

Working Together to Create Ecological Site Descriptions in Far West Texas: A Two Phase Approach



Michael R. Margo¹ and Lynn E. Loomis²
¹Rangeland Management Specialist and ²Soil Scientist, USDA-NRCS, Marfa Soil Survey Office, Marfa, TX

Summary

Utilizing the interdisciplinary two phase approach described here, rangeland management specialists (RMS) and soil scientists (SS) have created more than 35 ecological site descriptions in conjunction with soil surveys on predominantly private lands in Far West Texas. The first and most important phase in the ecological site development effort begins with RMS and SS collaborating during legend building and map unit design. Without a RMS's input during map unit design, SS can potentially create map units that do not relate well to ecological sites. This makes the subsequent development of the ecological site concept difficult. In areas where ecological sites are the primary interpretive focus, soil map units should be designed to get the ecological site correct.

Phase two focuses on the actual development of the ecological site description document. This requires active solicitation of knowledgeable individuals. Workshops while providing an excellent opportunity for group participation can be costly. Without travel funds, short day-trips and email correspondence are our primary means of one-on-one communication.

Phase 1

Rangeland Management Specialist and Soil Scientists Working Together to Design Map Units

Participants: RMS and SS

Tasks: Actively work together during four key steps of soil survey (initial or update projects):

1. Legend Building
2. Mapping/Documentation
3. Sampling
4. Field Review

1. Legend Building

- Develop map unit and ecological site concepts concurrently.
- RMS and SS together rapidly record plant species list with ocular cover estimates, soil name, and UTM coordinates at many locations (Tier 1).
- SS observes landscape patterns, parent material, relief, and soil properties in shovel slices.
- Mutual teaching/learning: RMS teaches plant identification and SS teaches landforms and parent material.

2. Mapping/Documentation

- RMS collects additional kinds of data such as line point intercept data (Tier 2).
- SS describes and records pedons and delineates map units based on ecological sites.
- Mutual teaching/learning: RMS continues teaching plant identification and how to recognize ecological sites and states within sites in the field. SS teaches soil morphology (texture, horizon designation, structure) and soil classification.
- Once SS understands local ecological site concepts, RMS need not be present during subsequent mapping and documentation.

3. Sampling

- RMS collects more intense data such as plant production and soil stability (Tier 3).
- SS describes soil morphology and samples pedon in characterization pit.
- Mutual teaching/learning: RMS continues teaching plant ID and ecological site concepts and SS continues teaching soil morphology and classification.
- With adequate soils knowledge, RMS can independently verify soil components and collect additional Tier 3 data throughout the project area.

4. Field Review

- RMS, SS, quality assurance (QA) personnel concurrently approve ecological sites and soil map units in the field (Tier 4).

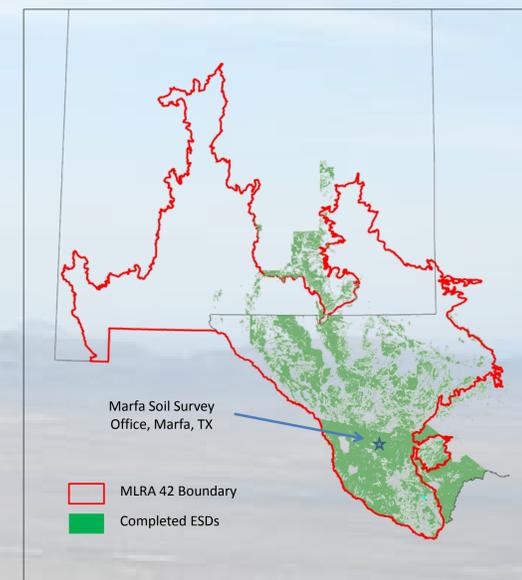
Necessary Data Collectors: Rugged field tablet computer (i.e. Panasonic Toughbook with internal GPS) loaded with ArcGIS, DIMA (Database for Inventory, Monitoring, and Assessment) and PedonPC to record plant and soil data.

Outcome:

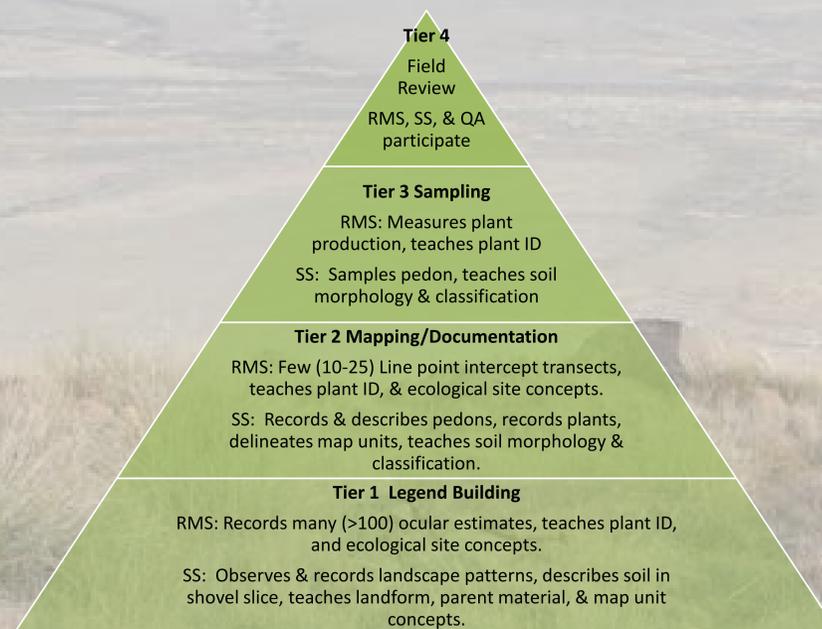
- Rangeland management specialists and soil scientists concurrently acquire the necessary knowledge and understanding of the local physical environment that controls plants.
- Soil map unit components are linked to ecological sites based on mutually agreed decisions.
- Soil map units are accurately and consistently mapped.
- A common ecological site development issue of multiple climax plant community potentials within a soil map unit component is minimized.
- The development of the ecological site document (Phase 2) is simplified.



Michael Margo, rangeland management specialist (right) practices texturing soil as Lynn Loomis, soil scientist, provides instruction.



Spatial extent of 38 ecological site descriptions, spanning over 16 million acres, completed from the Marfa Soil Survey Office, since 2006.



Marfa Pyramid

Marfa Soil Survey Office Concurrent Field Tasks Phase 1



Marfa Soil Survey Office Collaborators - Phase 2

USDA is an equal opportunity provider and employer

Phase 2

Developing Ecological Site Description Documents

Participants: Individuals with local, subject, and/or geographic knowledge (landowners/managers, stakeholders, agency personnel of various disciplines, university staff, researchers, etc.)

Tasks: Actively participate in the development of state and transition model, provide insight on vegetation history and dynamics, review final document.

Methods: Three methods of collaboration have been used in west Texas each with both pros and cons:

1. Workshops:

Advantages: Excellent opportunity for collaborators from a large geographic area to sit down together and discuss state and transition models through a PowerPoint presentation.

Disadvantages: Cost (travel expense for some participants). Scheduling conflicts (low turnout of invited guests).

2. One-on-one communication:

Advantages: No need to schedule one or two day workshops. Excellent opportunity to spend time with select individuals. Ideally done face-to-face but telephone communication is needed when individuals are at a long distance.

Disadvantages: Face-to-face communication usually limited to about a two hour driving radius from office. Takes longer to get input from numerous individuals compared to a one or two day workshop.

3. Email correspondence:

Advantages: Low cost and efficient.

Disadvantage: Very few individuals respond with comments or suggestions.

Acknowledgement: We thank Jim Clausen, NRCS Soil Scientist, Marfa, TX, for helping test this approach and reviewing this poster.