Appendix G

Best Management Practices

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Definitions

Nonpoint sources refers to diffuse or unconfined sources of pollution where wastes can either enter into, or be conveyed by the movement of water to, public waters (Oregon Water Quality Standards, 340-41-007(17)). Silvicultural sources, such as erosion from a harvest unit or surface erosion from a road are considered nonpoint sources.

Best Management Practices are defined as "methods, measures or practices selected by an agency to meet its nonpoint source control needs. BMP's include, but are not limited to, structural and nonstructural controls, operations, and maintenance procedures BMP's can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters." (40 CFR 130 2, EPA Water Quality Standards Regulation.)

Usually BMP's are applied as a system of practices rather than a single practice BMP's are selected on the basis of site specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility (EPA Interagency Nonpoint Task Force, 1985)

BMP's are basically a preventative rather than an enforcement system. BMP's are a whole management and planning system in relation to sound water quality goals, including both broad policy and site-specific prescriptions.

Introduction

Best Management Practices are the primary mechanism to enable the achievement of water quality standards (Environmental Protection Agency 1987) BMP's will be selected and tailored for site specific conditions to arrive at the project level BMP's for the protection of water quality. The process for determining appropriate BMP's and for ensuring their implementation at both the Forest Plan and Project level is described. Following is a description of the methods and procedures that will be used to control or prevent nonpoint sources of pollution from resource management activities and to ensure compliance with the·

Clean Water Act of 1972, as amended (1977 and 1987). Section 319 of the Clean Water Act Amendments of 1987 requires that the States determine those waters that will not meet the goals of the Act, to determine those nonpoint source activities that are contributing pollution, and to develop a process of determining BMP's to reduce such pollution to the "maximum extent practicable." This Appendix is designed to fulfill the intent of the requirements of Section 319.

Oregon Administrative Rules (Chapter 340-41-001-975). Department of Environmental Quality (DEQ). Oregon's Administrative Rules contain water requirements for the protection of identified beneficial uses of water.

Memorandum of Understandings· The Oregon Department of Environmental Quality and U.S Department of Agriculture, Forest Service (2/12/79 and 12/7/82), and "Attachments A and B" referred to in this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands, respectively)

Washington Administrative Code (Chapter 173-201). Department of Ecology (DOE). Washington's Administrative code contains water requirements for protection of various classes of surface waters.

Memorandum of Understanding: The Washington Department of Ecology and U S. Department of Agriculture, Forest Service (7/79), and attachment A referred to in this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest, 12/78).

California's Porter-Cologne Water Quality Control Act (California Water Code, Division 7). The Water Quality Control Plan for the North Coast Region was approved by the North Coast Regional Water Quality Control Board on April 28, 1988. It is pending approval by the State Water Resources Control Board and the Environmental Protection Agency.

The Draft North Coast Regional Water Quality Control Plan contains water quality objectives that are considered necessary to protect those present and probable future beneficial uses of water.

Memorandum of Understanding: The State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.

The EPA has certified the Oregon Forest Practices Act and Washington Forest Practices Rules and regulations as BMP's. The State of Oregon compared Forest Service practices with these State practices and concluded that Forest Service practices meet or exceed State requirements. As state practices change, comparisons are made to ascertain that Forest Service practices meet or exceed these changes. Monitoring and evaluation will determine the need for changes in BMP's and/or state standards.

Forest Services management practices will meet, as a *minimum*, the substantive State BMP requirements, and other considerations required by the National Forest Management Act (NFMA), and other authorities, for the protection of the soil and water resource.

The general BMP's described herein are action initiating mechanisms which call for the development of detailed, site-specific BMP prescriptions to protect beneficial uses and meet water quality objectives. They are developed as part of the NEPA process, with interdisciplinary involvement by a team of individuals that represent several areas of professional knowledge, learning, and/or skill appropriate for the issues and concerns identified. BMP's also include such requirements as Forest Service manual direction, contract provisions, environmental documents, and Forest Plan Standards and Guidelines. Inherent in prescribing project-level management requirements is recognition of specific water quality objectives which BMP's are designed to achieve.

BMP Implementation Process

In cooperation with the State, the primary strategy for the prevention and control of nonpoint sources is based on the implementation of BMP's determined necessary for the protection of the identified beneficial uses.

The objective is to identify the most practical means of attaining water quality objectives. Water quality objectives include water quality measures that adequately reflect the needs of identified beneficial uses

The Forest Service Nonpoint Source Management System consists of:

1. Selection and design BMP's based on site-specific conditions, technical, economic and institutional feasibility, and the water quality standards of those waters potentially impacted.
2. Implementation and enforcement of BMP's.
3. Monitoring to ensure that practices are correctly applied as designed.
4. Monitoring to determine the effectiveness of practices in meeting design expectations and in attaining water quality standards Evaluation of the appropriateness of water quality criteria to reasonably assure protection of beneficial uses.
5. Evaluation of monitoring results and mitigation where necessary to minimize impacts from activities where BMP's do not perform as expected.
6. Adjustment of BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level. Evaluate possible adjustment of water quality standards.

BMP Selection and Design - Step 1

Scoping: Potential concerns are identified, e.g., mass wasting, water quality, etc. as part of the NEPA process for environmental analysis. Public notices are dispersed inviting comment and participation in the process. Alternatives are developed to address potential problems and to accomplish project objectives.

Environmental Analysis: Each alternative is evaluated for its potential effect on different resources, including water From this analysis, a preferred alternative is identified, along with the measures (BMP's) needed to reduce risk and increase the potential for success.

Documentation: An Environmental Assessment (EA) or Environmental Impact Statement (EIS) is developed with a decision notice and includes required measures (BMP's).

Water quality standards are used as objectives towards which practices are designed to protect beneficial uses.

Appropriate BMP's are selected for each project by an interdisciplinary team. BMP selection and design are dictated by water quality objectives, soils, topography, geology, vegetation, climate, economics, institutions, constraints, etc. Environmental effects and water quality protection options are evaluated and a range of practices is considered. A final set of practices are selected that not only protect beneficial uses, but meet other resource needs. These final selected practices constitute the BMP's.

The selected BMP's, an estimate of their effectiveness, and a plan for monitoring them is included in the project EA or EIS. The site-specific BMP prescriptions are normally included in project implementation plans, but may also be included in the body or appendix of a project environmental document.

BMP Implementation and Enforcement - Steps 2 and 3

The site-specific BMP prescriptions are taken from plan-to-ground by a combination of project layout and resource specialists (hydrology, fisheries, soil, geology, etc.). Final adjustments to fit the BMP prescriptions to the site are made before implementing the resource activity.

When the resource activity (e.g., timber harvest or road construction) begins, timber sale administrators, engineering representatives, resource specialists, and others ensure that the BMP's are implemented according to plan. A similar implementation process is used for other resource activities (range management, mining, etc.) on national forests.

BMP implementation monitoring is done before, during, and after resource activity implementation. This monitoring answers the question: Did we do what we said we were going to do? Some examples of implementation monitoring for a streamside management unit BMP prescription may be:

1. Before project: checking Stream Management Units (SMU's) along streams to see if layout meets the objectives of the BMP prescription, or if the road crossing of a stream is properly located and designed per estimates made during the environmental analysis.
2. During project: during timber felling, the timber sale administrator checks to see if the timber fallers understand marking prescription for timber to be felled in the SMU. The timber sale administrator also observes ongoing harvest operations to see if the activity meets the objectives defined in the project plan.
3. After project: measuring canopy stream shading to see if the amount specified in the BMP prescription was retained, or monitoring a beneficial use of the water to determine a change or trend in use.

Enforcement is carried out primarily through internal project reviews and contractual enforcement, e.g., timber sale contract, grazing or special use permit, etc.

Contract enforcement is a more formal method used to achieve desired results. Normally, each project is assigned a person as a contracting officer. For timber sales, that person is called a timber sale administrator. The project is routinely monitored to ensure that practices are being carried out in the manner and method prescribed in the contract, permit, etc. When a contractor or permittee is not in compliance, they can be held in breech with penalties (e.g., bond forfeiture) until remedies are implemented.

Often during the course of an activity, adjustments are made if it is determined that unsatisfactory results are currently resulting or may occur. This can often mean that a contract modification may be necessary (as in the case of a timber sale).

BMP Monitoring - Step 4

Once BMP's have been implemented, further monitoring is done to evaluate their effectiveness. BMP "effectiveness monitoring" answers the question: Are BMP's effectively meeting management objectives and protecting water quality?

Water quality standards are the "yardstick" against which the effectiveness is tested If, through objective monitoring, BMP's do not meet prescribed objectives, then information is available to modify either the BMP's for future management, or the objectives, or both.

The natural variability of water quality under unmanaged conditions is an important factor that will be considered during the monitoring and evaluation. Additionally, effectiveness monitoring will include measurement against land management objectives, as well as water quality objectives

Some examples of the types of BMP effectiveness monitoring to be conducted are:

1. Measuring stream temperatures to see if the riparian prescriptions in a watershed are maintaining water temperature.
2. Storm period surveillance monitoring of a road system to see if road rocking is effectively preventing road surface erosion.

Another type of more costly and time consuming monitoring is "validation." The purpose of validation monitoring is to answer the question of whether standards, coefficients, requirements, and guidelines are appropriate to meet objectives, e.g., protect beneficial uses.

Examples:

(1) Did the change in water temperature impact the fish population?

(2) Did the soil compaction effect tree growth?

Validation Monitoring will need to be closely coordinated with, or in some cases, conducted by research. It may require the establishment of permanent plots or administrative studies. This kind of monitoring will be very limited and will require coordination to select projects with broad application and to prevent duplication. Only those coefficients and standards that are not reasonably validated by existing research or documentation should be candidates for this monitoring.

The monitoring and evaluation section of the Forest Plan, Chapter 5, contains more detailed monitoring descriptions. Once a specific project is designed, a site-specific monitoring plan may be developed.

Results of monitoring should be shared with State and local agencies as well as available to the public. Monitoring design, sampling, and laboratory analyses will be coordinated.

BMP Evaluation and Adjustment - Steps 5 and 6

The technical evaluation and monitoring described above will determine how effectively BMP's protect and/or improve water quality. If the evaluation indicates that water quality objectives are not being met and/or beneficial uses are not being protected, corrective action will consider the following three components:

1. The BMP : Is it technically sound? Is it really best, or is there a better practice which is technically sound and feasible to implement?
2. The implementation program or processes: Was the BMP applied entirely as designed? Was it only partially implemented? Were personnel, equipment, funds, or training lacking which resulted in inadequate or incomplete implementation?
3. The water quality standards: The water quality standards are established to protect the beneficial uses of water. They include numeric and narrative criteria that, when exceeded, are assumed to indicate detrimental impacts on beneficial uses. They are intended to provide a benchmark for evaluating harm to beneficial uses.

Assessing the applicability of the standards is a responsibility of the State. The Forest Service will provide information to the State to address the following types of questions:

Do the standards describe the conditions necessary for protecting beneficial uses?

Are standards higher or lower than that necessary for protecting beneficial uses?

Do the standards reflect the natural variability occurring within the natural and human-affected ecosystem?

Do the parameters and criteria that constitute water quality standards adequately reflect (are they sensitive enough) human-induced changes to water quality and beneficial uses?

Corrective action may be initiated once the reason for failing to achieve the management objectives is understood. The management practice may have to be changed, the water quality objectives modified, or both.

Training

National Forest personnel involved with project location, design, layout, administration, and maintenance activities will receive BMP training. The training will consist of BMP awareness, as well as the more technical aspects such as planning, implementation, monitoring, and evaluation.

General Best Management Practices and Examples

Individual general Best Management Practices are described in General Water Quality Best Management Practices, Pacific Northwest Region, 11/88. Also included in this document is a description of the process, and limitations and use of these BMP's. Each BMP listed includes the Title, the Objectives, the Explanation, Implementation and Responsibility, and Monitoring. Evaluations of ability to implement and estimated effectiveness are made at the project level.

Not all of the general BMP's listed will normally apply to a given project, and there may be specific BMP's which are not represented by a general BMP in this document.

The sensitivity of the project determines whether the site-specific BMP prescriptions are included in the EA/EIS or in the sale/project plan, or the analysis files.

Following is an example of a general BMP, as described in this document, along with an example of a site-specific BMP which is developed at the project level.

General BMP

T-5. Title: Limiting the Operating Period of Timber Sale Activities

Objective: To ensure that the Purchaser conducts operations in a timely manner, within the time period specified in the Timber Sale Contract (TSC).

Explanation: The TSC specifies a Normal Operating Season, during which, operations may generally proceed without resource damage. Operations are permitted outside the Normal Operating Season only when they can be conducted without damage to soil, water, and other resources. Where determined to be necessary through the environmental analysis, the TSC will limit operations to specific periods or weather conditions. Operations are not permitted to continue if damage will occur.

Implementation & Responsibility: Limited operating periods are identified and recommended during the Timber Sale Planning Process by the interdisciplinary team and followed through the life of the timber sale primarily by the Sale Administrator.

Ability to implement: Add at project level.

Effectiveness: Add at project level.

Monitoring. Done during implementation of timber sale activities by the Sale Administrator, Forest Service Representative (FSR), engineers, and watershed specialists. Also see Appendix D monitoring plan item: Water Resource Monitoring.

Specific BMP

PT-5. Title. Limiting the Operating Period of Timber Sale Activities

Objective: To ensure that the Purchaser conducts operations in a timely manner, within the time period specified in the Timber Sale Contract (TSC).

Explanation: The Ship Mountain Timber sale contains sensitive soils that are subject to soil compaction during tractor skidding, and a non-surfaced road that is not suitable for wet weather haul.

The normal operating season for the Forest will be enforced for the Ship Mountain Timber sale. All operations off Forest Road 10 (non-surfaced) will be halted at the onset of wet weather to prevent erosion and damage to the road. Tractor skidding on units 1-5 will be restricted if soil moisture is above the level established by the soil scientist. Other operations can continue outside the normal operating season if they can be conducted without damage to soil, water, and other resources

Implementation and responsibility: For the Ship Mountain Timber sale the normal operating season for the Forest will be enforced. All operations off of Forest Road 10 (non-surfaced) will be halted at the onset of wet weather to prevent

erosion and damage to the road. Other operations can continue outside of the normal operating season if they can be conducted without damage to soil, water, and other resources. The forest watershed specialists will work with the timber sale administrators to evaluate the potential for resource damage if operating outside of the normal operating season.

Ability to implement: High

Effectiveness: High

Monitoring: Monitoring identified for this BMP in the Forest Plan BMP Appendix applies.

References

1988, USDA Forest Service, Pacific Northwest Region, General Water Quality Best Management Practices, November, 1988

1987. US Environmental Protection Agency. Nonpoint Source Controls and Water Quality Standards. Water Quality Standards Handbook, Chapter 2, General Program Guidance, Page 2-25, August 19,1987.

1985, US Environmental Protection Agency. Final Report on the Federal/State/Local Nonpoint Source Task Force and Recommended National Nonpoint Source Policy. Office of Water, Washington, D.C. Page 17.