, et al., 2009, Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems, Chapter 2 – "Stratify Land into Monitoring Units", page 131).
- Map units should always be confirmed in the field.
- Ensure snapping is enabled (add the Snapping Toolbar if necessary). Also ensure 'Snap to Sketch' is enabled once in your editing session, this will allow you to create map units that are fully contained within one other map unit.
- Meadows should be digitized as distinct map units. Meadows are important resources for sage-grouse and so take care in identifying and delineating all meadows within the project area.
- If very small (< 900 square meters) map units are created when the conifer map units are automatically created, use the Delete Vertex tool ( ) to delete the vertices that segment the small map unit from the surrounding map unit. That small map unit will be subsumed into the surrounding map unit.

## C4. OPTIONAL - Identify and delineate anthropogenic features proposed for modification

**C4.1** In the Table of Contents window, right-click on the **Proposed_Modified_Features** layer and open the attribute table.

**C4.2** Start an editing session by right-clicking on the **Proposed_Modified_Features** layer in the Table of Contents and selecting 'Edit Features > Start Editing'.

**C4.3** Review any features that are already delineated and edit as needed. Ensure that the outer extents of all anthropogenic features proposed for modification are digitized correctly. Delineate additional features as needed.

**C4.4** Populate the 'Type' and 'Subtype' fields for each entry. Be sure to save edits and stop editing when done. The 'Type' and 'Subtype' provided here should reflect the current 'Type' and 'Subtype' of the feature, NOT the 'Type' and 'Subtype' after modification.

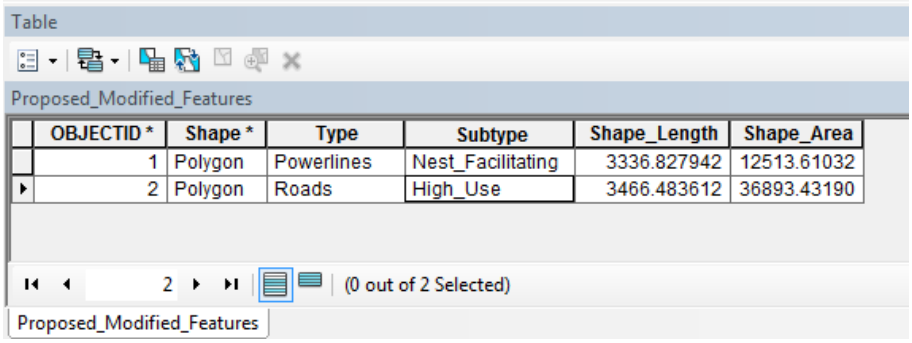



Figure 13: Example completed Proposed_Modified_Features attribute table

## C5. Run Credit Tool 2

[ArcToolbox > CreditTools > Credit Tool 2]

- **Map_Units or Modified_Anthro_Features** = the Map_Units layer edited in step C3. The provided feature class MUST be located within the project's unique geodatabase.
- **Proposed_Modified_Features** (optional) = the Proposed_Modified_Features layer edited in step C4. The provided feature class MUST be located within the project's unique geodatabase.
- **Project Folder** = the unique folder for this project. A copy of the **Credit_Project_Area** will be saved as a shapefile to this folder. Provide this layer as the 'Project Extent' to NDOW to request the **Dist_Lek** layer.

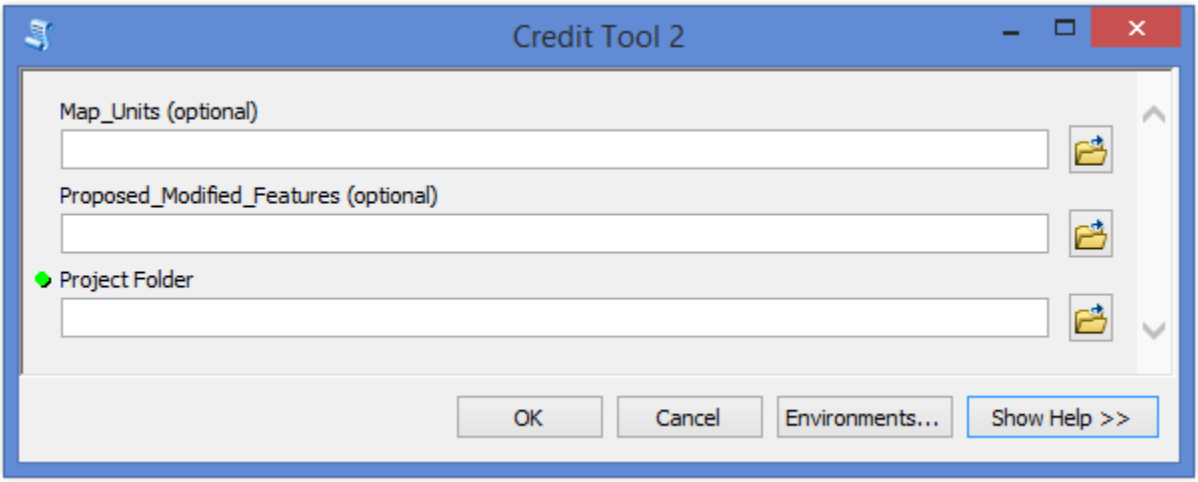



Figure 14: Credit Tool 2 interface

## C6. Acquire the Dist_Lek layer from the Nevada Department of Wildlife (NDOW)

**C6.1** Submit a Data Request Form, available from the NDOW website at http://www.ndow.org/Nevada_Wildlife/Maps_and_Data/Data/.

**C6.2** Provide the **Credit_Project_Area** layer as the 'Project Extent'. The **Credit_Project_Area** layer is saved as a shapefile in the project folder. Clarify that you are requesting the **Dist_Lek** layer for the purpose of assessing a Credit project site for the Conservation Credit System.

## C7. Identify and delineate anthropogenic features

Review each layer in the Anthro_Feature feature group that was created in Credit Tool 2as a starting point to help identify and delineate anthropogenic features that exist within the extent of the Analysis_Area. These layers are named 'Anthro_*feature type*_Clip' in the project .gdb, where *feature type* refers to a specific anthropogenic Subtype (e.g. Mines). A combination of these layers, aerial imagery, and knowledge of the site should be used to identify existing anthropogenic features within the Analysis_Area layer. Also see the additional guidance provided in Appendix 1.

If you have already digitized anthropogenic features and all features have been merged into a single feature class, skip this step and provide that feature class or shapefile as the 'Current_Anthro_Features' parameter in Credit Tool 3. Ensure the 'Type' and 'Subtype' fields in the attribute table are populated with the correct codes found in Table 1. Note that some Subtype codes have changed for anthropogenic features listed in Table 1 in v1.4 of the HQT.

For each anthropogenic feature layer in the Anthro_Feature feature group of the map document that requires modification, edit as follows:

**C7.1** Right click on the layer in the Table of Contents, click 'Edit Features', then click 'Start Editing'. Using editing tools, modify and/or delineate features as needed.

**C7.2** Open the attribute table and populate the 'Type' and 'Subtype' fields for each entry. Use the Type Code and Subtype Code for each attribute as provided in Table 1. Be sure to save edits and stop editing when done.

**C7.3** For credit projects that propose to remove or modify existing anthropogenic features, populate the 'Subytpe_As_Modified' field with the subtype that the feature will be modified to. If the feature is to be removed, select N/A. If the project will not remove or modify existing anthropogenic features, this attribute field will not be present.

### Tips

- Do not change the names of the '**Anthro_*_feature type_*_Clip**' layers. If existing anthropogenic features of a specific type are digitized in a layer other than the '**Anthro_*_feature type_*_Clip**' layer created by Credit Tool 2, copy and paste those features into the appropriate '**Anthro_*_feature type_*_Clip**' layer.
  - Click the Edit tool ( ▶ ) on the Editor toolbar
  - Click the feature you want to copy. Hold down SHIFT while clicking features to select additional features.
  - Click the Copy button (  ) on the Standard toolbar.
  - Click the Paste button (  ) on the Standard toolbar.
  - Click the '**Anthro_*_feature type_*_Clip**' layer in which to store the pasted feature.
  - Click OK. The feature is pasted into the appropriate layer.

- Use the Data Driven Pages feature in ArcGIS to check your work before moving on:
    - Create a grid index to facilitate review of aerial imagery at approximately 1:3,000 scale.

[ArcToolbox> Cartography Tools> Data Driven Pages> Grid Index Features]

- Output Feature Class = a new layer named **GridIndexFeatures**
- Input Features = **Analysis_Area**
- Generate Polygon Grid that intersects input feature layers or datasets = *checked*
- Use Page Unit and Scale = *unchecked*
- Polygon Width = 1000 (in meters)
- Polygon Height = 1000 (in meters)
- *All other fields = blank*
    - Add the Data Driven Pages toolbar (Customize >Toolbars >Data Driven Pages), then set up data driven pages by clicking the Data Driven Page Setup icon ( ) and selecting **GridIndexFeatures** as the Layer. Leave all other options unchanged and click 'OK'.
    - Flip through every page using the next page icon ( ) for a thorough review.

## C8. Run Credit Tool 3

[ArcToolbox > CreditTools > Credit Tool 3]

- **Analysis_Area** = the **Analysis_Area** layer created by Credit Tool 2. This layer MUST be located within the project's unique geodatabase.
- **Dist_Lek** = the Dist_Lek layer provided by NDOW. This layer should be scaled from 0 - 1 (or within that range) and have the same extent as the **Analysis_Area**. See step C6.
- **Current_Anthro_Features** (optional) = leave blank, unless existing anthropogenic features were not delineated within each '**Anthro_**feature type**_Clip**' feature in step C7, in which provide the feature class or shapefile in which anthropogenic features were delineated. Ensure that the provided layer has a 'Type' and 'Subtype' field in the attribute table, and that the Type and Subtype are categorized according to the 'Type Code' and 'Subtype Code' provided in Table 1.
- **Project Folder** = the unique folder for this project. Excel files containing the outputs from this process will be saved to this folder.
- **Project Name** (optional) = a unique name which will be included in the output file name, if desired.

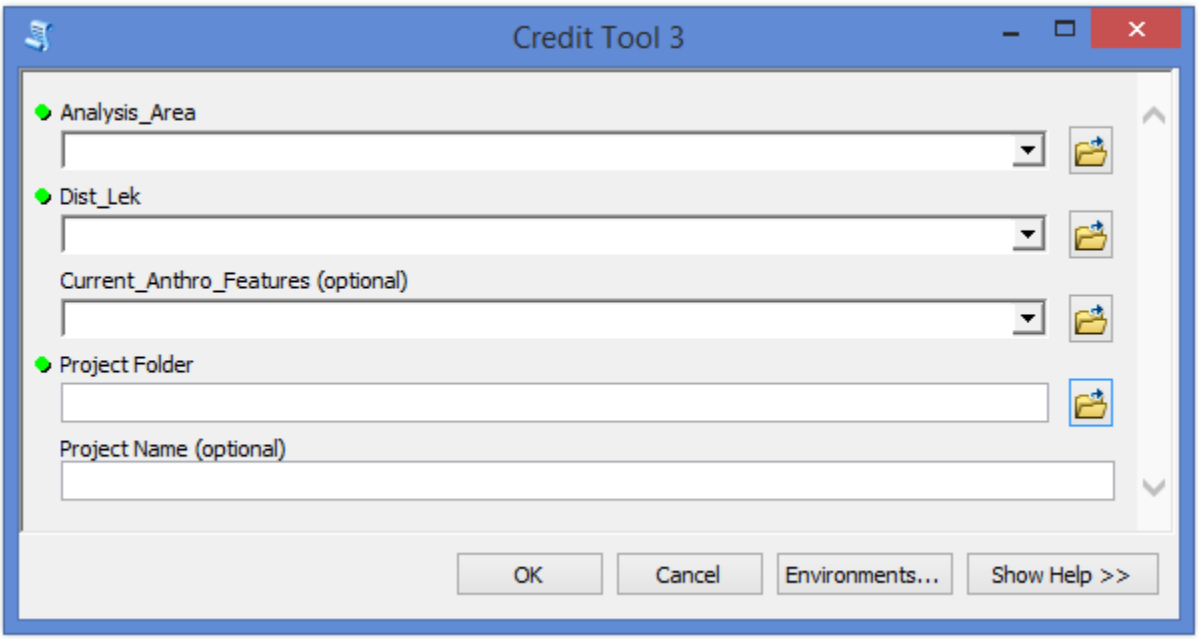



Figure 15: Credit Tool 3 interface

### Tips

- If a feature class named **Map_Units_Dissolve** already exists in the project geodatabase (which may be the case if you did not follow these steps but delineated map units through a separate process), that feature class will be overwritten by Credit Tool 3. You may either change that layer's name (we recommend **Map_Units_Dissolve_Copy**) or save a copy outside of the project geodatabase if overwriting that layer is not desired.

## C9. Specify number of transects for each map unit

**C9.1** Open the attribute table of the **Map_Units_Dissolve** layer.

**C9.2** Populate the 'Transects' field for each map unit with the number of transects to be sampled within each map unit according to the necessary sampling intensity (see Appendix 3. Recommended Transects Per Map Unit). The SETT recommends populating the Transects field with 3 times the number of transects as recommended for the map unit size. Refer to Appendix 3 for more guidance in transect generation and screening in the Desktop Analysis. For the map unit associated with existing surface disturbance, and any other map units where field data will not be collected, input '0'.

**C9.3** Save edits and stop editing when done.

### Tips

- Transect numbers should only be specified for map units that will be sampled in the field. For map units where field data will not be collected, input '0' in the 'Transects' field.
- After running Credit Tool 3, a raster layer named **Credit_Quality** has been added to the map document illustrating the local-scale habitat quality of the project. You may consider changing the credit project design if local-scale habitat quality is poor. Re-run the Desktop Analysis to evaluate changes to the project design. You may want to create a new geodatabase so as not to have the original results overwritten.

## C10. Acquire an approved Transects layer from the SETT

C10.1 Provide the **Map_Units_Dissolve** shapefile to the SETT with the Transect attribute populated. SETT will generate spatially balanced transects pre-screened for hazards including steep slopes for each project.

## C11. Run Credit Tool 4

[ArcToolbox > CreditTools > Credit Tool 4]

- **Map_Units_Dissolve** = the Map_Units_Dissolve layer created by Credit Tool 3. Ensure the 'Transects' field of the attribute table has been populated appropriately (if Transects have not been generated through a separate process)
- **Transects** = A point shapefile or feature class that represents transect locations.
- **Project_Folder =** The unique folder for this project. An Excel file with transect locations and bearings will be saved here.
  **Project_Name** (optional) = Provide a unique name which will be included in the output file name, if desired.

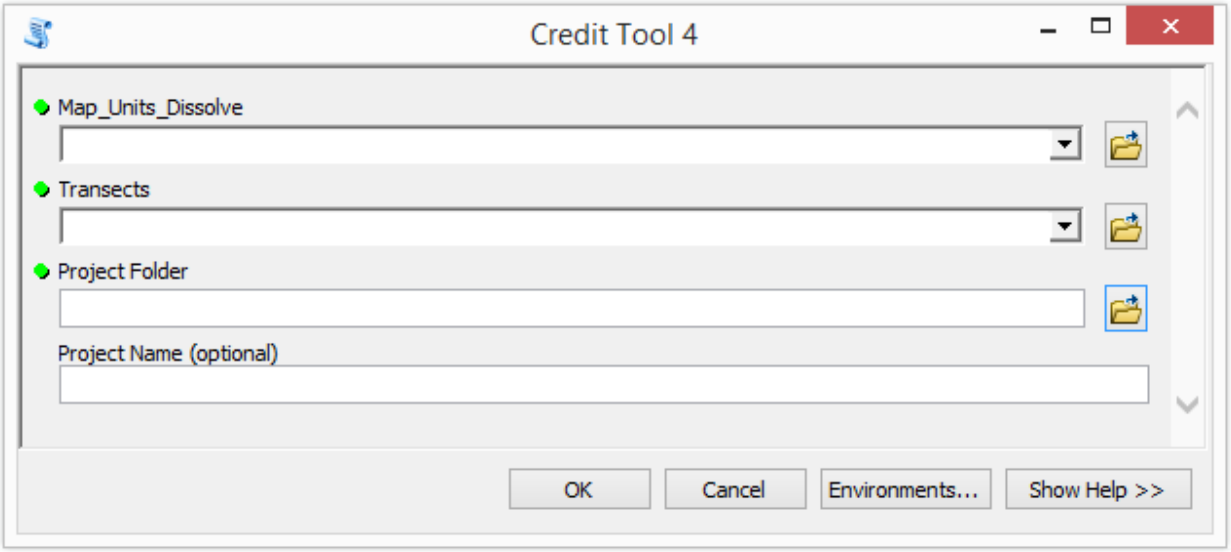



Figure 16: Credit Tool 4 interface

## C12. Add the exported data to the Credit Project Calculator

C12.1 Open the project folder to find exported data tables as Excel files.

C12.2 Copy the relevant columns from the tables and Paste Values into the corresponding worksheets and columns in the Project calculator. Strict copy and paste can lead to cell formatting changes See Figure 17 for a list of data generated during the Desktop Analysis that must be inputted into the Project HQT Calculator.

| | EXPORT TABLE | CALCULATOR WORKSHEET |
|---|---|---|
| ☐ | **Map_Units_Dissolve** | 1.1 Enter Map Unit Data |
| ☐ | **Current_Mgmt_Cat** | 1.3 Enter Mgmt Cats Data |
| ☐ | **Current_WMZ** | 1.3 Enter Mgmt Cats Data |
| ☐ | **Current_PMU** | 1.3 Enter Mgmt Cats Data |
| ☐ | **Current_Precip** | 1.3 Enter Mgmt Cats Data |
| ☐ | **Transects_SpatialJoin** | 1.2 Enter Transects Data |

Figure 17: Export Tables generated and corresponding Calculator worksheet

## Tips

- The Calculator includes more detailed instructions for how to input data from each field datasheet. See rows 1 and 2 in the relevant worksheet in the Calculator.
- After receiving an approved Transects layer from the SETT, you are now ready to complete Section 2. *Field Data Collection Method*. The field crew will confirm the boundaries of map units, add or remove transect locations, and confirm the location of anthropogenic features. When field work is complete, make any necessary revisions to the **Map_Units_Dissolve** layer, **Transects** layer, and **Current_Anthro_Features** layer.
- If the field crews recommend changes to the **Map_Units_Dissolve** layer, **Transects** layer, and **Current_Anthro_Features** layer, you must redo steps C8, C10 and C12. Specify the updated **Map_Units_Dissolve** layer for the Map_Units parameter and updated **Current_Anthro_Features** layer for the Current_Anthro_Features parameter in Credit Tool 3. Modify the **Transects** layer as necessary before running Credit Tool 4.
- Uplift from conifer removal will automatically be reflected in the Projected Seasonal Habitat Functions columns in the Map_Units_Dissolve layer.
- For Preliminary Credit Estimates, enter 'Yes' in the 'Summary' tab of the Project Calculator (cell F6). Preliminary Credit Estimates are intended to help with project planning and design before field data is collected. The average seasonal HSI value will be used in place of site-scale habitat quality for each map unit.

# 2. **Field Data**
# Collection Method

# FIELD DATA COLLECTIONS METHODS

The methods outlined below must be used for field data collection of attributes associated with the site scale, which defines habitat conditions at the site of proposed activities. Table 2 describes the attributes measured to calculate site-scale functional-acres for specified seasonal habitats. While non-certified personnel may assist independently in the collection of field data, a Field Certified Verifier is required to be within the credit or debit project area during field collection.

## TIMING OF FIELD DATA COLLECTION

Vegetation sampling of sage-grouse habitat attributes must 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. Take annual and site variations into account when approximating the peak of the growing season within the permissible window for the site. Peak growing season is indicated when the culms of cool season grasses have fully elongated and seed heads have emerged (not necessarily seed-ripe) and the majority of forb species are between early bloom and seed set phenological stages.

Field data must be collected 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. When making repeat visits to a site, attempt to collect data at a phenologically-similar time, or within two weeks of the first data collection for the site.

## FIELD MATERIALS REQUIRED

The following materials should be collected before the field visit:

1. Credit or Debit Project Calculator
2. Hand-held sub-meter accuracy GPS unit, preloaded with transect start points (accurate to 1-5 m)
3. Field maps, using aerial photos as background
4. Datasheets
5. Camera
6. 50-meter tape
7. Chaining pins
8. 1-meter tape or wooden ruler
9. PVC or wooden Daubenmire frame (20X50cm)
10. White board for photo of transects or photo transect datasheets
11. Rangefinder or 100-meter tape for distance to sagebrush
12. Plant field guides for the area
13. Walkie talkies (optional)
14. Resistance & Resilience Scorecard & Guide, available at: http://www.fs.fed.us/rm/pubs/rmrs_gtr322.pdf
15. A User's Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas and Lentic Checklist (if applicable), available at: http://www.blm.gov/or/programs/nrst/files/Final%20TR%201737-16%20.pdf
16. A User's Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas and Lotic Checklist (if applicable), available at: http://www.remarkableriparian.org/pdfs/pubs/TR_1737-15.pdf
17. Ability to Control Wildfire Scorecard: *Contact the Sagebrush Ecosystem Technical Team (SETT).*

Table 2. Attributes measured and summary of data collection methods

| ATTRIBUTE | RESOURCE | SAGE-GROUSE SEASON | DATA COLLECTION SUMMARY |
|---|---|---|---|
| **Sagebrush canopy cover** | Cover | ▪ BREEDING<br>▪ LATE BROOD-REARING | The percent canopy cover is estimated with line intercept (% of sagebrush canopy intersecting transect line). |
| | Cover and Foraging | ▪ WINTER | |
| **Total shrub canopy cover (including sagebrush)** | Cover | ▪ BREEDING | The percent canopy cover is estimated with line intercept (% of total shrub canopy intersecting transect line). |
| **Sagebrush height** | Cover and Foraging | ▪ WINTER | The sagebrush height is determined by measuring the tallest point of a shrub that is intersecting the transect line. |
| **Distance to sagebrush cover** | Cover -Trigger | ▪ LATE BROOD-REARING | Distance to nearest sagebrush cover (cover equivalent to area of at least ~30x30 m, with density of 10% canopy cover, and average height of 30cm) is measured from the 30 m point along each 50 m transect. |
| **Perennial forb canopy cover** | Foraging | ▪ BREEDING<br>▪ LATE BROOD-REARING | Percent cover of perennial forbs is determined by sampling within a standard-sized Daubenmire plot (20x50 cm) at 10 meter increments along a 50 m transect (5 plots total/ transect). |
| **Forb species richness (# of species)** | Foraging | ▪ BREEDING<br>▪ LATE BROOD-REARING | Abundance of forbs (annual and perennial) is determined by sampling within a standard-sized Daubenmire plot (20x50 cm) at 10 meter increments along a 50 m transect (5 plots total/ transect). |
| **Perennial grass canopy cover** | Cover-Trigger | ▪ BREEDING | Species and percent cover of perennial grasses is determined by sampling within a standard-sized area of Daubenmire plot (20x50 cm) at 10 meter increments along a 50 m transect (5 plots total/ transect). |
| | Cover | ▪ LATE BROOD-REARING | |
| **Invasive annual grass canopy cover** | Modifier | ▪ BREEDING<br>▪ LATE BROOD-REARING | Percent cover of annual grasses is determined by sampling within a standard-sized area of Daubenmire plot (20x50 cm) at 10 meter increments along a 50 m transect (5 plots total/ transect). |

# DETAILED INSTRUCTIONS

### F1. Conduct Site Reconnaissance

Upon initial arrival at the site, field crews should conduct reconnaissance (walking or driving) together to quality-check the map unit delineations. Map units, especially in agricultural and meadow areas, often change from year to year, and may not reflect even relatively recent aerial photography. As well, changes in some vegetation communities may not be evident on aerial photographs, such as understory composition. Crews should be prepared to modify map unit boundaries (both further sub-dividing maps units and conglomerating existing maps units) in the field based on observations, and should also come to a common understanding of the plants present, and the protocol that follows. Any changes to map units must be noted and map unit and relevant GIS data files must be corrected after field work is complete. In addition, if sites have high variability that cannot be accounted for through changes in map unit delineations, additional transects should be added to the protocol based on the best judgement of the verifier. In addition to checking the map unit delineations, crews should also confirm placement and type of anthropogenic features, especially powerlines.

### F2. [Repeat Steps F3 - F9 for each Map Unit]

### F3. Complete Map Unit Datasheet

The map unit datasheet should be the first form filled out when arriving at the site and continued to be filled out as the sampling is completed (see Appendix 8. Map Unit Datasheet). For each map unit, record the date, map unit description, and other mandatory information. The total number of map units sampled within the project site should be counted and recorded after all map units have been sampled.

### F4. Complete Resistance & Resilience Scorecard

Complete the Resistance and Resilience Score Sheet for each ecological site/map unit within the project area (see *Field Materials Required*, the Resistance & Resilience Scorecard should have been partially filled out during the Desktop Analysis), referring to the accompanying field guide[1]. One Resistance and Resilience Score Sheet can be used for multiple map units that are anticipated to have the same result based on site conditions. Once the score cards are complete, an area weighted average score for the project site should be calculated and entered into the Calculator on the Baseline and Reserve Account tab.

### F5. Complete Ability to Control Wildfire Scorecard

Complete Wildfire Score Sheet for each ecological site/map unit within the project area (see *Field Materials Required*, the Wildfire Scorecard should have been partially filled out during the Desktop Analysis), referring to the accompanying field guide. One Wildfire Score Sheet can be used for multiple map units that are anticipated to have the same result based on site conditions. Once the score cards are complete, an area weighted average score for the project site should be calculated and entered into the Calculator on the Baseline and Reserve Account tab.

### F6. Complete Lentic or Lotic PFC Checklist (if applicable)

**F6.1** Complete the Lentic or Lotic PFC Assessment Checklists for the credit projects only.

F6.1(a) Each PFC Reach will be named as followed: **XXX-PFC-[ReachName]**

F6.1(b) Photos should be labeled as XXX_PFC_ReachName_##_YYMMDD.jpg

F6.1(c) Datasheets should be compiled together into one scan and labeled **XXX_PFC**_Datasheets_YYYYMMDD.pdf

[1] Miller, Richard F.; Chambers, Jeanne C.; Pellant, Mike. 2014. A field guide for selecting the most appropriate treatment in sagebrush and piñon-juniper ecosystems in the great basin: Evaluating resilience to disturbance and resistance to invasive annual grasses, and predicting vegetation response. Gen. Tech. Rep. RMRS-GTR-322 REVISED. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 66 p.

F6.1(d) **XXX** is three letter abbreviation for project site and the **Reach Name** should be a descriptive location name of the reach surveyed (LowerKidCreek; UpperFish)

F6.1(e) Example: DBR-PFC-Lower, DBR_PFC_Lower_1_20180628.jpg, DBR_PFC_Datasheets_20180628.pdf

## F7. [Repeat Steps F8 - F9 for each Transect]

## F8. Navigate to Transect and Begin Data Collection

### F8.1 Establishing a Transect

F8.1(a) Navigate to a transect start point via hand-held GPS. Insert a chaining pin in the ground, and lay out or thread a 50-meter transect using the random bearing generated for that transect, using magnetic north. Pull the tape taut and anchor the 50 m end with a chaining pin. Populate all fields at the top of transect datasheet (Appendix 13. Transect Datasheet), with the date, observer initials, site name, map unit number, the transect number and UTMs (including UTM Zone and Datum), GPS type, transect bearing, whether the transect is within an altered or unaltered meadow, photo point numbers, and camera type.

**NOTE:** If a transect crosses a map unit boundary into another map unit or outside of the project area, the transect will need to be reflected back into the map unit by 90 degrees, priority to the right, if not, then left. If that doesn't work pick the next randomly generated point in that map unit.

**NOTE:** If a transect passes through a shrub thicket too dense to sample properly (i.e., willow, serviceberry, mahogany, desert peach, etc.) at a distance of greater than 50 m, reflect the transect 90 degrees to the right, if not possible then reflect 90 degrees to the left. If reflecting does not work pick the next randomly generated point for that map unit.

**NOTE:** If, upon arriving at the assigned transect, the map unit was mapped incorrectly and the transect now falls outside of the designated map unit, please follow the procedure below:

**If you can see the correct map unit within a reasonable distance**

Starting with North, moving to East, South, and then West if each previous does not work, determine a direction that will, using the shortest route, place you within the map unit. At the border of the map unit, measure 50 meters in the cardinal direction you have determined, and at the end of the 50m is the location of your new transect. If moving 50m will again place you outside the desired map unit, move as far as you can and stop just before exiting the desired map unit. This is the location of your new transect. Proceed as normal with your bearings, even with having to reflect the transect if needed. Record new UTMs and make note of the transect relocation and what direction was chosen.

**If you cannot see the map unit, or map unit is outside of a reasonable distance**

Sample and reassign the transect to the map unit it currently falls within. Go to the next backup transect for this map unit and just add the transect into the map unit that you sampled in.

**NOTE:** If sampling a very small meadow (e.g. upland spring or seep) in which a transect will reflect multiple times and has the potential overlap onto itself, follow one of the two procedures depending on what will be most effective for site specific conditions:

1. For seeps or springs: Reflect the transect off the boundary of the map unit using an angle of your choice that will keep the transect from overlapping on itself (this can be done in GIS to prescreen applicability of this method).
2. For thin, linear stringer meadows: Prescreen your points prior to field collection to ensure a point falls in an area that will ensure a full 50 meters can be sampled. The goal is to quantify the best habitat possible in the map unit. Starting at the transect location, choose an initial bearing and subsequent bearings that offer the least number of reflections.

Record data as if one continuous transect was completed in the datasheets, however please note what methods and bearings you used on the datasheet.

F8.1(b) Transects will be named as followed: **XXX-MU#-T##**

F8.1(c) **XXX** is three letter abbreviation for project site, **MU#** is the map unit number (3-digits), and **T##** is the transect number (3-digits), all of which should be named based on information from the pre-field work desktop analysis.

F8.1(d) Example: DBR-001-001

**F8.2** Photo Points

F8.2(a) Using a white board label it with the project site, date, transect name, and transect direction. Lean it next to the chaining pin it at the 0 meter mark of the transect.

(i) If the photo board is obstructed in any way at the chaining pin, move the photo board until it is visible or move the vegetation aside. Should someone be required to hold the photo board, ensure they hide their face and are crouching low in order to be as least visible as possible.

F8.2(b) Stand away from the start of the transect and align camera in direction of the transect so that the bottom of the white board is at the photo's bottom center (Figure 18) and the camera is in landscape (not portrait) format.

F8.2(c) Take photo.

F8.2(d) Photos will be named as followed: **XXX_MU#_T##_[Descriptor]**_YYYYMMDD.jpg

F8.2(e) **XXX** is three letter abbreviation for project site, **MU#** is the map unit number, and **T#** is the transect number, all of which should be named the same as the transect or reach name. The Descriptor describes the type of photo. Use **T#** for Transect Photos and **AF##_#** for Unknown Photos. For all other photos, use a descriptor with no spaces (BigSagebrush#; MuddyPool#) or a general Miscellaneous descriptor (**Misc#**), where # is a unique sequential number for each photo of that type.

F8.2(f) Example: DBR_001_001_T1_20180512.jpg, DBR_005_007_AF04_01_20180515.jpg, DBR_003_010_GiantHole01_20180515.jpg, DBR_002_003_Misc07_20180515.jpg

**NOTE:** For data collection: Always stand on the right side of the transect. Field data should be collected on the left side of the transect.

Figure 18. Transect photo example

**NOTE:** All species from Line intercept, Daubenmire plots, and general species lists, should be recorded using the following nomenclature. Species names should be recorded using full scientific name or the USDA PLANTS database species code (http://plants.usda.gov/).

If you can identify the genus, but not the species either use the PLANTS database genus code (http://plants.usda.gov). ALWAYS define the genus portion of the code in the notes section of the transect datasheet (e.g., *Artemisia* species = AR01). In addition, note if it is annual or perennial for forbs and graminoids.

Do not use common names.

If you *cannot* identify the genus, use the following codes and a short description/drawing:

- **AF#** = Annual forb (also includes biennials)
- **PF#** = Perennial forb
- **AG#** = Annual graminoid
- **PG#** = Perennial graminoid
- **SH#** = Shrub

## F9. Daubenmire Plots

### F9.1 Daubenmire Frame Placement

F9.1(a) Place the top of a Daubenmire frame on the left side of the transect line with the top at the 10 meter mark, aligned down the transect line (see Figure 33). The frame should be placed with the long side parallel to the transect. Take care not to damage any vegetation. Repeat these placements every 10 m, for a total of 5 plots along the 50 m transect.

### F9.2 Grass and Forb Cover

F9.2(a) Record all grass and forb cover that falls within the plot using the following cover classes listed in Table 3. If the plant is rooted outside the plot, but its cover falls

within the plot, those estimates should be counted towards cover. Do not include cover of a plant that falls outside of the plot, even if the plant is rooted within the plot.

F9.2(b) Identify cover for each of the following functional group categories:

- PF = perennial forb (live cover only)
- PG = perennial grass (live or residual)
- IAG = invasive annual grass (live or residual)

Table 3. Cover classes for use when estimating cover in Daubenmire frames

| COVER CLASS | RANGE OF COVER (%) | MID-POINT OF CLASS (%) |
|---|---|---|
| 1 | 0-5 | 2.5 |
| 2 | 5-25 | 15.0 |
| 3 | 25-50 | 37.5 |
| 4 | 50-75 | 62.5 |
| 5 | 75-95 | 85.0 |
| 6 | 95-100 | 97.5 |

**NOTE:** The following invasive annual grass species should be included, but not limited to, in the estimate of annual invasive grass cover:

- Cheatgrass (*Bromus tectorum*)
- Medusahead (*Taeniatherum caput-medusae*)
- Red Brome (*Bromus rubens*)
- Rattlesnake chess (*Bromus briziformis*)
- Ventenata (*Ventenata dubia*)

**F9.3** Forb Species Count

F9.3(a) For each Daubenmire plot, record the USDA PLANT code or scientific name for each forb species that are rooted within the plot, annual and perennial. Once all 5 plots are completed for a transect, tally and record the count of all forb species identified within the 5 plots, this will give you a total forb species count per transect.

F9.3(b) Record all plant species encountered along the transect in the notes section of the datasheet.

## F10. Distance to Sagebrush Cover

**F10.1** Measure the distance to the nearest sagebrush, or sagebrush mixed shrub community, cover from the 30 m mark of the transect and record the distance in meters on the datasheet.

F10.1(a) Sagebrush or sagebrush mixed shrub community cover must have at least of 10% canopy cover in a minimum 30x30 m patch size with average height of 30 cm.

F10.1(b) If the transect is located within sagebrush cover, then record distance as 0 m.

## F11. Line Intercept

**F11.1** Shrub Canopy Cover

F11.1(a) You can begin at the 0 m or the 50 m mark for line intercept. For the entire length of the transect, record start and stop locations (in centimeters) for all shrub species intercepting the transect using the following categories:

- Low sagebrush
- Big sagebrush
- Other

F11.1(b) Interceptions less than 5 cm are not recorded as canopy cover.

F11.1(c) If a gap is greater than or equal to 5 cm stop your intercept recording. Resume intercept once you reach canopy cover that is greater than or equal to 5 cm.

F11.1(d) Dead or decadent shrubs, if still rooted, count towards shrub canopy cover.

F11.1(e) Canopy cover for each shrub species is recorded, even if multiple species are overlapping.

F11.1(f) For multiple non-sagebrush shrubs of the same species that overlap, you may record the start and stop of the entire section instead of for each individual shrub.

**NOTE:** The total lengths of shrubs will be added together over the 50 meters to calculate the percent canopy cover of sagebrush and total shrubs.

**NOTE:** The following sagebrush species are the species of sagebrush in Nevada that the CCS recognizes. No other species should be counted as sagebrush. For example, *Artemisia spinescens, Artemisia ludoviciana*, while they are "sage" species, they should not count as sagebrush, but are considered as "other" shrub canopy cover.

- *Artemisia arbuscula (L)*
- *Artemisia cana (B)*
- *Artemisia frigida (L)*
- *Artemisia longiloba (L)*
- *Artemisia nova (L)*
- *Artemisia papposa (L)*
- *Artemisia tridentata ssp. tridentata (B)*
- *Artemisia tridentata ssp. vaseyana (B)*
- *Artemisia tridentata ssp. Wyomingensis (B)*
- *Artemisia tripartita (B)*

**F11.2** Sagebrush Height

F11.2(a) For each sagebrush plant intercepting the transect, record the tallest vegetative portion to the nearest cm. Do not include the inflorescence of sagebrush as height.

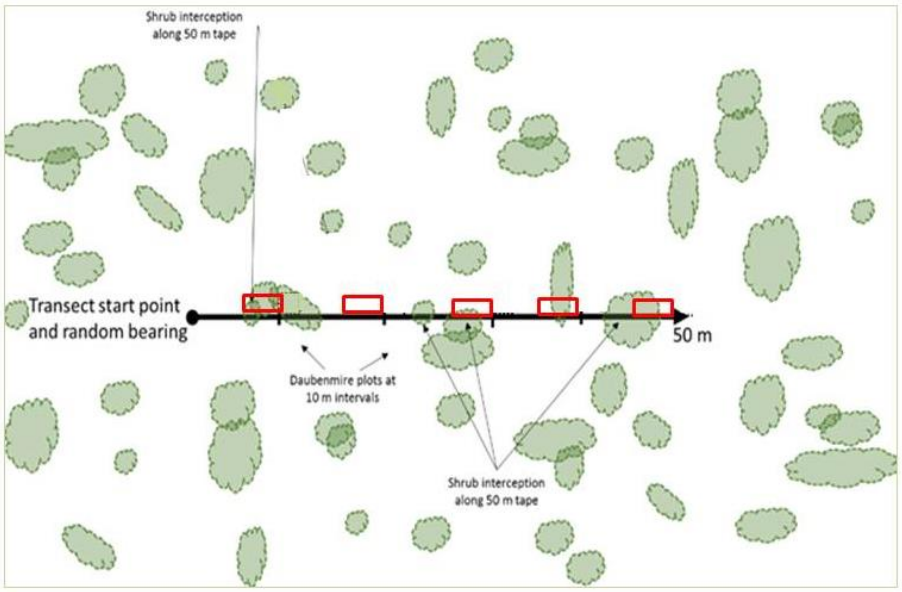



Figure 19. Diagram of transect and plots

## F12. Document Anthropogenic Features

**F12.1** The anthropogenic features map developed in the pre-field desktop analysis should be ground-truthed on foot or in a vehicle. Additional features that are identified should be marked on the map and digitized in the office in ArcGIS; similarly GPS coordinates collected and recorded in the field should be added to ArcGIS in the office.

**F12.2** Newly identified features should be noted on the anthropogenic features datasheet for the project site.

F12.2(a) If features are marked on the map, be sure to attach map to the anthropogenic features datasheet.

F12.2(b) If features are marked using GPS, be sure to record GPS unit name and use the following naming code: **XXX-** # where **XXX** is the three letter abbreviation for project site, and # is a unique sequential number for each feature identified in the field.

## F13. Input Data into Credit or Debit Project Calculator

**DATA REQUIRED:** All Field Datasheets completed during the Desktop Analysis, Credit or Debit Project Calculator

**F13.1** Open the Project Calculator.

***For each Field Datasheet:***

**F13.2** Enter the relevant data into the corresponding worksheets and columns in the Calculator. See Table 4 for a list of field datasheets completed during the field data collection that must be inputted into the Calculator.

Table 4. Field Datasheets completed during the Field Data Collection and corresponding Calculator Worksheet

| | FIELD DATASHEETS | REFERENCE STEP | CALCULATOR WORKSHEET |
|---|---|---|---|
| ☐ | **Map Unit Datasheets** | F3 | 2.1 Track Field Sheets |
| ☐ | **Resistance & Resilience Scorecard** | F4 | 3.1 Enter Baseline & Rsrv Acct |
| ☐ | **Ability to Control Wildfire** | F5 | 3.1 Enter Baseline & Rsrv Acct |
| ☐ | **Transect Datasheets** | F8 - F9 | 2.2 Enter Field Info<br>2.3 Enter Shrub Data<br>2.4 Enter Forbs & Grass Data |

**NOTE:** The Calculator includes more detailed instructions for how to input data from each field datasheet. See row 1 in the relevant worksheet in the Calculator.

**NOTE:** If the Credit Buyer has decided to use 100% site scale function in lieu of field sampling, change the "Current Average Seasonal HSI" for Spring, Summer, and Winter to 100% in Tab 1.1 Enter Map Unit Data in the Debit Project Calculator.

## F14. Scan Datasheets

**F14.1** Scanned Datasheets (one .pdf per transect or reach) will be named as followed: **XXX_MU**#_Datasheets_YYYYMMDD.pdf and **XXX_Anthro**_Datasheets_YYYYMMDD.pdf

**F14.2** **XXX** is three letter abbreviations for project site and **MU**# is the map unit number.

**F14.3** The order of scanned sheets per transect will be as follows: Map Unit Datasheet, Resistance & Resilience Scorecard, Ability to Control Wildfire Scorecard, Transect 1 Photopoint Datasheet, Transect 1 Datasheets, Transect 2 Photopoint Datasheet, Transect 2 Datasheets, Transect # Photopoint Datasheet, Transect # Datasheets. The Anthropogenic Datasheets should be a separate scan.

**F14.4** Example: DBR_052_Datasheets_20180527.pdf, DBR_Anthro_Datasheets_20180512.pdf

# 3. Credit/Credit Obligation Calculation

# CREDIT/CREDIT OBLIGATION CALCULATION

This section provides a step-by-step overview of the field process for generating credits and securing credits to offset a credit obligation. These steps will be completed by the Project Proponent, Technical Service Providers, Verifiers and the Credit System Administrator, depending on their roles and skillsets. All pre-field and post-field work steps are detailed in Sections 3.1 and 3.2 in the CCS Manual or are outlined in the Project Checklist in the Appendix.

Please contact the Sagebrush Ecosystem Technical Team (SETT) with questions on any step in this process.

## TOOL PREREQUISITES

- Credit or Debit Project Calculator (NOTE: *Section 1: Desktop Analysis* and *Section 2: Field Data Collection Methods* contain critical information on completing the Calculator.)
- Credit Projects
  - Pre-Field Work Submittal Checklist (completed)
  - Verifier Project Assessment Submission Packet
  - Quality Assessment
  - Management Plan
  - Participant Contract
  - Financial Assurances
  - Credit Purchase Agreement
  - Credit Transfer Form
  - Annual Monitoring Form
  - Notice of Validation
- Debit Projects:
  - Pre-Field Work Submittal Checklist (completed)
  - Verifier Project Assessment Submission Packet
  - Quality Assessment
  - Debit Project Review Form
  - Credit Purchase Agreement
- Recommended: Current versions of the Nevada Conservation Credit System Manual and HQT Methods document for reference.

## DETAILED STEPS TO CALCULATE CREDITS

The User's Guide covers steps D2 in *Section 3.1: Generating Credits* of the Nevada Conservation Credit System Manual (Figure 20) and steps B2 in *Section 3.2: Acquiring Credits* of the Nevada Conservation Credit System Manual for regulatory offset credit Buyers only. Before beginning, ensure the project has been planned in a way that avoids and minimizes residual impact to the maximum practical extent. Review *Section 3: Credit System Operations* of the Manual for more information.

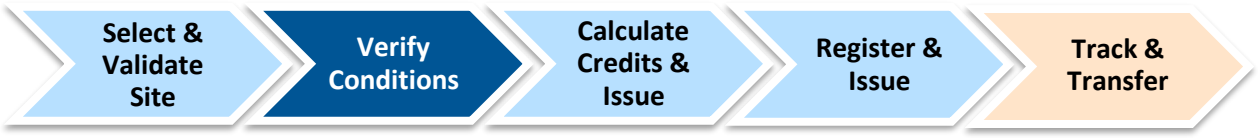



Figure 20. Overview of the process steps to generate credits


Figure 21. Overview of the process to calculate credit obligation and acquire credits

## D/B2.1 SUBMIT PROJECT VALIDATION CHECKLIST

The Project Proponent completes an eligibility screen, describing a potential project and completing some pre-project paperwork. This step is typically supported by a knowledgeable Technical Support Provider, Verifier, or Aggregator who helps the Project Proponent complete this Pre-Field Work Submittal Packet, which includes a Validation Checklist, Debit Project Review Form if applicable, and valid shapefiles of the project site. This checklist records proposed management actions, timeline, and location of a proposed project site. It also confirms certain minimum eligibility criteria, such as basic information related to ownership, site history, and land protection.

**Product ■ Completed Pre-Field Work Submittal Packet**

## D/B2.2 VALIDATE & IDENTIFY CONSERVATION OPPORTUNITY

The Administrator reviews the Pre-Field Work Submittal Packet. If all criteria are met, the Administrator coordinates approval from any additional validation leads, such as relevant regulatory agencies, and issues a notice of validation to the Project Proponent. A notice of validation is a statement that the project is eligible to generate credits if all information provided is accurate and complete. It is not a confirmation of the quantity of credits or debits to be issued.

If criteria are not met, the Administrator provides reasons why the project may not be eligible to participate in the CCS.

## D/B2.3 PROJECT VERIFICATION

Once a notice of validation is submitted, the Verifier, working closely with the Project Proponent, is able to begin the process of field verification. The Verifier performs a review of all relevant forms and documentation, and schedules a site visit with the Project Proponent[2] to determine the most logical division of the project site for site verification. The pre-field ArcGIS work must be completed and approved by the Administrator prior to any project verification. The Verifier follows the process defined in the HQT to define the credit project boundaries and calculate the pre-project conditions.

Once the map units and sampling locations have been approved, the verifier can then begin field verification of the pre-project conditions. This approval is not a confirmation of the quantity of the credit amount or obligation. Although baseline habitat function for credit projects is based on the site scale, regional standard baseline, calculating pre-project condition is necessary for the Credit Project Proponent to confidently estimate and Administrator to agree to post-project habitat function performance standards. For debits, baseline is defined as the condition of the site prior to any new or expansion of an existing anthropogenic disturbance. Debit sites require a field assessment to determine pre-project conditions. Verification of debit baseline functional acres occurs before the anthropogenic disturbance has been implemented.

[2] Verifiers follow a defined Verification Protocol that is the focus of the Verifier certification training conduct by the Credit System Administrator.

Complete the Competing Land Use assessment and input contribution percentage from Table 5 for projects on private land into the Calculator.

Table 5. Competing Land Uses reserve account categories and contribution percentages for credits on privately-owned land

| MINIMUM COMPETING LAND USE RELATED REQUIREMENTS | CONTRIBUTION PERCENTAGE |
|---|---|
| Participant Contract and Conservation Easement and Ownership of Subsurface Rights | 0% |
| Participant Contract and Conservation Easement | 1% |
| Participant Contract and Ownership of Subsurface Rights | 3% |
| Participant Contract | 4% |

The Verifier fills in the pre-project data results from the field inventory, completes any necessary calculations using the HQT, and provides the completed Verifier Project Assessment Submission Packet to the Administrator. This packet should include all GIS data within a geodatabase with the appropriate naming conventions, transect and map unit datasheets, transects photographs, field maps, meaningful notes, anthropogenic disturbance review forms, PFC checklists for each riparian area, R&R and Wildfire scorecards representing each map unit, the completed HQT calculator indicating the credit estimate, the Verifier Project Assessment Submission Form, as well as notes on any assumptions made, potential discrepancies, issues, etc.

The Verifier must then work with the Administrator to go through a Quality Assessment Process, which must be signed by the Administrator before the credit amount can be finalized. From the approval of a Quality Assessment Process, the Credit Project Proponent begins drafting a Management Plan and can move forward with the project.

All pre-field and post-field work steps are detailed in Sections 3.1 and 3.2 in the CCS Manual or are outlined in the Project Checklist in the Appendix.

**Product ■ Verifier Project Assessment Submission Packet**
**Product ■ Quality Assessment**

# APPENDICES

# Appendix 1. Guidance for Delineating Anthropogenic Features

The layers of anthropogenic features provided in the Nevada Data Package are to be used initially when delineating disturbance within the analysis area. Every project will require extensive research and manually searching of the Analysis Area in order to accurately assess existing anthropogenic disturbance. The layers provided for many features are only intended to help identify locations for certain disturbances, and further delineating of boundaries and information regarding status will be needed. The sections below describe further explanations and guidance for individual or groups of anthropogenic features.

## General Guidance

All anthropogenic features should be digitized as polygon features. If you prefer, you may digitize linear features such as transmission lines as line features, then use the buffer tool to buffer each feature by the appropriate distance to create a polygon feature class. Add a 'Buff_Dist' field, type— "long integer", to the attribute table as you are digitizing and record half of the estimated road or transmission line width in this field (we recommend 5 m for powerlines and roads, and 3 m for distribution lines). The buffer is related to the width of the transmission or distribution line, not the weight. Use that field as the buffer distance in the buffer tool. Then copy the new anthropogenic polygons over to their appropriate, pre-generated layer.

For mining or renewable energy facilities, proposed infrastructure such as roads and powerlines that are located within or immediately adjacent to anthropogenic features should be categorized as mining or renewable energy features, however this only applies to active operations. Roads or powerlines or sections of the roads or powerlines that fall outside of the project footprint, such as those connecting the project to existing infrastructure, should be categorized as roads and powerlines. Active roads or powerlines within inactive operations should receive their respective weights and distances and not be incorporated within the inactive operation footprint.

## Towers

- **Communications (**Communications)**:** Tall structures designed to support antennas for telecommunications and broadcasting.
- **Meteorological** (Meteorological)**:** Tall structures designed to support meteorological measuring instruments, including those installed to test the feasibility of wind farms.

## Powerlines

The Powerlines layer is an empty shapefile. All data sources containing powerlines also typically contain rights of way and corridors; sometimes more than half of the identified powerlines do not actually exist. For this reason, other means including aerial imagery, contacting local rural electric associations, and ground-truthing will be required to accurately delineate powerlines.

- **Nest Facilitating** (Nest_Facilitating): Major and minor three phase electrical power transmission and distribution lines with cross members, supporting arms, etc. Do not include buried transmission lines.
- **Non-Nest Facilitating** (Non_Nest_Facilitating): Single phase distribution lines or any three phase distribution lines with no or a single cross arm that does not support nesting raven or raptor occupancy.

## Mines

The Mines layer is a point feature shapefile that only identifies the location of current mining operations during various stages of activity. It is the responsibility of the verifier to confirm and obtain accurate

footprints, status, and other information from the BLM or other sources to delineate a mining anthropogenic disturbance.

- **Active – Large** (Active_Large): Total area of 60 acres or more, active
- **Active – Medium or Small** (Acitve_Small): Total area less than 60 acres, active
- **Inactive – Large** (Inactive_Large): Total area of 60 acres or more, inactive (no longer removing material from the ground and very little, if any, associated human activity. Some infrastructure, hard structures, or facilities are still present on the site. Do not include reclaimed mines or non-reclaimed mines with no remaining infrastructure).
- **Inactive – Medium or Small** (Inactive_Small): Total area less than 60 acres, inactive (see above definition of inactive).
- **Ancillary – Large** (Active_Large_Ancillary): Features at the discretion of the Administrator to include but not limited to: rapid infiltration basins (RIBs), productions shafts, pipelines, quarries, and other structures that are not located within the primary footprint of the anthropogenic feature and will generally be located away from the main disturbance.
- **Ancillary – Medium or Small** (Active_Small_Ancillary): Same description as Ancillary – Large.

Inactive Mines

Inactive mines are defined as those no longer removing material from the ground and very little, if any, associated human activity. This includes mines that are actively being reclaimed. The entire footprint of a mine during the reclamation process is considered inactive. The entire footprint of a mine that is not being reclaimed but still contains some major infrastructure, hard structures, or facilities is considered inactive.

For mines that are considered reclaimed, only the permanent feature (pit), should be delineated and classified as an inactive mine. Non-reclaimed mines with no remaining infrastructure are not considered inactive, except for the permanent pit.

### Oil and Gas

- The Oil and Gas layer is a point feature shapefile that only identifies the location of current oil and gas operations during various stages of activity. It is the responsibility of the verifier to obtain an accurate footprint, status, and other information from the BLM or other sources to delineate an Oil and Gas anthropogenic disturbance. **Producing** (Producing): Activity is occurring at the well pads.
- **Inactive** (Inactive): Activity is not occurring at the location.

The layers for oil and gas projects vary extensively in activity status and boundaries, ensure that adequate research is conducted to verify the extent of active energy projects.

### Roads

- **Interstate** (Interstate): Roads with an Interstate functional classification as defined by the Federal Highway Administration.
- **High Use – Paved or Improved; Commercial** (High_Use): Roads with an Arterial or Major Collector functional classification as defined by the Federal Highway Administration. Roads to commercial facilities (e.g., mines, geothermal plants), which may not necessarily be classified by the Federal Highway Administration.
- **Low Use – Improved; Local** (Low_Use): Roads with a Minor Collector or Local functional classification as defined by the Federal Highway Administration.

The Roads layer should be used 'as is' unless there is justification for removing or additional roads. There is substantial subjectivity in delineating roads (primarily smaller, secondary roads and two tracks), so to avoid potential for bias, the layer should be used consistently for all projects. However, changes will

likely need to be made in situations where increased activity exists, such as road access to a mine or other development.

For mining or renewable energy facilities, proposed infrastructure such as roads and powerlines that are located within or immediately adjacent to anthropogenic features should be categorized as mining or renewable energy features. Proposed roads or powerlines that fall outside of the project footprint, such as those connecting the project to existing infrastructure, should be categorized as roads and powerlines.

Do not digitize pipeline rights-of-way as roads, unless the right-of-way contains a road that meets the definitions above.

### Renewable

The Renewable layer is a polygon feature shapefile that only identifies the location of current Renewable operations during various stages of activity. It is the responsibility of the verifier to obtain an accurate footprint, status, and other information from the BLM or other sources to delineate a Renewable anthropogenic disturbance.

- **Geothermal** (Geothermal): Utility-scale geothermal projects
- **Geothermal Ancillary** (Geothermal_Ancillary): Any above-ground facilities associated with utility-scale geothermal projects at the discretion of the Administrator to include predominantly above ground pipelines and other structures that are not located within the primary footprint of the anthropogenic feature and will generally be located away from the main disturbance.
- **Solar** (Solar): Utility-scale solar projects and any associated above-ground facilities.
- **Wind** (Wind): Utility-scale wind farm projects and any associated above-ground facilities.

The Renewable layer (wind, solar, geothermal) includes leased parcels, which may or may not be in development or production. These boundaries are a very rough guideline to help identify areas that may have renewable energy development and further research to confirm the status is essential. Exclude transmission lines connecting to the main grid (categorize as 'Power Lines').

### Linear Right of Way

Linear Rights of Way (LROW) include linear features that do not fall under the Roads or Powerlines classifications, or that are associated with an existing disturbance, such as a pipeline ancillary to a geothermal plant. Linear features that are permitted within Linear Rights of Way can include pipelines, buried transmission lines, or buried fiber optic cables. LROW will fall under two categories:

LROW – High: A linear feature that meets one of the following criteria 1) height greater than 48 inches or 2) width (ground disturbance) greater than 25 feet.

LROW – Low: A linear right of way feature that is less than 48 inches in height and 25 feet in width.

### Excluded Features

Anthropogenic features not described in Table 1 are considered 'de minimus' and should not be digitized, including:

- **Fences**
- **Agricultural or Ranching related activities or infrastructure**

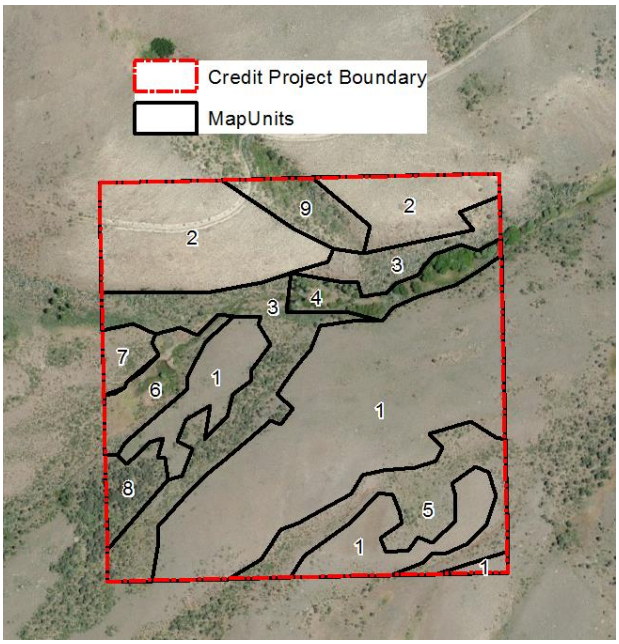
### Anthropogenic Feature Review

When changes are made that deviate from the layers provided or when classifying status of mines or other anthropogenic features, the SETT will require a brief synopsis with justification and rationale behind these decisions. This is primarily to ensure that changes (i.e. adding or removing roads) are done in a consistent manner across credit and debit projects. This will also aid in maintaining records to

increase transparency during the HQT process. See the Anthropogenic Disturbance Review Form in Appendix 7. Anthropogenic Features Datasheet.

# APPENDIX 2. GUIDANCE FOR DELINEATING MAP UNITS

**Project Area:** The project area is the area that is being evaluated, and includes all habitats within the boundaries of what is delineated as the project area. For credit projects, the project area is the extent of the obligation by the credit developers. For debit projects, the project area is the extent of the proposed surface disturbance plus the indirect effects area.




**Map Units:** The map units are sub-divisions of the project area based on unique vegetation communities, structure, and site potential. Map units need to be defined in order to capture differences in the site-scale habitat attributes assessed to more accurately inform the functional acre scores. See the *Field Data Collection Methods* for a list of attributes assessed. When delineating map units, it is important to keep these attributes in mind as they are the drivers of the habitat function scores. For example, map units should be delineated based on expected variation in sagebrush canopy cover and distance to sagebrush cover. Elevation, slope, aspect, soil type and other factors should also be considered, as they may impact vegetation distribution.

Although map units can be somewhat subjective, a map unit should encompass a relatively homogenous area of vegetation. Map units should also be delineated based on the potential of the site to support a particular vegetation community, so that map unit boundaries will not become less relevant over time. Map units should be delineated based on ecological sites, recent aerial photography, and ground verification. Major breaks such as changes in vegetation community, relative abundance of species, water vs. terrestrial, shrub land vs. meadow, and roads vs. undeveloped area, are relatively straight-forward to delineate via aerial photography. In addition, supplemental data layers within GIS can help identify other distinctions such as changes in topography (elevation, slope, and aspect) or soils which may affect vegetation composition. Defining map units requires a good working knowledge of the habitats important to sage-grouse and local site conditions. If possible, a site visit is encouraged to help inform the map unit delineation process prior to initiating the Desktop Analysis. Map unit boundaries may also be modified based on site conditions identified during field data collection. If the field crews recommend changes to the **Map_Units_Dissolve** layer, you must update the **Map_Units_Dissolve** layer and redo steps D10/C8, and D14/C12. Specify the updated **Map_Units_Dissolve** layer for the Map_Units parameter in step D10/C8.

**Stepwise Order of Sources to Use:**

1. DRG or ESD layer provided in Data Packet.
    a. Clip, then Union the DRG layer with the Map Units Layer.
    b. Visually inspect, and if more detail is needed, utilize the ESD layer for smaller scale delineation.
    c. **Note:** This only helps delineate general ecosite boundaries and fine tuning may be needed.

2. Aerial Imagery within GIS and compared to other sources (i.e., Google Earth).
    a. Visually confirm DRG or ESD delineation and adjust and further define as needed.
    b. **Note:** Aerial imagery should verify that map units should be relatively homogenous.
3. Examine NRCS Soil Series Maps to get to a more fine-scale map unit delineation.
    a. See Data Required Section for access instructions.
4. Review other layers for additional insight such as Fire, PJ, Annual Grass, Topography, etc.
5. **Note:** DRGs will typically be sufficient for larger-scale Debit Projects in addition to meadow delineation, while finer-scale ecosite delineation is needed for Credit Projects.
6. **Note:** Areas known to exhibit higher annual invasive abundance are recommended to be separate map units. Aspect should also be considered when reviewing map unit delineation due to the greater propensity of annual invasive dominance on South-facing slope.

**Meadows:** A meadow is generally defined as a mesic area containing obligate or facultative wetland forbs and grasses that is typically free of upland shrubs. This area will typically be wet for most of an average water year, and thus green (NDVI >0.3) through the end of summer that likely serve as late brood-rearing habitat. Dry meadows (upland patches of non-riparian grasses) are not considered to be meadows. Meadows that are dried to the extent that they are not likely to be functioning in the future as late-brood rearing habitat (i.e., encroachment of upland shrubs, loss of riparian plants expected over time) should not be considered. Meadows that are dried due to drought but have the potential to function when the water year approaches normal, should still be considered.

If it appears to possibly be a meadow, err on the side of it being a meadow. If reconnaissance or field sampling determines it to not be a meadow or falling within the above exceptions, it is easier to merge the polygon into a larger upland map unit than to divide it out as a small meadow later. All potential meadows should be visually confirmed.

**Stepwise Order of Sources to Use:**

- Aerial Imagery within GIS and compared to other sources (i.e., Google Earth).
    a. Begin to define general meadow areas.
    b. Compare various years' imagery (Various layers or the Google Earth Timeline).
- SGI Mesic Resources Layer (Detailed 30-year NDVI average during the brood-rearing season).
    a. See Data Required Section for access instructions.
    b. **Note:** Target areas with a 30-year average NDVI value of >0.3, which are the four shades of green provided in the Mesic Resources – Persistence layer. If different management practices have been applied over the last 30 years that have significantly altered the management of water in an area, utilize the online interactive map to get an average NDVI that reflects current management for the appropriate period of time.
    c. **Note:** This only helps fine-tune delineation of large meadows and lotic systems and will generally not pick up smaller riparian systems.
- Create a grid index to facilitate review of aerial imagery at approximately 1:3,000 or finer scale.
    a. [ArcToolbox> Cartography Tools> Data Driven Pages> Grid Index Features]
        i. Output Feature Class = a new layer named **GridIndexFeatures**

ii. Input Features = **Analysis_Area**

iii. Generate Polygon Grid that intersects input feature layers or datasets = *checked*

iv. Use Page Unit and Scale = *unchecked*

v. Polygon Width = 1000 (in meters)

vi. Polygon Height = 1000 (in meters)

vii. All other fields = blank

viii. Add the Data Driven Pages toolbar (Customize >Toolbars >Data Driven Pages), then set up data driven pages by clicking the Data Driven Page Setup icon ( ) and selecting **GridIndexFeatures** as the Layer. Leave all other options unchanged and click 'OK'.

b. Flip through every page using the next page icon ( ) for a thorough review of small riparian systems (i.e., stringer meadows, hillside seeps).

- Review other layers for additional insight such as Annual Grass or Topography.

### Additional rules for map unit delineation:

1. Minimum map unit size should generally be 0.5 acres, unless there are features such as stringer meadows that are appropriate to delineate at a smaller scale. Map units less than 5 meters in width may be excluded from the credit or debit calculation.
2. Clusters of willow or other dense catches of woody riparian vegetation within meadows should not be delineated as separate map units. However, transects should not be run through the areas of dense willow patches.
3. For debit projects, map units should first be delineated by indirect disturbance area, proposed surface disturbance, and already existing disturbance areas. Indirect and proposed should then be further subdivided according to the standards guidelines. No sampling will occur in existing disturbance areas, so no further subdivision is needed. This map unit will be assigned a site scale score of zero and no transects will be generated in this map unit.
4. For debit projects, term features should be separate map units from permanent features.
5. For debit projects, reclaimed mine (or other disturbance type) areas should be delineated as separate map units
6. For credit projects, treatment areas where a change in the site scale score is anticipated should be delineated as separate map units. (Even if currently they are similar in vegetation to other areas, but a change is not expected in those areas.)

# APPENDIX 3. RECOMMENDED TRANSECTS PER MAP UNIT

This section provides guidance for the number of transects per map unit based on area and variability of the habitat within the map unit. When delineating map units, the technician should seek to maximize map unit area while minimizing variability within each map unit. Once map units are defined, the sampling intensity (number of transects per map unit) should be determined based on the acreage of the map units and the relative homogeneity of vegetation within the map unit. Table 6 contains the minimum number of transects required for each map unit, based on map unit size, and should be chosen with the map unit size in mind when delineating map units using aerial imagery, the technician should note which map units have a mosaic of vegetation or patchiness that may require a greater level of sampling intensity. Similarly, map units which are more obviously homogeneous should be noted as they may allow the lower level of sampling intensity required. More transects can always be completed in sequential order from the backup batches of transects if the results do not seem to adequately represent the landscape.

Table 6. Minimum number of transects required based on map unit acreage

| Map Unit Size: | 0.5 TO <40 ACRES | 40 TO <640 ACRES | ≥640 ACRES |
|---|---|---|---|
| Transects per Map Unit: | 2 - 3* | 4 - 8* | 8 - 16* |

*Choose the higher end of the range for map units with higher variability or map units that may be seeking uplift in the future. The SETT recommends for credit projects, to select for the higher range of transects to adequately represent the landscape. In addition to the requirements above, it is required to generate additional backup transects that can be used in order as needed.

### Additional guidance for generating random transect locations and bearings:

1. Transects that are impeded by clusters of willow or other dense patches of riparian woody vegetation within meadows should be discarded and alternative, random sample points should be generated. To avoid creating an incentive to modify riparian habitat that supports sage-grouse habitats but is not used directly by sage-grouse, and thus does not receive credits, clusters of willows or other riparian woody vegetation will receive the habitat function score of the map unit that it is contained within.
2. If a transect will cross a map unit boundary into another map unit or outside of the project area, the transect will need to be reflected back into the map unit by the field crew and continued. Do not discard transects near map unit boundaries, as this would bias results.
3. Transects falling within areas having steep slopes (>50%), large rock outcrops, talus slopes, or unsafe hiking routes can be rejected and an alternative random sample point be used in sequence. The SETT will do an initial pre-screening for these features to exclude these areas. If transects are rejected in the field, document all rejected points and justification for the rejection.
4. The pre-field submission calculator should include the number of transects planned for each map unit, and a roads layer, to the best of the Verifier's knowledge, that are accessible by vehicle, ATV, or UTV that is planned to be used by the Verifier.

Do not sample transects that originate in or cross existing surface disturbance. Discard and select an alternative, random sample point.

# APPENDIX 4. DEBIT TOOL OVERVIEW

This appendix describes what each Debit Tool is doing 'under the hood' so users have a better understanding of how the Debit Tools work.

### Debit Tool 1

Debit Tool 1 prepares the user for digitizing and/or categorizing the proposed surface disturbance of the debit project. If a feature class or shapefile is provided as Proposed_Surface_Disturbance, the tool projects the provided layer to the standard coordinate system of the Desktop Analysis, named 'Proposed_Surface_Disturbance_Debits', adds the layer to the map document, adds fields for Type, Subtype, Term, and Rehab, and applies domains for the added fields to restrict data entry to valid inputs. If a feature class or shapefile is not provided, an empty feature class with the same projection, fields, and domains is created and added to the map document. The map document is saved before the tool finishes.

### Debit Tool 2

Debit Tool 2 uses the Proposed_Surface_Disturbance_Debits feature class as edited by the user to create the Analysis_Area and clip all provided anthropogenic feature templates to the Analysis_Area for the user to digitize new features and confirm existing. The feature class provided by the user MUST be located within the project's geodatabase, however, it may be a different feature class than that created as an output of Debit Tool 1. This is intended to allow the user to use geoprocessing tools as necessary when digitizing the boundaries of the proposed surface disturbance. The 'Subtype' field is used to lookup the distance for buffering each feature to create the Analysis_Area. Distances for each subtype are provided in Table 1. It is important that the Subtype field is populated and all values are exact matches of those found in Table 1. The Analysis_Area is also saved as a shapefile in the project's folder so that the Dist_Lek layer can be acquired from NDOW within its extent. The map document is saved before the tool finishes.

### Debit Tool 3

Debit Tool 3 completes a majority of the geoprocessing necessary to evaluate the debit project. It takes as input the Analysis_Area created in Debit Tool 2 (which MUST be located within the project's geodatabase) and a folder to save the output Excel files within. Optionally, a feature class or shapefile containing current anthropogenic features within the Analysis_Area may be provided. This layer will be copied to the project's geodatabase (overwriting any existing feature class named "Current_Anthro_Features") and used instead of merging the individual anthropogenic feature layers. This is intended to allow users who have previously digitized anthropogenic features through a different process to use those data. It is not recommended; ensure that the Subtype field is populated appropriately.

Debit Tool 3 merges all anthropogenic feature layers to create "Current_Anthro_Features", and then calculates the indirect anthropogenic disturbance associated with those features by using the Subtype field to lookup the weight and distance associated with that feature, which is provided in Table 1. The "Current_Anthro_Disturbance" raster is created in the project's geodatabase. It repeats this process for "Projected_Anthro_Features", which is created by merging the proposed surface disturbance with the current anthropogenic features, and "Permanent_Anthro_Features", which is created by merging only those features with a 'Term' of permanent (coded as '9999' in the 'Term' field).

Next, the tool calculates the seasonal local-scale modifiers for each term by multiplying the rasters created above by the appropriate seasonal modifiers. See the HQT for information on which modifiers apply to which seasons. Using these results, the tool creates a visual depiction of the project impact by selecting the maximum per season impact from each seasonal local-scale habitat raster.

The tool then creates the Map_Units layer. First, it creates map units for areas categorized as 'de minimus' habitat quality based on pinon-juniper cover and annual grass cover. It also creates map units for the proposed surface disturbance. Finally, it adds fields for 'Map_Unit_ID', 'MapUnitName', and 'Meadow' and assigns domains to those fields. The map document is saved before the tool finishes.

### Debit Tool 4

Debit Tool 4 is run after the user has delineated map units based on vegetation types. The tool creates another set of unique map units for areas that overlap existing surface disturbance, and then dissolves all multi-part map units to create Map_Units_Dissolve. The tool calculates the area in acres for each map unit. The tool calculates the proportion of each map unit in each Management Category, WAFWA management zone, Priority Management Unit, and Precipitation zone. These proportions are exported to Excel files in the project's folder. The tool calculates the average HSI value for each season and the average local-scale modifier for each season. Finally, the tool adds a 'Transects' field to the Map_Units_Dissolve layer to allow the user to create a number of transects per map unit. The map document is saved before the tool finishes.

### Debit Tool 5

Debit Tool 5 will either create random points based on the number provided in the 'Transects' field of the Map_Units_Dissolve layer or will take a point shapefile or feature class provided by the user that contains transect locations. The tool adds three fields for Bearing and populates the field with a random number between 0 and 360 degrees for each transect. The tool also provides the UTM easting and northing. Finally, the tool performs a spatial join of the created transects or the provided transects with the Map_Units_Dissolve layer and exports the data table to an Excel file within the project's folder.

# APPENDIX 5. CREDIT TOOL OVERVIEW

This appendix describes what each Credit Tool is doing 'under the hood' so users have a better understanding of how the Credit Tools work.

### Credit Tool 1

For most credit projects, Credit Tool 1 prepares the user for digitizing map units within the credit project boundaries. A feature class or shapefile defining the outer extent of the credit project must be provided as 'Credit_Project_Boundary'. If the provided layer contains multiple features, those features will be retained (e.g., the provided layer is not dissolved; multiple features are acceptable). The tool projects the provided layer to the standard coordinate system of the Desktop Analysis, clips out any areas that are not within management categories PHMA, GHMA, or OHMA, and names this feature class 'Credit_Project_Area'. The tool uses that to create the Map_Units layer, adds the layer to the map document, adds fields for 'Map_Unit_ID', 'MapUnitName', and 'Meadow', and applies domains for the added fields to restrict data entry to valid inputs.

For projects that propose to modify or remove existing anthropogenic features, the user should check the corresponding box before running Credit Tool 1. The user may also, but is not required to, provide a feature class or shapefile defining the outer extent of the feature to be modified or removed. If that is not provided, the tool will create a template. The tool adds fields for 'Type' and 'Subtype' and applies domains for the added fields to restrict data entry to valid inputs. If the provided feature class or shapefile already has those fields present, the tool will copy those fields to a new field named 'Type_copy' or 'Subtype_copy'. The user must populate the 'Type' and 'Subtype' fields with the *current* status of the feature. The map document is saved before the tool finishes.

### Credit Tool 2

For most credit projects, Credit Tool 2 uses the Map_Units feature class as edited by the user to create the Analysis_Area and clip all provided anthropogenic feature templates to the Analysis_Area for the user to digitize new features and confirm existing. The feature class provided by the user MUST be located within the project's geodatabase, however, it may be a different feature class than that created as an output of Credit Tool 1. This is intended to allow the user to use geoprocessing tools as necessary when digitizing the map units. Credit Tool 2 creates the Analysis_Area by buffering the Map_Units layer by the maximum distance found in Table 1. This is to ensure that any anthropogenic features that may have an indirect impact on the project are captured during digitization of existing anthropogenic features.

For projects that proposed to modify or remove existing anthropogenic features, Credit Tool 2 uses the Proposed_Modified_Features layer to calculate the area of indirect benefit of the project, named "Indirect_Benefit_Area". Any areas that are not within management categories PHMA, GHMA, or OHMA are clipped out. The tool also adds a field named 'Subtype_as_Modified' to each clipped anthropogenic feature layer for the user to indicate which features will be modified or removed, and to what status they will be modified. The map document is saved before the tool finishes.

### Credit Tool 3

Credit Tool 3 completes a majority of the geoprocessing necessary to evaluate the credit project. It takes as input the Analysis_Area created in Credit Tool 2 (which MUST be located within the project's geodatabase) and a folder to save the output Excel files within. Optionally, a feature class or shapefile containing current anthropogenic features within the Analysis_Area may be provided. This layer will be copied to the project's geodatabase (overwriting any existing feature class named "Current_Anthro_Features") and used instead of merging the individual anthropogenic feature layers. This is intended to allow users who have previously digitized anthropogenic features through a different

process to use those data. It is not recommended; ensure that the Subtype field is populated appropriately.

Credit Tool 3 merges all anthropogenic feature layers to create "Current_Anthro_Features", and then calculates the indirect anthropogenic disturbance associated with those features by using the Subtype field to lookup the weight and distance associated with that feature, which is provided in Table 1. The "Current_Anthro_Disturbance" raster is created in the project's geodatabase. It repeats this process for projected condition for credit projects that propose to modify or remove existing anthropogenic features by using the 'Subtype_As_Modified' field instead of the 'Subtype' field. The area of indirect benefit is merged with the Map_Units layer and a field named 'Indirect' is added to the Map_Units layer signifying 'True' if the map unit is outside of the credit project boundary but within the indirect benefits area. For most credit projects, the 'Indirect' field will read 'False' for all map units.

Next, the tool calculates the seasonal local-scale modifiers for each term by multiplying the rasters created above by the appropriate seasonal modifiers. See the HQT for information on which modifiers apply to which seasons. A multiplier for removal of pinon juniper is also applied depending on the cover (i.e., phase) of pinon juniper present. For map units where the actual percent cover is less than 1%, this multiplier is removed at a later step. Using these results, the tool creates a visual depiction of the project benefit by selecting the maximum per season benefit from each seasonal local-scale habitat raster, subtracting the regional average site-scale habitat quality and multiplying by the management importance factor. This visualization is intended as an aid only, site-scale habitat quality data must be collected before credits can be known.

The tool then dissolves all multi-part map units to create Map_Units_Dissolve. The tool calculates the area in acres for each map unit. The tool calculates the proportion of each map unit in each Management Category, WAFWA management zone, Priority Management Unit, and Precipitation zone. These proportions are exported to Excel files in the project's folder. The tool calculates the average HSI value for each season and the average local-scale modifier for each season.

Finally, the tool adds a 'Transects' field to the Map_Units_Dissolve layer to allow the user to create a number of transects per map unit. The map document is saved before the tool finishes.

### Credit Tool 4

Credit Tool 4 will either create random points based on the number provided in the 'Transects' field of the Map_Units_Dissolve layer or will take a point shapefile or feature class provided by the user that contains transect locations. The tool adds three fields for Bearing and populates the field with a random number between 0 and 360 degrees for each transect. The tool also provides the UTM easting and northing. Finally, the tool performs a spatial join of the created transects or the provided transects with the Map_Units_Dissolve layer and exports the data table to an Excel file within the project's folder.

# APPENDIX 6. DATA DESCRIPTIONS

## Provided Data

- **Input Data Geodatabase (InputData.gdb)**
  - Annual Grass Layer (**Annual_Grass_Layer**): This polygon feature class identifies areas of likely cheatgrass or other annual grass dominated landscapes. It is used to identify de mnimis habitat quality for debit projects.
  - De Minimis Debit Raster **(DeMinDebits**): This raster represents areas of de minimis habitat quality for debit projects based on presence of annual grass or phase III pinon-juniper.
  - Distance to Brood-Rearing Habitat (**Dist_Brood**): This raster represents habitat function associated with distance to brood-rearing habitats in Nevada. Use to calculate the Distance to Brood-Rearing Habitat modifier.
  - SEP Management Categories Map (**Mgmt_Cat**): This feature class delineates the boundaries of Sagebrush Ecosystem Program (SEP) Management Categories in Nevada. Use for informing the Credit System's Mitigation Ratio.
  - Biological Significant Units (**NV_BSU**): This feature class delineates the boundaries of the Biological Significant Units in Nevada.
  - Nevada Counties (**NV_Counties**): This feature class represents county boundaries in Nevada.
  - Nevada Disturbance Response Groups (**NV_DRG**)[3]: This feature class delineates the boundaries of ecological sites that have been grouped into identified disturbance response groups.
  - Nevada Ecological Site Descriptions (**NV_ESD**): This feature class delineates the boundaries of ecological sites.
  - Priority Conservation Areas (**NV_PCA**): This feature class delineates the boundaries of Priority Conservation Areas, which are defined as the intersection between Sagebrush Focal Areas and (SFA) and Priority Habitat Management Areas (PHMA) in Nevada.
  - Population Management Units (**NV_PMU**): This feature class delineates the boundaries of the NDOW Population Management Units in Nevada.
  - WAFWA Management Zones (**NV_WAFWA**): This feature class delineates the boundaries of the WAFWA Management Zones in Nevada.
  - Percent Cover of Pinon Juniper (**PJ_Cover**): This raster represents percent cover of pinon juniper at a 30m pixel resolution.
  - Phase III Pinon-Juniper (**PJ_Phase_III**): This feature class represents areas of Phase III (>20% cover) pinon-juniper.
  - Pinon-Juniper Phase Map (**PJ_Phases**): This feature class represents pinon-juniper by phase, where phase I is <10% cover, phase II is 10% - 20% cover, and phase III is >20% cover.
  - Uplift from Pinon-Juniper Removal (**PJ_Uplift**): This raster represents the multiplier applied to credit projects that propose to remove pinon juniper.
  - Precipitation Regime (**Precip**): This feature layer is reclassified such that areas with less than 25.4 cm of precipitation are categorized as arid, and areas with greater than 25.4 cm are categorized as mesic. It is derived from the 30-year normal PRISM dataset available at http://prism.oregonstate.edu/normals/. Use for identifying the precipitation regime of individual map units.

[3] Disturbance Response Grouping of Ecological Sites Increases Utility of Ecological Sites and State-and-Transition Models for Landscape Scale Planning in the Great Basin. Tamzen K. Stringham, Patti Novak-Echenique, Devon K. Snyder, Sarah Peterson, and Keirith A. Snyder. *Rangelands* 2016 38 (6), 371-378

    - Breeding Habitat Suitability Index (**Spring_HSI**): This raster dataset provides an index of local-scale habitat functionality for sage-grouse in Nevada during the spring season, which corresponds to the breeding life history period for sage-grouse.
    - Late Brood-rearing Habitat Suitability Index (**Summer_HSI**): This raster dataset provides an index of local-scale habitat functionality for sage-grouse in Nevada during the summer season, which corresponds to the late brood-rearing life history period for sage-grouse.
    - Over-Wintering Habitat Suitability Index (**Winter_HSI**): This raster dataset provides an index of local-scale habitat functionality for sage-grouse in Nevada during the winter season, which corresponds to the over-wintering life history period for sage-grouse.
- **Anthropogenic Features Geodatabase (Anthro_Features.gdb)**
    - Anthro_Attribute_Table: This table provides the indirect-effect weights and distances of anthropogenic features. Data in this table is also provided in Table 1.
    - emptyRaster: This raster is used to ensure consistent raster processing by serving as a snap raster and providing cell sizes for raster calculations.
    - Mines: Federal mine locations derived from Mineral Resource Data System (MRDS) data.
    - Oil_Gas: Federal oil and gas well locations derived from Automated Fluid Mineral Support System (AFMSS) data dated 12/2012.
    - Powerlines: Empty feature class to allow users to more easily delineate powerlines.
    - Renewable: Geothermal leases dated 2013.
    - Roads: State, federal, and county roads compiled by Nevada Department of Transportation (NDOT).
    - Towers: Communications tower locations derived from FCC data.
    - Urban: Boundaries of census blocks in Nevada categorized based on a Wikipedia search of all cities/townships.
- **Layer_Files Folder**: Includes layer files that may be used to standardize the symbology of outputs of the Desktop Analysis. Instructions for applying symbology to layers using layer files are provided throughout the User's Guide at appropriate steps.
- **Scripts Folder**: Contains text of the Python scripts used to generate the Desktop Analysis Tools, to be used for reference if desired.

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# APPENDIX 7. ANTHROPOGENIC FEATURES DATASHEET

# NEVADA CONSERVATION CREDIT SYSTEM

## Anthropogenic Disturbance Review Form

Due to the significant variability in anthropogenic disturbance delineation within the CCS, the SETT requires justification and rationale for delineation of anthropogenic features associated with credit and debit projects. This form is to help track and justify delineation of features completed by the certified verifier in order to assure the most accurate assessment of anthropogenic disturbance for each project. Generally, these questions do not apply to the proposed surface disturbance for a debit project; the SETT primarily is interested in the classification of anthropogenic features within the Analysis Area. Proposed surface disturbance will be analyzed separately by the SETT.

Please describe any deviation from the provided Roads layer in the Nevada Data Package. If applicable, please provide rationale for any removals or additions.

What sources were used to verify and confirm the status of a mine or geothermal facility (e.g. active, inactive, actively being reclaimed, etc.) within the analysis area?

What sources in addition to aerial imagery (e.g. Rural Electric Association (REA) data, visual inspection and documentations) were used to confirm Powerline Subtypes?

If a Phase III Distribution line identified from a REA was reclassified as Non Nest Facilitating, please provide the documentation and evidence below. This would include photographs, recorded distance of continuous single crossarm Phase III poles, or other documentation.

Project: _____

Name of Certified Verifier: _____ Date: _____

| **Project Site Name:** | Version: SETT 061217 |
|---|---|
| **Marked on map or with GPS unit (circle one).** | **GPS Unit name if applicable:** |

## ANTHROPOGENIC FEATURES

| Feature Type | Camera/ Photo # | Name (if marked using GPS) | UTM E | UTM N | Notes |
|---|---|---|---|---|---|
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| **Notes :** | |
|---|---|

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# APPENDIX 8. MAP UNIT DATASHEET

| **Project Site Name:** |
| --- |
| Total number of Map units within Project Site: |

| Map Unit Number: | Dates of map unit transects: |
| --- | --- |
| Total number of transects:<br>Names of transects: | Total number of photos:<br>Aspect of MU: Slope of MU: |
| Map Unit Description (1 to 2 sentences describing vegetation, topography, and other features relevant to sage-grouse within map-unit): | |
| Notes: | |

# APPENDIX 9. TRANSECT NOTES DATASHEET (OPTIONAL)

| **Project Site Name:** |
|---|
| |

| Map Unit Number: | Date: |
|---|---|
| Transect number: | Observers: |
| Moved or Reflected? | Rejected? |
| Notes (Include reasoning for changes and new transect starting location and aspects): | |

| Map Unit Number: | Date: |
|---|---|
| Transect number: | Observers: |
| Moved or Reflected? | Rejected? |
| Notes (Include reasoning for changes and new transect starting location and aspects): | |

# APPENDIX 10. RESISTANCE & RESILIENCE SCORECARD

**Score Sheet for Rating Resistance and Resilience to Disturbance to Invasive Annual Grasses in the Great Basin** (adapted from Miller et al. 2014)

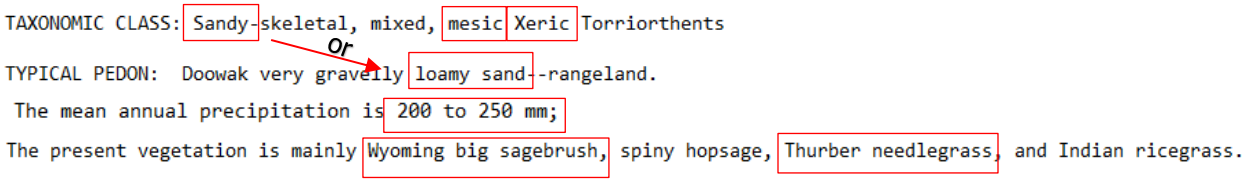
| **Map Unit Name/Number:** | **Ecological Site Name/Number:** | **Date:** |
|---|---|---|
| **Acreage of Map Unit/Ecosite:** | **UTMs:** | |
| **SITE CHARACTERISTICS** | **SITE CONDITION (select one)** | **SITE SCORE** |
| **Temperature (Soil temperature regime + Species or subspecies of sagebrush) - Desktop** | | |
| **Soil temperature regime** | **1** = hot-mesic<br>**2** = warm-mesic<br>**3** = cool-mesic or cool-cryic<br>**4** = warm frigid<br>**5** = cool-frigid<br>**6** = warm-cryic | |
| **Species or subspecies of sagebrush** | **1** = Wyoming, low, black, or Lahontan<br>**2** = basin, Bonneville, or xeric<br>**3 =** mountain | |
| **Moisture (Precipitation + Soil Texture + Soil Depth) - Desktop** | | |
| **Precipitation** (in) | **1** = <10<br>**2** = 10-12<br>**3** = 12-14<br>**4** = >14 | |
| **Soil texture** | **1** = clay, sand, or silt<br>**2** = silty loam, sandy loam, or clay loam<br>**3** = loam | |
| **Soil depth** (in) | **0 =** very shallow (<10)<br>**1 =** shallow (10-20)<br>**3 =** moderately deep to deep | |
| **Vegetation (Plant groups modified by soil depth) - On-Site** | | |
| **Plant Groups**<br>Deep-rooted perennial grasses (DRPR) potentially dominant in shallow to deep soils >10 in.<br>Sandberg bluegrass (POSE) potentially dominant in very shallow soils <10 in.<br>Perennial forbs (PF)<br>Invasive annual grasses (IAG) | **0 =** DRPG and POSE scarce to severely depleted (DRPG < 2-3/$m^2$) and less than 5% foliar cover<br>**3 =** DRPG on soils >10 in. scarce, but POSE or PF >50% foliar cover<br>**6 =** DRPG on soils >10 in. depleted (2-3/$m^2$ or about 5-10% foliar cover) and/or co-dominant with IAG, **or** on soils < 10 in. POSE and PF 5-15% foliar cover and co-dominant with IAG.<br>**9 =** DRPG and PF dominant on soils > 10 in. **or** POSE and PF dominant on soils < 10 in. | |
| | **TOTAL:** | |
| **R & R RATING (circle one)** | **Very low** < 10; **Low** = 10-14; **Moderate** = 15-20; **High** > 20 | |

**Guide to Soil Temperature Regime**

| | Hot-Mesic | Warm-Mesic | Cool-Mesic | Warm-Frigid | Cool-Frigid | Warm-Cryic | Cool-Cryic |
|---|---|---|---|---|---|---|---|
| **PPT (in)** | <4 | 4-8 | 8-12 | 12-14 | 14+ | 16+ | 18+ |
| **Moisture Regime** | Dry Aridic | Typic Aridic | Aridic bordering Xeric | Xeric bordering Aridic | Typic Xeric | Typic Xeric | Typic Xeric |
| **Indicator Plants** | PIDE4, ATCO, SABA14, SAVE4, ACHY, LYSH, PLJA | PIDE4, ATCO, KRLA2, HECO26, ACHY | ARNO4, ARTRW8, JUOS, JUOC, ACTH7 | ARNO4, ARAR8, ARTRV, ARTRW8, JUOS, JUOC, PIMO, ACTH7 | ARTRV, SYMPH, AMAL2, PIMO, JUOS, JUOC, FEID, ACNE10, POTR5 | ARTRV, ARSP8, ARAR8, SYMPH, AMAL2, CELE3, ABCO, POTR5 | PIEN2, PIAR, PIFL2 |
| **Ecological Zones** | Salt Desert Scrub | Desert Basin | Sagebrush Semi-Arid | Upland Sagebrush, Juniper/ Pinon | Upland Mountain Sagebrush, Pinon/ Juniper | Mountain Sagebrush | High Mountain |

**Derive from NRCS Official Soil Series Description (OSDs) based on Soil Web Survey's Map Unit Descriptions*

*Example of Cool-Mesic (Doowak series):*



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# APPENDIX 11. ABILITY TO CONTROL WILDFIRE SCORECARD

**Ability to Control Wildfire Scorecard**

| **Map Unit Name/Number:** | **Ecological Site Name/Number:** | **Date:** |
|---|---|---|
| **Acreage of Map Unit/Ecosite:** | **UTMs:** | |
| **SITE CHARACTERISTICS** | **SITE CONDITION (select one)** | **SITE SCORE** |
| **Topography/ Access/ Response Time - Desktop** | | |
| **Average percent slope in project area** (GIS) | **1 =** 0-10%<br>**3 =** 11-25%<br>**5 =** greater than 25% | |
| **Access to project area for suppression resources** | **1 =** paved road<br>**2 =** improved dirt road<br>**4 =** unimproved two-track<br>**5 =** hike or aircraft | |
| **Response Time of Fire Suppression Resources for Initial Attack** | **1 =** Less than 1 hour<br>**3 =** 1-2 hours<br>**5 =** greater than 2 hours | |
| **Average aspect of project site** (GIS) | **1 =** N,NE<br>**2 =** NW, E<br>**3 =** W. SE<br>**4 =** S, SW, Flat | |
| **Road Distance to Available Water Sources** | **0 =** <1 mile<br>**3 =** 1 to 3 miles<br>**5 =** >3 miles | |
| **Vegetation/Fuel Type/Ignition Risk – On-Site** | | |
| **Dominant fuel type in project area**<br>(Fire Behavior Fuel Models based on USDA Forest Service Gen. Tech. Rep. RMRS-GTR-153. 2005) | **0 =** Irrigated pasture (NB3)<br>**1 =** Riparian wet meadow (GR3)<br>**3 =** Perennial Grass (GR1, GR2, GR4)<br>**5 =** Shrub (SH1, SH2)<br>**7 =** Grass/Shrub (GS1, GS2)<br>**8 =** Heavy Shrub/Grass (SH5, SH7)<br>**10 =** Pinyon/Juniper (TU1, TU4, TU5) | |
| **Dominant fuel type adjacent to the project area** (w/in 1 mile) | **0 =** Irrigated (NB3) / Riparian (GR3)<br>**1 =** Perennial Grass (GR1, GR2, GR4)<br>**5 =** Shrub (SH1, SH2)<br>**7 =** Shrub/Grass (GS1, GS2)<br>**8 =** Heavy Shrub/Grass (SH5, SH7)<br>**10 =** Pinyon/Juniper (TU1, TU4, TU5) | |
| **Invasive Annual Grass Cover**<br>(Based on HQT data) | **0 =** 0%<br>**5 =** 1-5%<br>**10 =** >5 | |
| **Vegetation Condition Class VCC** (departure from historic conditions) LANDFIRE Map | **1 =** Low<br>**2 =** Moderate<br>**3 =** High | |
| | **TOTAL:** | |
| **WILDFIRE RATING (circle one)** | **High** < 21; **Moderate** = 21-35; **Low =** >35 | |

# APPENDIX 12. PHOTO TRANSECT DATASHEET

# Project site:

# Date:

# Transect ID:

# Bearing:

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# APPENDIX 13. TRANSECT DATASHEET

**NEVADA CONSERVATION CREDIT SYSTEM HABITAT QUANTIFICATION TOOL**

**Site-Scale (4th Order) Attribute Measurements**

| | | | |
|---|---|---|---|
| Site Name: | | | |
| Date: | Observers: | Start time: | End time: |
| Transect name: | Transect UTM E: | Transect UTM N: | |
| Transect Sample Bearing: | GIS/Camera / Photo #'s: | | |
| Is transect located within what would generally be called a meadow? Yes No | | | |
| What sagebrush species is the transect dominated by? Big Low/Black N/A | | | |

**DISTANCE TO SUITABLE SAGEBRUSH COVER (10% PER 30M X 30M AREA)**

Distance from 30m mark: _____ *if transect within suitable cover, distance = 0

**LINE INTERCEPT (SHRUB COVER)**

| Low/Big Sagebrush/ Other | Start | Stop | Sagebrush Height (cm) | | Low/Big Sagebrush/ Other | Start | Stop | Sagebrush Height (cm) |
|---|---|---|---|---|---|---|---|---|
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| Shrub species encountered along transect: | Notes for Line Intercept: |
|---|---|
| | |

## DAUBENMIRE PLOTS (HERBACEOUS COVER)

**Record percent cover using the following coverage classes: 0 = 0%, 1 = >0-5%, 2 = 6-25%, 3 = 26-50%, 4 = 51-75%, 5 = 76-95%, 6 = >96%**

**PF = Perennial Forbs; PG = Perennial Graminoids; IAG = Invasive Annual Grasses**

| Plot # | Functional Group | Cover Class |
|---|---|---|
| 1 | PF | |
| | PG | |
| | IAG | |

| Plot # | Functional Group | Cover Class |
|---|---|---|
| 4 | PF | |
| | PG | |
| | IAG | |

| Plot # | Functional Group | Cover Class |
|---|---|---|
| 2 | PF | |
| | PG | |
| | IAG | |

| Plot # | Functional Group | Cover Class |
|---|---|---|
| 5 | PF | |
| | PG | |
| | IAG | |

| Plot # | Functional Group | Cover Class |
|---|---|---|
| 3 | PF | |
| | PG | |
| | IAG | |

## UNIQUE PERENNIAL & ANNUAL FORBS IN DAUBENMIRE FRAMES:

**List all unique forb species found across all plots within this transect:** **Total Count: _____**

## ALL SPECIES LIST:

| Graminoid and other Forb species encountered on plot: | All invasive and noxious (*) weeds encountered on plot and a rough cover estimate of each: | Notes for Daubenmire plots: |
|---|---|---|
| | | |

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# APPENDIX 14. PROJECT CHECKLIST


# Project Checklist

**Project Name** _____

**▪Project Proponent** _____

***Verifier** _____

| Date Completed | | |
|---|---|---|
| ☐ | Attend Verifier Training for the Current Year* | Typically March |
| ☐ | Pre-Field Work Submittal Checklist*▪<br>Conflict of Interest Disclosure Form<br>Site Validation Checklist (Credit Projects Only)<br>Debit Project Review Form Part 1 (Debit Projects Only)<br>Pre-Field Credit System Calculator<br>Valid CCS Shapefiles with Map Units and Transects<br>Valid CCS Shapefiles of PFC Reaches for Surveying (Credit Projects Only) | Submit to SETT<br>Two Weeks Prior<br>to Fieldwork Start |
| ☐ | SETT Approval of Pre-Field Work Submittal Packet*<br>Will Provide the Transects Upon Final Approval | Expect two weeks<br>post submission |
| ☐ | Conduct Fieldwork*<br>Anthropogenic Features Review Form<br>Map Unit Datasheets<br>Resistance & Resilience Scorecards (Credit Projects Only)<br>Ability to Control Wildfire Scorecards (Credit Projects Only)<br>Transect Datasheets [Project Site]-[MU#]-[T##]<br>PFC Datasheets (Credit Projects Only) [Project Site]-PFC-[ReachName]<br>Other _____ | April 15th – June 30th<br>(Variable per Year) |
| ☐ | Enter Data into Calculator* | |
| ☐ | Name Photos* [Project Site]_[MU#]_[T##]_[{Descriptor} or {Unknown Code_#}]_YYYYMMDD; [Project Site]_PFC_[ReachName]_[##]_YYYYMMDD | |
| ☐ | Scan Datasheets* [Project Site]_[{MU#} or {PFC} or {Anthro}]_Datasheets_YYYYMMDD.pdf | |
| ☐ | Verifier Project Assessment Submission Form*<br>Project Geodatabase and Map (.mxd)<br>Final Credit System Calculator<br>Anthropogenic Features Review Form<br>Map Unit Datasheets<br>Resistance & Resilience Scorecards (Credit Projects Only)<br>Ability to Control Wildfire Scorecards (Credit Projects Only)<br>Transect Datasheets<br>PFC Datasheets (Credit Projects Only)<br>Transect Photographs<br>Other _____ | Submit to SETT<br>By October 31st<br>Or project may be<br>subject to a new Version |
| ☐ | Receive QA Results from SETT* | Expect one month<br>post submission |

☐ Complete and Sign Debit Project Review Form Part 2▪ (Debit Projects Only)
If not purchased or transferred within 5 years from signing of Debit Project Review Form Part 2, then the Debits must be rerun under the newest Version

☐ Draft Management Plan▪* (Credit Projects Only) Submit to SETT

☐ Finalize and Sign Management Plan Section A▪ (Credit Projects Only) Submit to SETT
If not completed within 90 days from approval of a new Version, then the Credits will be subject to the new Version

☐ Credits Eligible for Sale▪ (Credit Projects Only)

☐ Pre-Sale Annual Management and Monitoring Report▪ (Credit Projects Only) Submit to SETT By July 31st

Year HQT is Completed (Year 0) _____

Year 1 Year 2 Year 3 Year 4

**If Credits are Not Sold by Year 5 (Credit Projects Only)**

☐ Conduct 5-Year Qualitative Assessment▪ (Maintains Credits for another 5 years) Re-start Pre-Sale Annual Monitoring Cycle

Or

☐ Remove Project from CCS▪

**When an Arrangement is Made to Sell/Transfer Credits, Completed with Each Credit Sale/Transfer**

☐ Finalize Financial Assurance Plan▪ (Credit Projects Only) Submit to SETT

☐ Participant Contract▪ (Credit Projects Only) Submit to SETT

☐ Set up Financial Assurance Account▪ (Credit Projects Only)

☐ Finalize and Sign Management Plan Section B▪ (Credit Projects Only) Submit to SETT

☐ Credit Purchase Agreement▪ Submit to SETT

☐ Credit Transfer Form▪ (Credit Projects Only) Submit to SETT

☐ Debit Project Review Form Part 3▪ (Debit Projects Only) Submit to SETT

☐ Annual Management and Monitoring Report▪ / **15-Year Verification*** (Credit Projects Only) Submit to SETT By July 31st / **By October 31st**

Year HQT is Completed (Year 0) _____ Term of Project _____ Years

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 6 | Year 11 | Year 16 | Year 21 | Year 26 |
| Year 2 | Year 7 | Year 12 | Year 17 | Year 22 | Year 27 |
| Year 3 | Year 8 | Year 13 | Year 18 | Year 23 | Year 28 |
| Year 4 | Year 9 | Year 14 | Year 19 | Year 24 | Year 29 |
| Year 5 | Year 10 | **Year 15** | Year 20 | Year 25 | **Year 30…** |

# APPENDIX 15. BIENNIALS AND SUBSHRUBS GUIDE

| |
|---|
| When in doubt, look it up on USDA plants. All plants should be correctly identified to species as much as possible.<br>If plant can't be identified to species, identify to Perennial Forb (PF01, etc.), Annual Forb (AF01, etc.), or Shrub (SH01, etc.). If that cannot be figured out, classify it as "Unknown Other" |

| |
|---|
| Succulents should be categorized as "Other" Sedges and Rushes should be categorized as "Grass" |
| All "Annual/Biennial" and "Biennial/Perennial", ignore the Biennial and go with the other. All "Biennial" and "Annual/Biennial/Perennial" should be Annuals. Exceptions below. |
| All "Shrub/Subshrub" and Forb/Herb/Subshrub", ignore the Subshrub and go with the other. All "Subshrub" and "Forb/Herb/Shrub/Subshrub" should be Shrubs. Exceptions below. |

| |
|---|
| If you come across a specific plant that is a sage grouse preferred forb (verified by literature), but not on the list below, let us know. |

| **Biennials Categorized as Perennials** |
|---|
| **Astragalus lentiginosus** |
| Erigeron colomexicanus |
| Erigeron divergens |
| Erigeron flagellaris |
| Erigeron lobatus |
| Grindelia squarrosa |
| Hackelia nervosa |
| Lepidium virginicum |
| Machaeranthera canescens |
| Melilotus officinalis |
| Mentzelia leucophylla |
| Mentzelia pumila |
| Mentzelia torreyi |
| Oenothera biennis |
| Phacelia mutabilis |
| Potentilla newberryi |
| Potentilla norvegica |
| Tragopogon porrifolius |
| Tragopogon pratensis |
| Vicia villosa |

| **Subshrubs Categorized as Forbs** |
|---|
| Agoseris glauca |
| **Astragalus lentiginosus** |
| Chimaphila menziesii |
| Chimaphila umbellata |
| Orthilia secunda |
| Penstemon petiolatus |
| Petrophytum caespitosum |
| Phlox stansburyi |
| Phlox viridis |
| Pyrola asarifolia |
| Pyrola chlorantha |
| Pyrola minor |
| Pyrola picta |
| Sphaeromeria cana |
| Tiquilia canescens |


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

Sagebrush Ecosystem Technical Team (SETT)
(775) 684-8600