Using Ecological Site Descriptions for Rangeland Restoration

Michael R. Margo, USDA-NRCS, Marfa Soil Survey Office

Sandstone Hill
Loamy
Delaware Mountains
Presentation Outline

1. Definition of an ecological site
2. Mapping soils and ecological sites
3. Components of an ecological site description
4. Value of ecological sites
As you look across the landscape it is easy to recognize that some parts look different than others in the kinds and amounts of vegetation.
An **ecological site** is a conceptual landscape division defined by recurring soil, landform, geological, and climate characteristics. A site produces distinctive kinds, amounts, and proportions of vegetation and **responds similarly to management actions and natural disturbances.**
Each **Ecological Site** is the product of all the Environmental Factors responsible for its development.

**Climate**

*These abiotic factors interact to govern how plant species are distributed along environmental gradients, and how they respond to other factors such as disturbances and management:*

**Geomorphology**

**Soils**

**Fire**

**Herbivory**

**Drought**
How do we begin to develop ecological sites?
Vegetation specialists and soil scientists working together to produce soil maps

- Soil scientists describe the soil.
- Rangeland specialists collect vegetation data
Soil Series

The soil series is defined by a range of variability.
Each soil map unit has a dominant ecological site.
Deep, clayey soils occurring on basin floors
**Clay Flat, ecological site**

Deep, loamy soils occurring on alluvial fans
**Loamy ecological site**

Deep, loamy and gravelly soils on alluvium
**Gravelly, ecological site**

Shallow, gravelly soils on limestone bedrock
**Limestone Hill & Mountain ecological site**
Plant community dynamics within an ecological site

*Not a different ecological site but different states*

Potential

Gravelly ecological site

? 

Overgrazed

Gravelly ecological site
Plant Community Dynamics within an Ecological Site

These land areas have the same vegetation potential!

Tobosa Grassland Reference Plant Community

Tobosa/Shrubs

Bare Ground/Shrub

Cropland

Bare Ground/Tobosa

Eroded

Clay Flat
Ecological Site Descriptions

* Each Ecological Site Description contains the following information:

- Topographic features
- Climatic features
- Soil features
- Hydrologic features
- Plant Communities
- Plant Community Dynamics
- Annual Production Estimates
- Associated Wildlife Species
- Wildlife Plant Preference & Use
- Site Use & Management

* Ecological Site Descriptions will provide the foundation that will assist land managers in making timely, well informed resource management decisions.
Value of Ecological Sites

- ESDs provide land managers the information needed for evaluating, managing, and restoring the land.

- ECOLOGICAL STATES REPRESENT THE RANGE OF POSSIBILITIES
  - Useful for inventory, conservation planning, setting objectives
  - Individual land managers can examine the probabilities, costs, benefits and timeframes for moving to new states or maintaining existing states
  - Conservation practices (prescribed grazing, prescribed fire, brush management, restoration techniques) are linked to transitions
<table>
<thead>
<tr>
<th>Relative Rating</th>
<th>Soil Symbol</th>
<th>Count</th>
<th>Acres</th>
<th>Depth</th>
<th>Rangeland Productivity</th>
<th>Ecological Site</th>
<th>Soil Unit Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NLA</td>
<td>7</td>
<td>1,747</td>
<td>Deep</td>
<td>1900 lbs</td>
<td>Draw</td>
<td>Nillo soils, 0 to 2 percent slopes, occasionally flooded</td>
</tr>
<tr>
<td></td>
<td>BBA</td>
<td>4</td>
<td>1,007</td>
<td>Deep</td>
<td>1000 lbs</td>
<td>Draw</td>
<td>Bigetty silt loam, 0 to 1 percent slopes, occasionally flooded</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,754</td>
</tr>
<tr>
<td>2</td>
<td>CEB</td>
<td>35</td>
<td>14,992</td>
<td>Deep</td>
<td>900 lbs</td>
<td>Loamy</td>
<td>Cesario and Fizzleflat loams, 1 to 5 percent slopes</td>
</tr>
<tr>
<td></td>
<td>SOA</td>
<td>10</td>
<td>2,235</td>
<td>Deep</td>
<td>900 lbs</td>
<td>Loamy</td>
<td>Stovall silt loam, 0 to 3 percent slopes</td>
</tr>
<tr>
<td></td>
<td>SRA</td>
<td>35</td>
<td>24,307</td>
<td>Deep</td>
<td>400 lbs</td>
<td>Loamy</td>
<td>Straddlebug silty clay loam, 0 to 3 percent slopes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>41,535</td>
</tr>
<tr>
<td>3</td>
<td>GSA</td>
<td>36</td>
<td>10,793</td>
<td>Deep</td>
<td>750 lbs</td>
<td>Gravelly/Loamy</td>
<td>Gemelo and Straddlebug soils, 1 to 3 percent slopes</td>
</tr>
<tr>
<td></td>
<td>BOC</td>
<td>78</td>
<td>14,359</td>
<td>Moderate</td>
<td>700 lbs</td>
<td>Gravelly/Loamy</td>
<td>Borunda soils, 1 to 8 percent slopes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25,152</td>
</tr>
<tr>
<td>4</td>
<td>QBE</td>
<td>28</td>
<td>16,795</td>
<td>Deep</td>
<td>600 lbs</td>
<td>Loamy/Gravelly/Clay Hill</td>
<td>Quadria, Nolam, and Musgrave soils, 0 to 30 percent slope</td>
</tr>
<tr>
<td></td>
<td>CIC</td>
<td>55</td>
<td>11,060</td>
<td>Deep</td>
<td>600 lbs</td>
<td>Gravelly</td>
<td>Chilicotal very gravelly sandy loam, 1 to 8 percent slopes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>27,855</td>
</tr>
<tr>
<td>5</td>
<td>MOA</td>
<td>20</td>
<td>8,352</td>
<td>Deep</td>
<td>1200 lbs</td>
<td>Clay Flat</td>
<td>Martillo and Butcherknife soils, 0 to 3 percent slopes</td>
</tr>
<tr>
<td></td>
<td>CID</td>
<td>17</td>
<td>2,270</td>
<td>Deep</td>
<td>600 lbs</td>
<td>Gravelly</td>
<td>Chilicotal very gravelly sandy loam, 5 to 16 percent slopes</td>
</tr>
<tr>
<td></td>
<td>EUA</td>
<td>1</td>
<td>6</td>
<td>Deep</td>
<td>400 lbs</td>
<td>Gravelly</td>
<td>Equipaje-Arug complex, 1 to 3 percent slopes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10,627</td>
</tr>
<tr>
<td></td>
<td>VOC</td>
<td>95</td>
<td>298</td>
<td>Shallow</td>
<td>1200 lbs</td>
<td>Basalt Hill</td>
<td>Voico and Pardo soils, 1 to 8 percent slopes</td>
</tr>
<tr>
<td></td>
<td>LGC</td>
<td>20</td>
<td>3,233</td>
<td>Shallow</td>
<td>1000 lbs</td>
<td>IHM</td>
<td>Lingua very gravelly loam, 1 to 8 percent slopes</td>
</tr>
<tr>
<td></td>
<td>BIC</td>
<td>9</td>
<td>2,017</td>
<td>Shallow</td>
<td>650 lbs</td>
<td>LHM</td>
<td>Bissett-Rock outcrop complex, 1 to 8 percent slopes</td>
</tr>
<tr>
<td></td>
<td>CHD</td>
<td>26</td>
<td>5,377</td>
<td>Shallow</td>
<td>650 lbs</td>
<td>Gravelly</td>
<td>Cheosa and Loyplace soils, 1 to 8 percent slopes</td>
</tr>
</tbody>
</table>
Accessing Ecological Site Descriptions

http://websoilsurvey.sc.egov.usda.gov

Welcome to the Ecological Site Description (ESD) System for Rangeland and Forestland

The Ecological Site Description (ESD) application provides the capability to enter, edit, and view reports of rangeland and forest land ecological site descriptions. Anyone may view reports of approved Ecological Site Descriptions. Data entry, edit, download, and viewing draft reports is for authorized users only.

https://esis.sc.egov.usda.gov/Welcome/pgESDWelcome.aspx
Questions?

Michael Margo
USDA-NRCS, Marfa, TX
michael.margo@tx.usda.gov
432-729-3217