Protecting Soil and Water Resources

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Why Soil and Water Conservation?

Landowners who wish to practice stewardship on their lands need to assess the potential negative impact of their management activities on soil and water resources, both on and off their property. Soil and water conservation is focused on the prevention of erosion and off-site movement of sediments, nutrients and pesticides, the maintenance of normal water levels in wetlands, and the reduction of flood flows into estuaries.

The soil and water components of a forest determine its character and productivity. Influences by people over time have changed the soil and water balances that exist on our forestlands, making conservation an important and necessary management practice. For example, intensive management practices such as site preparation, road construction, herbicide and fertilizer use, and the use of fire have altered forest conditions in some areas. If not performed properly, these practices have the potential for significant topsoil and nutrient loss. This often results in reduced productivity and increased off-site water pollution. Additionally, the cumulative effects of drainage projects in a region often result in reduced water storage capacity and increased downstream flooding, as well as reduced fish/wildlife habitat and species diversity.

Avoiding costly penalties for non-compliance with state and federal regulations provides an additional incentive to manage the soil and water resource. Familiarity with the policies of the U.S. Army Corps of Engineers, Environmental Protection Agency (EPA), and state and local health authorities can save landowners considerable aggravation and money.

Options for Soil and Water Conservation

Landowners should employ **Best Management Practices (BMPs)** to minimize soil erosion and water pollution and protect wetland resources. The BMP guidelines are published in a manual available from the South Carolina Forestry Commission. These BMPs include recommendations for runoff diversion structures for forest roads and skid trails, streamside management zones, contour operations, and wetland forest harvesting and regeneration activities.

Regardless of a landowner's objectives, forest management plans must adhere to minimum standards that include BMPs for soil and water conservation. These standards also promote timber, wildlife, recreational and aesthetic values.

Landowners who have environmentally-sensitive forestlands with high erosion potential should design their management plans primarily to protect and enhance the soil and water resources. This includes lands adjacent to estuaries, areas containing wetland-dependent endangered species habitat or buffer zones between agricultural lands and open waters. In such cases, management activities are focused on prevention of erosion and off-site movement of sediments, management of nutrients and herbicides, maintenance of long-term water levels in wet areas, and the reduction of flood flows into estuaries.

Even where management activities emphasize other resources, management plans must include soil and water conservation as a necessary component. BMPs help landowners to protect the soil and water resources. They should be applied where primary management activities could adversely affect soil and water conditions, or on sites where soil and water management plays an important role.

When soil and water conservation is the primary objective, wood production may be limited to careful single-tree or group-selection harvesting with low impact equipment to minimize soil and water disturbance. Reforestation of badly eroded areas requires special management practices such as contouring, grade stabilization structures, water and sediment control basins, land smoothing, cover crop and tree planting on fragile areas, and livestock exclusion. Recreational activities on areas where soil and water conservation has been given highest priority should be limited to low-impact activities with a minimum of vehicular access and soil exposure. In all cases, the forest understory and ground cover should be managed to reduce soil exposure and enhance filtering action, and to improve wildlife habitat.

Soil and water resource conservation as a secondary objective automatically includes the use of BMPs. However, special attention is needed on deep sandy soils where high infiltration rates require special nutrient and pesticide management practices to protect the ground water. Heavier clay soils also require special consideration to prevent erosion and compaction. Water management during silvicultural, grazing and recreational activities, for wildlife habitat management,

or for reduction of flood flows, may require special drainage or water retention projects and practices.

Soil and water conservation efforts enhance the productivity and quality of other resources. They promote sustainable timber production by reducing the erosion of fertile topsoil. BMP buffer zones provide a high diversity of species and stand structure for wildlife habitat and aesthetic and recreational values. In turn, sustainable timber production provides the economic basis for keeping the land in forest cover and protecting soil and water resources.

Where to Start

Most counties in South Carolina have soil surveys. These surveys have the soil mapped out and classified according to land-use capability. The USDA Natural Resources Conservation Service has land-use recommendations for all these capability classes. Landowners interested in management of their lands are encouraged to follow these guidelines as well as the forestry BMPs for all land management activities.

Practices that Enhance Soil and Water Conservation

Where soil and water conservation is a major goal, the management activities will include intensive conservation practices that address specific conservation needs. Examples include the following:

- establishing and maintaining a vegetative cover on forest and grazing lands which have a high erosion potential;
- restoring actively-eroding areas and protecting them from damage during silvicultural or grazing operations;
- constructing access roads and firebreaks on highly-erodible slopes in a manner that reduces erosion potential; this includes planning for gentle grades, constructing turnouts, installing water bars and planting grass seed on temporary roads;
- using prescribed burning to promote herbaceous ground cover for erosion control purposes;
- limiting pesticide use and nutrient additions (including aerial applications) to the type and amount as specified on the product label;
- managing drainage networks to perpetuate long-term water table levels and maintain wetland functions.

Where soil and water resources are managed as a secondary goal, all management activities should follow the BMPs. The effectiveness of soil and water conservation practices can be evaluated against the stated objectives in the management plan with the help of conservation experts. These experts can recommend the use of BMP's during harvesting, site preparation, road construction, stream crossings and firelines. Erosion control and soil conservation measures such as contouring, mulching and replanting may be suggested, as is the amount of active erosion and soil displaced by windrowing. The rate and method of pesticide application and the degree of brush and weed control as well as information on soil tests and fertilizers may be recommended. Finally, any wetlands may be inspected to evaluate compliance with guidelines and to assess new changes in hydrologic characteristics.