

**FSH 2509.22 – SOIL AND WATER CONSERVATION HANDBOOK
CHAPTER 10 – WATER QUALITY MANAGEMENT FOR
NATIONAL FOREST SYSTEM LANDS IN ALASKA**

contracted, all mitigative measures should be included in the contract. The Contracting Officer assures compliance with the management requirements, contract specifications, and operating plans.

4. REFERENCES. Federal Clean Water Act (Public Law 95-217), Coastal Zone Management Act (Public Law 92-583), Alaska Coastal Management Program (6 AAC 50.010); Alaska Water Quality Standard Regulations (18 AAC 70); Alaska Drinking Water Regulations (18 AAC 80.050); EPA - Quality Criteria for Water, 1976.

18.5 – PRACTICE: Lake Fertilization for Fish Habitat Improvement

1. OBJECTIVE. Limit eutrophication in Forest lakes.

2. EXPLANATION. This is an administrative practice. Fertilization can be used to improve the growth of aquatic fauna and flora within a lake and in turn increase fish productivity within the lake. Too much fertilization, however, can cause over production of unwanted vegetation within the lake and eventually can limit fish habitat. Lake fertilization shall be carefully evaluated and monitored to assure that excessive nutrient levels do not result.

3. IMPLEMENTATION. Project location, feasibility, suitability, application rates and frequency, and any needed mitigative measures will be identified through the NEPA process using an interdisciplinary approach. Pre-and post-fertilization water quality monitoring shall be done on selected representative lakes to evaluate nutrient concentrations in the water. If fertilizer application is contracted, all mitigative measures should be included in the contract. Chemical materials shall be certified as free of impurities prior to use. The Contracting Officer assures compliance with the management requirements, contract specifications, and operating plans.

4. REFERENCES. Federal Clean Water Act (Public Law 95-217), Coastal Zone Management Act (Public Law 92-583), Alaska Coastal Management Program (6 AAC 50.010); Alaska Water Quality Standards (18 AAC 70); Alaska Drinking Water Regulations (18 AAC 80.050); EPA - Quality Criteria for Water, 1976. "Policy and Guidelines for Lake Fertilization", June 30, 1979, ADF&G prepared by Lake Fertilization Team and F.R.E.D. Technology Series "Limnology Field and Laboratory Manual; Methods for Assessing Aquatic Productivity", Jeff Koenings and Gary Kyle, ADF&G No. 71, Feb. 1987.

19 - FIRE SUPPRESSION AND FUELS MANAGEMENT

Fire suppression activities on National Forest System lands are conducted to protect life and property and natural resources. Suppression activities include hand or mechanical fireline and access road construction, firing operations, and fire retardant drops or use of foaming agents. Water quality and soil erosion and productivity objectives are weighed with the need for rapid suppression during the development of suppression strategies. The suppression strategies CRITICAL (control), FULL (control), MODIFIED (contain) and LIMITED (confine) are outlined in Fire Management Plans. Since some watershed damage will likely result from suppression activities, an objective of the fire suppression program is to rehabilitate suppression-related damage. The fire suppression program covers cost of rehabilitation of damaged areas.

**FSH 2509.22 – SOIL AND WATER CONSERVATION HANDBOOK
CHAPTER 10 – WATER QUALITY MANAGEMENT FOR
NATIONAL FOREST SYSTEM LANDS IN ALASKA**

Fuels management activities are intended to reduce the size, cost, and damage of wildfire, protect or enhance wildlife habitat, provide silvicultural site preparation and promote forest health. Fuels management is a form of vegetation manipulation, and should be coordinated with other resource management goals. Vegetation is manipulated by changing fuel type, creating fuel breaks, or by reducing or altering fuels over extensive areas. Fuels management is also concerned with the manipulation of dead fuels such as cull logs and slash. These materials may be utilized, removed, or burned to reduce fuel loading.

19.1 – PRACTICE: Fire and Fuel Management Activities and Prescriptions

1. OBJECTIVE. Reduce flooding and erosion by controlling the frequency, intensity, and destructiveness of wildfire.

2. EXPLANATION. This is an administrative and preventive practice. These measures include: (1) fire suppression; (2) access roads; (3) fuel utilization and modification programs; (4) type conversions; (5) fuel reduction and prescribed burning; and (6) public information and education programs.

3. IMPLEMENTATION. Suppression of wildfires is an emergency and is covered by the rules, regulations, and policies for emergency response. Initial response to an incident is addressed in the fire plans. Fires that carry over into extra burning periods require an Escaped Fire Situation Analysis (EFSA). The EFSA analyzes the suppression activities in relation to the cost versus values at risk. Provisions can be made to mitigate adverse environmental impacts.

Fuel Management is implemented through normal program planning and budgeting, Forest Planning, and NEPA processes. These projects are initiated to accomplish specific resource or management objectives. Fuel management projects are evaluated by an interdisciplinary team to include: soil, timber, water, wildlife, fish, recreation, and fire staff representatives. The management objectives and requirements, and multiple resource protection prescriptions are documented through the NEPA process. Application of controls and prescriptions are the responsibility of the project officer.

4. REFERENCES. FSM 1950, 5102, 5103, 5121, 5150.2, 5150.3, and 5151.

19.2 – PRACTICE: Protection of Water Quality Through Prescribed Burning Prescriptions

1. OBJECTIVES. Maintain soil productivity, minimize erosion, and the introduction of ash, sediment, nutrients, and debris into surface waters, through the formulation of the burning prescription.

2. EXPLANATION. This is an administrative and preventive practice. Prescribed burning prescription elements include fire weather, expected fire behavior, slope, aspect, soil moisture, duff moisture, fuel moisture, time of burn, duration of burn, and firing patterns. All of these elements can directly influence fire intensity. Fire intensity directly affects how much of

**FSH 2509.22 – SOIL AND WATER CONSERVATION HANDBOOK
CHAPTER 10 – WATER QUALITY MANAGEMENT FOR
NATIONAL FOREST SYSTEM LANDS IN ALASKA**

the litter layer remains after burning. The amount of remaining litter and possible water repellency of the soil after burning can significantly affect erosion rates, infiltration and percolation rates, and runoff volumes, which affects water quality.

Techniques used to prevent soil erosion and water quality degradation are: (1) maintain integrity of riparian areas; (2) avoid intense fires, which may promote water repellency, nutrient leaching, and erosion; (3) retain or plan for sufficient ground cover to prevent erosion of the burned sites; (4) removal of all debris added to stream channels as a result of prescribed burning, unless debris is prescribed to improve fish habitat; (5) construct water bars in fire lines; and (6) target fine fuels for reduction while retaining larger fuels for stabilization.

3. IMPLEMENTATION. An interdisciplinary team should identify riparian and other environmentally sensitive areas for protection or other mitigation measures. The optimum and tolerable limits for soil and water resource needs should be established through the NEPA process. Field investigations are to be conducted to identify site-specific conditions that may affect the prescription. Monitoring and evaluation plans will ensure that the objectives have been met.

The prescription should identify any preburn work to be accomplished by Forest Service and/or other crews. This can include, but is not limited to, water barring firelines, reducing fuel concentrations, and monitoring fire weather.

4. REFERENCES. FSM 5140, 5142, 5150.3, 5151, and 5153.

19.3 – PRACTICE: Minimizing Watershed Impacts from Fire Suppression Efforts

1. OBJECTIVES. Minimize watershed impacts caused by fire related suppression activities.

2. EXPLANATION. This is an administrative and preventive practice. An Escaped Fire Situation Analysis shall be prepared for all fires that escape initial suppression action. The analysis will be prepared by a Line Officer with input from the Incident Management Team. Watershed considerations will be part of the analysis.

Heavy equipment operation on fragile soils, sensitive areas, and steep slopes should be avoided when possible. A Resource Advisor will be assigned on all project fires to advise the Incident Commander on resource values during the suppression effort.

3. IMPLEMENTATION. The Forest Supervisor and works assign a Resource Advisor for the Incident Management Team. Local technical experts are normally available to provide input to the Resource Advisor on water quality concerns and identify the location of fragile soils, sensitive or unstable areas, and other pertinent information.

4. REFERENCES. FSM 5130.3 and 5132; FSH 5109.19.

**FSH 2509.22 – SOIL AND WATER CONSERVATION HANDBOOK
CHAPTER 10 – WATER QUALITY MANAGEMENT FOR
NATIONAL FOREST SYSTEM LANDS IN ALASKA**

19.4 – PRACTICE: Stabilization of Fire Suppression Related Watershed Damage

1. **OBJECTIVE.** Stabilize all areas that have had their erosion potential significantly increased, or their drainage pattern altered by suppression related activities.

2. **EXPLANATION.** This is a corrective practice. Treatments for fire-suppression damages include, but are not limited to: (1) installing water bars and other drainage diversions in fire roads, firelines, and other cleared areas; (2) seeding, planting and fertilizing to provide vegetative cover; (3) spreading slash or mulch to protect bare soil; (4) repairing damaged road drainage facilities; and (5) clearing stream channels of debris that is deposited by suppression activities.

3. **IMPLEMENTATION.** The fire fighting forces either as a part of the suppression effort or before personnel and equipment are taken off the fireline does this work. The Incident Commander is responsible under the direction of the local Line Officer for repair of suppression related resource damage.

4. **REFERENCES.** FSM 2523 and 5130.2 and FSH 2509.13.

19.5 – PRACTICE: Emergency Watershed Rehabilitation

1. **OBJECTIVES.** Minimize the loss of soil and, the deterioration of water quality, both on and off site.

2. **EXPLANATION.** This is a corrective practice. Emergency rehabilitation is a mitigation measure that involves a variety of treatments. Treatments may include: (1) seeding grasses or other vegetation to provide a protective cover as soon as possible; (2) fertilizing; (3) clearing debris from stream channels; (4) water barring; and (5) construction or placement of soil stabilization structures. Treatments are selected on the basis of on-site values, downstream values, probability of successful implementation, social and environmental considerations, and cost compared to benefits.

3. **IMPLEMENTATION.** Damage surveys are conducted promptly to determine if emergency rehabilitation treatment is needed. The responsible line officer may assemble an interdisciplinary team, if significant resource damage has occurred. Team members normally include a hydrologist, a soil scientist, and other technical resource staffs, as needed. The survey results and proposed rehabilitation treatment measures are sent to the Regional Office and other appropriate agencies for approval. If the rehabilitation project is funded, a rehabilitation team begins work as soon as possible. Work should be completed before damaging storms occur. Rehabilitation projects are evaluated annually and following major storms and runoff events, until the watershed is stabilized. The evaluation determines the effectiveness of the rehabilitation measures and indicates if followup actions are needed.

**FSH 2509.22 – SOIL AND WATER CONSERVATION HANDBOOK
CHAPTER 10 – WATER QUALITY MANAGEMENT FOR
NATIONAL FOREST SYSTEM LANDS IN ALASKA**

In situations where National Forest System and other intermingled lands are involved, an interagency rehabilitation team may be requested to conduct the surveys. Prior coordination and agreements are necessary to ensure each landowner's needs and objectives are met.

4. REFERENCES. FSM 2523 and 2323.43b and FSH 2509.13.