



# Forest Management

## Introduction

Throughout the landscape, forestlands are utilized and managed in a variety of fashions in hopes of providing economic and environmental benefits. In addition to the vast cropping acreage, an agricultural operation's forest parcels provide valuable resources to the business as well as the surrounding environment.

Although timber harvesting is recognized as the highest revenue generating forest use, these lands are also used in agroforestry, silvopasture, recreational areas, and also serve the environment as fish and wildlife habitat while playing an important role in carbon sequestration. Proper forest planning and management can net tremendous benefits to the farm and community and protect soil and water resources. This information sheet will focus on the conditions and practices associated with the timber harvesting aspect of forest management, not necessarily the type of timber harvesting, such as clear cutting or high grading.



## Environmental Concerns

Poorly planned timber harvests can lead to undesirable impacts on the environment, such as increased soil erosion, surface water pollution, increased stream flows, and damage to fish habitat and spawning areas. The highest areas of concern within a timber harvest include the forest roads, skid trails, timber landings, stream crossings, and riparian areas. Erosion in these areas may result in sedimentation or turbidity in local streams or waterbodies. Proper planning will identify high risk zones or areas in need of additional protection such as streams, ponds, lakes, wetlands, steep slopes, highly erodible or wet soils, as well as springs, seeps, and important habitat and wildlife nesting sites. Knowing what features to protect and locating timber access infrastructure and Best Management Practices around these areas will minimize externalities to the local community and ecosystem.



Harvesting or operating during dry, frozen, or snow covered ground conditions will further reduce erosion and sedimentation potential. Forests, a combination of the plants and soil processes within, serve as natural water filtration systems, providing clean water for animals and humans alike. Forests also play a large role in groundwater recharge.

## Potential Economic Benefits

Sound forest planning and management leads directly to sustainable forest management which translates to re-occurring or long-term benefits to the farm. A well cared for and protected forest will generate economic gains in increased timber harvests, firewood cuttings, or the enhanced production of agroforestry crops such as mushrooms, berries, nuts and maple products. Allowing livestock to graze a mixed pasture and forest combination (silvopasture) will provide forage and shade benefits to the animals and retain some of the economic benefits of the timber stand. Recreational or hunting rights can be leased to neighbors resulting in additional revenue. And ultimately, a well developed and protected forest may increase the aesthetic value of the property increasing its worth if sold or sub-divided.

Implementing a well planned timber harvest and the necessary Best Management Practices will reduce costly repairs from severe erosion and potentially reduce the potential for water quality fines from turbid discharges to adjacent streams. Protected infrastructure such as forest roads, landings, and skid trails will remain available for future timber harvests. In conclusion, regardless of the type of timber harvest, logging damage will have a negative effect on the forest's future economic and ecological value.

For more information:

[A Municipal Offices Guide to Forestry In New York State](#)



## Summary of Best Management Practices

There are many Best Management Practices that are appropriate throughout a forestry system. Listed below are the main focus areas in a forestry system, all of which have their own set of BMPs. Many of these focus areas will be discussed further in this document. Utilize the link below to reference the NYS BMP Field Guide for Forestry that describes forestry BMPs in greater detail.



- Planning
- Log Landings
- Riparian Zones
- Wetlands, Seeps & Vernal Pools
- Forest Roads
- Skid Trails
- Stream Crossings
- Post-Harvest Wrap-up
- Hazardous Materials

For more information:

New York State Forestry Best Management Practices for Water Quality – [BMP Field Guide](#)

## Summary of Regulations

State and Federal regulations address possible impacts of forest activities, especially timber harvests, on water quality, environmental factors, and public safety. In addition to the items listed below, local municipalities may require or enforce other considerations as well.

- The US Army Corps of Engineers may require a permit for stream crossings, with possible exemptions for crossings that may be used with appropriate BMPs.
- The NY DEC requires a permit for stream crossings across certain classified streams and wetlands.
- Minimum residual stand densities (basal area) for timber harvesting are required in wetlands.
- Forest management roads are prohibited within 150 feet of designated State Wild, Scenic or Recreation Rivers. Cut trees must be top-logged in fire-prone parts of the State. The NY DEC also requires a permit for stormwater discharges from land clearing activities that disturb one or more acres of land. Silviculture practices, including managed timber harvesting, are exempted from this stormwater permit requirement.
- The NY DOT issues Special Hauling and Divisible Load Permits for log-truckers. State Vehicle and traffic laws regulate road use, truck weights, and allow towns to control seasonal use of roads. The damaging or leaving of mud or debris on roads is prohibited as well.
- State and Federal laws regulate the use and disposal of hazardous materials, including petroleum products, fuels and fluids, etc. State laws regulate the use and disposal of registered pesticides.

### State Regulations

[NYS Department of Environmental Conservation](#)

[NY Department of Transportation](#)

### Federal Regulations

[US Army Corps of Engineering](#)

## Background Information for Worksheets

### ***Does the Landowner have a forest management plan?***

Farms and landowners alike should utilize a forest management plan prepared by a professional forester. A forest management plan will identify and document the objectives of the landowner, the property location and history, contain a resource inventory/assessment including timber and wildlife present, an activity schedule outlining either timber harvests, BMP implementation, or other silviculture techniques to improve the forest, and generally include any other information regarding that parcel such as maps or necessary regulations or permits for logging. Professional foresters utilize helpful tools such as aerial photography, topographic maps, soil surveys, property and tax maps, and are able to conduct an inventory analysis of the timber and wildlife on the property and develop a plan to harvest or improve the forest resources. A forester will also conduct a cost/benefit analysis for the desired production or use of the land. These plans should be updated at least every five years to remain current with any regulations or environmental concerns such as plant diseases or invasive insects.



## Background Information for Worksheets

### ***How is the forest currently being used? How will the forest be used in the future?***

Forest lands may be utilized for one or a combination of the following uses; timber harvesting, firewood, agroforestry/maple products, silvopasture, or wildlife/recreational purposes. The land use goals will greatly influence the management level and infrastructure needed on the landscape.



### ***What is the average slope of the woodlot? List the locations where slopes exist?***

Steep and complex slopes present a higher risk for soil erosion and rapid runoff events. Long slopes make locating logging roads and skid trails difficult, especially when proper designs and BMPs are used with these structures.

### ***What is the primary soil drainage class for the woodlot?***

The soil type and especially the drainage class are very important when considering the risk of logging a specific woodlot. The stability of the soil is based on the texture, drainage, erodibility, and depth to limiting layers such as bedrock or shale. The more permeable and well drained the soil is, the less risk of surface runoff and the movement of

soil particles. The depth to water table or even a seasonal water table such as a fragipan should also be investigated. One should analyze the locations of certain soil types and characteristics when planning the location of logging roads, trails, and landings.

More information:

[NRCS Web Soil Survey](#):

Define Area of Interest:

Soil Data Explorer → Soil Properties & Qualities → Soil Qualities & Features → Drainage Class

### ***What is the erosion hazard for the woodlot?***

Erosion hazard is the probability that erosion will occur from timber harvesting activities if the soil is exposed. The hazard level is the combination of looking at all of the factors associated with the forest landscape, the overall watershed, the season/weather conditions, the equipment to be used, and the local areas of concern such as the hydrologically sensitive areas or possibly known important wildlife areas. Analyzing the erosion hazard will allow one to determine if the economic benefits of a desired timber harvest is worth the monetary and environmental risk within a specific woodlot. It may also help in identifying the necessary BMPs to be included in the timber harvest plan on that woodlot.



## Background Information for Worksheets

*Are there any limiting factors to forest use?*

### **Steep slopes**

- Steep slopes present the highest concern for severe erosion, equipment access, and personal safety.

### **Rock Outcrops**

- Rock outcrops identify areas where soil depth is minimal. Erosion risk and timber instability are present at these locations.

### **Streams**

- Streams represent areas of concern where appropriate timber harvest planning, equipment use, and BMPs are vital. Special consideration and protection are necessary adjacent to streams. See the Riparian Zones and Stream Crossing sections below for more information.

### **Wetlands**

- Wetlands are very sensitive and strictly regulated.
- Timber harvests are allowed, however, water flow in the wetland must not be altered.
- [USGS – Map of Federal wetlands](#)
- [NYS DEC – Map of NYS wetlands](#)

*Are there any known or exotic or invasive species within the woodlot?*

Special regulations, permits, types of timber harvests, or other advisable management considerations may be appropriate in woodlots with a presence of known or exotic or invasive species. Some of the most common timber invasive pests seen in New York include but are not limited to the following: Gypsy Moth, Woolly Adelgid, Asian Longhorn Beetle, Pine Shoot Beetle, and the Emerald Ash Borer.

In addition to pests affecting our forests, there are many diseases that remain a threat

throughout New York and the Eastern United States. The following list contains several prevalent diseases, however there are many more types and sub-types of diseases affecting trees, shrubs, and other types of woody vegetation: Oak Wilt, American Chestnut Blight, Amillaria Root Rot, Anthracnose and leaf spot disease, Annosus Root Rot, Beech Bark disease, and various Canker fungus diseases.



[NYS DEC – Environmental Resource Mapper](#)

Cornell Cooperative Extension for additional plant disease information.



*Are there any existing roads (skid trails, truck roads, landings) in the woodlot? If so, what is their use?*

An inventory of existing infrastructure is necessary in analyzing the past timber harvests of a woodlot. It may provide useful infrastructure to be used again, improved with BMPs, or simply identify roads or skid trails that are poorly located or constructed and should be avoided in the future. Old roads may be re-vegetated and returned to forest.

## Background Information for Worksheets

### *What is the condition of existing roads and landings?*

Forest Roads – Roads passable to log trucks, between a publicly-maintained road and the log landing, to which harvested forest products are brought from the woods. Roads with exposed dirt surfaces are a major source of siltation from timber harvesting practices.

- Roads should be designed as narrow as possible to reduce ground disturbance.
- Roads should be located on higher, stable ground (soils) and graded to gently shed water off of itself.
- Roads should avoid both long and steep slopes, especially slopes greater than 10%.
- Wet areas should be avoided and use should be limited during wet, unstable periods when ground damage and sediment runoff will occur (late fall freeze and early spring thaw).
- Road ditches should not outlet directly to streams, settling ponds may be necessary.
- Drainage structures such as water bars, broad based dips, rolling dips, and open top culverts help control water, prevent erosion runoff and protect roads.
- Slash or branches can be used at drainage structure outlets to disperse flow onto the forest floor; slash can also be used in trails to protect the road base, thus protecting the soil.
- Pipe culverts should be used in areas of heavy traffic and placed at a 30 degree minimum downgrade angle.
- Keep all mud off of public roads; rubber mats, tires, or coarse gravel may aid in removing mud from equipment.
- Rubber belt deflectors work well on roads that will receive regular use after the harvest event; placed at a 10 degree minimum downgrade angle.
- Locate roads away from streams, ponds, lakes, and wetlands whenever possible, and provide adequate filter strips.
- Utilize diversion ditches when necessary to catch upslope flows and divert them safely into the forest with a stabilized outlet.



Skid Trails – Roads or trails upon which logs are dragged from the stump to a landing or processing area. Trail surfaces are rough and may be subject to erosion.

- Trails should be designed as narrow as possible and located at least 100' apart to reduce ground disturbance; trails should also be placed “cross-slope” on a hillside.
- Trails should avoid slopes greater than 15%, and should incorporate BMPs to provide grade checks.
- A trail “turn-up” may be used to break up long slopes and reduce water flow velocities.
- Drainage structures such as water bars, broad based dips, rolling dips, and open top culverts help control water, prevent erosion runoff and protect skid trails.
- Slash or branches can be used at drainage structure outlets to disperse flow onto the forest floor; slash can also be used in trails to protect the road base, thus protecting the soil.
- Excessive rutting indicates poor, unstable soils, or poor logging conditions altogether.
- Utilize “low-value” trees as log bumpers at trails turns, reducing debarking on valuable residual timber.
- Equipment rutting should be kept less than 12”; all skid trails should be smoothed out and re-seeded after work is completed or if a significant delay is expected.

## Background Information for Worksheets

**Landings** – (also referred to as a processing area) – Loading area where logs are gathered, cut to length, sorted, and loaded on trucks for transport to a mill. Heavy, vast, and prolonged disturbance occur at the landings thus making them an area of high potential risk.

- Landings should avoid low, wet areas, steep slopes, and should be located on well drained soils.
- Locate landings away from streams, ponds, lakes, and wetlands whenever possible, and provide adequate filter strips.
- Landing size should be minimized to limit disturbance, thus avoid whole-tree logging and depositing slash at the landing.
- Strive to locate landings as close to the main road while still remaining out of public view.
- Silt fencing may be necessary to capture sediment around the landing perimeter.
- Geotextile fabric may be necessary to stabilize ground at sites receiving heavy equipment traffic.
- Clean up any garbage at the site and re-vegetate the area after work has been completed.



### ***If stream crossing exist, are they properly located, stable and maintained?***

Timber harvesting is very risky adjacent to streams, however, in many cases stream crossing may not be avoidable. Small streams are highly sensitive to changes to temperature, siltation, and water levels. There are several concepts to understand and necessary BMPs associated with stream crossings.

- Roads and skid trails should approach the stream at a right angle, and remain stable at all times.
- Locate crossings where stream bottoms are firm and banks are stable and shallow.
- Portable bridges and arch culverts work well at small streams for skid trails and small equipment.
- Temporary bridges and culverts should be removed before high-water season and maintained after storm events.
- Keep use of equipment in the stream to a minimum.
- Streams may be forded at dry stream bed, or where stream flow is low and water quality will not be impaired; stabilize stream bottom with geotextile fabric, rip-rap, concrete, timber or rubber mats.



### ***How are riparian areas managed during timber harvesting?***

Also known as streamside management zones, riparian zones are areas next to streams, ponds, lakes, wetlands, and other water bodies where forest harvesting activities are modified to protect water quality, fish, and other aquatic resources.

Riparian zones have many important functions; they contain a high diversity of animal and plant life, often have late-succession habitat, serve as nesting sites for many bird species and corridors for animals, act as filter strips protecting water

quality from upslope runoff, and provide shade to keep streams cool during summer months. Listed below are some key factors when protecting riparian zones during timber harvests:

- Keep logging roads out of riparian zones, except where stream crossing are necessary.
- Degree of canopy opening and biomass removal should be kept to a minimum within riparian zones.
- Trees along stream banks enhance bank stability and provide shade and should not be harvested.
- Use cables or winches to remove trees fallen in the riparian zone immediate to the waterbody.
- Riparian areas are typically broken into several zones extending away from the waterbody. Timber harvesting practices and forest management are different in each zone.

## Background Information for Worksheets

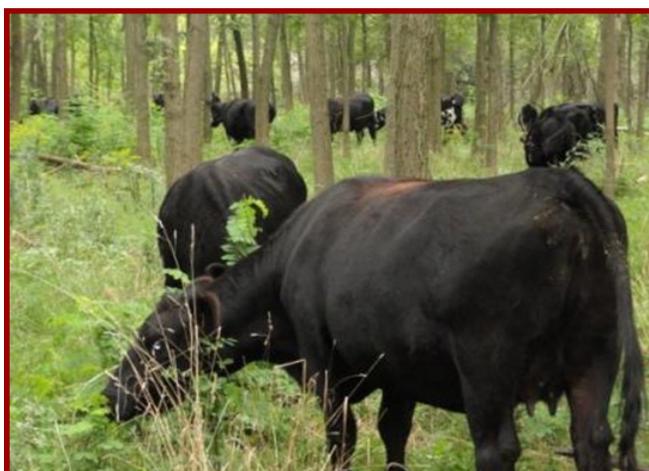
### ***Do you plan on harvesting timber in the next 5 years?***

The date of the last timber harvest will provide a gauge on when the latest ground disturbance has occurred in the woodlot and when the next disturbance is scheduled. Exposed or compacted soil from logging takes time to return to a stable state. Frequently disturbed soils will be less stable, less productive, and prone to erosion. There may also be an opportunity to restore disturbed ground or repair roads, trails, stream crossings, or BMPs between harvest events.

### ***Are livestock allowed free access to the woodlot?***

#### ***If so, complete Pasture Management Worksheet***

Silvopasture is a livestock management style that incorporates forest lands or early succession areas into their pasture system. The mixed land use provides the benefits of shade and shelter to livestock while maintaining some level of timber harvesting or mast production on the same acres. The Pasture Management Worksheet should be completed if the access area of the woodlot is significant.



For more information:

Cornell Cooperative Extension: [Agriculture – Silvopasture](#)

### ***Is the woodlot enrolled under Forest Tax Law?***

The New York Forest Tax Law (Real Property Tax Law 480-a) is a land use tax incentive supporting forest lands and their sustainable management. It is designed as a tax break for forest landowners, which promotes forestland and its uses and reduces further development of these lands. The tax break requires a minimum enrollment of 50 acres, an associated management plan, and a 10-year commitment.

For more information on the Forest Tax Law:

[NYS DEC Forest Tax Law](#)

## SUMMARY

AEM Tier 2 Assessments document environmental stewardship and establish benchmark conditions on the farm. They also identify resource concerns and areas of opportunity. The AEM Tier 2 worksheets also help to further establish baseline data that can be used to prioritize issues for Tier 3 planning.

Tier 2 Assessments should be completed on-site with the farmer. When the initial assessment is completed, appropriate feedback in the form of an AEM Tier 2 Worksheet Summary should be provided to the farmer. The summary should include an overall level of concern for the worksheet, explanation of the overall ranking, a list and description of items of greatest concern, as well as, documentation of what is being done well and what areas need improvement. After the evaluation is complete, the farm should be given a ranking which will determine their priority to advance to the AEM Tier 3 planning phase. Appropriate ranking categories that could be used are: High, Medium, or Low Priority. A ranking procedure that has been approved by your local AEM Team should be used to make the ranking determinations.