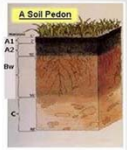
Healthy soils are an important inter-related factor contributing to healthy vegetation and watersheds. Healthy soils absorb water and make it available for plants, cycle nutrients, and filter pollutants. For a project like Rainey Creek with a goal of vegetation improvement, my first step as an agency scientist is to review Forest Plan direction and to look at the soil and vegetation inventory data and maps we have available for the project area.

Soil Resources

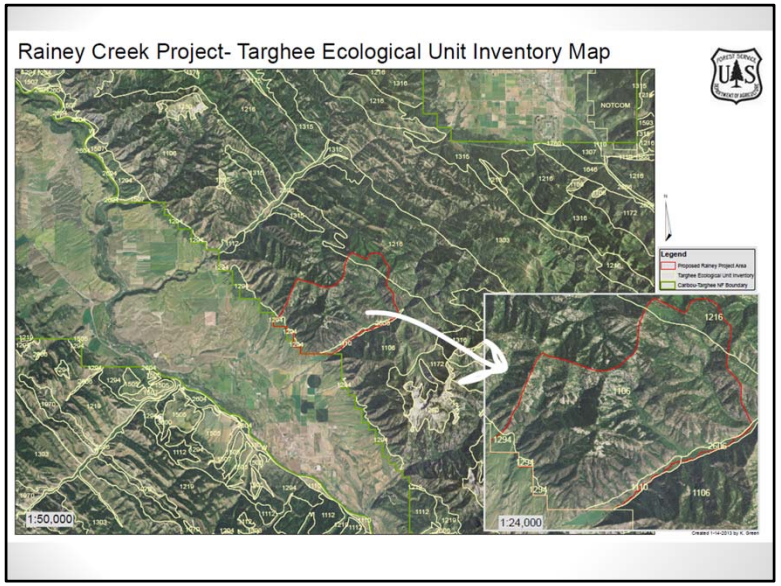


Targhee Forest Plan- Forest-wide Soils Direction

Goal- Long-term soil productivity is sustained by retaining fine organic matter and woody residue on activity areas.

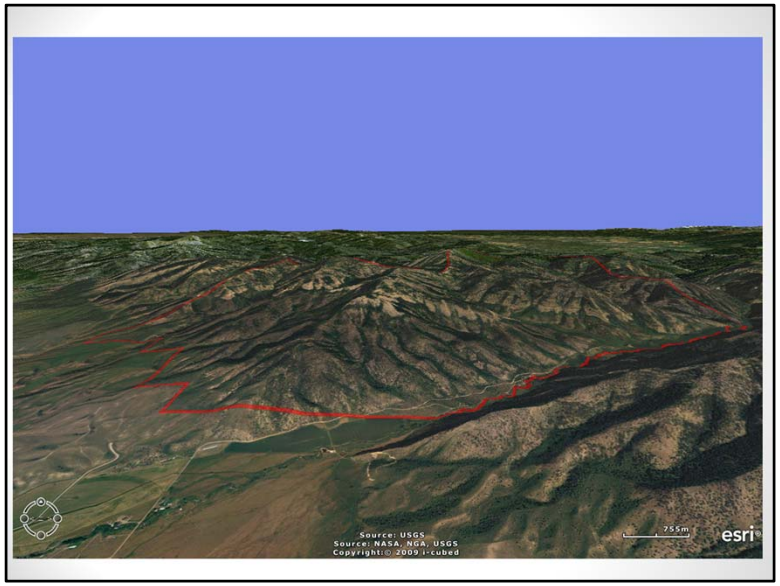
1. **Fine organic matter**. Generally strive to maintain fine organic matter over at least 50% of the area.
2. **Woody residue** requirements for materials three inches in diameter or larger. Sustain site productivity by providing the following minimum amounts of woody residue dispersed on the site.

The Forest Plan direction specific to soil resources is to maintain soil productivity by using the guidelines of fine organic matter, (or ground cover, litter or duff), on the soil surface and amount of down trees and limbs >3 in diameter on-site. The intent of these two guidelines is to provide latitude for management actions while leaving enough ground cover to control erosion and approximately the naturally-occurring amount of down trees to sustain long-term nutrient cycling.



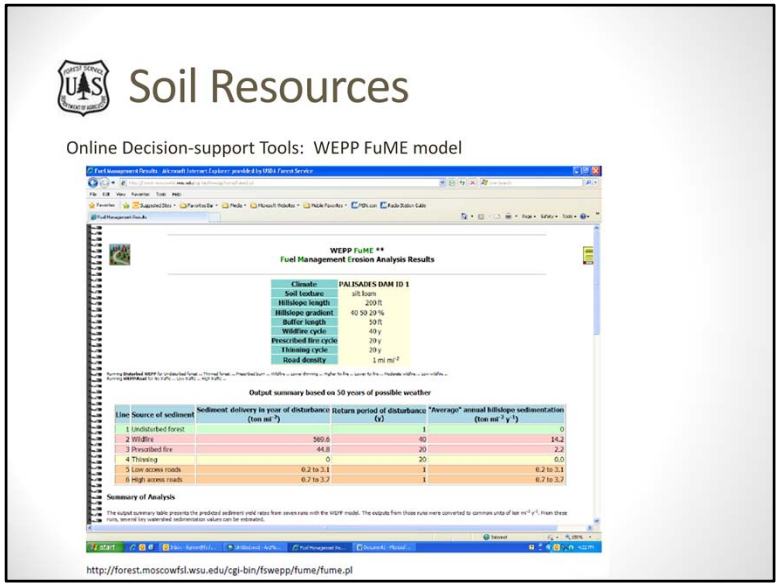
The inventory information is available to everyone on the web at WebSoilSurvey http://websoilsurvey.nrcs.usda.gov/. Maps similar to these are available, as well as reports on soil properties and potential limitations to different management actions. The majority of the mountain slopes in the project area are mapped as 1106.

Map unit 1106 is a complex, meaning there are several different sites described, but they are too intermingled to delineate at the mapping scale. Looking at this photo taken of the project area, we can predict where the different soils are likely to occur and what the management limitations are for those different sites. The southwest facing convex positions have thin, rocky, limey soils that support mountain mahogany on the mid to upper mountain slopes. These sites are more limited than other sites for prescribed burning. Burning these sites may be more of a risk due to a combination of the very steep slopes, shallow soils, and the potentially lengthy regeneration timeframe for the mahogany. The lower portion of the slope, or toeslope, has deeper soils due to colluvium from the upper slope, and these deeper soils currently support more juniper. These toeslopes would be more suited to mechanical brush treatment and prescribed fire. The concave positions are supporting maple, and in some places aspen. Due to the position, these sites receive additional moisture and typically have deeper, more productive soils. These concave areas would be well-suited to vegetation treatments. The north-facing slopes in this area support conifer forest types, and slope would likely be the main limiting factor on these sites.



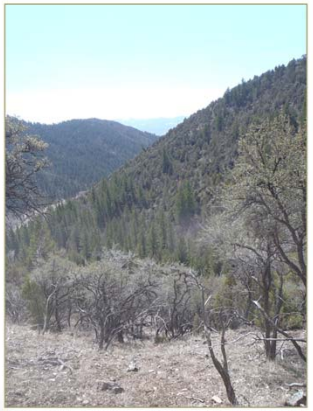
The 3-D image can also help differentiate the different landforms and slope shapes in the project area.

Field verification is the next step to assess pre-treatment ground cover and confirm soil properties described in the inventory are accurate for this project area.



After looking at the Forest Plan direction, visiting the site and considering the natural limitations, we can use one of the online management support tools available on the web. This is a screen view of a web-based WEPP FuME model run for a sample slope in the Rainey Creek project area. This model uses local climatic conditions and a few user-input soil and site conditions. The model can be used to compare predicted erosion rates that result from a variety of common vegetation treatments as well as natural occurrences such as wildfire. This is a simple model output that helps the land manger make an informed decision about how different vegetation treatment options may affect erosion rates. The return period for the disturbances also helps the manager compare effects over time.

Soil Resources



Questions?