

Portneuf West Bench Fuels Project 04/23/03

Environmental Consequences (Chapter 4) Soils

Alternative 1 (No Action) Alternative

No change in the present condition would change until dry summer wild fires occurred. Uncontrolled wildfires in the area can cause soil erosion losses rates as high as 100 tons/acre/year or more in major areas where the soils are without vegetation cover, under certain rainfall conditions that may occur in the first year following the wildfire. The Pocatello BLM RMP erosion management goal is to keep erosion losses to less than 5 tons/acre/year.

Alternative 2 (Proposed Action) Alternative

Natural erosion losses would be expected to be less in areas where hand cutting or mechanical treatment leave additional residue ground cover to protect the soil. Erosion losses on all low intensity burn areas and natural surface access roads would exceed five tons per acre rate for the first year. Erosion losses would still be substantial in the second and third year where grazing is being allowed in burned areas, reducing ground cover below the amount need to protect the soil. Estimated erosion losses on low intensity burned project areas on BLM would range from and an estimated 7 tons per acre rate per year in project area unit # 46 to 21 tons per acre per year rate on unit # 52 during the first year (reference to Dan's Table one). The soils here lack protective duff layers commonly associated with higher precipitation forest soils. Without grazing, erosion rates in the second or third year will drop to acceptable management levels and near natural levels in five years as the vegetative cover is reestablished.

Erosion levels in drainage ways below burned areas are expected to increase and affect some small land slips areas occurring along the Papoose creek as a result of additional water runoff.

The Natural Resource Conservation Service (NRCS) recommend an erosion tolerance level of less than 5 tons per acre per year on deep soils to prevent loss of soil productivity in topsoil. (USDA Agricultural Research June 1994 page 13) Long termed soil structure, organic matter content and nutrient content are lost with the removal of topsoil. (Rangeland Health, National Academy Press, Washington D.C. 1994 page 98) There is also a reduction in hydrologic soil function with loss of topsoil.

Soils for the Portneuf West Bench Fuels Project are identified in the Bannock and Caribou Forest Soil Surveys. See the attached soil map referred to in chapter 3.

RECOMMENDED MEASURES

Curtailling vehicle activity to dry or frozen soils conditions will be beneficial in reducing the amount soil erosion that will occur. Vehicle use should be restricted during moist soil conditions to prevent soil compaction.

Avoid treatment in grass-shrub areas that are in good ecological condition.

Have slash buster work only dry or frozen ground conditions and slopes < 30 Percent.

Minimize burning treatment on any slope > 30 percent.

Rest burned areas for a minimum of two years or more as need to prevent soil erosion.

Maintain buffer zones on ephemeral and perennial streams.

For monitoring, I recommend using the basal vegetation cover transect method that is used for running the WEPP soil erosion model. The WEPP method estimates erosion loss in tons/acre/yr based on changes in vegetative field cover.

For areas that we burn, I recommend using the 3F-Bridge monitoring system. This system will measure erosion in tons/acre/yr losses or deposition in the field at a specific location.

Vegetation monitoring should be done prior to treatments as well as after, to estimate rates soil erosion movement. In order to keep erosion losses less than agency standards, residual ground cover after treatment will have to be greater than 25 percent in all projects

CUMULATIVE or RESIDUAL IMPACTS.

Vehicle traffic for application of projects will increase the soil compaction. This is especially true for traffic on moist soils. Soil compaction, by heavy objects penetrate and compact soil material to depths of 15 to 20 inches. The surface layer, 4 to 6 inches is usually released from compaction by frost action. Deeper soil compaction, that is not affected by frost action, remains in the soil for years. Soil erosion and compaction will limit root growth, reduce soil productivity and contributes to water erosion and runoff down stream. Deep soil road compaction will increase over time.

Soil erosion rates that exceed 5 tons per acre per year, will lose topsoil nutrients and organic matter that is not replacable in a millennium of time with the soils limited ability to renew itself.