# "An ESD Development Journey in the Elkhorn Mountains"

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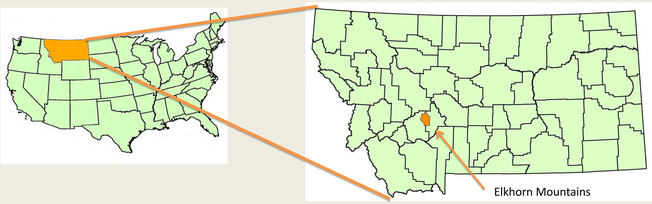
## Goal:

Demonstrate interagency participation in development of ecological site descriptions (ESD's) applicable on public and private lands.

## Objectives:

1. Identify and classify legacy data.
2. Identify ecological site description needs for the Helena National Forest.
3. Collect rangeland inventory data for ESD site concept verification and development.
4. Develop 2-5 ESDs for the project area.
5. Develop a plan to systematically complete ESDs for remaining FS lands.
6. Follow guidance in the Interagency Ecological Site Handbook for rangelands.




This collaborative effort was initiated following attendance of the "ESD development technical workshop" in Billings in 2011 and the "Using ESDs as a decision making tool workshop" in Spokane in 2012. These workshops are fostering development of interdisciplinary and interagency relationships and partnerships that are advancing the ESD development process. The Forest Service and Natural Resources Conservation Service are the major partners in this project. The Montana Natural Heritage Program, Bureau of Land Management, Montana State University and Agricultural Research Service are also active participates.

## Legacy Data Considerations

The value of legacy data in the development of ecological site descriptions is determined by three primary considerations: The level of detail and accuracy with which the data can be associated to a precise physical location; the nature of the original data elements that were collected; and the ability to associate the legacy data with the current ecological site classification system.

It is first necessary to determine the level of accuracy associated with the description, mapping, or GPS coordinates for the physical location of the legacy data. Data collected prior to the use of GPS technology may be accompanied by hard-copy quadrangle maps or aerial photos with locations delineated or referenced with a legal description. Early generation GPS data may have plot coordinates but no documentation of the GPS unit accuracy. In all cases it is an important first step to evaluate the locational accuracy of the data and avoid using or interpreting the data beyond the spatial accuracy limitations.

To associate legacy vegetation data with the current ecological site classification system, at a minimum it must describe the plant community and dominant species, include measurements or estimates of cover, and it must be associated with soil pedon data. Vegetation data classified to the plant community phase is particularly useful. Soil pedon data is necessary because it facilitates using an abiotic ecological site key to assign an ecological site to the plot location. Pedon data collected concurrently with vegetation data in conjunction with GPS coordinates are of greatest value and can be used in the development of ecological site descriptions. Accurately geo-referenced vegetation data that is not accompanied with pedon data can be useful at scales broader than the ecological site level. For example it may be useful in locating sites with higher proportions of desirable vegetation or potential reference sites, or to evaluate the extent and distribution of dominant plant communities. However, the ecological site for these locations will need to be field verified before it can be reliably used in ecological site evaluations.

The legacy data available for this project is housed in the Forest Service Natural Resource Information System (NRIS) database. These data consisted of macro plots collected between 1985 and the present. Tenth-acre ocular cover data and full species lists were the vegetation data attributes collected on 1963 plots. All plots were geo-referenced; early plots were digitized from markings on maps and on later plots GPS coordinates were collected. No soil pedon data was gathered at the plot locations.

What is the best way to utilize this dataset for ESD development? The data revealed, a significant amount of cool season dominant reference community species were present when the data was collected. We decided to target the plots that had greater than 20% cover of bluebunch wheatgrass (Pseudoroegneria spicata), rough fescue(Festuca campestris), or mountain big sagebrush (Artemisia tridentata ssp. vaseyana).




## 2012 Inventory

Legacy data was used to target locations that might be in the reference plant community phase or reference state. Without pedon data we needed to revisit these plots to determine the ecological site associated with these plots. Due to the remote locations and road conditions, access to the plots was very time consuming. In an attempt to maximize field data collection while at each plot, we decided to gather a moderate level intensity of data at each site.

The following inventory protocols were gathered in order to develop site concepts and ecological dynamics of the sites. Data was collected by two Forest Service seasonal employees concurrently; Sarah Brame, a soil scientist, collected pedon data and soil site stability. Jessica French, a rangeland management specialist, gathered the vegetation data.

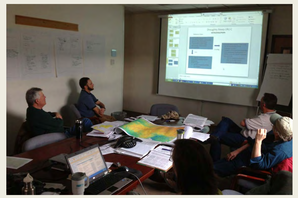
## Protocols

- Collect line-point intercept transects for foliar and ground cover (100 points)
- Gather 1 representative 4.8 square foot hoop to get an estimate of herbaceous production and species composition by weight. Shrub production estimated in 0.01 acre plot.
- Soil pedon description of the site.
- Soil stability test (9 samples along the transect)
- Key Ecological Site and Habitat Type
- Plant census or full species list of 0.1 acre plot and classified as: Rare 1-10 plants, Common 11-100 plants, Abundant >100 plants within tenth acre plot.
- Describe 17 identified Rangeland Health Indicators
- 1 line intercept transect for shrub cover
- Photographs
- GPS site location

A full inventory of all the protocols was completed on 22 sites. Eight additional sites had pedon data and a full species list gathered.

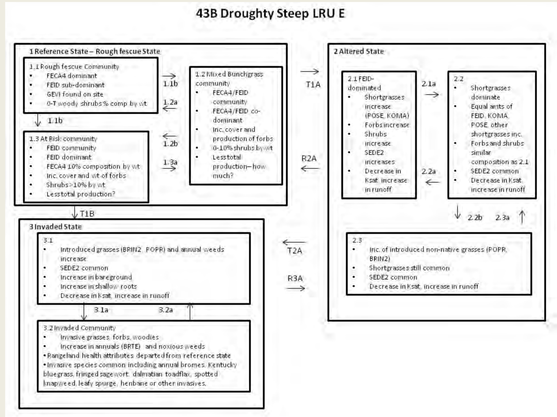
## Data Management

All field data collected for this project has been entered into the Database for Inventory, Monitoring and Assessment (DIMA). The field sheets were scanned and filed with the digital photographs. The database and all associated data have been distributed to the appropriate people. The pedons were also entered in PedonPC and have been uploaded into NASIS.



## Site Concept STM Development

In late November we had our first interagency ecological dynamics and State and Transition Model (STM) concept development workshop. Participants included representatives from the Forest Service, NRCS, BLM and Montana Natural Heritage Program. Jeb Williamson with the ARS queried the dataset collected this past summer and developed some summary spreadsheets for analysis. These spreadsheets along with plot photos and local knowledge were consulted to draft the state and transition models for two ecological sites.




## Summary

This collaborative project has been a learning experience for all the partners involved. As we go through the process we learn more about the best methods to achieve the goals and objectives. We learned the value and use of the legacy data available for this specific ESD development project area. We are in the process of developing site concepts and STM's for two ecological sites. As we continue forward with this project and develop ESDs we will follow guidance outlined in the interagency ESD handbook. This project has been successful thus far because of the willingness of all partners to participate and the overwhelming support of upper management of everyone involved. We are confident this project is pioneering a way for other Forests to develop ESD's given similar beginnings, objectives and support.

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