



Fundamental Best Management Practices For Water Quality Protection During Forest Harvests

Maine Forest Service, DEPARTMENT OF CONSERVATION, 22 State House Station, Augusta, ME 04333

Best Management Practices (BMP's) are recommended procedures that, when applied appropriately, should result in the greatest protection of the environment during a forest harvest operation. BMP's are not regulations, but in some instances may be necessary for compliance with regulations.

What is Water Quality?

Water quality refers to the life supporting **chemical**, **physical** and **biological** aspects of streams, rivers, ponds, lakes and wetlands. Chemical properties include pH (how acidic or alkaline the water is), dissolved oxygen, nutrients and the presence of chemical pollutants. Physical properties include temperature, turbidity (how clear or cloudy the water is), stability of channels, transport of nutrients, volume and speed of the water, streambed material, and sticks and logs that have naturally fallen into the waterbody.

Where should I apply water quality BMP's?

BMP's should be implemented to protect all waterbodies within and adjacent to a forest harvest. These include:

- ✿ Rivers, lakes and ponds,
- ✿ Coastal areas,
- ✿ Ephemeral flow areas (areas that flow into streams, but have no defined, continuous channel),
- ✿ Streams (natural water channels with a defined, continuous channel and banks) and
- ✿ Wetlands (areas with saturated soils, or flooding during a significant portion of the year).

Why do I need to apply BMP's?

Harvesting can impact water quality by

- ✿ Reducing the soil's ability to absorb water by disturbing, removing and/or compacting the forest floor.
- ✿ Increasing soil erosion.
- ✿ Diverting and concentrating water flow within roads and trails or placing debris into watercourses.
- ✿ Decreasing the benefits of vegetation next to waterbodies.

BMP's can reduce these impacts by mimicking or protecting natural forest functions. BMP's may:

- ✿ Minimize the risk of sedimentation.
- ✿ Maintain natural water flows.
- ✿ Protect shoreland vegetation.

In addition BMP's can help keep you in compliance with water quality rules and regulations.

What Specific BMP's should I apply?

The Best Management Practices appropriate for one job may not be right for the next. A range of factors including terrain, slope, soils, stand type, equipment, materials and experience will impact the practice applied to a job. **The outcome**—protection of water quality through adherence to fundamental Best Management Principles—**is more important than the practice** used.

SEVEN FUNDAMENTAL BEST MANAGEMENT PRINCIPLES

1. Define Objectives and responsibilities

The landowner, forester and logger should participate in discussions of harvest objectives and a resulting written contract should specify who is responsible for implementing BMP's. Determine applicable local, state and federal legal requirements before the harvest.

NOTE: Maine laws hold landowners responsible for preventing mud, sediment and other pollutants from entering waterbodies.

2. Pre-Harvest Planning

Pre-harvest planning can help avoid problems, reduce costs, increase efficiency, protect roads and trails, create an attractive harvest, and protect water quality. Some steps in pre-harvest planning are:

- ✿ Locate harvest area and property boundaries on the ground.

- 🌿 Identify waterbodies on maps and on the ground.
- 🌿 Identify the areas where BMP's are needed.
- 🌿 Lay out harvest operation on the ground.
- 🌿 Choose site-appropriate BMP's.
- 🌿 Match equipment to the site and harvest operation.
- 🌿 Plan for changes in site conditions that may increase the risk of negative impacts to water quality (such as heavy rains with exposed soil).
- 🌿 Identify BMP's for harvest and closeout before starting the harvest.
- 🌿 Consider the needs of future operations.

3. Anticipate Site Conditions

Time operations appropriately; harvesting under frozen, snow-covered or dry conditions can be an important BMP. Properly chosen and installed BMP's can extend the harvest season. Determine whether previous operations have created conditions that are impacting or could impact water quality. Plan to monitor, maintain and adjust BMP's as needed.

4. Control Water Flow

Understand how water moves within and around the harvest area and decide how it will be controlled. Smaller volumes of water are easier to control and have less potential to erode soil than larger volumes. Slow down and spread out runoff. Throughout the harvest site, direct small volumes of water into undisturbed forest floor. Protect the natural flow of water through wetlands and wetland soils—use BMP's to avoid disruption of flows by skid trails and haul roads.

5. Minimize and Stabilize Exposed Soil

Limit disturbance of the forest floor. An intact forest floor is an inexpensive BMP. Areas of undisturbed forest floor filter sediment, debris and pollutants and prevent them from reaching waterbodies. Stabilize¹ areas of exposed soil within filter areas and in areas where it has potential to erode.

6. Protect the Integrity of Waterbodies

Protect stream channels and banks. Leave enough shoreland vegetation to maintain water quality. Vegetation helps maintain water quality by providing shade, stabilizing banks, and supplying nutrients.

¹ **Stabilize** exposed soil using **temporary** (hay, mulch, brush, slash, seed, biodegradable blankets) or **permanent** (wood chips, synthetic blankets, gravel, riprap, permanent vegetation) **measures**.

7. Handle Hazardous Materials Safely

Be prepared for an emergency by keeping an emergency response kit and contact information for handling fuel, oil or chemical spills. Use and store hazardous materials properly.

Where do I need to be especially careful?

To increase the effectiveness of BMP's protect the integrity of filter areas. Filter areas include:

- ◆ **Banks** of waterbodies (these protect and contain the waterbodies).
- ◆ **Forest floor** (the leaf litter, woody debris and organic soil layer absorb and filter water).
- ◆ **Trees and other vegetation** (reduce fluctuations in water temperature, stabilize banks, and add woody debris and organic matter).

As the slope to the waterbody increases, the width of the area that needs to be protected increases. This is because water will move faster down these slopes increasing the amount of erosion. Careful harvesting that does not disturb the forest floor can take place within the filter area. The minimum recommended filter area width for flat ground is 25 feet. Specific site conditions and regulations may require wider filter areas.

For More Information

For information and advice about specific BMP's, or help understanding the laws pertaining to forestry and water quality contact your local Maine Forest Service District Forester.

Further reading:

Best Management Practices for Forestry: Protecting Maine's Water Quality (Available from the Maine Forest Service)

For more information, please contact:

Maine Forest Service
 DEPARTMENT OF CONSERVATION
 22 State House Station
 Augusta, ME
 04333-0022
 (207) 287-2791 or
 1-800-367-0223
 forestinfo@maine.gov



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