



Identifying Ecological Sites

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Ecological Sites

- A framework for stratifying and describing rangelands for assessments, land suitability, and land management planning.
- Land (soil)-based classification system



Ecological Site – Definition (2013)

- **An ecological site, as defined for rangeland, is a distinctive kind of land based on recurring soil, landform, geological, and climatic characteristics that differs from other kinds of land in its ability to produce a distinctive kinds and amounts of vegetation and in its ability to respond similarly to management actions and natural disturbances.**

Ecological Site Development

- Background information: literature, existing data, local expert knowledge, relict sites, photos
- Evaluate existing data – development of the ecological site concept
- Defining the ecological site ‘modal’ concept: soil properties, elevation, slope, aspects, vegetation dynamics – disturbance regimes, climatic variability
- Based on reference conditions representing natural states – developed within the natural range of variability

Ecological Site Descriptions

- **Physiographic Features**
- **Climatic Features**
- **Influencing Water Features**
- **Representative Soil Features**
- **Plant Communities - description & dynamics, models, growth curves, function, structure, cover**
- **Management Interpretations**
- **Other Information**

Interagency Effort

- **MOU (2013)– BLM/NRCS/USFS Interagency Workgroup – develops/recommends policy, procedures and data management for the development and use of ESD's.**
- **January 2013: Interagency Ecological Site Handbook for Rangelands**

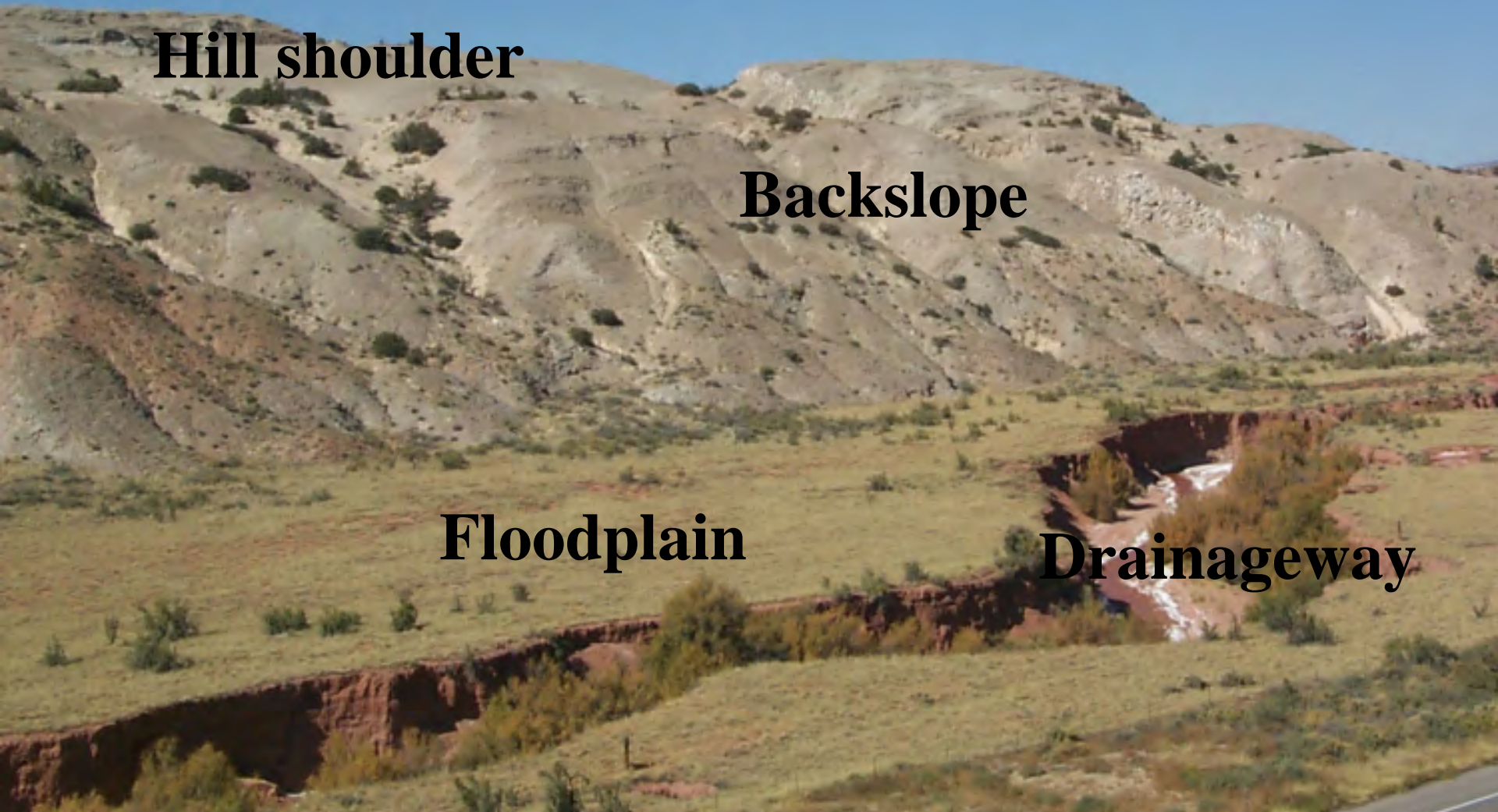
Landforms and Soils

Hill shoulder

Backslope

Floodplain

Drainageway





Claypan 10-12

Aspen Thicket/Aspen Woodland)

Claypan 10-12

Stony Mahogany Savanna

Mountain Ridge

Aspen Woodland

Loamy 12-16

Ecological Site Descriptions

- **Management interpretations:**
 - **Fire** – different states in the same ecological site may react differently to fire
 - **Forest/woodland** – manage pest outbreaks and documents vegetation change
 - **Hydrology** – provide information on site characteristics such as erosion potential
 - **Grazing** – how grazing affects plant composition and ecological processes
 - **Invasive species** – STM's highlight vulnerable ecological sites and states
 - **Restoration** – some states are easier to change than others
 - **Wildlife** – ESD's prioritize areas for habitat projects

Agency Applications

- ESD's can be used at different planning levels: Strategic (National), Operational (State/Regional), Tactical (Ranch/Allotment)
- National:
 - Development of consistent data collection methodologies and protocols
 - Consistent training tool and information source
 - Relationship with other classification systems
 - Incorporate into landscape functional units
 - GIS/Soil/ESD mapping tools

National Level

- Strategic – (National Level) ESD's help set realistic management objectives. Ex – 'Utilize ESD's to conduct land health assessments to determine if standards of rangeland health are being met. Develop specific objectives to conserve, enhance, or restore priority sage grouse habitat based on ESD's and assessments'.

A Report on National Greater Sage-Grouse Conservation Measures – by the Sage-Grouse National Technical Team 12/2011

State and Regional Level

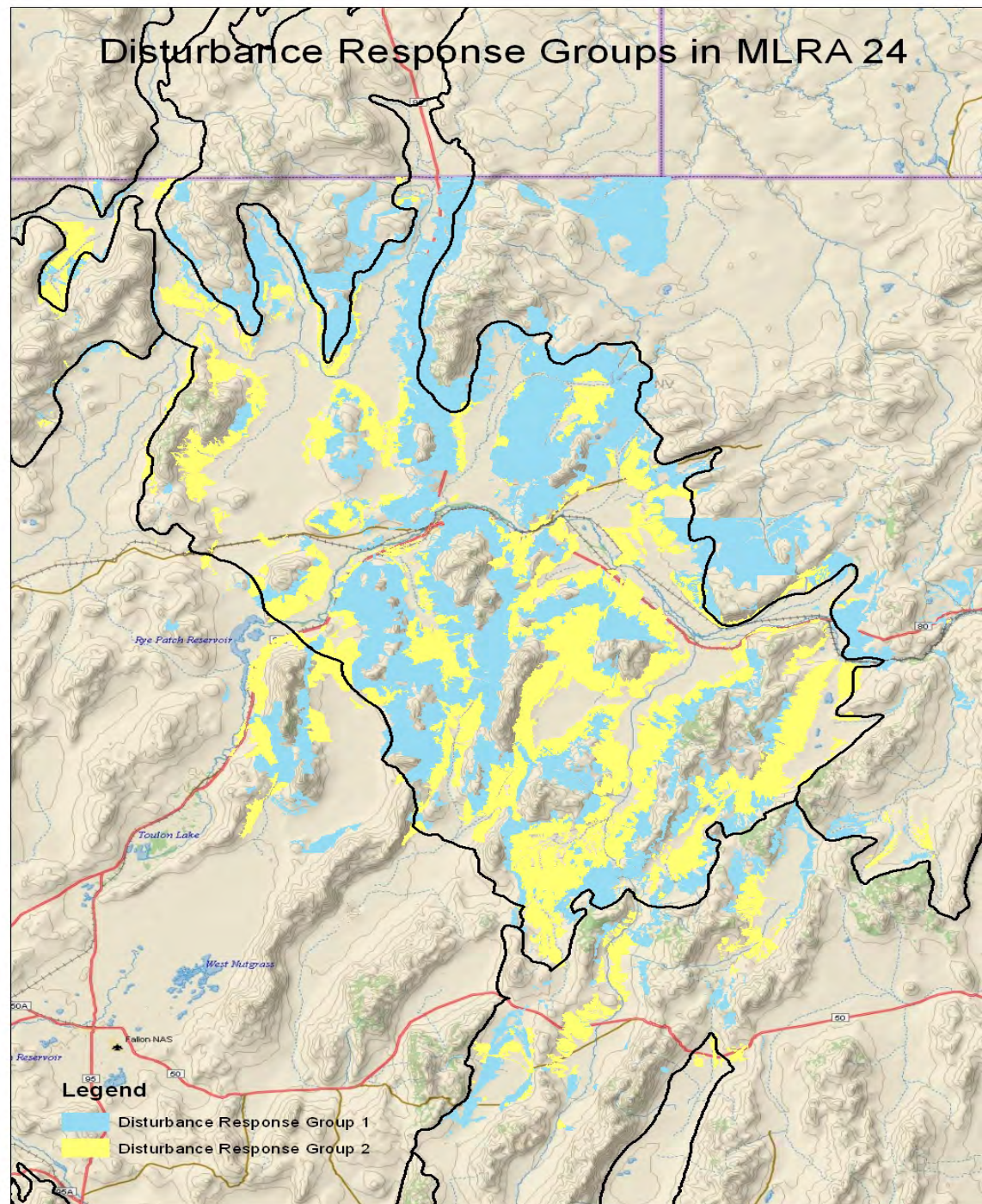
- **Operational:**
 - **Refine the planning unit to areas that respond similarly**
 - **Provide baseline information for land health assessments and monitoring**
 - **Incorporate GIS/Soil/ESD's into effective mapping tool**
 - **Watershed interpretations – erosion potential, hydrologic condition**

Allotment Level

- **Implementation of conservation practices: What is possible? What's the likelihood of success or failure? What are the costs?**
- **Determine goals and objectives**
- **Determine carrying capacity**

Regional or Allotment Level:

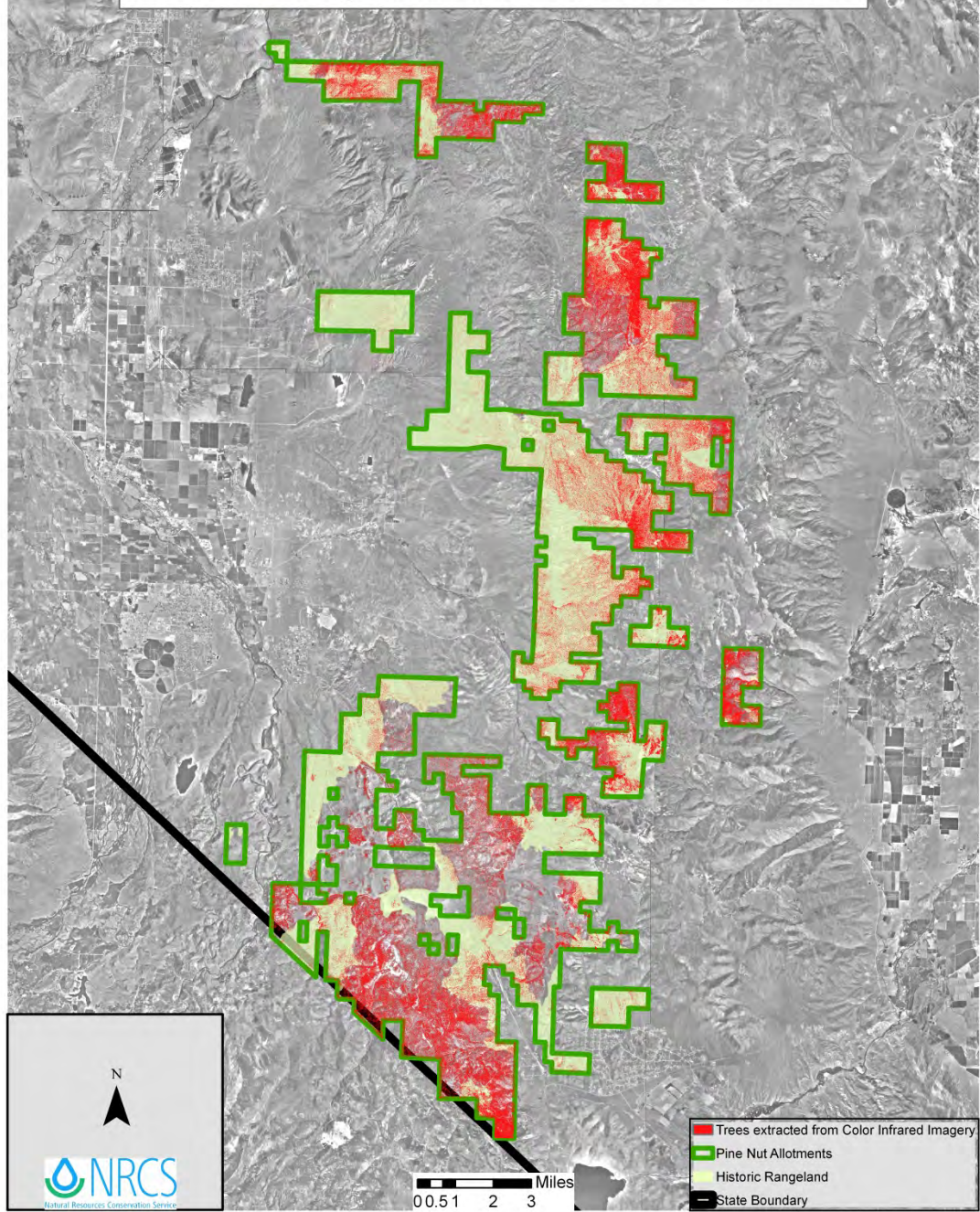
Refine Planning Units using Disturbance Response Groups for monitoring and land health assessments



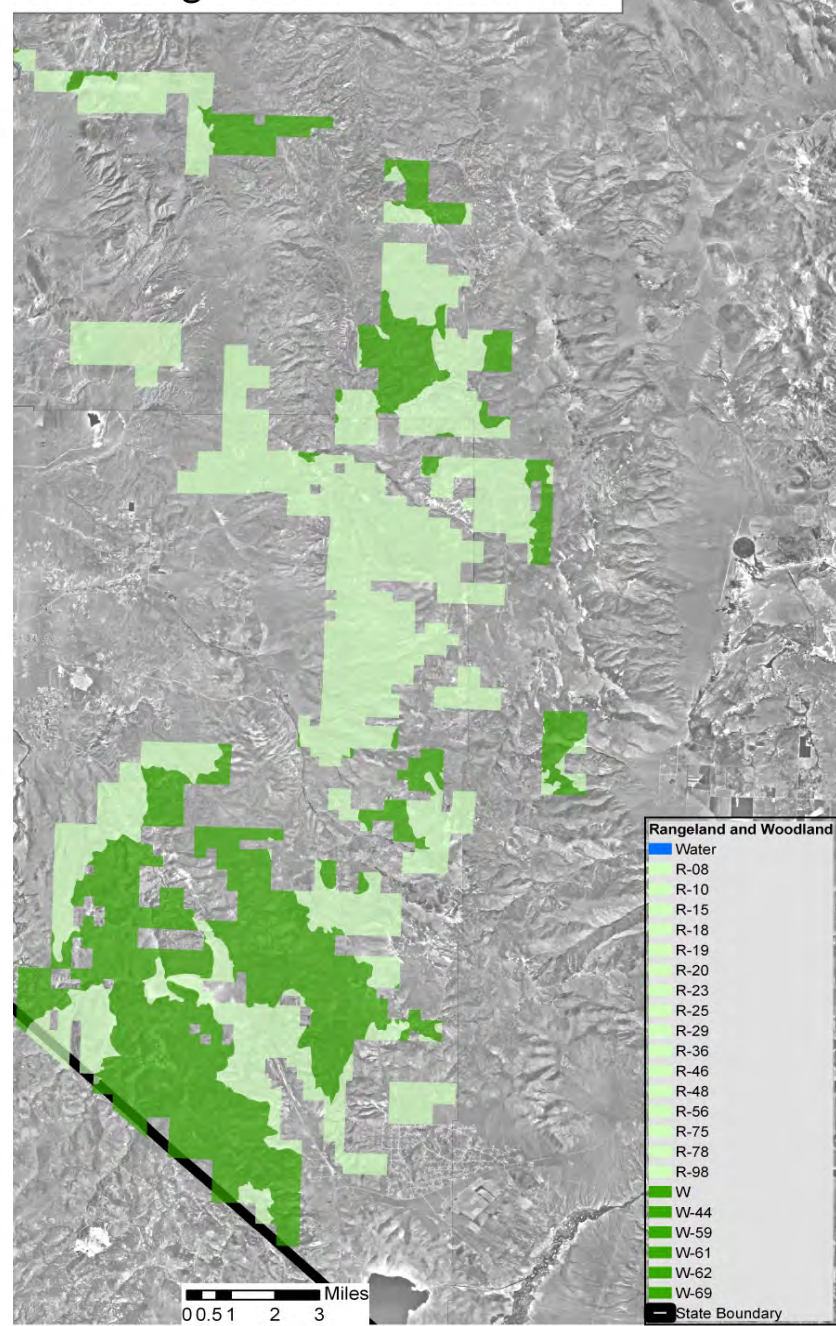
Ecological Sites near Active Leks

- **Elko County, NV: 214 Active leks – 5km buffer**
 - **Claypan 10-12: 65 (30%)**
 - **Claypan 12-16: 47 (22%)**
 - **Loamy 8-10: 44 (21%)**
 - **Shallow Clay Loam 10-14: 19 (9%)**
 - **Shallow Calcareous Loam 8-10: 19 (9%)**
 - **Loamy 10-12: 13 (6%)**
 - **Shallow Calcareous Loam 10-14: 4 (2%)**

Historic Rangeland with Current Vegetation



Historic Rangeland and Woodland

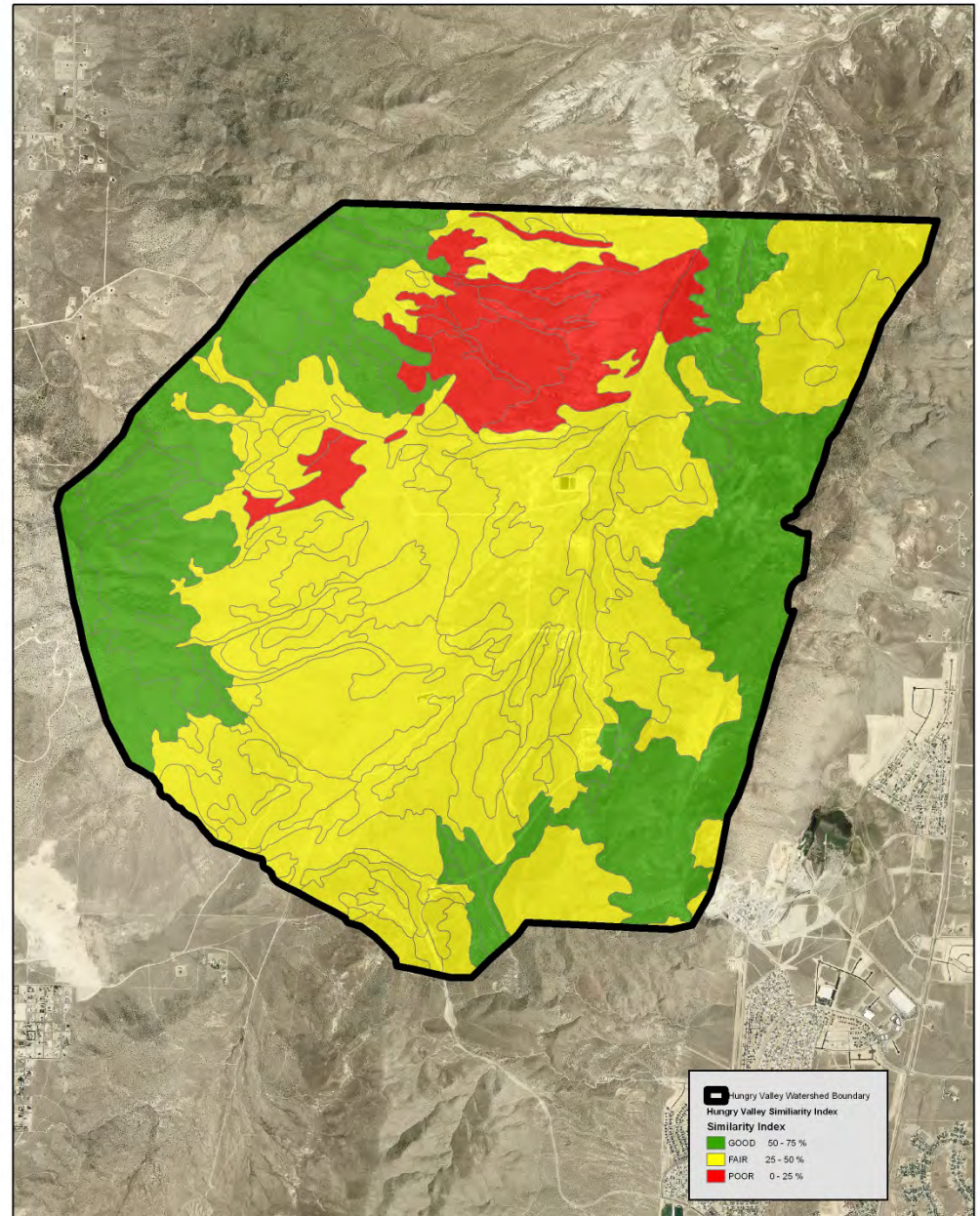


Watershed Level:

Invasive Species
Management –
STM's highlight
vulnerable
ecological sites



Hungry Valley Similarity Index



Ranch Level Applications

- **Grazing Management** – STM's describe how grazing affects plant composition and ecological processes; what species to manage for; carrying capacity
- **Invasive Species** – what species are more vulnerable to disturbances (spread/establishment)
- **Fire Management** – describes the role of fire in vegetation change, reduce fire risk, etc.
- **Restoration or Range Improvements** – what actions are most likely to have a positive impact/prioritize areas

Ranch/Allotment Level Conservation Practice Applications

- **Brush Management (314)**
- **Prescribed Burning (338)**
- **Prescribed Grazing (528)**
- **Range Planting (550)**
- **Restoration & Management of Rare and Declining Habitats (643)**
- **Riparian Forest Buffers (391)**
- **Tree/Shrub Establishment (612)**
- **Upland Wildlife Habitat Management (645)**

Brush Management – Create the desired plant community consistent with the ecological site



Phase 3: Pinyon and Juniper Removal – Mechanical Cutting



**Wildfire Restoration – STM's help
prioritize areas where restoration is
most likely to succeed**



Finally... ESD's provide:

- A common framework for communication of resource information among disciplines, agencies and organizations.
- Information describing the interactions amount soils, vegetation and land management.
- A foundation to assess current condition, management opportunities, and monitor changes.
- A framework for transferring experience and knowledge.

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Welcome to the NRCS Soils Website.

Helping People Understand Soils

Soils is part of the National Cooperative Soil Survey, an effort of Federal and State agencies, universities, and professional societies to deliver science-based soil information.



[North America Node of GlobalSoilMap.net](#)

GlobalSoilMap.net is a global consortium that has been formed with the aim of making a new digital soil map of the world using state-of-the-art and emerging technologies for soil mapping and predicting soil properties at fine resolution. This new global soil map will be supplemented by interpretation and functionality options that aim to assist better decisions in a range of global issues like food production and hunger eradication, climate change, and environmental degradation. This is an initiative of the Digital Soil Mapping Working Group of the International Union of Soil Sciences (IUSS). This effort is organized by continent (nodes). The North America Node is comprised of Canada, Mexico, and the United States. Currently, the National Cooperative Soil Survey provides the leadership for the North America Node. Jon Hempel (Director of the USDA-NRCS National Soil Survey Center) is the Node Leader and James Thompson (West Virginia University) is the Scientific Coordinator.

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[11th Edition of Keys to Soil Taxonomy Now Available in Spanish](#)

This translation will expand the horizons of U.S. Soil Taxonomy by allowing professionals in all parts of the world to apply and interpret the system in a more uniform and consistent way. While soils differ globally, the ability to apply a system that is universally understood and accepted is a goal shared by many soil scientists. As the world struggles with global warming and other environmental challenges, having a universally accepted method that can be applied when soil problems are addressed will contribute to successful outcomes.

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[More Than "Just" Office Space ...](#)

Taking pride in who we are and what we do was the motivation behind the recent "sprucing up" of the offices of the National Soil Survey Center (NSSC). The NSSC is an important part of NRCS, the federal agency committed to soil and conservation. Jon Hempel, the Center's director, wanted that commitment to become a clear message for anyone who spends time at the Center. With that goal in mind, Hempel turned NSSC gathering places into museum-like spaces designed to inform, inspire, and motivate all who work or visit the Center.

[...More Info](#)

[Keys to Soil Taxonomy Released in E-Book Format](#)

Information For:

- > Geographers
- > Soil Scientists
- > Land Use Managers
- > Teachers and Students
- > City and County Planners

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[Ecological Site Information System \(ESIS\)](#)

ESIS is the NRCS repository for ecological site descriptions and for information associated with the collection of forestland and rangeland plot data. ESIS is organized into two applications and associated databases; the Ecological Site Description (ESD) application and the Ecological Site Inventory (ESI) application. This section, plus the access tab on the right, provides quick access to technical resources and technical guidance for developing and understanding ecological sites.

[...More Info](#)



[Ecological Site Description \(ESD\)](#)

The ESD application is used to enter, edit and store ecological site information. Only approved ecological sites for forestland and rangeland are available to the public. Open this section to access approved and non-approved ESD's. Entry/Edit privileges are required to access non-approved sites. Click on MLRA/state of interest, and available ESDs within that MLRA/LRU for the state will be displayed.

[...More Info](#)



[Forage Suitability Group Descriptions \(FSGD\)](#)

Forage suitability group descriptions (FSGDs) are interpretive reports which provide a soil and plant science basis for conservation planning where forage crops are grown. FSGDs identify adapted forage species, yearly forage production estimates, and distribution of production during the growing season. Open this section to access approved and non-approved FSGD's. Click on MLRA/state of interest, and available FSGD's within that MLRA/LRU for the state will be displayed.

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[Ecological Site Inventory \(ESI\)](#)

The Ecological Site Inventory (ESI) application provides the capability to enter, edit, and retrieve rangeland, forestry, and agro-forestry plot data. ESI stores plot data collected via the Soil-Woodland Correlation Field Data Sheet (ECS-005), the Windbreak-Soil-Species Evaluation Data Sheet (ECS-004) and the Production and Composition Record (RANGE-417). To access ESI information, open this section or click on either the Forest or the Rangeland, "button" to the left.

Technical Resources

- [USDA - ARS Range Database](#)
- [Web Soil Survey](#)
- [Ag Handbook 296](#)
- [Climate Data](#)
- [Soil Change Guide](#)

Technical Guidance

- [National Range & Pasture Handbook](#)
- [National Biology Manual](#)
- [National Biology Handbook](#)
- [National Forestry Manual](#)
- [National Soil Survey Handbook \(NSSH\)](#)