

# Forest Roads and Water Quality

## Stream Crossings

Establishing proper stream crossings in a wooded habitat is integral to a responsible timber harvest. Selecting locations with little or no slope, a stable stream bottom and minimal runoff can aid in equipment mobility and maintaining the natural setting. It is important to use materials that are non-toxic to aquatic life and can be easily removed in the case of high flow or when no longer needed. Portable bridges, arch culverts, skidder bridges and geotextile fords can be effective in maintaining the integrity of water quality.

## Skid Trails

A quality design and maintenance approach to skid trails is important to maintain water quality. All water should be diverted off of skid trails and water bars should be installed to prevent erosion in rutted terrain. Slopes and poorly drained soils should be avoided when planning skid trails, and it is best to use previously constructed roads and trails to limit new soil disturbance. When closing out a harvest, all disturbed areas should be smoothed, mulched and seeded with native vegetation.



Photo by Peter Smallidge



Photo by Robert Duckett

## Winter Roads

Some areas may require frozen ground provided through winter roads, but adequate drainage and preservation of the forest floor is still necessary. Water backup should still be prevented through the use of timber bridges, ice bridges and rubber mats - all of these stream crossing solutions must also be easily removable, and soil fill should be avoided.

This guide was written by CCE Onondaga County with help from Kristina Ferrare, Peter Smallidge, Robert Duckett and the NYS Forestry Best Management Practices for Water Quality Manual in 2015 and updated in 2020. A professional consulting forester is able to plan and manage all aspects of a timber harvest, applying their knowledge and experience to protect water quality and other values your forest provides. For more on the Master Forest Owner program: <http://blogs.cornell.edu/ccemfo/>. Photos on front cover by Peter Smallidge (bottom left, bottom right) and Roy Widrig (bottom center, main). Contact CCE Onondaga County for information about finding a professional consulting forester at (315) 424-9485 or visit [www.cceonondaga.org](http://www.cceonondaga.org).

# Water Quality Management for Timber Harvesting



Cornell Cooperative Extension  
Onondaga County



Funding for this brochure and Cornell Cooperative Extension programming in the Skaneateles Lake Watershed is provided by the City of Syracuse Water Department.

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# Water Quality Management

The first step in protecting water quality in a timber harvest is a forestry plan that honors the health, biodiversity, wildlife habitat, and sustainability of the forest over time. Appropriate planning and the implementation of best management practices (BMPs) can be cost-effective, keep water clean, and provide a positive image of forestry and timber harvesting operations.

## Log Decks and Landings

Landings are often the most visible element of a timber harvest, usually located close to highways and within the public's view. If possible, landings should be obscured from sight. The re-use of properly placed existing landings is preferred. Landings should be isolated from surface water and wetlands to prevent disturbed soils from washing into streams. Locate landings on firm, well-drained or frozen soils. Buffer landings with undisturbed forest or structures that contain surface flow. Coarse stone or rocks applied to the trail before entering the highway allows mud and soil to shake trucks, preventing debris from soiling the highway.



Photo by Peter Smallidge

## Riparian Zones

Riparian Zones, or Streamside Management Zones (SMZs) are areas adjacent to streams, ponds, or wetlands. These transitional areas act as a buffer for water bodies and regulate nutrient loading, decrease sediment movement, control water temperature and light penetration, stabilize stream banks, enhance aquatic habitats and amphibian life, and act as corridors for terrestrial animals. Their protection during timber harvest is integral for water quality and ecosystem function. Riparian Zones are not no-cut zones, but timber harvesting should be limited and soil disturbance should be avoided.



Photo by Roy Widrig

## Wetlands and Vernal Pools

Protection of wetlands, vernal pools and seeps is incredibly important during a timber harvest. These wetlands, pools and seeps protect water quality, help regulate fluctuations in flow, and provide unique habitats for plants and animals. Vernal pools provide a breeding ground for amphibians. These areas are often dry except during periods of heavy rainfall and seasonally wet times. The areas should be avoided during timber harvests. Seeps or natural springs should be avoided by machinery as their disturbance cause rutting and disrupt groundwater flow.



Photo by Billy Humphries

## Soil Stabilization

Soils exposed during a harvest should be stabilized after a harvest, including seeding and mulching, if necessary. Seed mixes should fit the natural environment of the harvest and include native varieties of plants that fit your specific forest. Reseeding is an effective, cost-efficient treatment for soils exposed by a timber harvest in order to reduce erosion and sedimentation into nearby surface waters. Soil stabilization should be considered after a harvest at stream crossings, skid trails, log decks and landings or any area with exposed soil.