

1. INTRODUCTION

Michigan is bordered by four of the Great Lakes, which are the largest group of freshwater lakes on earth, containing 20 percent of the world's freshwater. Forty thousand (40,000) of the 95,000 square miles of Great Lakes are contained within Michigan's boundaries. In addition, Michigan's land mass includes 11,000 inland lakes and 36,000 miles of rivers and streams. Clean water is one of our greatest natural assets.

Management practices on forest lands, by all owners, will determine if the forests remain healthy and productive. Healthy, stable and productive forests are closely associated with the highest quality of surface and ground water. Integrating the water and soil protection practices described in this manual can prevent erosion, sedimentation and soil compaction, an essential part of maintaining a healthy forest and healthy watersheds. Other uses and activities can also have long-term impacts on ground water.

The 19 million acres of forested land in Michigan are a great natural resource asset. The sustainable management of Michigan's forests serves to protect the health of Michigan's waters and communities. These forests, about one-half of the State's land area, are owned by many people. The largest owner group contains approximately 385,000 individuals whose private holdings range from small woodlots to tracts of several thousand acres. Fifty-three percent (53%) of Michigan's forested acres are held by this group. The next largest ownership group is public forest lands (20% owned by the State, and 15% by the Federal government). The forest products industry and timber investment firms own the remaining 12% of forest land.

In forestry operations, poor management practices can degrade surface water and groundwater quality by introducing the following major pollutants: sediment (mineral and organic), nutrients, chemicals, heat and debris. Forest landowners and their agents and contractors are responsible for any damage to streams, lakes, and wetlands resulting from any aspect of a logging or other forest management operation. Environmental degradation is covered by existing laws in Michigan. Violation of those statutes or failure to secure the necessary permits can result in financial penalties to the landowner. The landowner or their designated agent must obtain a permit to cross a stream, construct a road that disturbs more than one acre of soil, or engage in an earth change within 500 feet of water body. **Regular inspection of all roads, bridges, culverts, and preventive actions taken to prevent erosion and the movement of sediment into surface waters, are part of a high quality and sustainable forest management operation.**

The purpose of this manual is to assist the forest landowner and persons who do forest management work on the ground. It provides specific guidance on how to protect water quality, critical habitat, and aquatic resources, while conducting timber harvesting or other forest management activities. It was revised with assistance from staff in the Michigan Department of Natural Resources (DNR) and the Michigan Department of Environmental Quality (DEQ). It takes language extensively from the original 1994 DNR publication, "Water Quality Management Practices on Forest Land". Many of the graphics are courtesy of the Wisconsin Department of Natural Resources' (WDNR) BMP Field Manual. The U.S. Environmental Protection Agency (EPA) document entitled "National Management Measures to Control Nonpoint Source Pollution from Forestry" was also a source of information in developing this manual. This manual provides information and guidance on how to plan, design and implement a system of Best Management Practices that will protect water and soil quality while harvesting timber or engaging other forest management treatments.

In 1987, the federal Clean Water Act of 1972, was amended to address nonpoint source pollution. The Environmental Protection Agency developed new legislation that would require every state to develop sets of "Best management Practices for all major land use activities, such as Agriculture, Forestry, Turf Management, Golf courses, etc. Unlike the regulations regarding

point source discharges to surface waters, the amended Act, commonly referred to as Section 319, stated that the use and application of the specifications and guidance stated in the variety of BMPs manuals would be voluntary and not regulated by the states or EPA or any other federal agency. However, these specifications and guidance, such as those stated in this manual, were developed based on federal research activities on how to address the pollution of America's surface waters by nonpoint source pollutants, such as sediment, fertilizers, and pesticides. In Michigan, the Michigan Department of Environmental Quality is the primary agency, working under both state and federal regulations, to ensure protection of Michigan's surface waters and it has determined that proper use and application of the BMPs in this manual will accrue vastly improved water quality across the state.

The guidance described in this manual can be adjusted to the conditions of the site at the time logging or other forest management activities are carried out. The goal is to provide guidance that protects water and soil quality, while allowing for the efficient removal and transport of forest products, as well as allowing for post-harvest treatments such as prescribed burning or site preparation/regeneration practices.

If you see questionable forestry practices, you may report them to the Michigan Sustainable Forestry Initiative (SFI) Implementation Committee which maintains an "Inconsistent Practices Hotline" at 800-474-1718. If you see forest practices that are threatening water quality, you may report them to the DEQ Pollution Emergency Alerting System (PEAS) at 800-292-4706 (within Michigan) or 517-373-7660 (outside of Michigan).

To ensure clarity between legal requirements and voluntary soil and water protection practices and guidance described in this manual, the following has been used:

Legal requirements are denoted by the symbol .

2. LAWS AND PERMITS

In addition to the BMPs and other types of management practices described in this manual, loggers, land managers and landowners should be aware of existing regulations relating to forest management and water quality protection. Most of these laws and regulations are listed in Appendix C, List of Applicable Laws in Michigan. This chapter summarizes certain permits related to water quality. For more information, please contact your local DEQ office. To contact your local DEQ office, please visit the DEQ online at www.michigan.gov/deg and select DEQ locations. You may also call the DEQ Environmental Assistance Center toll-free at 800-662-9278.



Stream Crossings

When constructing a new or upgrading an existing stream crossing, there are three specific statutes of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), that always apply. These are: Part 31, Water Resources Protection; Part 91, Soil Erosion and Sedimentation Control; and Part 301, Inland Lakes and Streams. For each part, there are a legal set of rules and regulations that apply. In certain cases, Part 303, Wetlands Protection and Part 305, Natural Rivers, may also apply, if a stream crossing occurs in a wetland environment or on a stream within the watershed boundary of a legally designated Natural River system.

To be in compliance with Parts 31, 301 and 303, the responsible party must complete the DEQ/United States Army Corps of Engineering (USACE) "Joint Permit Application" (JPA)

package. The JPA covers permit requirements pursuant to State and Federal rules and regulations for construction activities where the land meets the water and including streams and wetlands. These types of areas are often referred to as the land/water interface.

The JPA is available electronically for on-line submittal through the Michigan Timely Application and Permit Service (MITAPS). Visit: www.michigan.gov/jointpermit for more information about MITAPS, to download or view the JPA.

If you have questions regarding completing the JPA, contact your local DEQ office. A DEQ office location map and staff contact information can be viewed at www.michigan.gov/deq.

Please note that a Part 91 permit, Soil Erosion and Sedimentation Control (see below) is usually required before constructing any roads or landings. Landowners or their designated representative should also note that a permit from the DNR, under Part 305, Natural Rivers, may also be required, if conducting forest management activities within one of the 16 designated Natural River systems.



Soil Erosion and Sedimentation Control Regulations

Part 91, Soil Erosion and Sedimentation Control (SESC), of the Natural Resources and Environmental Protection Act, PA 451, 1994, as amended (NREPA), has the primary intent of protecting the waters of the State from the deposition of sediment and wind erosion as the result of earth change activities during construction. Specifically, a Part 91 permit is required for those activities involving earth changes that are one or more acres in size or within 500 feet of a lake or stream.

When enacted, Part 91 was considered legislation that was primarily applied to regulate construction activities to protect the waters of the State. Section 9115 (1) states a person engaged in the logging industry is not required to obtain a permit under this part. However, all earth changes associated with the activities listed in this section shall conform to the same standards as if they required a permit under this part. Generally, landings will not be an issue as their size can often be kept to under an acre. However, access roads and landings **outside** the logging or harvest area in excess of an acre or that are within 500 feet of a lake or stream require a permit.

Part 91 permit applications are obtained by contacting your local county enforcing agency (CEA). Such agencies may include the county drain commissioner's office, county building department, or county conservation district office. In some counties, there are multiple municipal enforcing agencies (MEA) that can issue Part 91 permits. To locate the appropriate CEA or MEA for the county you are interested in through the internet, visit: <http://www.deq.state.mi.us/sesca>.

A public agency that has been designated by DEQ as an Authorized Public Agency (APA) does not need to obtain a Part 91 permit for earth change activities from a CEA or MEA but must comply with Part 91, follow approved procedures and maintain an APA status with training and other requirements. DNR, Michigan Department of Transportation and numerous county road commissions are Authorized Public Agencies..

Wetlands and Floodplains

Per Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), specified silvicultural and timber harvesting activities are exempt from obtaining a wetlands permit. Construction or maintenance of forest roads, or temporary roads for moving forestry equipment, is exempt, providing the roads are constructed and maintained in a manner to assure that any adverse effect on the wetland will be otherwise minimized. However, grading or "land balancing" in wetlands associated with a forestry operation requires a permit because it is dredging and filling. It should also be noted that a permit is required for tree clearing if the purpose of the activity is to subject the land to a use to which it was not previously subject (i.e., preparation for development). In sum, typical forestry operations in wetlands including standard cultivation activities and even plantations are exempt, but the exemption does not permit land alterations to convert wetlands.

Any construction, fill or alteration of a floodplain of a river, stream, or drain which has a drainage area greater than or equal to 2 square miles, will require a State floodplain permit under Part 31, Water Resources Protection, of the Environmental Protection Act, 1994 PA 451, as amended (NREPA). With respect to forest management, such projects include placement of fill for road construction, or installing a culvert or bridge. The applicant uses the JPA package (described in the previous stream crossings section) to obtain a floodplain permit.

Other Laws Affecting Forest Management

Michigan's forests are not only valued for their production of wood products, but also because they contain vital cultural and archaeological resources. They also provide critical habitat for rare, threatened and endangered plants and animals.

With respect to cultural and archaeological resource protection, Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), contains legislation that reserves for the State the exclusive right and privilege of exploring, surveying, excavating and regulating through its authorized officers, agents and employees, all aboriginal records and other antiquities, including mounds, earthworks, forts, burial and village sites, mines or other relics, and abandoned property of historical or recreational value found upon or within any of the lands owned by or under control of the State.

An archaeological site is a place where remnants of mankind's past are sealed in the soil. The scientific and historic value of a well-preserved archaeological site is far greater than the value of the artifacts found there. The exact location of artifacts in the ground, their spatial relationships to other artifacts, to soil composition, to bits of charcoal, bone or chemically distinct areas of soil are all clues that archaeologists can translate into a more complete picture of the past. Archaeological sites also preserve items that are fragile and can be easily recognized only by a specialist. These include tiny fragments of burned plant remains, pollen, charcoal suitable for radiocarbon dating, deteriorated bits of pottery or leather, and the traces left in the soil by hearth fires, refuse pits or privies.

Proper management of archaeological sites is guided by one overriding principle: avoid disturbing the soil. The following guidance cover some common situations that land managers should keep in mind:

1. Grading or bulldozing of the site should be avoided whenever possible.
2. Pulling stumps, planting trees, laying utility lines and other activities requiring excavation of soil should be avoided.
3. Activities that will involve only the surface of the site, such as lawn seeding or laying woodchip trails, are acceptable.
4. Erosion control measures, if done carefully, will benefit the site, as long as soil disturbance is minimized.
5. In the case of historic foundation walls and similar structures, careful trimming of saplings and other vegetation growing within them will aid preservation of the site. In such cases, the roots should be left in place because attempts to remove them can damage fragile masonry.
6. Vandalism is a common cause of damage to sites. Sites in isolated locations should not be marked in any way. Unless a site is under responsible, direct care, anonymity is the best protection. In such cases, the site's exact location should be known only to the land manager or others directly responsible for the site. Sites in public view that can be checked regularly can be marked and interpreted for the public. In these cases, the combination of public inspection and public awareness minimizes the chances of serious damage to the site. An example of an isolated location is a forest accessible only by a two-track road.

Sand Dunes Protection and Management, Part 353 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) regulates use in 'critical sand dune' areas including developmental, silvicultural and recreational activities. Information on the location of critical dune areas as well as the permitting agencies (DEQ or a local unit of government) can be found the DEQ website, www.michigan.gov/deq/land.

In Michigan, threatened and endangered species are protected on both public and private lands. Endangered Species Protection, Part 365 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) states an individual may not harm or take threatened and endangered species. When it is uncertain if a threatened or endangered species occupies the area to be harvested, or timber harvest impacts are unclear, the landowner or other responsible party should contact the DNR and request an environmental review. Removing uncertainty may reduce impacts and clarify appropriate operational procedures. The process can be initiated in two ways: 1) The DNR Wildlife staff receives a written request for review of a proposed project; or 2) a proposed project site can be reviewed on the Endangered Species Assessment website, www.mcqi.state.mi.us/esa/. In both cases, the location of the proposed project is compared with Michigan Natural Features Inventory (MNFI) data for known locations of endangered or threatened species and other natural features (special concern species, exemplary natural communities, and geologic features). If a threatened or endangered species will be taken or harmed, an Endangered Species Permit, issued by the DNR, is required.

Those using the Endangered Species Assessment website can perform their own preliminary review and request a formal review (if necessary) directly on the website. Others can request an environmental review by sending a written request with the following information:

- Brief description of the proposed project
- Brief description of the location (town, range, section, county)
- What is there now (buildings, type of vegetation, recent disturbance)
- Map of location clearly marked with major roads for reference

A written response to a formal review request may take approximately 3 to 4 weeks. Reviews are processed in the order they are received. **The DNR cannot give out location data or conduct reviews over the phone; all requests must be received in writing.** There is no charge for this service. Mail requests to:

ENDANGERED SPECIES SPECIALIST
WILDLIFE DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES
PO BOX 30444
LANSING MI 48909-7944
PHONE: 517-373-1263; FAX: 517-373-6705



3. FUELS, LUBRICANTS AND SPILLS

Chemical releases in Michigan are potentially reportable under one or more of twenty-six different State and Federal regulations. Determining which regulations apply to a specific release can be an overwhelming task. The "Release Notification Requirements in Michigan" table, compiled by the DEQ Environmental Science and Services Division, is designed to help owners and operators of facilities in Michigan, including vehicles and farms, determine their potential notification and reporting requirements, in the event of a chemical release. Check your permits, licenses, registrations, pollution prevention plans, and local ordinances for additional release reporting requirements. Visit the DEQ website at www.michigan.gov/deq and type "spill/release reporting" in the Search field.

The remote locations that are typical of most forestry operations result in many on-site maintenance activities. The equipment operator must constantly guard against spills of fuels, lubricants or other toxic materials. Proper equipment maintenance, including routine checks of hoses and fittings, is the key to protecting surface water and ground water resources from the impacts of fuel and lubricant spills and leaks.

Common sense, care, proper planning, and the anticipation of problems that may occur can eliminate or reduce potential water quality problems arising from spills.

Spill Prevention Best Management Practices

The following BMPs/precautions should be adopted for all activities requiring equipment operations:

- A contingency plan for accidental spills should be developed for every operation. This may be a generic plan with customized conditions for particular sites or jobs. Also, at least one spill kit, as recommended by DEQ, should be available on every job site.
- Provide receptacles in maintenance areas or in vehicles for collecting solid wastes such as empty grease tubes, oil filters and other trash. The materials collected in these receptacles must be disposed of properly, at an approved solid waste site. Empty oil barrels should be recycled or properly disposed of as solid waste at an approved land fill.
- Locate fueling areas away from water bodies and drainage structures and at locations where a potential spill can be contained and properly treated. This will minimize the chance of surface water or groundwater contamination. Where a spill does contaminate

soil, the contaminated material must be removed from the site and deposited at a facility licensed for that purpose.

- Designate a specified area for draining lubricants from equipment during routine maintenance. The area should allow all waste lubricants to be collected and stored until transported off-site for recycling, reuse, or disposal at an approved site. Maintenance activity should not occur while equipment is located in water bodies, flood plains or wetlands.
- Provide maintenance vehicles with the equipment necessary to collect and store lubricants drained during repair activities. Breakdowns could require lubricants to be drained from equipment at locations away from the designated collection area.



Spills

When spills of fuels or lubricants do occur, if the spill is large, an emergency situation may exist. An operator or any member of a logging crew must be prepared to take action to keep the spill from spreading and entering the water courses on the site. Any emergency spill should be reported to the **Pollution Emergency Alerting System (PEAS) at (800) 292-4706**. Additional contacts may be necessary or desirable, depending on the location and spill situation. It is recommended that each logging site have a completed Spill Response Plan that is available to all members of the crew.

4. TIMBER HARVEST PLANNING

Timber harvesting includes felling, forwarding, sorting, loading and hauling of timber products. Harvest operations require haul roads, log landings and skid trails to be developed and maintained. Timber harvesting, and other silvicultural treatments such as tree planting, soil scarification, and herbicide application, are vital and integral parts of management of forest resources. The treatments contribute to a healthy and vigorous forest. These practices perpetuate the land use which has the greatest potential for protecting surface water quality.

Pre-Harvest Planning

Pre-harvest planning may help minimize potential soil and water quality problems. Pre-harvest planning is the collection of information about the area to be harvested and the use of this information to determine the best time and method to harvest while protecting water and site quality. The planning includes deciding where current and new roads and skid trails are located. Consideration should be given to water quality protection measures and appropriate BMPs. Large forest operations tend to use checklists and timber sale proposal specifications which address these.

Pre-harvest planning helps the logger or forest resource professional in developing a timber sale contract that protects water quality, as well as soil and site productivity. This may include a map (may not be drawn to a specific scale) identifying such concerns as:

- Property boundaries
- Streams and drainage areas
- Soils
- Slope

- Approximation of proposed main haul road and skid trail locations
- Potential log landings
- Stream crossings
- Riparian management zone designations
- Vernal pools or open water wetlands

Figure 1 is an example of a harvest site map with BMPs mapped out accordingly. Note that this is an example only. The use of topographical maps may be of use in forested areas having variable and sloping terrain.

A narrative may also be part of the planning in which road and trail specifications, along with amount and size of machinery for harvest and removal of timber products, are identified. Timing of harvest and timber sale contract conditions may be included as well.

Harvest Site Map

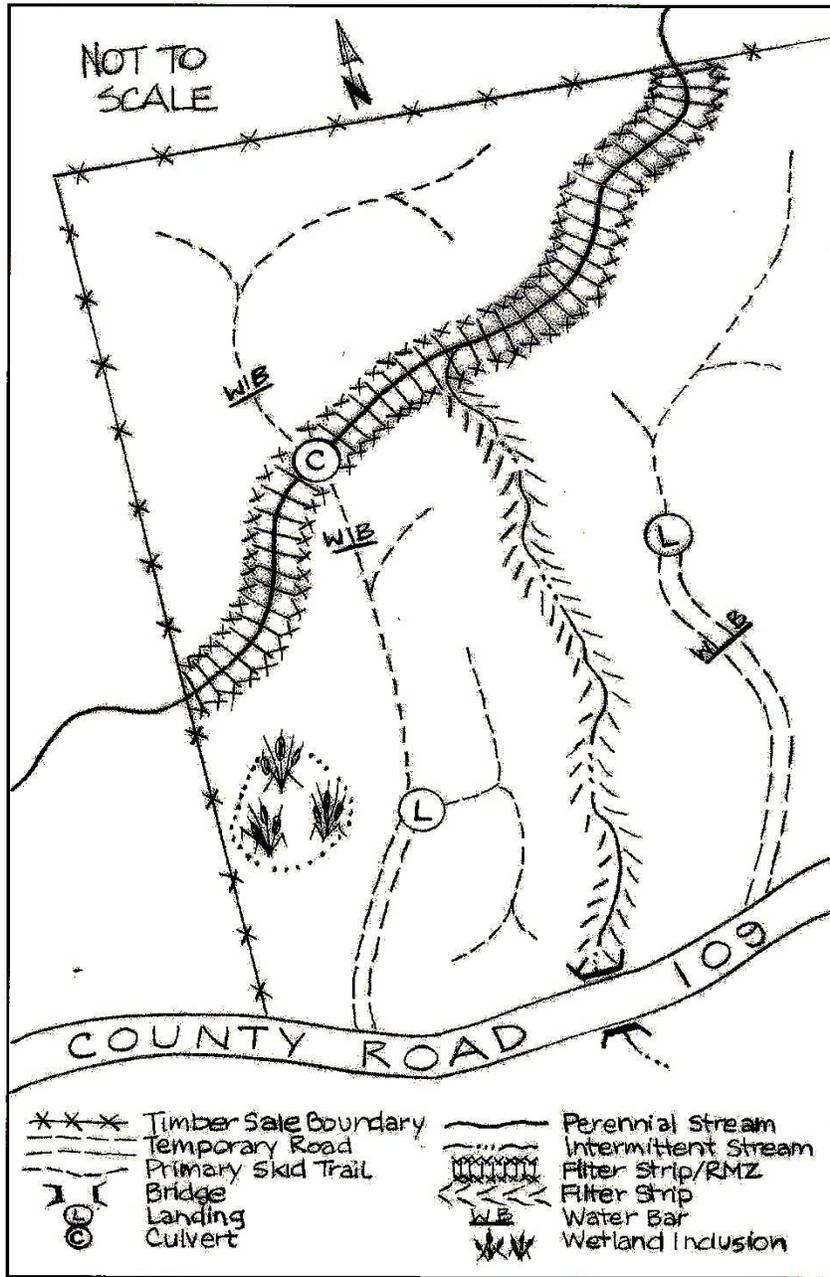


Figure 1. Pre-Harvest Site and BMP Plan Map