SOIL QUALITY STANDARDS

INTRODUCTION

Soil quality standards provide threshold values to identify when changes in soil properties or conditions become detrimental. This condition results in significant change or impairment in the productive capacity, hydrologic function or environmental health of the soil.

Areas of detrimental soil disturbance that affect soil productivity, should not be of a size or extent that would result in a significant change in production potential for the activity area. The size or extent of detrimental soil disturbance that is allowable and which affects hydrologic function is determined by the Region 5 Cumulative Watershed Effects Analysis (Chapter 20, R-5 Forest Service Handbook [FSH] 2509.22).

Use the following threshold values to identify detrimental soil disturbance for an activity area: Soil Productivity, Soil Hydrologic Function, and Soil Environmental Health.

SOIL PRODUCTIVITY

Soil cover for erosion protection is sufficient to prevent the rate of accelerated soil erosion from exceeding the rate of soil formation.

The kind, amount and distribution of soil cover necessary to avoid detrimental accelerated soil erosion is guided by the Region 5 Erosion Hazard Rating system (Chapter 50, R-5 FSH 2509.22) and locally adapted standard erosion models and measurements.

For highly erodible soils (soils developed from granitic parent material), ground cover should be in excess of 90 percent and evenly distributed. Skid roads, trails, temporary roads, and landings would be tilled to the depth of 18 inches or more, straw mulched or re-spread slash, and planted.

Soil porosity is at least 90 percent of the total porosity found under undisturbed or natural conditions. Porosity is evaluated between 4 and 8 inches below the surface for soils with tree and shrub potential, and between 0 and 4 inches for soils with herbaceous potential.

Organic matter is present in sufficient amounts to prevent significant short or long-term nutrient cycle deficits, and to help avoid adverse physical soil characteristics.

The kinds and amounts of organic matter are guided below and by local analyses.

Soil organic matter in the upper 12 inches of soil is at least 85 percent of the total soil organic matter found under undisturbed conditions for the same or similar soils.

Surface organic matter is present in the following forms and amounts:

Litter and duff occurs over at least 50 percent of activity area. Determine minimum organic layer thickness locally and base it on an amount sufficient to persist through winter season storms and summer season oxidation.

Use the presence of living vegetation that could contribute significant annual litter fall to compensate for conditions when immediate post-disturbance litter and duff coverage is too thin or less than 50 percent.

If the soil and potential natural plant community are not capable of producing cover over 50 percent of the area, adjust minimum amounts to reflect potential soil and vegetation capability.

Large woody material, when occurring in forested areas, is at least 5 logs per acre in contact with the soil surface. Desired logs are about 20 inches in diameter, about 10 feet long and represent the range of decomposition classes defined in exhibit 2, section 2.41. Attempt to protect logs in decomposition classes 3 through 5 from burning and mechanical disturbance.

Do not count stumps as large woody material. Large woody material requirements may be waived in strategic fuelbreak areas.

Soil Moisture Regime is protected where productivity or potential natural plant community are dependent upon specific soil drainage classes.

SOIL HYDROLOGIC FUNCTION

Infiltration and permeability are not reduced to ratings of 6 or 8 as defined in Region 5 Erosion Hazard Rating System (Chapter 50, R-5 FSH 2509.22).

SOIL ENVIRONMENTAL HEALTH

Soil reaction class, buffering or exchange capacities, or biological populations are not altered to the degree that significantly affects soil productivity, soil hydrologic function, or the health of humans and animals.

DEFINITIONS

Litter and duff are the organic layers on top of mineral soil consisting of fallen vegetative matter in various stages of decomposition. Specifically referred to as O horizons in soil descriptions (Oi, Oe and Oa horizons). Litter includes woody material up to 3 inches in diameter.

Soil environmental health is the inherent capacity of a soil to absorb, filter or degrade added chemicals, heavy metals or organic compounds.

Soil hydrologic function is the inherent capacity of a soil to intake, retain and transmit water.
Soil organic matter is the organic fraction of soil. Includes plant, animal and microbial residues, fresh and at all stages of decomposition, and the relatively resistant soil humus.

Tillage is the mechanical treatment of compacted or puddled soils to restore desirable porosity. Tillage is accomplished with implements such as winged sub-soilers, forest cultivators and disks. Ripping with toolbar mounted rock rippers is not considered tillage.

Activity area is that area of land to which soil productivity soil quality standards are applied. It is that area within a management area where soil disturbing activities take place. It is of a practical size for management, sampling, and evaluation. Activity areas include timber harvest units within a sale area, burn areas within a prescribed burn, and grazing areas within an allotment. System roads and trails and other dedicated areas are not considered activity areas.