

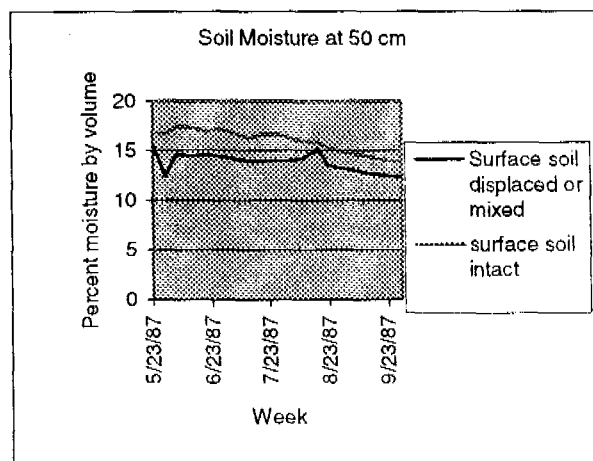
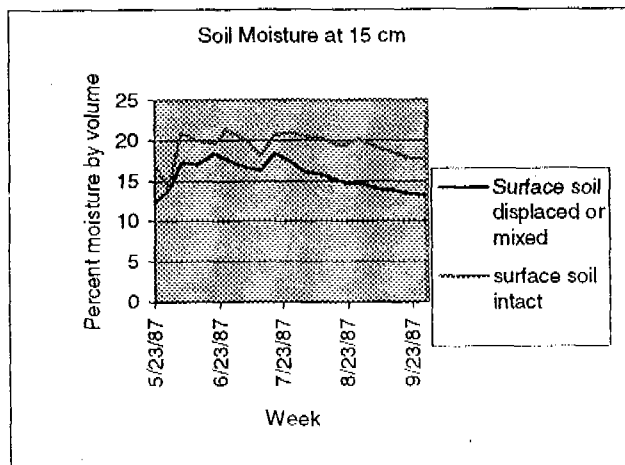
Landform, stream, slope, and soil information was used with watershed historic files and photos to delineate landslide prone terrain for watershed assessments and most timber sale analyses. Field reviews were used to refine those delineations, avoid areas of risk, or adjust project designs to minimize risk. Watershed staff, sale layout foresters, marking crews, and sale administrators have become increasingly skilled at hazard identification and marking or harvest unit adjustment to minimize tasks.

Effectiveness Monitoring:

Effectiveness monitoring was documented for a study implemented in 1987-1988. This study measured soil moisture on a tractor logged and dozer piled harvest unit at 6 paired stations, 2 soil depths: 6 and 20 inches, and 2 soil conditions: mixed or displaced surface soil (from dozer piling or skidding), and intact surface soil. Obvious skid trails were not included in sampling. Sampling sites were located on the ridge to avoid effects from upslope. All plants were kept weeded out from around the sampling sites to minimize differential transpiration loss.

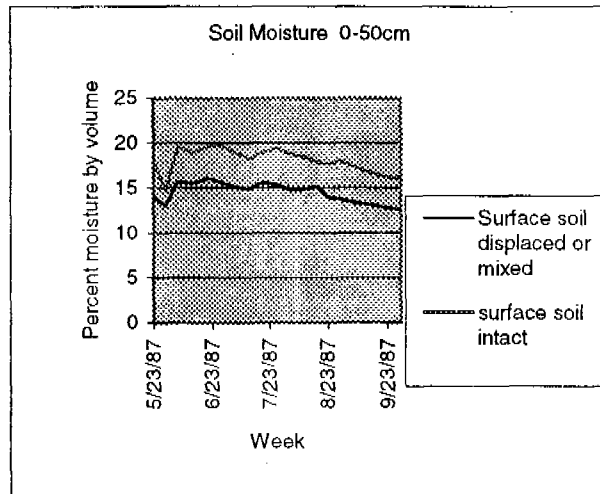
Where the volcanic ash cap had been displaced or mixed with underlying material, soil water retention was very significantly lower throughout the growing season at both depths for the period of study, and for the soil profile as a whole from 0-20 inches ($p=0.000$). Mean difference between impacted and unimpacted surface soils was 3.4 percent for surface soil, 1.5 percent for subsoil, and 2.9 percent for the weighted average. This probably translates into lower moisture availability during the growing season and poorer plant growth. Transects within the harvest unit indicated that an average of almost 80 percent of this unit had soils similarly mixed or displaced by skidding or dozer piling. Recovery of native forbs and shrubs may be more highly affected by such disturbance because of their reliance on vegetative propagation in the surface soil. This magnitude of soil disturbance has been frequently observed to result in vigorous colonization by non-native plant species adapted to soil disturbance, and prolonged early seral conditions favorable to gopher activity.

The following graphs show trends in soil moisture for the growing season of 1987 for the surface soil, subsoil, and weighted average for the rooting zone.



LT-22A6Q HT-461a T25N R 4E Sec 20 NW 1/4
 Elev. 6000 Slope 0-20% Asp. Flat to East

From: Nez Perce NF 12th Annual Monitoring & Evaluation Report
 FY 1999



Effectiveness monitoring of a spring prescribed burn on the South Fork Clearwater indicated no areas of observable soil erosion. However, burning in annual grasslands may promote expansion of annuals or noxious weeds, with consequent losses of surface litter and below ground organic matter that contribute to soil aggregation and stability over the long term. To address this issue, monitoring plots were installed on the 1999 Pinchot fire in the Selway Bitterroot wilderness to evaluate expansion of knapweed after fire, and changes in ground cover and rill or gully erosion.

Ten monitoring plots were also established on the Blanco prescribed burn to evaluate watershed response. About 97 percent of the area burned at low intensity. Bar soil averaged less than 5 to 10 percent. No rill or gully development was observed. Draws did not show evidence of increased erosion.

Continued informal monitoring of road cut and fill revegetation has reaffirmed the need to develop sources of native, site-adapted seed or planting stock for this and other revegetation work.

Validation Monitoring:

Data from the 1997 landslide inventory has not been compiled and analyzed, because of other forest priorities. (It has since been compiled in FY 2000 with the help of a high school volunteer.)

Monitoring Evaluation:

Use of soil information in risk assessment, project analysis and design, and better understanding and mitigation of soil impacts associated with road construction, logging, and site preparation is improving.