



SECTION 8

Forest Lot and Riparian Management

Keeping Hauser Lake Clean

Target Audience and Activities

This Section of Best Management Practices (BMPs) is directed at the property owner with forest land in the Hauser Lake watershed. Management of your forested lot may range from timber harvesting to preservation and/or enhancement of vegetation along waterways for wildlife habitat and water quality protection.

Timber Harvesting. If you are planning to harvest trees for commercial sale you are required to adhere to the rules and regulations of the Idaho Forest Practice Act (IFPA), a law intended for protection of water quality, forest productivity and wildlife habitat. Before commencing a forest practice, notification must be given to the Idaho Department of Lands (IDL), the state agency responsible to ensure compliance to the FPA. Six categories of forest practices require notification:

- Timber harvesting and related road construction, or road construction and reconstruction away from the harvesting area.
- Practices associated with reforestation.
- Application of insecticides, herbicides, rodenticides, and fertilizers for forest management purposes.
- Management of slash resulting from harvest, management, or improvement of forest tree species.
- Conversion of harvested forest land to another use.
- The use of prescribed fire.

In forest industry terminology, if you are not a timber company, you are a Family Forest Owner. In Idaho, Family Forest ownership is twice the acreage owned by industrial timber companies. The applica-

tion of BMPs on these private lands is just as important as on industrial, state and federal ownership land.

State and federal audits are routinely conducted on various harvested lands to determine whether BMPs were being applied and how effective they were at protecting water quality. Audit results indicate that Family Forest landowners generally have more departures from BMPs than found on other ownerships. Common problems include: inadequate Stream Protection Zones (SPZs), inadequately sized stream crossings, inadequate road surface drainage, and ditches and culverts that don't work.

Even in the likelihood that you will be hiring a professional timber operator, this section along with other suggested reference material, (see page 8-8) will allow you to assess whether proper BMPs are being applied on your harvested land to protect the water quality in the Hauser watershed. **As a knowledgeable land steward you should ensure that the conduct of forest practices on your land exceeds the minimum requirements of the IFPA.**

Managing Your Forested Lot is Important!

Why is forested land important to water quality? The forest assists nature in maintaining water quality by keeping soil in place, storing nutrients, and balancing water flows. Forested land also helps to moderate stream water temperatures to support healthy fish populations and other aquatic life.

The biggest concern for managing forested land adjacent to lakes, streams, or wetlands is the erosion and deposition of soil. The amount of soil erosion and sedimentation will depend on soil type, steepness of slopes, vegetation cover, pattern of snowmelt, rainfall, and the amount of soil that has been disturbed or exposed by your forest management activities.

A properly managed forest lot can provide a balance of sustainable benefits for both the environment and you.

Have a Management Plan

A landowner should develop a management plan before beginning any forest management activities. This plan should make clean water a priority while meeting the landowner's objectives. An important part of the management plan is a map of the area that shows all water bodies, the direction water flows across the property, roads and trails, vegetation, im-permeable areas (roofs, driveways, and decks), soil types, and slopes.

You may obtain advice and assistance in preparing a management plan by contacting any of the referenced agencies on page 8-8 of this manual. You can also contract with a private consulting forester. Other fact sheets in this series that are useful in preparing a management plan include Section #1 *Stormwater Runoff*, and Section #6 *Landscaping and Construction Management*.

BMPs for Protecting Nearshore Waters

Adding or enhancing a filter strip will help preserve water quality, and there are other BMPs to follow as you care for vegetation near streams or the lake shore. Follow these guidelines to help protect your lake or stream:

- Rake dead leaves and brush away from the water; compost vegetation in a sturdy structure away from the shoreline.
- Never dump leaves and vegetative debris into a lake or stream because this releases nutrients and organic acids into the water and uses up valuable oxygen.
- Avoid disturbing wetlands within your forested property.
- Avoid burning near streams or near the lake-

shore because the remaining ash is highly alkaline and may change the pH of the lake and promote growth of undesirable plants.

- When treating diseases or insect pests, use chemicals responsibly and use only the required amount. **Note: Use of fertilizers and other chemical applications within 25 feet of the streams or the lake shore is discouraged.**

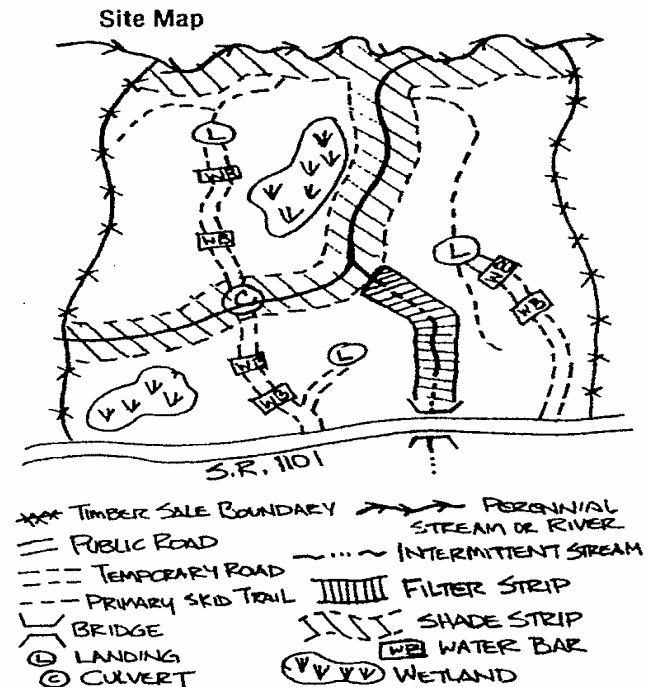


Figure 1: Map of management area showing roads, harvest areas, filter strips, landings, water bodies, and no-harvest areas.

BMPs for Upland Timber Harvesting

Timber harvesting is an integral part of wood lot management that involves cutting trees and removing them from the site. Harvesting temporarily disturbs the environment in the immediate area and should therefore follow a plan that incorporates water quality protection in all operations:

- Time the harvest to be compatible with soils, topography, and weather conditions. Soil disturbance is generally greatest under wet conditions and least under frozen conditions.
- Locate landings (areas where harvested trees are brought for processing) away from low, poorly drained areas and outside of stream bank or lake-shore protection zones.
- Never deposit harvesting slash (treetops, branches) or debris into wetland areas.

- Follow road BMPs when designing and laying out skid trails.
- Prevent erosion and sedimentation along roads by filling in ruts, seeding disturbed areas, and installing water diversion structures and erosion barriers.

BMPs for Site Preparation

Mechanical:

The purpose of mechanical site preparation is to enhance conditions for the establishment, survival, and growth of desired tree species. Mechanical site preparation involves clearing the site for planting, seeding or natural regeneration, and providing partial control of other vegetation competing with crop trees. Site preparation is usually done by a contractor with specialized equipment.

- Avoid operation during periods of saturated soil conditions when such operations may cause rutting, compaction or accelerated soil erosion.
- Avoid disposing of residues from shearing and raking operations in wetland areas. Deposit residues in stable upland locations.
- Be sure that slash piles do not interfere with natural drainage patterns.
- Consider shearing and raking under frozen conditions to minimize incorporation of soil into slash piles.
- Follow land contours to promote soil stability.
- Use patch or row scarification (clearing) where terrain or soil type calls for minimum soil disturbance.
- Low slash and small brush should be left to slow surface runoff, return soil nutrients and provide shade for seeding.

Chemical:

- Chemical site preparation is another method of preparing a site. Consult Idaho Dept. of Lands or the County Extension Service for proper herbicide advice and **do not spray near water.**

Manual:

- Hand or individual tree site preparation with hand tools is recommended in small areas and should be considered near water.

BMPs for Forest Roads

Erosion that occurs during forest road construction, and throughout the life of the forest road has a great potential to degrade lakes, streams, and wetlands. An important first step is to determine how the roads will be used now and in the future.

To minimize the impact of road construction, roads should be built to comply with IFPA plan and design guidelines. Always consult a professional for proper road design and construction. Below are some BMPs that should be followed:

- Design roads for minimal disruption of drainage patterns.
- Use barriers, such as silt fencing and hay bales, where siltation and erosion may occur (see Section #1). Mulch and seed exposed soils.
- Where the road must cross a stream, construction of a temporary or permanent stream crossing must be in compliance with the Idaho Stream Channel Protection Act. A Joint Application for permits must be obtained from the Idaho Department of Water Resources, U.S. Army Corps of Engineers or Idaho Dept. of Lands for any alterations within the beds and banks of continuously flowing natural streams in Idaho. **A wrong choice of stream crossing method can result in major damage to both the immediate site and down-stream water uses.**
- Minimize the number of times a road crosses running water or wetlands.
- Driving through open water is not recommended. Skidding through streams is not permitted.
- Water crossings using a culvert or bridge should cross a stream at a 90° angle to the stream bed in areas where the stream edge is stable.
- Use properly sized culverts or bridges where necessary. Remove any temporary culverts or bridges after the road has been abandoned. Always re-vegetate disturbed soils.
- Design roads for maximum cross drainage using water diversion structures (e.g., water bars) to minimize down road flow.
- Close all temporary roads after use to prevent unwanted use by off-road vehicles that could be detrimental to the site.
- Always route drainage through a vegetative filter strip so sediment can be removed before water reaches a surface water body.

Valuing your Trees

This portion of the fact sheet will cover the importance of maintaining and enhancing your forested lot by retaining existing trees. Trees, shrubs and grasses are an excellent, inexpensive and attractive way to control runoff and erosion. Roots hold soil and help stabilize slopes by trapping and using precipitation that would otherwise run off. They also increase soil

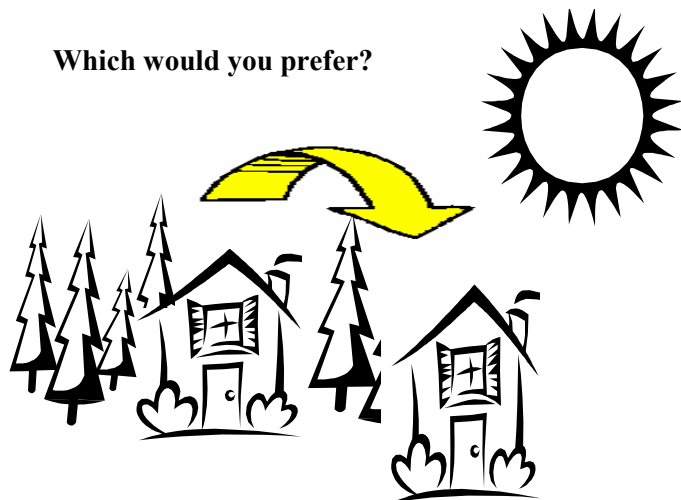
porosity, allowing water to infiltrate rather than run off. Vegetation helps protect water quality by filtering out nutrients and pesticides that could otherwise reach Hauser Lake and cause algal blooms or excessive plant growth. Trees and shrubs also improve air quality by taking in carbon dioxide and giving off oxygen.

In addition, trees provide shade and help moderate weather extremes such as hot sun or strong winds. Trees and shrubs offer habitat for wildlife and privacy for humans by screening adjacent property.

Retain Existing Trees and Shrubs!

Native vegetation is best because it is adapted to the local climate and usually has strong, well-established root systems that provide better erosion control, water-cleaning capacity, and stability for plants. Existing trees and shrubs also offer more typical habitat for wildlife and are more resistant to pests and disease.

When developing a management plan for property development keep in mind to save existing vegetation. If native trees and shrubs were removed in the past, planting and nurturing replacements will help increase your property value and your enjoyment while helping to protect water quality.



Which would you prefer?

Suggested Species for North Idaho

DECIDUOUS TREES

- Quaking aspen** (*Populus tremuloides*)
- Black cottonwood** (*Populus trichocarpa*)
- Western paper birch** (*Betula papyrifera*)
- Rocky Mountain Maple** (*Acer glabrum*)

CONIFERS

- White Pine** (*Pinus monticola*)
- Lodgepole Pine** (*Pinus contorta*)
- Ponderosa Pine** (*Pinus ponderosa*)
- Whitebark Pine** (*Pinus albicaulis*)
- Grand Fir** (*Abies grandis*)
- Douglas Fir** (*Pseudotsuga menziesii*)
- Subalpine Fir** (*Abies lasiocarpa*)
- Englemann Spruce** (*Picea engelmannii*)
- Western Larch** (*Larix occidentalis*)
- Pacific Yew** (*Taxus brevifolia*)
- Western Red Cedar** (*Thuja plicata*)
- Western Hemlock** (*Tsuga heterophylla*)

SHRUBS

- Alder** (*Alnus* sp.)
- Elderberry** (*Sambucus cerulea*)
- Huckleberry** (*Vaccinium membranaceum*)
- Serviceberry** (*Amelanchier alnifolia*)
- Red-osier dogwood** (*Cornus stolonifera*)
- Chokecherry** (*Prunus virginiana*)
- Willow** (*Salix* sp.)
- Wild Rose** (*Rosa gymnocarpa*)
- Shiny Leaf Spiraea** (*Spiraea betulifolia*)
- Mountain Ash** (*Sorbus sitchensis*)
- Snowberry** (*Symphoricarpos albus*)
- Thimbleberry** (*Rubus Parviflorus*)
- Buckbrush** (*Ceanothus velutinous*)
- Twin Flower** (*Linnaea borealis*)
- Mountain Lover** (*Pachistima myrsinites*)
- Ocean Spray** (*Holodiscus discolor*)

BMPs for Existing Trees

Protect bark, limbs, and roots during construction; tie planks around trees to protect them from equipment; do not drive or park equipment over the root area.

- Safeguard roots because they are the most important part of a tree; avoid filling, compacting, or removing soil from the root area; root area is at least as large as the area under the crown of the tree.
- Trim dead and dying limbs and remove diseased growth. Properly dispose of diseased limbs and bark to avoid providing an opportunity for the disease to spread.

- When trees are too crowded, remove some to allow more light and water to reach other remaining stems.
- Contact your local zoning office for restrictions related to thinning trees in a lakeshore area.

Establishing New Plants

- Use native species when available because they are hardier, more resistant to disease and pests, and provide natural habitat for wildlife.
- Include a variety of trees and shrubs; emphasize diversity of species, heights, and ages.
- Plant in the spring or fall.
- When planting, (see Figure 2.) dig a hole 1 to 2 feet wider than the root system and backfill with original soil; water root area thoroughly, add a 3 to 6 inch layer of mulch, and stake only if necessary. Remove stakes within one year, if used.
- Nurture new vegetation (simply planting a tree is not enough to ensure it will survive); water regularly and deeply; avoid short, frequent watering because it promotes shallow roots systems; fertilize and prune as necessary; provide protection from deer, rodents and other pests.

BMPs for Maintaining Stream Bank or Shoreland Vegetation

Adding a filter strip will help preserve water quality, and there are other BMPs to follow as you care for stream bank or near-shore vegetation. Follow these guidelines to help protect your lake or stream:

- Rake dead leaves and brush away from the water; compost vegetation in a sturdy structure away from the shoreline.
- Never dump leaves and vegetative debris into a lake or stream because this releases nutrients and organic acids into the water.
- Avoid burning on the beach, near shore or along a stream bank because the remaining ash is highly alkaline and may change the pH of the stream or lake and promote growth of undesirable plants.
- Use lake water for irrigating trees, shrubs, and lawns; lake water usually can supply nutrients your near-shore vegetation needs to promote healthy growth. Screen irrigation intakes to protect aquatic life and prevent clogging.
- When treating diseases or insect pests, use chemicals responsibly and use only the required amount.

- Scout for pests and diseases; treat early to avoid widespread damage. Contact County Extension Agent or Idaho Dept. of Lands for help.
- Water during times of low rainfall; trees should receive 1 inch of water per week under the crown canopy.
- If trees are too crowded, remove some to allow more light and water to reach remaining stems.
- Minimize the thinning of trees within the stream-side or lakeside filter buffer strip.
- Use native species when available because they are hardier, more resistant to disease and pests, and provide natural habitat for wildlife.
- Include a variety of trees and shrubs; emphasize diversity of species, heights, and ages.
- Plant in the spring or fall.
- Nurture new vegetation (simply planting a tree is not enough to ensure it will survive); water regularly and deeply; avoid short, frequent watering because it promotes shallow root systems; prune as necessary; and provide winter protection.
- When planting, dig a hole 1 to 2 feet wider than the root system and backfill with original soil; water root area thoroughly, add a 3- 6 inch layer of mulch, and stake only if necessary. Remove stakes, if used, within one year.

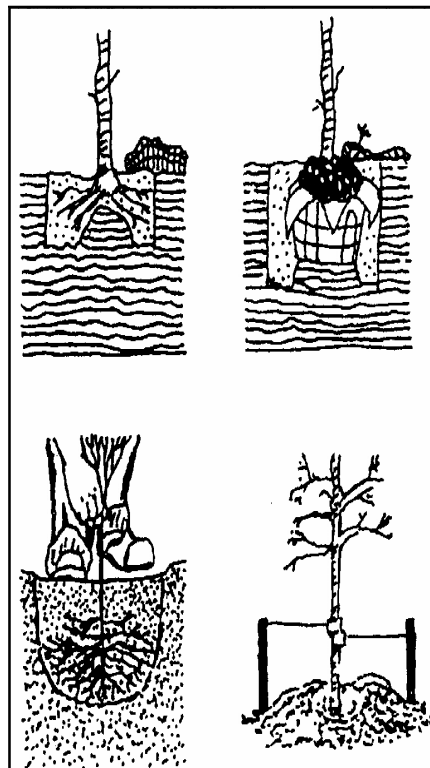
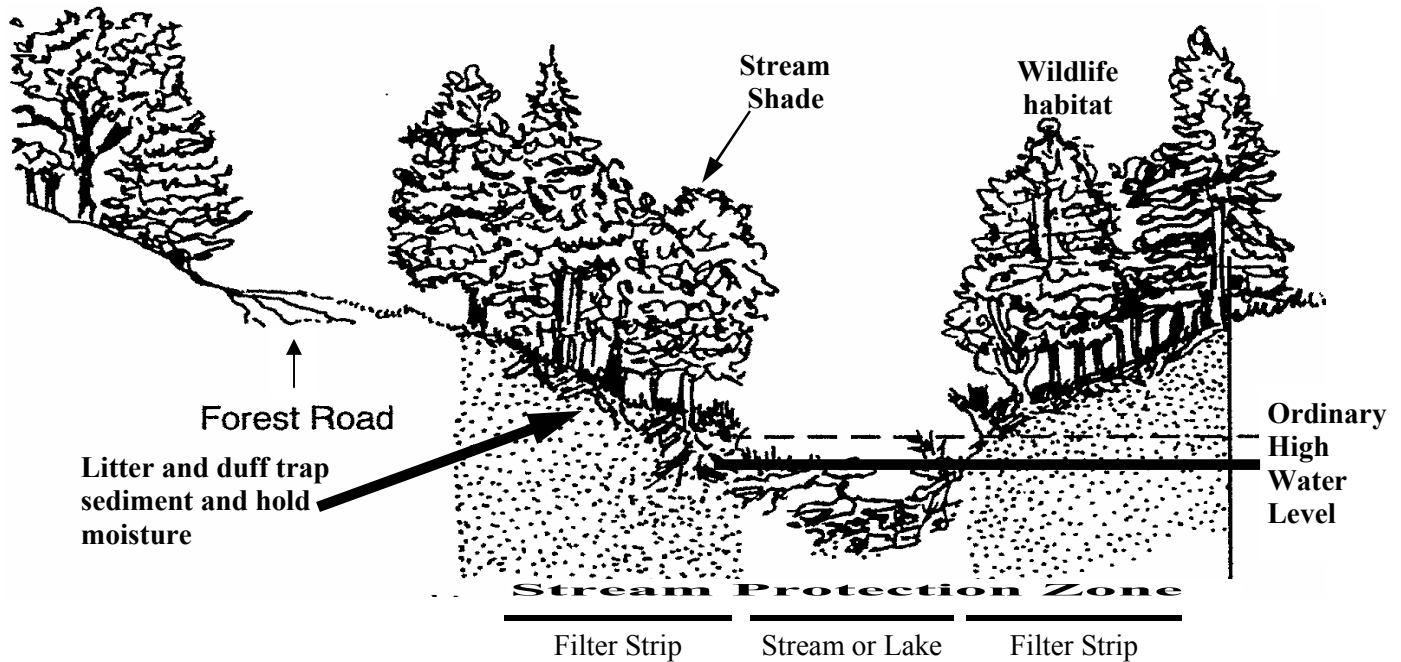


Figure 2:
When planting a tree, dig a hole 1-2 feet wider than the roots, plant so that tree base is at grade, water well, and add 3-6 inches of mulch. Don't forget to care for the tree after planting. Even native species may need watering for the first year or two to establish.



Stream Protection Zone

Stream Protection Zone (SPZ) is a term used in the Idaho Forest Practices Act (IFPA) that mandates a 75-foot minimum distance from a Class I (used by fish or for domestic water supply) stream, lake, or other water body that must be protected because of its importance to wildlife habitat, water quality and fish habitat (Figure 3). Even though the IFPA SPZ only refers to lot owners who harvest timber commercially, everyone harvesting timber near a water body should allow for a Stream Protection Zone. *Why?* First, by maintaining stream shade, water temperatures are kept in check even through the heat of the summer, which helps fish spawning and rearing. Bordering vegetation also provides 90 percent of the food found in streams. Second, wildlife depend on riparian areas for habitat. Research has shown that 59% of land birds use SPZ's for breeding. SPZ's also provide food and shelter for deer, elk, bears, and small animals. Third, vegetative litter and duff retard rain drop impact reducing erosion. The overall function of an SPZ is to protect water quality along streams, lakes and other water bodies.

Riparian Areas

Riparian areas are those areas adjacent to creeks, streams, rivers, and lakes where vegetation is strongly influenced by the presence of water. Riparian vegetation filters out sediment which builds stream banks, forms productive wet meadows and floodplains, and reduces sedimentation of lakes. Riparian areas in good condition slowly release water to stream channels, thus improving seasonal water

Figure 3: *Function of Stream Protection Zones, Riparian areas, and Vegetative Filter Strips.*

quantity and quality. They also stabilize the water table as well as water to be recharged, and assist in the beneficial recycling process of accumulated nutrients. Therefore, any alteration, degradation or destruction of riparian habitat can have significant environmental and economic consequences on the watershed.

Riparian areas are critical components of watershed health. Sediment, bacteria, nutrients, and temperature are water quality parameters that are influenced by riparian area management. Improper management practices can lead to poor water quality and habitat in the tributary streams that empty into Hauser Lake.

Excess sediment can cover spawning and resident fish sanctuaries making them unusable. Sediment carries nutrients which can lead to the eutrophication of lakes (algae blooms and excessive aquatic plant growth).

Decreased plant cover leaves more soil exposed to rain impact and soil compaction, further reducing infiltration rates. A slower infiltration rate means that more water will run off and less water will be available for plant growth, subsurface percolation, and ground-water recharge.

The BMPs on the following pages will help you enhance your forested lot for both water quality protection and its resale value.

A **healthy riparian area** is the key to a healthy stream system. Lush riparian and wetland vegetation along the waters edge will:

- **Slow** flood flows and reduce erosion and property loss.
- **Secure** food and cover for fish, birds and other wildlife.
- **Keep** water cooler in the summer and prevent ice damage in winter.
- **Reduce** water pollution by filtering out sediment, chemicals, and nutrients from runoff.
- **Provide** important breeding habitat for birds.
- **Shelter** animals when brooding or fawning.
- **Hold** more water in the soil, slowly releasing it for longer season stream flows and groundwater re-charge.

Best Management Practices

Vegetation Filter Strip

A vegetation filter strip is an area of trees and shrub vegetation adjacent to streams, lakes, ponds, and wetlands. Filter strips in the Hauser Lake basin occur mostly as a natural riparian area that intercepts sediment, nutrients, pesticides, and other materials in surface runoff which in turn reduce nutrients and other pollutants in shallow subsurface water flow. A filter strip is also an effective storm water management tool that minimizes the exposure of soil, and maintains the residual vegetation. The filter strip traps sediment and provides a zone of infiltration before runoff reaches surface water bodies. Filter strips should be established between developed areas and surface water bodies or adjacent property whenever possible. A minimum amount of management is permitted in the filter strip if it does not result in soil disturbance. Clearing vegetation down to the lake or stream for a walkway, for home safety, and for beach and dock development are environmentally acceptable amounts of disturbance as long as precautions are taken to reduce excess surface water runoff.

When developing a filter strip the width of the strip will vary depending on steepness (percent slope), length of the slope, and soil type. Recommendations for filter strip widths for forest lot management are given in Table 1 (percent slope is defined in Section #1, *Stormwater Management*, page 1-6).

Table 1: Filter strip width guide for forest lot management.

Slope of land between management activity and water body (percent)	Recommended width of filter strip (slope distance in feet)
0 – 10	75
11 – 20	76 – 85
21 – 40	86 – 110
41 – 70	111 – 150

* Distance is measured to the edge of soil disturbance, or in the case of fills, from the bottom of the fill slope.

FYI: Research on farm land adjacent to water bodies has shown significant reductions in surface water nutrient levels where filter strips are used. (University of Minnesota Extension Service, Shoreland Best Management Practices).

- **Channel vegetation.** Establishing and maintaining adequate plants on stream banks, berms, bare soil, and associated areas is an excellent way to improve riparian condition.
- **Wetland development/restoration.** Construction or restoration of a wetland facility to provide the hydrological and biological benefits of a wetland. Establishing or improving wetlands is an excellent way to improve riparian areas.
- **Critical Area Planting.** Planting vegetation, such as trees, shrubs, vines, and grasses or legumes, on highly erodible or critically eroding areas. This practice is an excellent way to reduce sediment runoff from any problem area.
- **Livestock exclusion.** Excluding animals from a riparian area not intended for grazing.
- **Nutrient Management.** Managing the amount, form, placement, and timing of fertilizer applications adjacent to water bodies. Increase efficiency, reduces loss.
- **Planting to reduce erosion.** Using adapted plant species and double seeding techniques to reduce the formation of gullies eroded by storm water runoff. When used in combination with small rock structures, this can be very effective and aesthetically pleasing.
- **Ponds.** Embankment or excavated ponds that are used to water animals. Small constructed ponds are valuable as sources of water when stream access is prevented to provide riparian area protection.

- **Slash.** Keep stream free of green slash and debris created by logging and clearing. Rotting debris can use up oxygen that is needed to sustain fish and other aquatic organisms. Don't burn slash in SPZ.
- **Stream bank and shoreline protection.** Using vegetation or structures to stabilize and protect stream banks against scour and erosion (may require a stream channel alteration permit).
- **Wildlife habitat.** Leave tall trees such as cottonwoods for eagle and osprey nesting habitat. Leave snags (large dead trees) and forage producing trees for homes and food and protect the forest from wildfire hazards.

Recommended Reading:

Copies of the following material on water quality may be obtained for free from the Idaho Department of Environmental Quality ("DEQ") Coeur d'Alene.

Forestry for Idaho: BMP's - Forest Stewardship Guidelines for Water Quality

An excellent color pamphlet with photographs displaying and explaining proper and improper uses of forest practice BMPs, along with forest ecology and water quality concepts.

Rules and Regulations Pertaining to the Idaho Forest Practices Act, Title 38, Chapter 13, Idaho Code

State of Idaho Catalog of Storm Water Best Management Practices for Idaho Cities and Counties

A comprehensive landowner and contractors BMP guide for the control and treatment of storm water, erosion, and sedimentation. You may examine this Catalog at Dept. of Lands, Kootenai County Building and Planning Dept. or the DEQ office in Coeur d'Alene. Also, it is best to use a professional when designing and installing commercial grade BMPs.

Visit the Idaho Department of Water Resources on line at www.idwr.idaho.gov for more information on the **Stream Channel Protection Act**.

For More Information

Call, write or visit...

Idaho Dept. of Lands
3780 Industrial Ave South
Coeur d'Alene ID 83815
(208)769-1525

Natural Resources Conservation Service
7830 Meadowlark Way, Suite C-1
Coeur d'Alene, ID 83815
(208) 762-4939

Kootenai Shoshone Soil & Water
Conservation District
7830 Meadowlark Way, Suite C-1
Coeur d'Alene, ID 83815
(208) 762-4939 Ext 101

Idaho Department of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
(208) 769-1422

See Resource Directory (Appendix B) for additional agency contacts.

Notes: