Riparian Area Harvesting and BMPs

Great Plains Riparian Forest Management Summit

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Preview

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- Primary silvicultural nonpoint pollution problems
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- Practice principles and precautions
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The Clean Water Act and Best Management Practices

The federal Clean Water Act was passed to reduce pollution from point sources such as wastewater discharges and non-point sources such as polluted runoff.

Point source

Point sources are "any discernable, confined and discrete conveyance from which pollutants are or may be discharged into navigable waters." according to the Clean Water Act.

Nonpoint sources

"Nonpoint sources of pollution are diffuse and may include excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas; oil, grease, and toxic chemicals from urban runoff and energy production; sediment from improperly managed construction sites, crop and forest lands, and eroding stream banks; salt from irrigation practices and acid drainage from abandoned mines; bacteria and nutrients from livestock, pet wastes, and faulty septic systems. NPS pollution is caused by rainfall or snow melt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water." -- Clean Water Act amendments of 1987.

Clean Water Act and state-level wetlands laws

- The Clean Water Act and state-level wetlands laws provide some regulatory protections that may affect actions such as depositing fill. Nevertheless, use of Best Management Practices may make several forestry-related activities exempt from fill permit requirements (see section 232.3c(6)(i - xv)). Foresters (and others) should identify the provisions that apply to their plans before taking action and consult their local authorities for advice.
- http://www.epa.gov/owow/wetlands/regs/index.html

Primary silvicultural nonpoint pollution problems*

- sediment
- nutrients
- forest chemicals
- organic debris
- temperature
- stream flow

*from USEPA Nonpoint Management Measures for Forestry

Best Management Practice

A Best Management Practice is "...a practice or combination of practices considered by a State [or authorized Tribe] to be the most effective means (including technological, economic and institutional considerations) of preventing or reducing the amount of pollution by nonpoint sources to a level compatible with water quality goals." (40 CFR 130.2(Q))

General categories of forestry measures

- Pre-Harvest Planning
- Streamside Management
- Forest Wetlands Protection
- Road Construction and Maintenance
- Timber Harvesting
- Revegetation
- Fire Management
- Forest Chemical Management

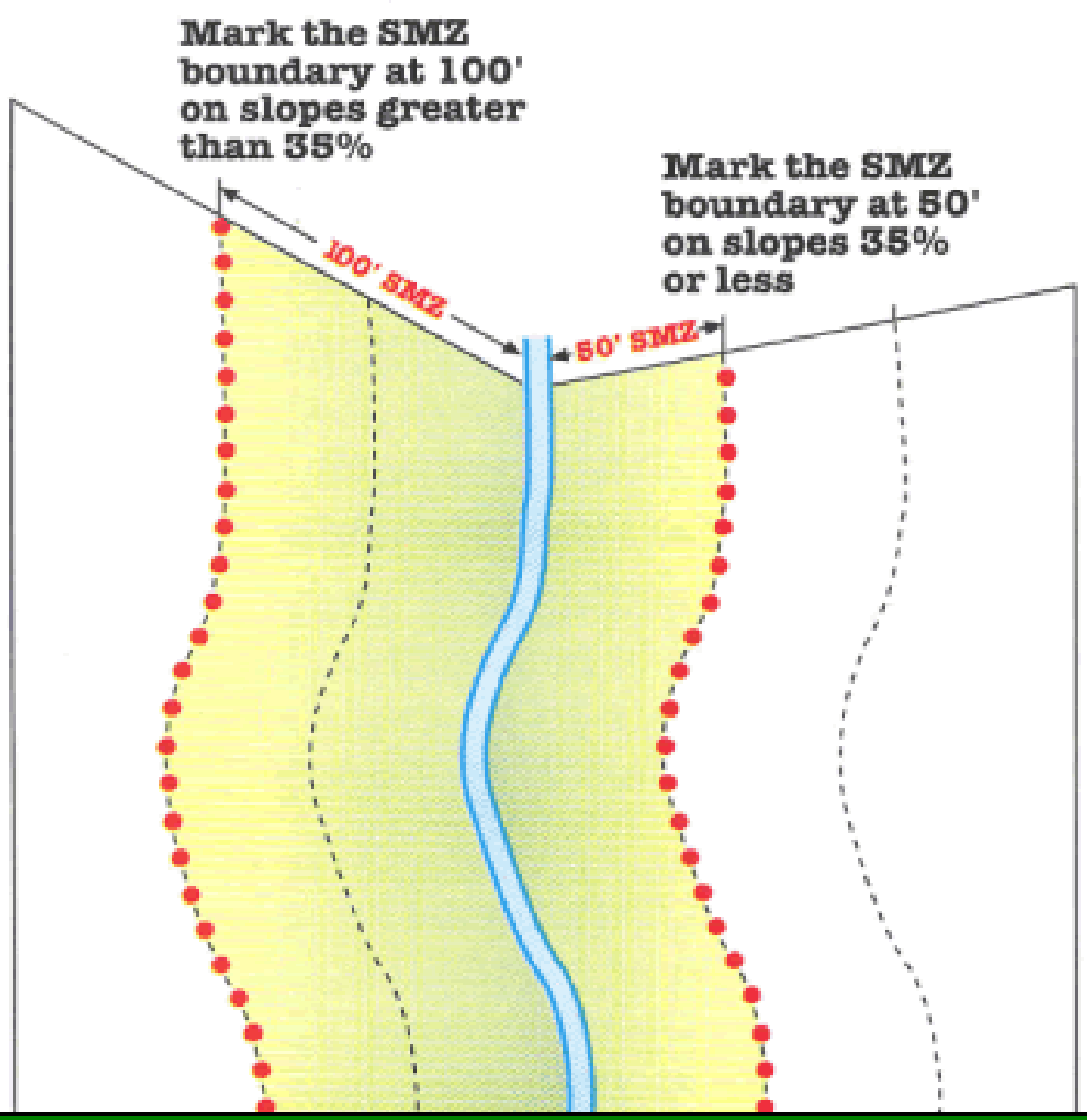
Streamside management zones

- Planning should identify areas to be avoided, such as wetlands and streamside management zones.
- SMZs are uncommonly valuable areas that need protection.

Factors determining width of SMZ

- erosiveness of the soil;
- steepness of the bank slopes;
- proximity to municipal watersheds;
- protection of adjacent wetlands; and
- sensitivity of the fish and wildlife habitat and other critical areas.

- On SMZ-slopes less than or equal to 35%, the SMZ boundary is 50' (slope distance)* from the OHWM.
- On SMZ-slopes greater than 35%, the SMZ boundary is 100' (slope distance) from the OHWM.
- The SMZ boundary is 50' regardless of the SMZ-slope.



SMZ width varies in response to factors like slope, type of stream, and vulnerable fish and wildlife species; these widths are examples of the State of Montana's BMPs.

SMZ harvesting practices

- Retain the appropriate diversity and size of tree and shrub species.
- Protect and retain trees and shrubs and snags that are below harvest quality. These provide wildlife habitat and stabilize soil.
- Retain bank edge trees for stream channel stability and to shade stream.
- Maintain sufficient ground cover to trap sediment.
- Immediately remove any logging debris which enters the stream channel.

Practices

- roads should not be constructed in SMZs except at designated stream or wetland crossings.
- operate vehicles only on roads
- do not side cast road construction material into SMZs
- do not handle, store, apply, or dispose of hazardous chemicals, fertilizers, or pesticides in SMZs
- do not deposit waste timber or slash in SMZs

Additional precautions for wetlands

- The streamside management zone should be extended to incorporate the wetlands nearby.
- Ultrawide, high-flotation tires on logging trucks and skidders should be used to reduce soil compaction and erosion.
- Operations should be suspended or limited when soils become saturated.

Precautions for wetlands

- The natural contour of the site should be maintained and action should be taken to ensure that forestry activities do not immediately or gradually convert the wetland to dry land.
- Where roads are constructed, cross drainage should be provided to maintain natural surface and subsurface flow.
- Construct road fills only when absolutely necessary. Gravel or. crushed rock should be used as fill to provide for water movement.

General principles

- Minimize the number of wet meadow and stream crossings.
- Keep road gradient as low as possible. The steeper the grades, the greater the velocity of the runoff. If steep grades are needed for short distances, follow by stretches of lesser grades to reduce runoff velocity.
- Determine the appropriate standard of road needed for the type of equipment; volume of traffic; and length of use. Selection of the appropriate road surfacing material will minimize erosion and reduce maintenance costs.

Stream crossings

- Design crossing to allow for fish passage and to protect water quality.
- Time construction to protect fish habitat and water quality.
- Design crossing to handle peak runoff and flood waters.
- Stream crossings should be at right angles to the stream channel and should include erosion protection measures.
- Crossings should be designed to protect the approach to the stream at the stream banks and stream bottom.

Culverts

- Culverts are generally used when it is necessary to cross small streams .
- Culverts should be oriented with the natural stream flow.
- Culverts must be designed and maintained to handle sediment and woody debris flow as well as stream flow.
- Culverts should be designed to allow fish passage .
- Erosion control measures, such as large boulders or riprap, should be installed to minimize sedimentation at culvert inflow and outfall

Bridges

- Bridges are generally used when large streams are crossed.
- Bridges should be constructed with minimum disturbance to the stream bank, channel and SMZ.
- Use portable, temporary bridges when possible.
- Cross where the stream is relatively narrow with low banks and firm, rocky soil. The channel should be straight and uniform above, at, and below the crossing. Locate bridges so the stream and road alignment are perpendicular to one another and straight in all four directions.
- Choose stream-crossing structures with the structural capacity to safely handle expected vehicle loads with the least disturbance to the watercourse. Consider stream size, storm frequency and flow rates, and intensity of use (permanent or temporary).

Fords

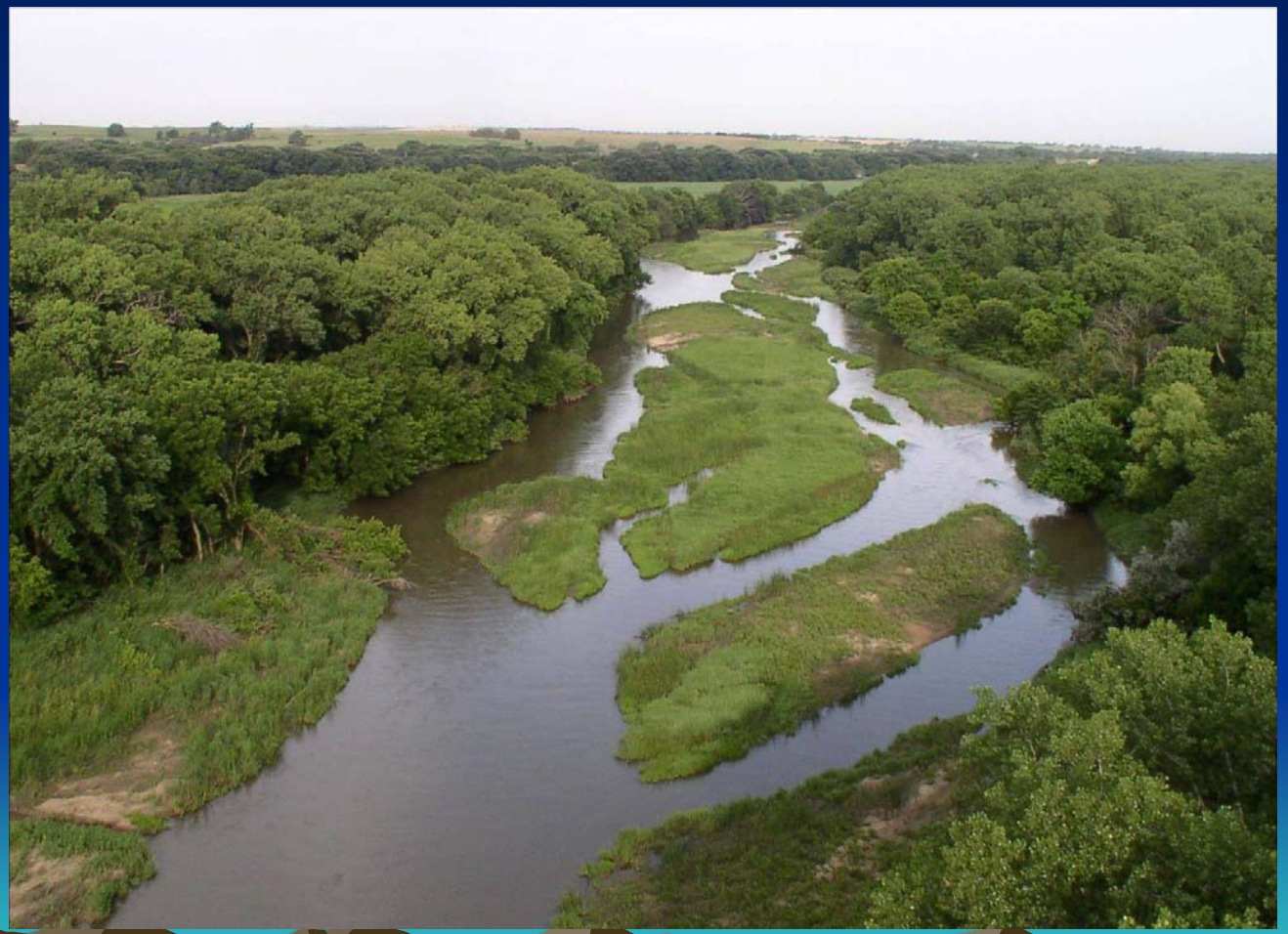
- Fords may be used if no practical alternative exists.
- The use of fords should be limited to areas where the stream bed has a firm rock or gravel bottom. There are several options to harden the bottom of fords including gravel and concrete or wooden planks
- The approaches to fords should be both low and stable enough to support traffic.
- No fish should be present during low flow.
- The water depth should be low enough to allow safe passage.

Wetland crossings

- Use multiple culverts to preserve the existing hydrology
- For temporary roads, consider the use of support systems such as geotextiles and various wood and metal platform devices.
- Schedule the harvest during the drier seasons of the year or during time when the ground is frozen. Do not skid (drag cut logs) through vernal ponds, spring seeps, or stream channels.
- Use brush or corduroy roads (rows of logs or limbs) to minimize soil compaction and rutting when skidding in wet areas.
- Consider chiseling to break up compacted road surface to reestablish soil porosity when hauling is completed.

Republican River in Kansas

Photo: Merle Illian - Republican River Control Projects



Woops!

Photo: Merle Illian - Republican River Control Projects

Wooooooops!!!!!!!!!!

Photo: Merle Illian - Republican River Control Projects

Oh! Oh!

Photo: Merle Illian - Republican River Control Projects

Prescribed fire BMPs

- Do not conduct intense prescribed fire for site preparation in the SMZ. Do not pile and burn for slash removal purposes in the SMZ, and avoid construction of fire lines in the SMZ or immediately adjacent or parallel to the SMZ.

Low intensity burn

Photo: Merle Illian - Republican River Control Projects

Safe use of chemicals

- Do not apply chemicals in streamside management zones or wetlands.
- Oil and fuel for equipment and vehicles must also be carefully handled and disposed.
- Develop a spill contingency plan.

The War on Invasives

You may find your state's BMP information

- http://www.forestrybmp.net/
- Your state forestry agency web site
- Your state water quality control agency NPS web site

REFERENCES

- EPA Watershed Academy's module on forestry best management practices (BMPs) in watersheds.
- http://www.epa.gov/watertrain/forestry/index.htm

- **Forestry Best Management Practices**, a poster developed by the USEPA and the American Forest and Paper Association;
- **Montana Guide to the Streamside Management Zone Law & Rules**, a booklet compiled by MT Dept of State Lands;
- **Montana Forestry BMPs**, a booklet compiled by MT Dept of Environmental Quality;
- **Forest Management for Water Quality**, a training course prepared by USDA-Forest Service and USEPA.
- **The US Environmental Protection Agency's Non-Point Source Forestry Management Measures**, which provide general guidance on management practices suitable for minimizing impacts on US waters.