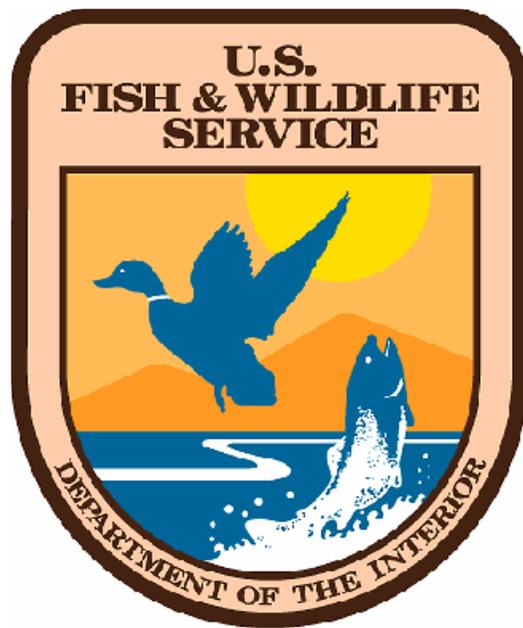


WILDLAND FIRE MANAGEMENT PLAN

CAPE MEARES NATIONAL WILDLIFE REFUGE

Oregon Coast National Wildlife Refuge Complex
Newport, OR



2004

WILDLAND FIRE MANAGEMENT PLAN
CAPE MEARES NATIONAL WILDLIFE REFUGE

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INTRODUCTION

This document will establish a Fire Management Plan for Cape Meares National Wildlife Refuge (NWR). This plan meets NEPA / NHPA compliance and will be implemented in cooperation with the Endangered Species Act of 1973, as amended, under the Section 7 programmatic review, and will take appropriate action to identify and protect from adverse effects on any rare, threatened, or endangered species.

This plan is written as an operational guide for a Fire Management Program which will continue full suppression of all wildland fires. It defines levels of protection needed to provide for firefighter and public safety, protect facilities and resources, and restore and perpetuate natural processes given current understanding of the complex relationships in natural ecosystems. It is written to comply with a Service-wide requirement that refuges with burnable vegetation develop a fire management plan (620 DM 1).

This Fire Management Plan (FMP) outlines a program of full suppression of all wildland fires. There will be no prescribed fires or pile burning on the Refuge. Because of the infrequent fires in the area, very little information on the ecological effects of fire in Sitka Spruce/Western Hemlock is available, and an intense fire could destroy the old growth forest that makes the area so unique. Management decisions at Cape Meares NWR are primarily concerned with the protection of seabird nesting colonies on the cliffs, protection of threatened and endangered species and the recently de-listed peregrine falcon, maintaining the integrity of the Research Natural Area, and preserving old-growth forest character. Based on these objectives, mechanical control of fire will be allowed only at the Refuge boundary and at established roadways. Control efforts within the Refuge will be by manual methods or by aerial control, as described in this document.

The Oregon Coast National Wildlife Refuge Complex (Complex), which includes Cape Meares NWR, has no dedicated fire staff, permanent or temporary, and no authority to hire any fire staff. The Complex will rely on assistance from the Willamette Valley National Wildlife Refuge Complex (NWRC) fire program, as well as local/county/state organizations.

The Oregon Department of Forestry (ODF) would be the initial responder to a wildland fire at Cape Meares NWR and State Scenic Viewpoint. The Netarts-Oceanside Rural Fire Protection District (Netarts-Oceanside Fire and Rescue 61) would respond to any structure fire within Cape Meares State Scenic Viewpoint and would assist as needed with a wildland fire. Oregon State Parks does not have a written agreement with the RFPD for this service.

Cape Lookout State Park, which also administers Cape Meares State Scenic Viewpoint, does not have a fire management plan, relying instead on ODF for wildland fire protection and response. Oregon State Parks pays an annual fire patrol assessment fee to ODF.

COMPLIANCE WITH USFWS POLICY

Originally named Cape Meares Migratory Bird Refuge, Cape Meares NWR was established “as a refuge and breeding ground for migratory birds and other wildlife” by Executive Order 7957, dated August 19, 1938 and signed by President Franklin Roosevelt. The name and land status, but not the purpose, was changed to Cape Meares National Wildlife Refuge by Executive Order 2416, signed July 25, 1940. On June 11, 1987, the U.S. Fish and Wildlife Service designated the entire Refuge a Research Natural Area (RNA) to further protect its unique vegetation, geology, and wildlife habitat in a naturally functioning ecosystem.

Under the provisions of a Memorandum of Agreement dated February 21, 1986, Cape Meares NWR is managed cooperatively with Oregon State Parks as a joint National Wildlife Refuge and State Scenic Viewpoint. Management of the forest resources are administered by the FWS, except that State Parks pays the annual fire patrol assessment to the Oregon Department of Forestry.

This plan will meet the requirements of the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA). For NEPA compliance, an Environmental Action Statement for a Categorical Exclusion has been completed for wildland fire suppression and prevention on this refuge (Appendix D). Compliance with the Endangered Species Act was accomplished through a Biological Evaluation (Appendix E). Compliance with the NHPA will be accomplished at the project level through a Request for Cultural Resource Compliance form (Appendix F) submitted to the Regional Archaeologist.

Authority and guidance for implementing this plan are found in:

- Protection Act of September 20, 1922 (42 Stat. 857; 16 U.S.C.594): authorizes the Secretary of the Interior to protect from fire, lands under the jurisdiction of the Department directly or in cooperation with other Federal agencies, states, or owners of forest.
 - Economy Act of June 30, 1932: authorizes contracts for services with other Federal agencies.
- Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66, 67; 42 U.S.C. 1856, 1856a and b): authorizes reciprocal fire protection agreements with any fire organization for mutual aid with or without reimbursement and allows for emergency assistance in the vicinity of agency lands in suppressing fires when no agreement exists.
- Disaster Relief Act of May 22, 1974 (88 Stat. 143; 42 U.S.C. 5121): authorizes Federal agencies to assist state and local governments during emergency or major disaster by direction of the President.
- National Wildlife Refuge System Administrative Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd et seq.: defines the National Wildlife Refuge System as including wildlife refuges, areas for the protection and conservation of fish and wildlife which are threatened with extinction, wildlife ranges, game ranges, wildlife management areas and waterfowl production areas. It also establishes a conservation mission for the Refuge System, defines guiding principles and directs the Secretary of the Interior to ensure that biological integrity and environmental health of the system are maintained and that growth of the system supports the mission.
- Federal Fire Prevention and Control Act of October 29, 1974 (88 Stat. 1535; 15 U.S.C.2201): provides for reimbursement to state or local fire services for costs of firefighting on federal property.
- Wildfire Suppression Assistance Act of 1989. (Pub.L. 100-428, as amended by Pub.L 101-11, April 7, 1989).
- Departmental Manual (Interior), Part 620 DM, Chapter 1, Wildland Fire Management: General Policy and Procedures (April 10, 1998): defines Department of Interior fire management policies.
- Service Manual, Part 621, Fire Management (February 7, 2000): defines U.S. Fish and Wildlife Service fire management policies.

- National Environmental Policy Act of 1969: regulations implementing the National Environmental Policy Act (NEPA) encourages the combination of environmental comments with other agency documents to reduce duplication and paperwork (40 CFR 1500.4(o) and 1506.4).
- Clean Air Act (42 United State Code (USC) 7401 et seq.): requires states to attain and maintain the national ambient air quality standards adopted to protect health and welfare. This encourages states to implement smoke management programs to mitigate the public health and welfare impacts of Wildland and prescribed fires managed for resource benefit.
 - Endangered Species Act of 1973.
 - U.S. Fish & Wildlife Service Fire Management Handbook.

The authority for funding (normal fire year programming) and all emergency fire accounts is found in the following authorities:

- Section 102 of the General Provisions of the Department of Interior's annual Appropriations Bill provides the authority under which appropriated monies can be expended or transferred to fund expenditures arising from the emergency prevention and suppression of wildland fire.
- P.L. 101-121, Department of the Interior and Related Agencies Appropriation Act of 1990, established the funding mechanism for normal year expenditures of funds for fire management purposes.
- 31 US Code 665(E)(1)(B) provides the authority to exceed appropriations due to wildland fire management activities involving the safety of human life and protection of property.

Authorities for procurement and administrative activities necessary to support wildland fire suppression missions are contained in the Interagency Fire Business Management Handbook.

FIRE MANAGEMENT OBJECTIVES

Overall Refuge goals and objectives for Cape Meares NWR are:

- To protect and preserve the existing cliff habitat and the Cape Meares old growth forest in an unaltered, natural condition to support migratory bird and other wildlife populations.
- To maintain the integrity of the refuge as a Research Natural Area, allowing natural processes to continue without interference from humans.
- To provide monitoring and to cooperate with other agencies, institutions of higher education, private organizations, and individuals in providing research opportunities.
- To provide, in cooperation with Oregon State Parks and Recreation, opportunities for quality wildlife-dependent recreation, interpretation, and outreach to enhance public appreciation, understanding, and enjoyment of Refuge resources.

The goals and objectives for Cape Meares NWR as a Research Natural Area are:

- To preserve an example of a significant natural ecosystem for comparison with those influenced by humans.
 - To provide an educational and research area for ecological and environmental studies.
 - To preserve gene pools of typical and endangered plants and animals.

The overall objective for fire management at Cape Meares NWR is to promote a program that provides for firefighter and public safety, reduces human-caused fires, and ensures that appropriate suppression response capability meets expected wildland fire complexity. Specific fire management objectives are:

- Promote a fire management program and control all wildland fires.
- Protect life, property, and resources from wildland fires at costs commensurate with resource values at risk.
- Use appropriate suppression tactics and strategies that minimize long-term impacts of suppression actions.

DESCRIPTION OF REFUGE

The Oregon Coast NWRC office is located in Newport, Oregon and serves as the administrative headquarters for Bandon Marsh, Cape Meares, Nestucca Bay, Oregon Islands, Siletz Bay, and Three Arch Rocks National Wildlife Refuges. This suppression-only plan addresses Cape Meares National Wildlife Refuge only. Bandon Marsh, Nestucca Bay, and Siletz Bay NWRs are addressed in a separate plan for suppression and pile burning, and Oregon Islands NWR is addressed in a suppression and prescribed fire plan (USFWS 2003). Three Arch Rocks NWR has obtained an exemption from preparing a Fire Management Plan due to lack of burnable vegetation (USFWS 2002).

GENERAL DESCRIPTION

Cape Meares is located on the Oregon Pacific Coast between Tillamook Bay and Netarts Bay, approximately 1.75 miles north of Oceanside and 6 miles west of Tillamook, Oregon. The Refuge is comprised of two units separated by Cape Meares State Scenic Viewpoint (Figure 1). A Memorandum of Agreement between State Parks and the Service exists for recreation management on the Refuge. Recreation under this agreement is defined as use of a hiking trail only. Cape Meares NWR consists of vertical coastal cliffs, rock outcroppings, and rolling headlands with old growth forest dominated by Sitka spruce and western hemlock. A 20 acre section east of the Three Capes Scenic Route consists of early seral stage forest adjacent to a clearcut. This section is undergoing natural regeneration following a complete blowdown of the old growth. Of the 138.5 acres that are included in the refuge, 110 acres are forest or shrubland, and 28.5 acres are rock outcroppings and cliffs (non-burnable). The larger refuge parcel to the north of the State Scenic Viewpoint is bordered on the west by the Pacific Ocean, on the north and east by private forestland which was clearcut approximately 30 years ago, and on the south by Cape Meares State Scenic Viewpoint. The smaller, southern parcel is bordered on the west by the Pacific Ocean, on the north by the State Scenic Viewpoint, and on the east and south by privately owned lands. This small Refuge protects one of the last stands of old-growth coastal forest in Oregon and serves, in effect, as an "island" ecosystem. Management decisions at the Refuge are primarily concerned with the protection of seabird nesting colonies on the cliffs, maintaining the integrity of the Research Natural Area, and preserving the old growth forest where bald eagles nest and marbled murrelets occur.

CLIMATE

The climate at Cape Meares is distinctly marine, characterized by abundant moisture and cool temperatures. Seasonal and diurnal temperature fluctuations are minimal, being strongly moderated by the ocean. Climate data from the Remote Automated Weather Station (RAWS) in Tillamook, 6 miles inland from Cape Meares, is summarized in Table 1. The mean annual temperature at this station is 50.5 °F. The lowest mean temperature is 42.7 °F in January and the highest is 59.1 °F in August. Average annual precipitation is 89.7 inches, with 93% falling from September through May. Actual temperatures at the Refuge are expected to be slightly lower than the values reported in Tillamook, and precipitation is expected to be slightly higher. Winters are characterized by strong, often violent storms, while spring and summer months experience persistent northwest winds and fog.

Table 1. Climate Summary for Tillamook 1 W (35894) RAWs Station, 1948-2003 *.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Maximum Temperature (°F)	49.5	52.5	54.0	57.0	61.0	64.5	67.2	68.5	68.4	62.5	55.0	50.2	59.2
Average Minimum Temperature (°F)	35.8	36.7	37.0	38.9	42.9	47.1	49.4	49.6	46.6	42.2	39.3	36.8	41.9
Mean Temperature (°F)	42.7	44.6	45.5	47.9	52.0	55.8	58.3	59.1	57.5	52.4	47.1	43.5	50.5
Average Total Precipitation (in)	13.7	10.5	10.2	6.5	4.3	3.2	1.4	1.6	3.4	7.5	13.1	14.3	89.7
Average Total Snowfall (in)	0.8	0.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	2.5

* 7/1/1948 to 3/31/2003; Tillamook, Oregon.

PHYSICAL RESOURCES

Cape Meares is located on a prominent coastal headland that rises over 640 feet above sea level. The western border of the headland ends dramatically at sheer cliffs above the Pacific ocean, while north aspects of the headland descend gradually to sandy beaches that occur beyond the Refuge boundaries. Topography is generally steep with a prominent gully formed from landslides of unstable soils being a landmark in the southern end of the refuge. The central portion of Cape Meares is less steep than the north or south portions and is bisected by the roadway to the lighthouse. There are two small drainages containing seasonal runoff streams. The headland is composed of solid basalt which was uplifted in the Tertiary Period. Overlaying the basalt are soils derived from sedimentary sandstones and/or siltstones. The soils range from shallow to moderate in depth and are well drained.

VEGETATION

Forested communities present at Cape Meares NWR include both Sitka spruce / salal (*Picea sitchensis* / *Gaultheria shallon*) and Sitka spruce–western hemlock / swordfern (*Picea sitchensis*–*Tsuga heterophylla* / *Polystichum munitum*) (Table 2). Neither community is represented in a pure stand which is typical for coastal Sitka spruce forests. There is a tendency for the salal understory to predominate toward the windward or coastal edge of the site and for the swordfern understory to dominate on steep northerly slopes and to the interior of the site. These communities represent classic old-growth forest conditions with much downed wood, large standing snags, and a variety of age classes present. The headland has been subjected to much windthrow, which is typical of Oregon coastal forests, and also contains a small portion of a former landslide area. The forest on surrounding lands has been harvested by clearcutting, the majority of which took place about 25-30 years ago.. On exposed windward areas and where soils are shallow, the vegetation is composed primarily of shrubby species.

The Sitka spruce–western hemlock / swordfern vegetation type, once common to the central and northern Oregon coast, remains uncut in only a few isolated areas, including Cape Meares NWR. This community is found on the upper reaches of the cape, usually on more gentle topography on all aspects. The canopy has a more closed appearance than that of the Sitka spruce / salal community. The western hemlock dominates the overstory in actual numbers of trees but the Sitka spruce are much larger in diameter. The two species are of similar age. Pockets of extensive blow-down are found in this community, especially on the north slope of the cape. The age of the spruce trees in this old-growth forest range up to approximately 275 years old and the hemlocks up to about 195 years old.

The Sitka spruce / salal community is found primarily as a narrow band atop the ocean cliffs. The key habitat characteristics for this community appear to be intense exposure to salt spray and high winds coming off the ocean. The spruce trees are widely spaced in this community and the understory is dominated by salal (30% - 80% cover), and salmonberry (*Rubus spectabilis*) (15% - 30% cover).

Because of adjacent clearcut logging practices, Cape Meares is more exposed to high winds and forest blow-down has increased. A substantial blow-down event occurred on the east side of the Refuge during a storm in November 1981. Most of the old-growth trees in the 20-acre unit were lost in this event, and the area is now an early seral stage forest. This stand appears to have been largely a Sitka spruce-western hemlock/swordfern stand. The understory in the community is dominated by swordfern with salal, salmonberry, leatherleaf licorice fern (*Polypodium scolieri*), wood sorrel (*Oxalis oregana*), evergreen huckleberry (*Vaccinium ovatum*), and vine maple (*Acer circinatum*) also occurring in lesser amounts. This site is one of the very few locations in the Pacific Northwest where timber salvaging was not conducted and natural forest regeneration was allowed to occur following the blowdown.

A coastal headland shrub community dominated by salal and salmonberry is represented at Cape Meares NWR, but covers very few total acres (Table 2). This community is found primarily on the south slopes of the two headlands that jut into the ocean. At each area the community grades into the Sitka spruce / salal forest community. Many herbaceous species found in the shrub community, including Pacific reedgrass (*Calamagrostis nutkaensis*) and angelica (*Angelica lucida*), are typical components of coastal headland grasslands and are not usually found in mature coastal headland shrublands, which indicates that these areas were apparently once grasslands which have succumbed to succession and invasion by salal and salmonberry.

Table 2. Vegetation at Cape Meares NWR .

Habitat	Acres	Fuel Model*
Sitka Spruce / Salal Forest	5	5/10
Sitka Spruce–Western Hemlock / Swordfern Forest	80	10
Forest Blowdown	20	11
Coastal Headland Shrub	5	5
Rock Outcroppings and Cliffs	28.5	Non-burnable

* NFFL Fuel Model

FISH AND WILDLIFE

Both the old growth and the windthrow/naturally regenerated forested areas provide habitat to a diversity of wildlife species. These areas are particularly rich in microhabitats due to the abundance of downed trees, snags, and well-developed forest canopy structure. Species found here include the threatened bald eagle and the threatened marbled murrelet (Table 3), in addition to numerous neotropical migratory bird species such as winter wren, chestnut-backed chickadee, varied thrush, and hermit warbler. The last, unverified report of northern spotted owl within Cape Meares is from the early 1980's and they are no longer considered as occurring within Cape Meares NWR. The vertical sea cliffs provide nesting habitat for peregrine falcons, pelagic and Brandt's cormorants, common murre, tufted puffins, pigeon

guillemots, western gulls, black oystercatchers, and rhinoceros auklets. A 1997 survey of small mammals and amphibian abundance within Cape Meares old-growth and windthrow habitats found northwestern and red-backed salamander as well as pacific tree frog, red-legged frog, rough-skinned newt, and ensatina. Small mammals found include four species of shrew; shrew-mole and coast mole; Townsend's chipmunk; western red-backed and red tree voles; and northern flying squirrel. Large mammals using the area include Roosevelt elk, black-tailed deer, and black bear.

Table 3. Threatened and Endangered Species found at Cape Meares NWR

Common Name	Scientific Name	Federal Status
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Marbled Murrelet	<i>Brachyramphus marmoratus marmoratus</i>	Threatened

CULTURAL RESOURCES

There is little information about the early historical use of Cape Meares. The headland was probably used by Northwest Coast Indians for a variety of purposes. There are no recorded prehistoric sites on Cape Meares NWR. The Cape Meares Lighthouse was established in 1890 and staffed until 1938, then automated and used until decommissioned in 1963. The lighthouse was listed on the National Register of Historic Places in 1993, and currently sits on State Park lands.

STRUCTURES AND FACILITIES

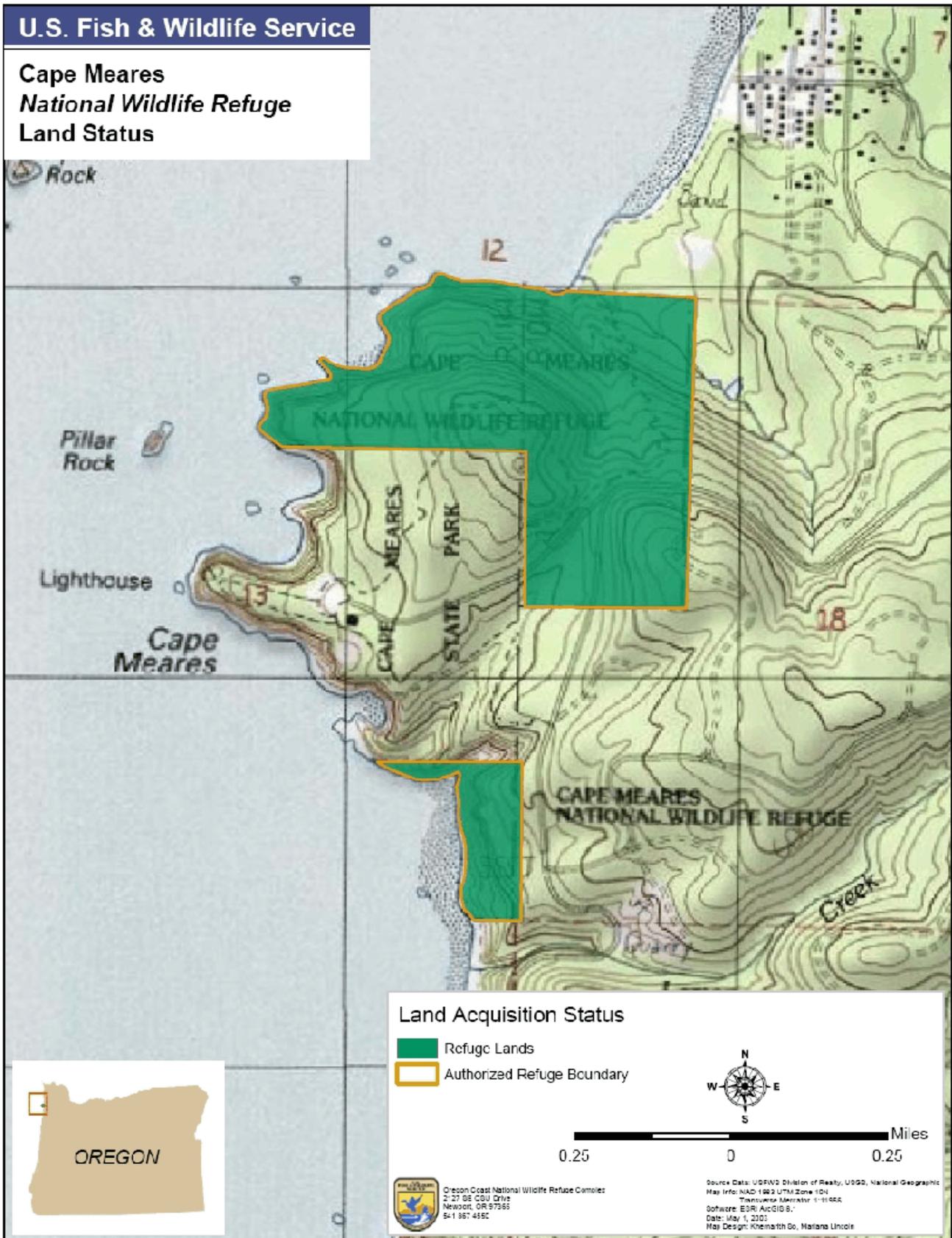
The Refuge itself contains no structures or facilities. However, there are interpretive facilities and structures owned by FWS but located on State Park land between the two units of Cape Meares NWR. These include kiosks, interpretive panels, and two wildlife viewing decks. The State Scenic Viewpoint itself houses a historic lighthouse, as well as a gift shop and restrooms. There are no privately-owned structures immediately adjacent to refuge lands.

PUBLIC ACCESS

Public access to the refuge is allowed on the northern parcel only, through the entrance road which leads through refuge land onto State Park land. The Three Capes State Scenic Route traverses through the southeast corner of the northern parcel, and refuge lands to the east of this route are closed to the public. A public hiking trail takes off to the north from the top of the entrance road and stays completely on refuge lands. A spur of this trail, also completely on refuge lands, branches off to the south and leads a short distance to a particularly remarkable large Sitka spruce. The remainder of the north parcel and the entire southern parcel are closed to the public.

The brochure for Cape Meares State Scenic Viewpoint can be found online at http://www.oregonstateparks.org/images/pdf/cape_meares.pdf.

Figure 1. Map of Cape Meares NWR .



WILDLAND FIRE MANAGEMENT SITUATION

HISTORIC ROLE OF FIRE

There is little published information available describing the specific historic role of fire on lands that now comprise Cape Meares NWR. Wildland fires along the coast are uncommon because of the large amount of precipitation and the normally moist and cool conditions. Extended periods of extreme drought are typically required for wildland fires to become a threat. Fire regimes in this region are estimated at recurrence intervals of more than 1000 years in coastal spruce-hemlock forests (Swanson 2001). However, because of the extremely high amount of fuel, if a fire were to occur at Cape Meares it could be very intense. Although wildland fires have been infrequent in Oregon west of the Cascade crest, there has been a preponderance of catastrophic fires. In May of 1860 the Nestucca Bay fire burned 320,000 acres. The Tillamook Burn, a series of fires occurring between 1933 and 1951, covered a total of 355,000 acres. The potential exists for an intense fire with a high rate of spread that could remove the old growth stand on Cape Meares.

Pre-settlement Fires

There is little information available describing the natural fire return interval of the Cape Meares area. Data from other temperate rainforest-type areas indicate that there may have been approximately one fire every few hundred years, under conditions of severe drought and high fuel loads. Swanson (2001) estimated a recurrence interval of more than 1000 years in coastal spruce-hemlock forests.

Post-settlement Fire History

Oregon Department of Forestry records indicate that fire season along the Oregon coast is typically from June 1 through September 30. Depending on the specific weather of any particular year, the fire season may start earlier or last longer. In the past 10 years the Oregon Department of Forestry (Tillamook District) has documented 35 wildland fire incidents totaling 4.24 acres in the area, caused solely by recreationists.

Prescribed Fire History

There have been no prescribed fires within or adjacent to Cape Meares NWR. Because of the limited role fire has played in the vegetation communities represented at the Refuge, no prescribed burning is planned on the Refuge.

RESPONSIBILITIES

The Oregon Coast NWR Complex does not have a dedicated fire management organization. The Zone Fire Management Officer/Prescribed Fire Specialist (FMO/PFS) located at Baskett Slough NWR (Willamette Valley NWRC) is responsible for fire management program oversight. The Oregon Coast NWRC Project Leader is responsible for planning and implementing the fire management program at Cape Meares and the other refuges within the Complex. The Project Leader will assign fire management responsibilities as collateral duties to appropriate staff who possess appropriate training, experience, and incident qualifications. Pre-suppression planning and work is accomplished by Complex staff in accordance with national and regional fire management direction under guidance from the Zone FMO. Emergency fire management actions will be handled by Complex staff according to training and incident qualifications. The Zone FMO will be immediately notified of all emergency actions. Additional information and direction is included in the Fire Dispatch Plan (Appendix C).

Project Leader (PL)

- ☐ Is responsible for implementation of all fire management activities within the Complex and will ensure compliance with Department and Service policies.
- ☐ Selects the appropriate management responses to wildland fires.
- ☐ Identifies pre-suppression projects and biological objectives to Zone FMO, notifies Zone FMO of project constraints, and ensures that Refuge resources are available to accomplish pre-suppression projects.
- ☐ Acts as the primary Refuge Resource Advisor during fire management planning and operations.
- ☐ Ensures fire effects monitoring is being implemented.

Deputy Project Leader (DPL)

- ☐ Coordinates Complex programs to ensure personnel and equipment are made available and utilized for fire management activities including fire suppression, pre-suppression projects, and fire effects monitoring.
- ☐ Ensures that the fire management program has access to Refuge and Complex resources when needed.
- ☐ Ensures that Complex staff consider the fire management program during Refuge-related planning and project implementation.
- ☐ Drafts wildland fire Burned Area Emergency Stabilization and Rehabilitation Plans for Project Leader; and is responsible for posting and enforcing fire restriction regulations.

Biologist

- ☐ Coordinates through Deputy Project Leader to provide biological input for the fire program with the Zone FMO.
- ☐ Assists in design and implementation of fire effects monitoring, with Zone FMO.
- ☐ Participates, as requested, in pre-suppression projects, fire suppression, and rehabilitation according to level of training.
- ☐ May serve as Resource Advisor on wildland fire incidents.

Zone Fire Management Officer / Prescribed Fire Specialist (FMO/PFS)

- ☐ Responsible for all fire-related planning and implementation for the Complex.
- ☐ Integrates biological objectives into all fire management planning and implementation.
- ☐ Solicits program input from the Project Leader and Biologist.
- ☐ Supervises pre-suppression project planning.
- ☐ Coordinates fire related training.
- ☐ Coordinates with cooperators to ensure adequate resources are available for fire operational needs.
- ☐ Is responsible for implementation of this plan.
- ☐ Is responsible for preparation of fire reports following the suppression of wildland fires and for pre-suppression projects requiring such..
- ☐ Prepares an annual report detailing fire occurrences and pre-suppression activities undertaken in each calendar year. This report will serve as a post_year's fire management activities review, as well as provide documentation for development of a comprehensive fire history record for the Complex.
- ☐ Submits budget requests and monitors FIREBASE funds.
- ☐ Maintains records for all personnel involved in suppression and pre-suppression activities, detailing the individual's qualifications and certifications for such activities.
- ☐ Updates all fire qualifications for entry into the Fire Management Information System.

- ☐ Nominates personnel to receive fire_related training, as appropriate.

Incident Commander (IC)

Incident Commanders (of any level) use strategies and tactics as directed by the Project Leader and WFSA where applicable to implement selected objectives on a particular incident. A specific Limited Delegation of Authority (Appendix I) will be provided to each Incident Commander prior to assuming responsibility for an incident. Major duties of the Incident Commander are given in the National Wildfire Coordinating Group (NWCG) Fireline Handbook, including:

- ☐ Brief subordinates, direct their actions, and provide work tools.
- ☐ Ensure that safety standards identified in the Fire Orders, the Watch Out Situations, and agency policies are followed at all times.
- ☐ Personally scout and communicate with others to be knowledgeable of fire conditions, fire weather, tactical progress, safety concerns and hazards, condition of personnel, and needs for additional resources.
- ☐ Order resources to implement the management objectives for the fire.
- ☐ Inform appropriate dispatch of current situation and expected needs.
- ☐ Coordinate mobilization and demobilization with dispatch and the Collateral FMO.
- ☐ Perform administrative duties, i.e., approving work hours, completing fire reports for command period, maintaining property accountability, providing or obtaining medical treatment, and evaluating performance of subordinates.
- ☐ Assure aviation safety is maintained to the highest standards.

Initial Attack

Employees participating in any wildland fire activities on Fish and Wildlife Service or cooperators' lands will meet fitness requirements established in PMS 310-1, except where Service-specific fitness requirements apply.

INTERAGENCY OPERATIONS

Cooperative agreements with various federal, state and local agencies generally provide that resources of each agency are available to assist in initial attack efforts. These agreements include details about payment among cooperators, list of response areas, communications frequencies, and preferred mode(s) of communication, and have been reviewed by a contract specialist and/or solicitor.

The U.S. Fish and Wildlife Service's Pacific Region, which includes the Oregon Coast National Wildlife Refuge Complex, is a party to the Master Cooperative Fire Protection Agreement of 1998. Fire suppression for Oregon Coast NWRC lands is provided for as detailed in this agreement, under the Reimbursable process rather than a Fee Basis.

Cape Meares NWR lands are within ODF's Tillamook Forest Protection District. ODF will have initial attack responsibility for wildland fires. Oregon State Parks pays the annual fire patrol assessment fee to ODF. The Netarts-Oceanside Rural Fire Protection District (Netarts-Oceanside Fire and Rescue 61) would respond to any structure fire within Cape Meares State Scenic Viewpoint and would assist as needed with a wildland fire.

The Oregon Coast NWRC will use the Incident Command System (ICS) as a guide for fireline organization. Qualifications for individuals is per DOI Wildland Fire Qualifications and Certification System, part of NIIMS and the National Wildland Fire Coordination Group (NWCG) Prescribed Fire Qualification Guide. Depending on fire complexity, some positions may be filled by the same person.

PROTECTION OF SENSITIVE RESOURCES

Natural Resources

It is a management objective to maintain the refuge's old growth stands in an unaltered condition. Therefore, the use of mechanized equipment and fire suppression chemicals are restricted. These restrictions are listed below. If human life and/or property are threatened, fire personnel may utilize any suppression tactic at their disposal to mitigate the threat. In this case, emergency ESA Section 7 consultation will be initiated if necessary.

- Minimum impact fire suppression tactics will be used to the fullest extent possible.
- Mechanical control (i.e., dozer line) of fire will be allowed only at the Refuge boundary and at established roadways (which include the entrance road and Three Capes Scenic Route in the northern parcel), and within a 20-foot buffer zone from these features.
- No vehicular traffic or mechanical equipment is permitted in the interior of the Refuge.
- Manual control of fire is allowed in all areas of the refuge, and will be accomplished with methods such as standard hand tools (shovel, flapper, Pulaski, etc.), backpack water sprayers, engine hose lays, and chainsaws. In the interior of the refuge, chainsaws may be used only to clear small-diameter vegetation around firelines.
- Aerial suppression efforts by helicopters and/or fixed wing aircraft may be utilized on the refuge. Water drops will be allowed in all areas of the refuge, except in the interior of the northern unit during the bald eagle nesting season (March 1 through August 31). Retardant drops are allowed at the refuge boundary and at established roadways, and within the 20-foot buffer zone, but are prohibited in the interior of the refuge (see additional restrictions below).
- Fire chemicals will be cautiously and conservatively used on the refuge. Fire retardant may be used only at the refuge boundary, established roadways, and 20-foot buffer zone, and is prohibited in the interior of the refuge. Additionally, Fire-trol® retardant will not be used on the refuge due to its cyanide component and toxicity to aquatic organisms. Foam may be used to reinforce firelines at the refuge boundary, established roadways, and the 20-foot buffer zone. In the interior of the refuge, foam may be used only to protect very high value wildlife habitats (e.g., old growth, large snags used for cavity nesters). Silv-ex® and Phos-chek® wildland fire foams will not be used on the refuge, since they are more toxic to aquatic organisms than other types of fire foams.
- Unburned snags will not be felled along fire lines, except where necessary to protect human life and property. When possible, the use of water and/or fire chemicals should be used to protect snags from burning (see restrictions above).

Cultural Resources

The Regional Archaeologist and/or his/her staff will work with fire staff, the Project Leader, and Incident Commanders to ensure that cultural resources are protected from fire and fire management activities. The Request For Cultural Resource Compliance (RCRC) form (Appendix F) will be used to inform the Regional Archaeologist of impending activities, thereby meeting the regulations and directions governing the protection of cultural resources as outlined in Departmental Manual Part 519, National Historic Preservation Act (NHPA) of 1966, Code of Federal Regulations (36CFR800), the Archaeological Resources Protection Act of 1979, as amended, and the Archaeological and Historic Preservation Act of 1974. The NHPA Section 106 clearance will be followed for any fire management activity that may affect

historic properties (cultural resources listed or eligible for listing on the National Register of Historic Places). No archaeological or historic sites have been identified on the Refuge. However, the Oregon coastal area is known to have been heavily used by Native American tribes prior to European settlement, and the potential exists for cultural sites to occur.

Impacts to archaeological resources by fire resources vary. The four basic sources of damage are (1) fire intensity, (2) duration of heat, (3) heat penetration into soil, and (4) suppression actions. Of the four, the most significant threat is from equipment during line construction for wildland fire holding actions (Anderson 1983).

The following actions will be taken to protect archaeological and cultural resources from wildland fire suppression activities:

- Minimum impact fire suppression tactics (MIST) will be used to the fullest extent possible.
- Resource Advisors will inform fire suppression personnel of any areas with cultural resources. The Resource Advisor should contact the Regional Archaeologist and/or his/her staff for more detailed information.
- Foam use will be minimized in areas known to harbor surface artifacts.
- Mechanized equipment should not be used in areas of known cultural significance.
- The location of any sites discovered as the result of fire management activities will be reported to the Regional Archaeologist.
- Rehabilitation plans will address cultural resources impacts and will be submitted to the Regional Archaeologist using the RCRC.

WILDLAND FIRE ACTIVITIES

Fire program management describes the operational procedures necessary to implement fire management at Cape Meares NWR. Program management includes fire prevention, emergency preparedness, fire behavior predictions, fire detection, fire suppression, burned area rehabilitation, and documentation.

All fires will be appropriately suppressed. Minimum impact suppression tactics will be employed to protect all resources.

Oregon Department of Forestry records indicate that fire season along the Oregon coast is typically from June 1 through September 30. Depending on the specific weather of any particular year, the fire season may start earlier or last longer.

FIRE MANAGEMENT STRATEGIES

Managing fire for resource benefit will not be a consideration at Cape Meares NWR. Fire damage to old growth forest could be severe, requiring over one hundred years before the site could be similar in age and structure to the pre-burn condition. Therefore, the fire management strategy for Cape Meares NWR will be to control and suppress any wildland fire as soon as possible following detection. Appropriate suppression action will be taken to provide for firefighter and public safety and protection of cultural and natural resources. In all cases, the primary concern of fire suppression personnel shall be safety, and if needed, all individuals not involved in the suppression effort will be evacuated.

Suppression strategies should be applied so that the equipment and tools used to meet the desired objectives are those that inflict the least impacts upon the natural and cultural resources. Minimum impact suppression tactics (MIST) will be employed to protect all resources. Natural and artificial barriers will be used as much as possible for containment. When necessary, fire line construction will be conducted in such a way as to minimize long-term impacts to resources. Sites impacted by fire suppression activities or by the fire will be rehabilitated as necessary, based on an approved course of action for each incident.

Specific fire management strategies for Cape Meares NWR are:

- Mechanical control of fire will be allowed only at the Refuge boundary and at established roadways. Mechanical control will not be allowed further than 20 feet from road edges.
- Control efforts within the Refuge boundary will be by manual methods or by aerial control. No vehicular traffic or mechanical equipment is permitted in the interior of the Refuge.
- All wildland fires will be controlled using the appropriate suppression strategy which considers safety, property, natural resources, and economics.
- Known cultural resource sites will be excluded from all fire management activities including fireline construction and water/retardant drops.

PREPAREDNESS

Preparedness is the work accomplished prior to fire occurrence to ensure that the appropriate response, as directed by the Fire Management Plan, can be carried out. Preparedness activities include: budget planning, equipment acquisition, equipment maintenance, dispatch (initial attack, extended, and expanded), equipment inventory, personnel qualifications, and training. The preparedness objective is to have a well trained and equipped fire management organization to manage all fire situations within the monument. Preparedness efforts are to be accomplished in the time frames outside the normal fire season dates.

Historical Weather Analysis

Climate data for the Tillamook 1 W RAWS (#358494), 1948-2003, are summarized in Table 1. The climate at Cape Meares is generally wet. The hottest and driest months are typically July and August. Fires would be most likely to start during this period, but fire intensity and rate of spread are expected to be low. During periods of extreme drought, however, the potential for extreme fire behavior and high rate of spread exists.

Graphs of Energy Release Component (ERC) and Burning Index (BI) data (2002-2003) from RAWS #350208 in Tillamook can be found in Appendix H, Table 2. Extreme values of ERC and BI rarely reach the 97th percentile, and the average values never surpass the 90th percentile, indicating that fire potential is low in this area. Because these are not long-term trends, caution must be used when using these data for fire management decisions until long-term weather trends can be established.

In the event of a severe drought or exceptionally high temperatures for an extended period of time, daily fire danger will be determined from existing resources such as data from the Weather Information Management Systems (WIMS) and the National Fire Danger Rating System (NFDRS), including daily temperature, relative humidity, wind speed, precipitation, and burning index (BI). Alternatively, fire danger ratings may be posted by using current fire precaution levels set by the Oregon Department of Forestry.

Weather station locations throughout Oregon state and the United States are depicted on a map at the U.S. Forest Service internet website (http://www.fs.fed.us/land/wfas/stn_loc.gif), as well as latest fire danger and next day forecast (<http://www.fs.fed.us/land/wfas/welcome.htm>).

Fire Prevention

An active fire prevention program will be conducted, as needed, in conjunction with other agencies to protect human life and property, and prevent damage to cultural resources or physical facilities.

A program of internal and external education regarding potential fire danger may be implemented. Visitor contacts, bulletin board materials, handouts and interpretive programs can be utilized to increase visitor and neighbor awareness of fire hazards.

During periods of extreme or prolonged fire danger emergency restrictions or area closures may become necessary. Such restrictions, when imposed, will usually be consistent with those implemented by neighboring agencies.

Staffing Priority Levels

The Oregon Coast NWRC has no dedicated fire staff; therefore, staffing priority levels and the Step-Up Plan are not applicable.

In extreme fire danger, one or more of the aircraft vendors listed in the Fire Dispatch Plan (Appendix C) will be contacted to make them aware of the fact that they may be called in the case of a fire.

Training

Departmental policy requires that all personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG). Oregon Coast NWRC will conform strictly to the requirements of the wildland fire management qualification and certification system and USFWS guidelines.

Fire suppression is an arduous duty. Poor physical condition of crew members can endanger safety and lives during critical situations. Personnel performing fire management duties will maintain a high level of physical fitness. This requires successful completion of a fitness pack test. Personnel must complete a three mile hike with a 45 pound pack in less than 45 minutes.

Basic wildland fire training refreshers for red-carded firefighters, as well as training in pump and engine operation, power saws, firefighter safety, fire weather and behavior, and helicopter safety and operations, are offered annually at other FWS units and neighboring agencies. Records are kept in a centralized database. On-the-job training is encouraged and will be conducted at the field level. Whenever appropriate, the use of fire qualification task books will be used to document fire experience of trainees. The Zone FMO will coordinate fire training needs with those of other nearby refuges, cooperating agencies, and the Regional Office.

The Oregon Coast NWRC supports the development of individual Incident Command System (ICS) overhead personnel from among qualified and experienced refuge staff for assignment to overhead teams at the local, regional, and national level.

Supplies and Equipment

The Oregon Coast NWRC maintains no fire cache. All FWS fire supplies and equipment available for use at Cape Meares NWR are located at Baskett Slough NWR under the control of the Zone FMO/PFS. Additional equipment and supplies are available through cooperators and the interagency cache system. Requests for additional personnel and equipment are made through the Zone FMO/PFS. Additional needs may be coordinated through the Siuslaw National Forest.

DETECTION

In general, fires will often be initially detected by a member of the general public or a volunteer and reported to the County (*e.g.*, 9-1-1), who would then contact State Parks or Refuge personnel. Refuge staff are currently working to improve communication with the local fire departments, ODF, BLM, and USFS in notification of suppression actions.

The first State Parks or Refuge employee to receive a report of a fire within or adjacent to the Refuge boundary should get the following information (also see Fire Dispatch Plan, Appendix C):

- Location of smoke or fire;
- Location of caller;
- Name and telephone number of caller;
- Color of smoke;
- Estimated size of fire;
- Type of fuel;
- Character of fire (running, creeping, etc.);
- Anyone on the fire;
- Did you see anyone in the area of vehicles leaving the area.

State Parks personnel from nearby Cape Lookout State Park are requested to notify FWS as soon as a fire is reported on Cape Meares NWR or State Scenic Viewpoint. As per the Dispatch Plan (Appendix C), the Oregon Coast NWRC Project Leader should then be notified of the fire and its location, and the Dispatch Plan followed from this point forward.

The Fire Management Plan does not discriminate between human-caused and lightning-caused fire. All wildland fires will be suppressed. However, detection shall include a determination of fire cause. Moreover, human-caused fires will require an investigation and report by law enforcement personnel. For serious human-caused fires, including those involving loss of life, a qualified arson investigator will be requested.

COMMUNICATIONS

The Complex does not have a radio system. Staff rely on cellular phones for all communications originating outside of the office. A list of cell phone numbers and assignments is located in the dispatch plan and contact list (Appendix C). For short-distance (up to one mile) communications, there are several Cobra “Micro-talk” 2-way radios available at the Complex office.

A wildland fire on the refuge will be immediately reported to the Complex office to notify the Project Leader, who will notify the Zone FMO/PFS at Willamette Valley NWRC.

PRE-ATTACK PLAN

Upon discovery of a fire, all subsequent actions will be based on the following:

- The Incident Commander (IC) will locate, size-up, and coordinate suppression actions. The IC will complete the pre-attack planning checklist.
 - Provide for public safety.
- Considering the current and predicted fire conditions, the IC will assess the need for additional suppression resources and estimate the final size of the fire. The potential for spread outside of the refuge should be predicted, as well as the total suppression force required to initiate effective containment action at the beginning of each burning period.
- The IC will assess the need for law enforcement personnel for traffic control, investigations, evacuations, etc., and make the request to the FMO.
 - Document decisions and complete the fire report (DI-1202).
- Should a wildland fire move into an extended attack a Delegation of Authority will be invoked. Once a Delegation of Authority has been authorized the IC will make the final decisions pertaining to the fire. A copy of the Delegation of Authority is in Appendix I.

FIRE MANAGEMENT UNITS

Fire Management Units (FMUs) are areas on a Refuge which have common wildland fire management objectives and strategies, are manageable units from a wildland fire standpoint, and can be based on natural or human-made fuel breaks. Due to the relatively small size and the preponderance of the old growth forest fuel type, Cape Meares NWR will be considered a single FMU.

Due to the potential for severe damage to old-growth forest resources, staff limitations, relatively small land management parcels, long response times, and values at risk on neighboring lands, this plan does authorize managing wildland fire for resource benefit at the Refuge. Wildland fires will be suppressed using the appropriate suppression response.

Fuel Types and Fire Behavior

The vast majority of the vegetation within Cape Meares NWR is old growth forest with a heavy downed wood and snag component. A fire in this type of forest would be expected to burn with much greater intensity than other fuel types due to the fuel load, although only under severe drought conditions. More

typically, fuel moisture within Cape Meares NWR is quite high due to frequent precipitation, persistent summer fog, and close proximity to the ocean.

In order to predict fire behavior for a given area, it is essential to understand the habitat types and fuel models present (Table 2), the specific management objectives for each habitat type, the typical fire behavior of the geographic region, and the potential effects of fire within each habitat type. The fuel type descriptions below are taken from *Aids to Determining Fuel Models For Estimating Fire Behavior* (Anderson 1982).

Fire behavior predictions are given for each of the fuel models based on dead fuel moisture of 8%, live fuel moisture of 100%, and a midflame wind of 5 mi/h. Ocean winds at Cape Meares are typically stronger than 5 mi/h; however, 1- and 10-hour fuel moistures are typically higher than 8% even in recent extreme drought years, as indicated by data from the Tillamook RAWs station (Appendix H, Figure 3).

Shrub Group, Fuel Model 5: Fire is generally carried in the surface fuels that are made up of litter cast by the shrubs and the grasses or forbs in the understory. The fires are generally not very intense because surface fuel loads are light, the shrubs are young with little dead material, and the foliage contains little volatile material. Usually shrubs are short and almost totally cover the area.

Expected rate of spread and flame length in this fuel model (given 8% dead fuel moisture, 100% live fuel moisture, and a midflame wind of 5 mi/h) are 18 chains per hour and 4 feet, respectively.

Forest Group, Fuel Model 10: Fires burn in the surface and ground fuels with greater fire intensity than the other forest litter models. Dead-down fuels include greater quantities of 3-inch or larger limbwood resulting from overmaturity or natural events that create a large load of dead material on the forest floor. Crowning out, spotting, and torching of individual trees are more frequent in this fuel situation, leading to potential fire control difficulties. Any forest type may be considered if heavy down material is present; examples are insect- or disease-ridden stands, wind-thrown stands, overmature situations with deadfall, and aged light thinning or partial-cut stands.

Expected rate of spread and flame length in this fuel model (given 8% dead fuel moisture, 100% live fuel moisture, and a 5 mi/h midflame wind) are 7.9 chains per hour and 4.8 feet, respectively. Fires such as this are at the upper limit of control by direct attack; more wind or drier conditions could lead to more extreme fire behavior and spread potential.

Logging Slash Group, Fuel Model 11: Fires are fairly active in the slash and herbaceous material intermixed with the slash. The spacing of the rather light fuel load, shading from overstory, or the aging of the fine fuels can contribute to limiting the fire potential. Light partial cuts or thinning operations in mixed conifer stands, hardwood stands, and southern pine harvests are considered. Clearcut operations generally produce more slash than represented here. The less-than-3-inch material load is less than 12 tons per acre. The greater-than-3-inch is represented by not more than 10 pieces, 4 inches in diameter, along a 50-foot transect.

Expected rate of spread and flame length in this fuel model (given 8% dead fuel moisture content and a 5 mi/h midflame wind) are 6.0 chains per hour and 3.5 feet, respectively.

Fire Effects

Because of the rarity of fires in the area, little information on observed ecological effects of fire in the Sitka spruce-western hemlock old growth forest is available. The forest communities at Cape Meares represent classic old growth forest conditions with much downed wood, large standing snags, and a

variety of age classes present. A fire through the understory would likely have minimal adverse effects on the wildlife and old growth forest. If a crown fire developed, the effects would be significant. Some of the trees within Cape Meares NWR are estimated to be close to three hundred years old and it would take at least two hundred years for the area to recover and provide comparable habitat.

The long fire interval of Sitka spruce-western hemlock forest is indicative of the role fire plays in the ecology of these tree species. Western hemlock fire resistance is low to moderate because of its thin bark, shallow root system, low dense branching habit, and highly flammable foliage; however, older trees often survive infrequent wildfires because of their large size and thick bark. In addition, hemlock grows in dense stands and often has lichen-covered branches, which increases its susceptibility to fire damage. Sitka spruce is very susceptible to fire damage due to its thin bark and shallow root system. Small to medium height conifers in the stand understory do provide ladder fuels for the fire to reach the tree crowns. Large crown fires are not typical but can be produced under severe drought conditions.

Old growth Sitka spruce-western hemlock forest is more protected from stand replacing crown fires than a younger forest of this type, since the trees are very large with fewer lower limbs, less dense than younger stands, and the understory is less dense and more uneven. The higher density of snags and dead topped trees in old growth do make old growth susceptible to spot fires. The higher density of large downed wood from natural stand thinning and dead trees provides more long-burning fuel at the ground level. A large stand replacement fire starting in the old growth at Cape Meares is unlikely but could occur within the old growth under unusual weather and fuel conditions.

Forest fires impoverish the soil by sweeping a cloud of nutrients from burning leaves, branches, and the forest floor into the atmosphere. But the large, water-saturated boles of live trees, snags, and downed logs usually do not burn through, so much of their large energy and nutrient reserves remain intact (Stewart 1990). Thus large, charred tree boles lie or stand pillarlike as a new young forest slowly emerges from the ashes. The 20-acre windthrow unit with its abundance of enormous old growth downed logs, as well as the intact old grown forest dominating the majority of Cape Meares would be expected to respond in this manner.

Salal, blackberry and salmonberry are all fire resilient and are not easily killed by fire. These shrubs regenerate vegetatively from extensive roots and rhizomes. They also quickly establish and re-establish in burned areas and other disturbed sites by vegetative means and/or stored seed.

Large stand-replacing fires cause major changes in habitats and bird communities. Many of the species present before the fire will be replaced by new species. In general, bark probing insect eaters, raptors, aerial insectivores, ground dwellers, and birds of open spaces will increase; and canopy dwellers and birds that reside in old growth forests with abundant understory will decrease.

Fire effects on wildlife are variable depending on the vegetation type and the behavior and intensity of the fire. Direct mortality is generally less significant than the effects of habitat changes resulting from the fire. Some species benefit from increased forage which regenerates after a fire, while others are harmed by other factors such as changes in vegetation or increased erosion. Fires in grassland, brush, or forest understory generally have less dramatic effects on wildlife populations than forest stand-replacing fires, which are likely to cause major changes in wildlife communities, with some species increasing and others decreasing or even disappearing from the burned area.

The effect of a fire on bird populations varies with the severity of the fire (stand replacement vs. underburn). Most bird species present prior to a stand replacement fire are canopy dwelling species; however, in the post fire environment, ground dwelling bird species become more dominant. A patchy,

low intensity fire could create snags, which are important perching and nesting sites for bald eagles; however, an intense fire could destroy the old growth forest and associated snags and downed wood that makes the area so unique. Fire season also overlaps the nesting period of bald eagles and would likely destroy any tree nests. Smoke and disturbance might adversely affect seabird or peregrine falcon nesting, but long-term effects would be minimal. Following an extremely intense stand-replacing fire, the suitability of the forest for species dependent on old growth, such as the marbled murrelet, would likely be greatly reduced, possibly precluding them from utilizing the refuge. It could be 50 to 100 years before the habitat recovered sufficiently to support nesting bald eagles.

In general, large mammal species are well adapted to changes in landscape patterns as a result of fire. However, lack of hiding and thermal cover may initially limit large mammal utilization levels in the burn area, depending on burn patterns and the distribution of cover patches. Large mammals may avoid the burned area for a time. With the exception of the initial direct loss of existing forage, fire will likely improve foraging habitats for large mammals in the burn area. New sprouts of brush species provide higher nutritional value than older decadent brush. Grasses and forbs are expected to sprout soon after fire and provide highly palatable forage.

Small mammals exhibit a varied response to stand replacing fires. Population declines within Cape Meares could be expected for chickarees (*Tamiasciurus douglasi*), and northern flying squirrels (*Glaucomys sabrinus*). Shrews may decline if most of the litter and duff on the forest floor has burned. Species that would benefit from the change from arboreal to ground vegetation include deer mice and Townsend chipmunks (*Eutamias townsendi*).

Amphibians would respond in either a neutral or negative manner, depending on the species and the severity of the burn. Terrestrial salamanders would decrease if a substantial portion of the duff and debris on the forest floor were burned away. A stand-replacing fire would have potential to adversely affect the more aquatic amphibians such as torrent salamanders. A very intense fire could heat small water bodies to temperatures that are lethal for eggs and larvae. The loss of overhead shade would result in higher summer stream temperatures, perhaps above the maximum tolerable for aquatic amphibians, for several years following the fire.

The effects of wildland fire suppression activities on threatened and endangered species are explained in the Section 7 Biological Evaluation (Appendix E).

SUPPRESSION TACTICS

Suppression involves a wide range of possible tactics from the initial attack to final control. To this end, all wildland fires will be suppressed in a safe, aggressive, and cost-effective manner to produce efficient action with minimal resource damage and limit smoke impacts to local communities.

Typical initial attacks will include an immediate assessment of danger to public safety and subsequent evacuations. All fires will be assessed by the first on-scene Incident Commander and attacked using minimum impact fire suppression tactics for the Refuge. Roads and natural barriers will be used to reduce fireline construction. Fireline and mop-up through riparian areas should consider long-term damage to vegetation. Unnecessary cutting and bucking should be replaced with alternative actions whenever possible. Back-fires and burnout operations should consider head fire intensities and attempt to avoid frying the soil or running fire into riparian areas. Where wildland fires cross roads, the burned area adjacent to the road should be mopped up and dangerous snags felled.

In addition to the consultation with the Project Leader or their representative, a resource advisor should be assigned to the incident from the beginning to both document rehabilitation needs, but to also assist with

on-the-ground tactical decisions. There will be only one Incident Commander responsible through the FMO to the Project Leader. The Incident Commander will designate all overhead positions on fires requiring extended attack. Reference should be made to a Delegation of Authority (Appendix I).

Suppression Conditions

For Cape Meares NWR, a full suppression alternative was selected requiring containment and control of wildland fires subject to wildlife considerations as well as limitations imposed by the Research Natural Area designation. Certain guidelines have been developed to assist with this strategy to protect the refuge from unnecessary damage. Heavy equipment use is not permitted within Cape Meares NWR. Aircraft/ retardant use is restricted due to wildlife and safety concerns. Unless life or property is in eminent risk, consultation with the Project Leader or their representative prior to their use is necessary.

Table 4. Suppression guidelines for Cape Meares NWR .

Suppression Tactic	Roads and Refuge Boundaries (up to 20 feet off of feature)	Interior of Refuge
Foam	IC Discretion	Prohibited, unless life/property threatened
Retardant	IC Discretion	Prohibited, unless life/property threatened
Dozer Line	IC Discretion with Resource Advisor Consultation	Prohibited, unless life/property threatened
Handline (including chainsaw work)	IC Discretion	Approved; use wetline whenever possible
Off-road travel	IC Discretion	Prohibited, unless life/property threatened
Bucket Drops (water)	Approved/utilize designated dips	Approved/utilize designated dips; prohibited in north unit March 1-August 31
Use of Hoselays	Approved	Approved
Burn Out From Control Points	Group Leader Direction w/IC	Group Leader Direction w/IC

Wildland Fire Situation Analysis

For fires that cannot be contained in one burning period, a Wildland Fire Situation Analysis (WFSA) must be prepared (Appendix J). In the case of a wildland fire, the Project Leader, in conjunction with the FMO, will prepare the WFSA. Approval of the WFSA resides with the Refuge Project Leader.

The purpose of the WFSA is to allow for a consideration of alternatives by which a fire may be controlled. Damages from the fire, suppression costs, safety, and the probable character of suppression actions are all important considerations.

Public safety will require coordination between all refuge and State Parks staff and the IC. Notices should be posted to warn visitors, trails may be closed, traffic control will be necessary where smoke crosses roads, etc. Where wildland fires cross roads, the burned area adjacent to the road should be mopped up and dangerous snags felled. Every attempt will be made to utilize natural and constructed barriers, including changing fuel complexes, in the control of wildland fire. Rehabilitation efforts will concentrate on the damages done by suppression activities rather than on the burned area itself.

Aircraft Operations

Where appropriate, aircraft may be used in all phases of fire management operations. All aircraft must be Office of Aircraft Services (OAS) or Forest Service approved. An OAS Aviation Policy Department Manual will be provided by OAS.

All aircraft will be required to avoid seabird colonies on the cliffs and offshore rocks. Helicopters may be used for reconnaissance, bucket drops and transportation of personnel and equipment. Natural helispots and parking lots are readily available in most cases. Clearing for new helispots should be avoided where possible, and may not take place within the refuge. Improved helispots will be rehabilitated following the fire.

As in all fire management activities, safety is a primary consideration. Qualified aviation personnel will be assigned to all flight operations.

REHABILITATION AND RESTORATION

There are 3 types of fire rehabilitation, Suppression, Burned Area, and Emergency Stabilization. Suppression rehabilitation restores and repairs property and resources from direct suppression activity damage, such as cut fences, dozer lines, and campsites. Burned area rehabilitation and stabilization restores resources and property damaged or otherwise impacted from the fire, such as burned waterlines and denuded hillsides.

Suppression Rehabilitation

In the event of a wildland fire, rehabilitation of fire suppression damage should be accomplished immediately. An appropriate time is within 7 days after the fire is controlled unless the Regional Fire Management Coordinator grants an extension. Funding for suppression rehabilitation comes from the specific fire cost account as established by the FMO. The Incident Commander, as agreed to by the Project Leader, will initiate suppression rehabilitation. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential hazards caused by the fire. These actions may include:

- Backfill control lines, scarify, and seed.*
- Install water bars and construct drain dips on control lines to prevent erosion.
- Restore natural ground contours that were altered.
- Remove all flagging, equipment and litter.
- Completely restore camping areas and improved helispots on State Park lands or private lands (camping and clearing for helispots not permitted on refuge lands).
- Revegetate to restore sensitive areas impacted by suppression actions.*

*If revegetation or seeding is necessary, only locally procured seeds of native plant species will be used.

A written suppression rehabilitation plan may be appropriate on larger incidents. Contractors or equipment may be hired to accomplish specialized work.

Emergency Stabilization Versus Rehabilitation

Emergency stabilization is the use of appropriate emergency stabilization techniques in order to protect public safety and stabilize and prevent further degradation of cultural and natural resources in the perimeter of the burned area and downstream impact areas from erosion and invasion of undesirable species. Rehabilitation is the use of appropriate rehabilitation techniques to improve natural resources as

stipulated in approved refuge management plans and the repair or replacement of minor facilities damaged by the fire.

Total "rehabilitation" of a burned area is not within the scope of the Emergency Rehabilitation funding. Emergency Rehabilitation funding can be used to begin the rehabilitation process if other funding is committed to continue the rehabilitation throughout the life of the project (beyond the initial 3 years of Emergency Rehabilitation funding). Major facilities are repaired or replaced through supplemental appropriations of other funding.

Burned Area Emergency Stabilization and Rehabilitation (ESR) Plan

The goal of the ESR Plan is to protect public safety and stabilize and prevent further degradation of natural and cultural resources, and to rehabilitate the stability, productivity, diversity, and ecological integrity of refuge lands after a wildland fire as described in approved refuge management plans. The ESR Plan is tiered to the refuge Comprehensive Conservation Plan (CCP), Habitat Management Plan (HMP), Fire Management Plan (FMP), and operations or step-down plans. Development of ESR Plan objectives is guided by resource management objectives, general management practices, and constraints identified in approved CCP, HMP, and/or supporting step-down plans.

If Burned Area Emergency Stabilization and Rehabilitation is required to reduce the effects of a wildland fire, then the Refuge should request appropriate funding through the Burned Area Emergency Stabilization and Rehabilitation (ESR) fund. The Service representative at the National Interagency Fire Center administers the ESR fund. A rehabilitation and restoration survey, plan, and request must be prepared and submitted according to agency guidelines. Smaller incidents may only need simple plans prepared by refuge staff. Larger incidents with extensive rehabilitation efforts should employ a ESR Team. A ESR Team is composed of personnel who specialize in key disciplines of resource management and are experts in ESR Plan preparation. A formal request for a ESR Team should be made in consultation with the Incident Management Team as soon as it appears damage may be significant. Instructions for ESR Team mobilization can be found in the National Wildfire Coordinating Group mobilization guide. Delays in making a request may hinder funding approval and magnify the damage. Once a ESR Team is employed, the Project Leader or their representative should provide guidance to the ESR team leader with expectations. The Project Leader, biologist, and FMO will review all ESR Plans. The final plan will be submitted to the Region for review prior to submission to the Washington Office. Direction on ESR guidelines can be found in the Service Fire Management Handbook section 5.1.

REQUIRED REPORTING

The IC will be responsible for documenting decisions and completing the fire report (e.g., ICS-214, DI-1202). The FMO will be responsible for any additional required reports.

FIRE INVESTIGATION

Fire management personnel will attempt to locate and protect the probable point of origin and record pertinent information required to determine fire cause. They will be alert for possible evidence, protect the scene and report findings to the fireline supervisor.

Prompt and efficient investigation of all suspicious fires will be carried out. However, fire management personnel should not question suspects or pursue the fire investigation unless they are currently law enforcement commission qualified.

Personnel and services of other agencies may be utilized to investigate wildland fire arson or fire incidents involving structures. All fire investigations should follow the guidelines outlined in 4.1-2 of the Fire Management Handbook (2000).

FIRE RESEARCH

Currently there are no fire research projects underway within or directly involving Cape Meares NWR.

PUBLIC SAFETY

The Oregon Coast NWRC is dedicated to ensuring the safety of each visitor and to all residents and property adjacent to the Complex refuges' boundaries. At Cape Meares NWR and State Scenic Viewpoint, the main entrance road may be closed to entry in case of fire.

Areas of fire activity may be clearly signed at the lighthouse shop and at the interpretive kiosk, as well as at the visitor center and bulletin boards at Cape Lookout State Park. Residents adjacent to the refuge and state park will be notified if a wildfire poses a threat to burn outside the refuge/state park boundary.

A first aid kit will be on-site for wildland fires. The local police, fire, and emergency medical services will be notified of any wildland fires.

PUBLIC INFORMATION AND EDUCATION

Educating the public on the value of fire as a natural process is important to increasing public understanding and support for the fire management program. In the case of a wildfire event, the Complex will use the most appropriate and effective means to explain the overall fire and smoke management program, including the rationale for the suppression strategy to be used. This may include supplemental handouts, signing, personal contacts, auto tour routes, or media releases.

The public information program will be developed as follows:

- The fire management program and suppression strategy may be incorporated into visitor contacts. Particular attention will be given when fires are conspicuous from roads or visitor use areas.
 - News releases will be distributed to the media as appropriate.
- The public information outlets of neighboring and cooperating agencies and the regional office will be provided with all fire management information and suppression plans.
- The fire management program will be discussed in informal talks with employees, volunteers, residents, and neighbors.

As outlined in the prevention section, emergency closures or restrictions may become necessary during periods of extreme or extended fire danger.

FIRE CRITIQUES AND ANNUAL PLAN REVIEW

FIRE CRITIQUES

Fire reviews will be documented and filed with the final fire report. The FMO will retain a copy for the refuge files.

ANNUAL FIRE SUMMARY REPORT

The FMO will be responsible for completing an annual fire summary report. The report will contain the number of fires by type, acres burned by fuel type, cost summary, personnel utilized, and fire effects.

ANNUAL FIRE MANAGEMENT PLAN REVIEW

The Fire Management Plan will be reviewed annually. Necessary updates or changes will be accomplished prior to the next fire season. Any additions, deletions, or changes will be reviewed by the Project Leader to determine if such alterations warrant a re-approval of the plan.

CONSULTATION AND COORDINATION

The following agencies, organizations and/or individuals were consulted in preparing this plan.

Roddy Baumann, Regional Prescribed Fire Specialist, Pacific Region, USFWS, Portland, OR.

Brian Gales, Prescribed Fire Specialist, Willamette Valley NWRC, Corvallis, OR.

Amanda McAdams, Regional Fire Ecologist, Pacific Region, USFWS, Portland, OR.

James Roberts, Regional Fire Planner, Pacific Region, USFWS, Portland, OR.

APPENDICES

APPENDIX A: REFERENCES

- Agee, James K. 1993. Fire Ecology of Pacific Northwest Forests. Island Press, Washington, D.C.
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- U.S. Fish and Wildlife Service. 1987. Refuge Management Plan. Oregon Islands, Cape Meares, Three Arch Rocks National Wildlife Refuges, Oregon.
- U.S. Fish and Wildlife Service. 2002. Three Arch Rocks National Wildlife Refuge request for fire management plan exemption. Memo to Regional Director, Pacific Region, Portland, OR. Oregon Coast National Wildlife Refuge Complex, Newport, OR.

U.S. Fish and Wildlife Service. 2003. (draft) Wildland Fire Management Plan: Oregon Islands National Wildlife Refuges. Oregon Coast National Wildlife Refuge Complex, Newport, OR.

U.S. Fish and Wildlife Service. 2002. Wildland Fire Management Plan: Baskett Slough National Wildlife Refuge. Willamette Valley National Wildlife Refuge Complex, Corvallis, Oregon.

U.S. Fish and Wildlife Service. 2002. Wildland Fire Management Plan: Nisqually National Wildlife Refuge Complex., Olympia, Washington.

APPENDIX B: DEFINITIONS

Agency Administrator. The appropriate level manager having organizational responsibility for management of an administrative unit. May include Director, State Director, District Manager or Field Manager (BLM); Director, Regional Director, Complex Manager or Project Leader (FWS); Director, Regional Director, Scenic Viewpoint Superintendent, or Unit Manager (NPS), or Director, Office of Trust Responsibility, Area Director, or Superintendent (BIA).

Appropriate Management Action. Specific actions taken to implement a management strategy.

Appropriate Management Response. Specific actions taken in response to a wildland fire to implement protection and fire use objectives.

Appropriate Management Strategy. A plan or direction selected by an agency administrator which guide wildland fire management actions intended to meet protection and fire use objectives.

Appropriate Suppression. Selecting and implementing a prudent suppression option to avoid unacceptable impacts and provide for cost-effective action.

Bureau. Bureaus, offices or services of the Department.

Class of Fire (as to size of wildland fires).

Class A - 3 acre or less.

Class B - more than 3 but less than 10 acres.

Class C - 10 acres to 100 acres.

Class D - 100 to 300 acres.

Class E - 300 to 1,000 acres.

Class F - 1,000 to 5,000 acres.

Class G - 5,000 acres or more.

Emergency Fire Rehabilitation/Burned Area Emergency Rehabilitation (EFR/BAER). Emergency actions taken during or after wildland fire to stabilize and prevent unacceptable resource degradation or to minimize threats to life or property resulting from the fire. The scope of EFR/BAER projects are unplanned and unpredictable requiring funding on short notice.

Energy Release Component (ERC). A number related to the available energy (BTU) per unit area (ft²) within the flaming front at the head of a fire. It is generated by the National Fire Danger Rating System, a computer model of fire weather and its effects on fuels. The ERC incorporates 1,000-hour dead fuel moistures and live fuel moistures; day to day variations are caused by changes in the moisture content of the various fuel classes. The ERC is derived from predictions of (1) the rate of heat release per unit area during flaming combustion and (2) the duration of flaming.

Extended Attack. A fire on which initial attack forces are reinforced by additional forces.

Fire Suppression Activity Damage. The damage to lands, resources and facilities directly attributable to the fire suppression effort or activities, including: dozer lines, camps and staging areas, facilities (fences, buildings, bridges, etc.), handlines, and roads.

Fire Effects. Any consequences to the vegetation or the environment resulting from fire, whether neutral, detrimental, or beneficial.

Fire Intensity. The amount of heat produced by a fire. Usually compared by reference to the length of the flames.

Fire Management. All activities related to the prudent management of people and equipment to prevent or suppress wildland fire and to use wildland and prescribed fire to achieve land and resource management objectives.

Fire Management Plan. A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational procedures such as preparedness plans, preplanned dispatch plans, prescribed fire plans and prevention plans.

Fire Prescription. A written direction for the use of fire to treat a specific piece of land, including limits and conditions of temperature, humidity, wind direction and speed, fuel moisture, soil moisture, etc., under which a fire will be allowed to burn, generally expressed as acceptable range of the various fire-related indices, and the limit of the area to be burned.

Fuels. Materials that may support combustion during a fire; primarily grass, surface litter, duff, logs, stumps, brush, foliage, and live trees.

Fuel Loading. Amount of burnable fuel on a site, usually given as tons/acre.

Hazard Fuels. Those vegetative fuels which, when ignited, may threaten public safety, structures and facilities, cultural or natural resources, and natural processes, or permit the spread of wildland fires across administrative boundaries except as authorized by agreement.

Initial Attack. An aggressive suppression action consistent with firefighter and public safety and values to be protected.

Maintenance Burn. A fire set by agency personnel to remove debris; i.e., leaves from drainage ditches or cuttings from tree pruning. Such a fire does not have a resource management objective.

Natural Fire. A fire of natural origin, caused by lightning or volcanic activity.

NFDRS Fuel Model. One of 20 mathematical models used by the National Fire Danger Rating System to predict fire danger. The models were developed by the U.S. Forest Service and are general in nature rather than site-specific.

NFFL Fuel Model. One of 13 mathematical models used to predict fire behavior within the conditions of their validity. The models were developed by U.S. Forest Service personnel at the Northern Forest Fire Laboratory, Missoula, Montana.

Prescription. Measurable criteria which guide selection of appropriate management response and actions. Prescription criteria may include safety, public health, environmental, geographic, administrative, social, or legal considerations.

Prescribed Fire. A fire ignited by agency personnel in accord with an approved plan and under prescribed conditions, designed to achieve measurable resource management objectives. Such a fire is designed to produce the intensities and rates of spread needed to achieve one or more planned benefits to

natural resources as defined in objectives. Its purpose is to employ fire scientifically to maximize net benefits at minimum impact and acceptable cost. A written, approved prescribed fire plan must exist and NEPA requirements must be met prior to ignition. NEPA requirements can be met at the land use or fire management planning level.

Preparedness. Actions taken seasonally in preparation to suppress wildland fires, consisting of hiring and training personnel, making ready vehicles, equipment, and facilities, acquiring supplies, and updating agreements and contracts.

Prevention. Activities directed at reducing the number or the intensity of fires that occur, primarily by reducing the risk of human-caused fires.

Rehabilitation. Actions to (1) limit the adverse effects of suppression on soils, watershed, or other values, or (2) mitigate adverse effects of a wildland fire on the vegetation-soil complex, watershed, and other damages.

Suppression. A management action intended to protect identified values from a fire, extinguish a fire, or alter a fire's direction of spread.

Unplanned Ignition. A natural fire that is permitted to burn under specific conditions, in certain locations, to achieve defined resource objectives.

Wildfire. An unwanted wildland fire.

Wildland Fire. Any non-structure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Situation Analysis (WFSA). A decision-making process that evaluates alternative management strategies against selected safety, environmental, social, economical, political, and resource management objectives as selection criteria.

Wildland/Urban Interface Fire. A wildland fire that threatens or involves structures.

APPENDIX C: FIRE DISPATCH PLAN

Fire Dispatch Plan 2003
Cape Meares National Wildlife Refuge

FIRE SIZE-UP

Use the following or the card, pocket guide, fireline handbook or red book guides.

Reporting party's name and phone number: _____

Time discovered: _____

Location of smoke or fire (plot on map; legal description): _____

Fire Behavior: ___Smoldering ___Creeping ___Running ___Crowning ___Spotting

Estimated size (acres): ___Spot ___1/4-1/2 ___1/2-3/4 ___1 ___
1-5 ___5+

Wind (midflame speed & direction) _____

Dry Bulb Temperature (°F): _____ Relative Humidity (%): _____

Fuel Type: ___Grass ___Brush ___Forest ___Slash

Adjacent Fuels: ___Grass ___Brush ___Forest ___Slash

Aspect: _____ Percent Slope: _____

Additional Resources Needed: _____

Special Considerations: _____

NOTIFICATION

Upon report of a wildland fire, contact staff in the following order:

- **Call 911** – request response by nearest fire department, ambulance if necessary, traffic control.
- Roy Lowe – Refuge Manager/Resource Advisor Work: (541) 867-4550

Cell:
(541)
270-1864

Home:
(541)
563-2012

- Rebecca Chuck – Deputy Refuge Manager Work: (541) 867-4550

Cell:
(541)
270-7811

Home:
(541)
574-9078

- Brian Gales – Zone Prescribed Fire Specialist Work: (541) 757-7236

Cell:
(541)
230-0343

Home:
(503)
982-8025

- David Pitkin -- Fish and Wildlife Biologist/Resource Advisor Work (541) 867-4550

Cell:
(541)
270-1863

Home:
(541)
996-2290

- Cape Mearns State Scenic Viewpoint Phone: (503) 842-3182
Pete Marvin, Park Manager (at Cape Lookout
State Park)
Cell: (503)
801-0205

- ***Contact one of the following Regional FWS Fire Duty Officers:***

Pam Ensley -- Regional
Fire
Management
Coordinator
Work:
(503)
231-6174
Cell: (503) 781-7978

Home:
(360)
835-7004

Andy Anderson -- Regional Fire
Management
Officer
Work:
(503)
231-6175

Cell: (503)
805-1312

Home:
(360)
666-5031

Roddy Baumann –
Regional
Prescribed Fire
Specialist
Work:
(503)
231-2075

Cell:
(503)
784-8348

Bruce Babb – Fire Specialist /
Regional WUI
Coordinator
Work: (503)
231-6234

Cell:
(503)
703-5823

ESTABLISHED SUPPRESSION GUIDELINES

Suppression guidelines for Cape Meares NWR.

Suppression Tactic	Roads and Refuge Boundaries (up to 20 feet off of feature)	Interior of Refuge
Foam	IC Discretion	Prohibited, unless life/property threatened
Retardant	IC Discretion	Prohibited, unless life/property threatened
Dozer Line	IC Discretion with Resource Advisor Consultation	Prohibited, unless life/property threatened
Handline (including chainsaw work)	IC Discretion	Approved; use wetline whenever possible
Off-road travel	IC Discretion	Prohibited, unless life/property threatened
Bucket Drops (water)	Approved/utilize designated dips	Approved/utilize designated dips; prohibited in north unit March 1-August 31
Use of Hoselays	Approved	Approved
Burn Out From Control Points	Group Leader Direction w/IC	Group Leader Direction w/IC

Wildland Fire Suppression. Measures to minimize impacts of fire suppression activities to sensitive natural resources (including listed species) are specified in the Wildland Fire Management Plan, Wildlife Fire Management section, under the heading Protection of Sensitive Resources: Natural Resources. These measures are based on a Refuge management objective to maintain old-growth forest stands in an unaltered condition, and are listed below. If human life and/or property are threatened, fire personnel may utilize any suppression tactic at their disposal to mitigate the threat. In this case, emergency Section 7 consultation will be initiated if necessary.

- Minimum impact fire suppression tactics will be used to the fullest extent possible.
- Mechanical control (i.e., dozer line) of fire will be allowed only at the Refuge boundary and at established roadways (which include the entrance road and Three Capes Scenic Route in the northern parcel), and within a 20-foot buffer zone from these features.
- No vehicular traffic or mechanical equipment is permitted in the interior of the Refuge.
- Manual control of fire is allowed in all areas of the refuge, and will be accomplished with methods such as standard hand tools (shovel, flapper, Pulaski, etc.), backpack water sprayers, engine hose lays, and chainsaws. In the interior of the refuge, chainsaws may be used only to clear small-diameter vegetation around firelines.
- Aerial suppression efforts by helicopters and/or fixed wing aircraft may be utilized on the refuge. Water drops will be allowed in all areas of the refuge, except in the interior of the northern unit during the bald eagle nesting season (March 1 through August 31). Retardant drops are allowed at the refuge boundary and at established

roadways, and within the 20-foot buffer zone, but are prohibited in the interior of the refuge (see additional restrictions below).

- Fire chemicals will be cautiously and conservatively used on the refuge. Fire retardant may be used only at the refuge boundary, established roadways, and 20-foot buffer zone, and is prohibited in the interior of the refuge. Additionally, Fire-trol® retardant will not be used on the refuge due to its cyanide component and toxicity to aquatic organisms. Foam may be used to reinforce firelines at the refuge boundary, established roadways, and the 20-foot buffer zone. In the interior of the refuge, foam may be used only to protect very high value wildlife habitats (e.g., old growth, large snags used for cavity nesters). Silv-ex® and Phos-chek® wildland fire foams will not be used on the refuge, since they are more toxic to aquatic organisms than other types of fire foams.
- Unburned snags will not be felled along fire lines, except where necessary to protect human life and property. When possible, the use of water and/or fire chemicals should be used to protect snags from burning (see restrictions above).

A full suppression strategy is the selected method for this Refuge due to the relatively small size of the Refuge and old-growth forest values to be protected. The maps found within the Fire Management Plan delineate the refuge boundaries, control points, and access roads. All fires will be suppressed, but MIST tactics should be utilized whenever practical and safe to do so. A Resource Advisor will be ordered for every fire in the initial phase.

First priority for suppression actions will be the establishment of a coherent command structure and identification of the Incident Commander to firefighters on scene and to dispatch regardless of the size of the fire. LCES (Lookouts, Communication, Escape Routes, Safety Zones) will be addressed and made known to every firefighter on scene through a comprehensive briefing. Once those areas have been addressed the priorities will be given to protect adjacent inhabited private structures, which are threatened, the second priority will go to Oregon State Parks facilities, historical structures, outbuildings and any private lands threatened with the third priority going to the protection of lands within the Refuge itself.

The IC will coordinate all orders through the Northwest Interagency Coordination Center (NWCC). A Safety Officer (SOFR) 2 or 3, Staging Area Manager (STAM), Task Force Leader (TFLD) or higher should be considered for early ordering. A Fire Investigator and Law Enforcement support should be routinely ordered. Traffic on the adjacent roads and the safety of the public as well as to emergency personnel is paramount.

Remember that as stated in FWS/RF95-00209 from September 21, 1995 from the Director of the U.S. Fish and Wildlife Service, there are; “some overriding principles: 1. Of paramount importance is the safety of the firefighters. No constraints for protection of endangered species or their habitat will be considered if they place firefighters in danger. **FIREFIGHTER SAFETY COMES FIRST ON EVERY FIRE, EVERY TIME.**” Therefore, if firefighter or public safety is threatened, any available suppression action may be implemented. If potential adverse effects to threatened or endangered species occur during these actions, emergency Section 7 consultation will be initiated.

COMMUNICATIONS:

The Complex does not have a radio system. Staff rely on cellular phones for all communications originating outside of the office. A list of cell phone numbers and assignments is located in the contact

list below. For short-distance (up to one mile) communications, there are several Cobra “Micro-talk” 2-way radios available at the Complex office.

CONTACT LIST

Table 5. Contact List for Cape Meares NWR, Emergency Services, and Neighboring Agencies .

U.S. Fish and Wildlife Service Contacts		
Oregon Coast National Wildlife Refuge Complex	2127 SE Marine Science Drive Newport, OR 97365-5258	Phone: (541) 867-4550 Fax: (541) 867-4551
Roy Lowe Refuge Manager	Newport, OR	Work: (541) 867-4550 Cell: (541) 270-1864 Home: (541) 563-2012
Rebecca Chuck Deputy Refuge Manager	Newport, OR	Work: (541) 867-4550 Cell: (541) 270-7811 Home: (541) 574-9078
David Pitkin Fish and Wildlife Biologist	Newport, OR	Work: (541) 867-4550 Cell: (541) 270-1863 Home: (541) 996-2290
Pam Johnson Administrative Officer	Newport, OR	Work: (541) 867-4550 Cell: (541) 270-7810 Home: (541) 574-4390
Dawn Grafe Refuge Operations Specialist	Newport, OR	Work: (541) 867-4550 Cell: (541) 270-1874 Home: (541) 336-1128
Jim Johnson Maintenance Mechanic	Newport, OR	Work: (541) 867-4550 Cell: (541) 270-5351 Home: (541) 574-4390
Willamette Valley National Wildlife Refuge Complex	26208 Finley Refuge Rd. Corvallis, OR 97333	Phone: (541) 757-7236 Fax: (541) 757-4450
Brian Gales Zone Prescribed Fire Specialist	26208 Finley Refuge Rd. Corvallis, OR 97333	Work: (541) 757-7236 Cell: (541) 230-0343 Home: (503) 982-8025
Region 1 Office	Fire Management 911 NE 11 th Avenue Portland, OR 97232-4181	Phone: (503) 736-4750 Phone: (503) 231-6170 Fax: (503) 231-2364
Pam Ensley, Regional Fire Management Coordinator	Portland, OR	Work: (503) 231-6174 Cell: (503) 738-7978 Home: (360) 835-7004
Andy Anderson, Regional Fire Management Officer	Portland, OR	Work: (503) 231-6175 Cell: (503) 805-1312 Home: (360) 666-5031

Roddy Baumann, Regional Prescribed Fire Specialist	Portland, OR	Work: (503) 231-2075 Cell: (503) 784-8348
Bruce Babb Regional WUI Coordinator	Portland, OR	Work: (503) 231-6234 Cell: (503) 703-5823

Law Enforcement, Fire, and Emergency Services		
Netarts-Oceanside Rural Fire Protection District	1235 5th Street Loop West, Tillamook, OR 97141	Phone: (503) 842-1153
Nestucca Rural Fire Protection District	Pacific City Fire Hall Sandlake Fire Hall	Phone: (503) 865-6014 Phone: (503) 965-6660
Tillamook County Sheriff	Tillamook, OR	Phone: (503) 842-2561
Tillamook County General Hospital	Tillamook, OR	Phone: (503) 842-4444

Neighboring Agencies		
Northwest Area Coordination Center (NWCC)	5420 NE Marine Drive Portland, OR 97218-1007	Phone: (503) 808-2720 Fax: (503) 808-2750
National Interagency Coordination Center	3833 S. Development Avenue Boise, ID 83705	Phone: (208) 387-5512
Oregon State Scenic Viewpoints Cape Meares State Scenic Viewpoint & Cape Lookout State Scenic Viewpoint	Cape Lookout State Scenic Viewpoint Office 13000 Whiskey Creek Road West Tillamook, OR 97141	Phone: (503) 842-3182 Fax: (503) 808-2750
Oregon Department of Forestry Tillamook District	5005 East 3 rd Street Tillamook, OR 97141	Phone: (503) 842-2545 Fax: (503) 842-3143
U.S. Forest Service Siuslaw National Forest Supervisor's Office	4077 SW Research Way P.O. Box 1148 Corvallis, OR 97339	Phone: (541) 750-7000 Fax: (541) 750-7234
U.S. Forest Service Siuslaw National Forest Hebo Ranger District	31525 HWY 22 P.O. Box 235 Hebo, OR 97122	Phone: (503) 392-3161 Fax: (503) 392-4203

APPENDIX D: ENVIRONMENTAL ACTION STATEMENT AND CATEGORICAL EXCLUSION

**UNITED STATES FISH AND WILDLIFE SERVICE
ENVIRONMENTAL ACTION STATEMENT**

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act of 1969 (NEPA), and other statutes, orders, and policies that protect

fish and wildlife resources, I have established the following administrative record and determined that the action of:

Implementation of the Wildland Fire Management Plan for Cape Meares National Wildlife Refuge

 X Is a categorical exclusion as provided by 516 DM 6, Appendix 1, 1.4.B (5) – “Fire management activities, including prevention and restoration measures, when conducted in accordance with Departmental and Service procedures.” No further NEPA documentation will be made.

 Is found not to have significant environmental effects as determined by the attached environmental assessment and finding of no significant impact.

 Is found to have significant effects and, therefore, further consideration of this action will require a notice of intent to be published in the Federal Register announcing the decision to prepare an EIS.

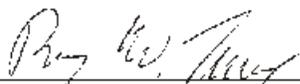
 Is not approved because of unacceptable environmental damage, or violation of Fish and Wildlife Service mandates, regulations, or procedures.

 Is an emergency action within the context of CFR 1506.11. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

Other supporting documents (list):

Roy W. Lowe, Project Leader
Oregon Coast National Wildlife Refuge Complex

Date



Roy W. Lowe, Project Leader
Oregon Coast National Wildlife Refuge Complex

 3/8/04
Date

APPENDIX E: SECTION 7 BIOLOGICAL EVALUATION – CAPE MEARES NWR

**Intra-Service Section 7 Biological Evaluation
United States Fish and Wildlife Service
Cape Meares National Wildlife Refuge**

Originating Official: Roy W. Lowe
Telephone: (541)867-4550
Date: November 20, 2003

I. Region: 1 (Pacific)

II. Service Activity (Program):

Implementation of the Wildland Fire Management Plan at Cape Meares NWR.

III. Pertinent Species and Habitat:

A. Listed species and/or their designated critical habitat within the action area:

Bald Eagle (*Haliaeetus leucocephalus*)
Marbled Murrelet (*Brachyramphus marmoratus marmoratus*)

B. Proposed species and/or proposed critical habitat within the action area: None

C. Candidate species within the action area: None

IV. Geographic area or station name and action:

Cape Meares National Wildlife Refuge, Tillamook County, Oregon

The Wildland Fire Management Plan is an operational guide for a Fire Management Program which will continue full suppression of all wildland fires. It defines levels of protection needed to provide for firefighter and public safety, protect facilities and resources, and restore and perpetuate natural processes given current understanding of the complex relationships in natural ecosystems. It is written to comply with a Service-wide requirement that refuges with burnable vegetation develop a fire management plan (620 DM 1).

The plan covers full suppression of all wildland fires. The plan sets objectives and describes methodology for fire suppression to meet the mission and goals of the refuge.

The Refuge has no full-time fire staff. Fire management oversight will be provided by the Prescribed Fire Specialist (PFS) at Willamette Valley NWRC in Corvallis, Oregon. The Project Leader will coordinate suppression actions with the PFS. The Project Leader will coordinate suppression actions with Oregon Department of Forestry and/or qualified FWS staff in accordance with the plan.

This evaluation addresses wildland fire suppression as described in the Wildland Fire Management Plan.

V. Location (attach map): See Wildland Fire Management Plan for map.

A. County and State: Tillamook County, Oregon

B. Section, township, and range (or latitude and longitude):

The Refuge is located in T1S, R10W, Section 18 and T1S, R11W, Section 13, Willamette Meridian.

C. Distance (miles) and direction to nearest town:

Approximately 1.75 miles north of Oceanside and 6 miles west of Tillamook, Oregon.

D. Include species/habitat occurrence on a map, if possible.

See the Wildland Fire Management Plan

VI. Description of Proposed Action:

The overall objective for fire management at Cape Meares NWR is to promote a program that provides for firefighter and public safety, reduces human-caused fires, and ensures that appropriate suppression response capability meets expected wildland fire complexity. Specific fire management objectives addressed in the Wildland Fire Management Plan are to:

- Promote a fire management program and control all wildland fires.
- Protect life, property, and resources from wildland fires at costs commensurate with resource values at risk.
- Use appropriate suppression tactics and strategies that minimize long-term impacts of suppression actions on natural resources.

VII. Determination of Effects:

A. Explanation of effects of the proposed action on species in item III. A.

Bald Eagle. Bald eagles nest, forage and perch within Cape Meares from approximately March 1 through August 31. Heaviest use occurs on the north unit, and there are approximately four nest sites, only one of which is used annually by the nesting pair. The nest sites are located in the NW¹/₄ NW¹/₄ of Section 18, T1S, R10W, Willamette Meridian. Fire suppression involving personnel and vehicle movements, heavy equipment operation along the entrance road, and low flying aircraft performing water and retardant drops would likely disturb the nesting pair of eagles. Activities near an active nest could affect reproductive success. A direct hit from a water or retardant drop could injure or kill eaglets in the nest.

Marbled Murrelet. Murrelets are not known to nest within Cape Meares but they have been observed within the refuge. Potential marbled murrelet nesting habitat is present in the old growth forest on refuge lands, and it is possible that they utilize refuge habitat for roosting around dawn

and dusk. Fire suppression activities such as personnel and vehicle movements, heavy equipment operation along the entrance road, and low flying aircraft performing water and retardant drops could disturb murrelets or destroy potential nesting habitat.

B. Explanation of actions to be implemented to avoid, minimize, or reduce adverse effects:

Wildland Fire Suppression. Measures to minimize impacts of fire suppression activities to sensitive natural resources (including listed species) are specified in the Wildland Fire Management Plan, Wildlife Fire Management section, under the heading Protection of Sensitive Resources: Natural Resources. These measures are based on a Refuge management objective to maintain old-growth forest stands in an unaltered condition, and are listed below. If human life and/or property are threatened, fire personnel may utilize any suppression tactic at their disposal to mitigate the threat. In this case, emergency Section 7 consultation will be initiated if necessary.

- Minimum impact fire suppression tactics will be used to the fullest extent possible.
- Mechanical control (i.e., dozer line) of fire will be allowed only at the Refuge boundary and at established roadways (which include the entrance road and Three Capes Scenic Route in the northern parcel), and within a 20-foot buffer zone from these features.
- No vehicular traffic or mechanical equipment is permitted in the interior of the Refuge.
- Manual control of fire is allowed in all areas of the refuge, and will be accomplished with methods such as standard hand tools (shovel, flapper, Pulaski, etc.), backpack water sprayers, engine hose lays, and chainsaws. In the interior of the refuge, chainsaws may be used only to clear small-diameter vegetation around firelines.
- Aerial suppression efforts by helicopters and/or fixed wing aircraft may be utilized on the refuge. Water drops will be allowed in all areas of the refuge, except in the interior of the northern unit during the bald eagle nesting season (March 1 through August 31). Retardant drops are allowed at the refuge boundary and at established roadways, and within the 20-foot buffer zone, but are prohibited in the interior of the refuge (see additional restrictions below).
- Fire chemicals will be cautiously and conservatively used on the refuge. Fire retardant may be used only at the refuge boundary, established roadways, and 20-foot buffer zone, and is prohibited in the interior of the refuge. Additionally, Fire-trol® retardant will not be used on the refuge due to its cyanide component and toxicity to aquatic organisms. Foam may be used to reinforce firelines at the refuge boundary, established roadways, and the 20-foot buffer zone. In the interior of the refuge, foam may be used only to protect very high value wildlife habitats (e.g., old growth, large snags used for cavity nesters). Silv-ex® and Phos-chek® wildland fire foams will not be used on the refuge, since they are more toxic to aquatic organisms than other types of fire foams.
- Unburned snags will not be felled along fire lines, except where necessary to protect human life and property. When possible, the use of water and/or fire chemicals should be used to protect snags from burning (see restrictions above).

Table 1. Established Suppression guidelines for Cape Meares NWR.

Suppression Tactic	Roads and Refuge Boundaries (up to 20 feet off of feature)	Interior of Refuge
Foam	IC Discretion	Prohibited, unless life/property threatened
Retardant	IC Discretion	Prohibited, unless life/property threatened
Dozer Line	IC Discretion with Resource Advisor Consultation	Prohibited, unless life/property threatened
Handline (including chainsaw work)	IC Discretion	Approved; use wetline whenever possible
Off-road travel	IC Discretion	Prohibited, unless life/property threatened
Bucket Drops (water)	Approved/utilize designated dips	Approved/utilize designated dips; prohibited in north unit March 1-August 31
Use of Hoselays	Approved	Approved
Burn Out From Control Points	Group Leader Direction w/IC	Group Leader Direction w/IC

VIII. Effect determination and response requested:

A. Listed species/designated critical habitat:

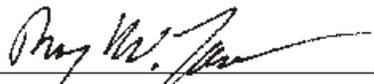
<u>Determination</u>	<u>Response requested</u>
<u> </u> No effect/no adverse modification	<u> </u> *Concurrence
<u> X </u> May affect, but is not likely to adversely affect species/ adversely modify critical habitat:	<u> X </u> Concurrence
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	
Marbled Murrelet (<i>Brachyramphus marmoratus marmoratus</i>)	
<u> </u> May affect, and is likely to adversely affect species/ adversely modify critical habitat	<u> </u> Formal Consultation

B. Proposed species/proposed critical habitat: None

C. Candidate species: None

X. Signatures:

Initiating Officer:



Roy W. Lowe, Project Leader
Oregon Coast National Wildlife Refuge Complex

2/27/04
Date

Reviewing ESO Evaluation:

- A. Concurrence X Nonconcurrency
- B. Formal consultation required
- C. Conference required
- D. Informal conference required
- E. Remarks (attach additional pages as needed):



Name:
Title: Senior Field Biologist, Acting in State Supervisor
Station: Oregon PWC.

3/3/04
Date

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Oregon Fish and Wildlife Office
2600 SE 98th Avenue, Suite 100
Portland, OR 97266
Phone: (503)231-6170 FAX: (503)231-6105

Reply To: 8330.01494 (04)
File Name: CapeMearesFirePlan.doc
TS Number: 04-1285

Memorandum

To: Project Leader, Oregon Coast National Wildlife Refuge Complex, Newport, OR

From: State Supervisor/Deputy State Supervisor, Oregon Fish & Wildlife Office, Portland, Oregon

Subject: Informal Consultation on Wildland Fire Management Plan for Cape Meares National Wildlife Refuge (1-7-04-I-0149)

This memorandum is the Oregon Fish and Wildlife Office's (OFWO) response to your request for Section 7 consultation on the Wildland Fire Management Plan (Plan) at Cape Meares National Wildlife Refuge (Refuge). A copy of the Plan was received in our Newport Field Office on December 17, 2003. Due to staff unavailability, the consultation package was forwarded to this office on January 27, 2004. A signed copy of the Plan was dated February 27, 2004 and received in this office on March 2, 2004. This document represents concurrence with your determination that the proposed action will not adversely affect threatened and endangered species listed under our jurisdiction. The species at issue in this consultation are bald eagles (*Haliaeetus leucocephalus*) and marbled murrelets (*Brachyramphus marmoratus marmoratus*). A complete administrative record of this consultation is on file in our office.

The Plan outlines a program of full suppression of all wildland fires. In order to maintain the refuge's old growth stands in an unaltered condition, the use of mechanized equipment and fire suppression chemicals are restricted under the Plan. Minimum impact fire suppression tactics will be used to the fullest extent possible. Mechanical control of fire and fire retardant will only be allowed at the Refuge boundary and at established roadways, and within a 20-foot buffer zone from these features. No vehicular traffic or mechanical equipment is permitted in the interior of the Refuge. Manual control of fire is allowed in all areas of the Refuge. Aerial suppression efforts may be utilized on the Refuge, except water drops in the interior of the northern unit during the bald eagle nesting season (March 1 through August 31). Fire_trol retardant and Silv_ex and Phoscheck wildland fire foams will not be used on the refuge. Unburned snags will not be felled along fire lines, and if possible will be protected from burning.

If human life and/or property are threatened, fire personnel may utilize any suppression tactic at their disposal to mitigate the threat. Under this scenario an emergency Section 7 consultation will be initiated, if necessary.

We believe the Plan is not likely to adversely affect bald eagles and marbled murrelets because:

- 1) Full suppression of all wildland fires will preserve the old growth forest that currently supports bald eagles and marbled murrelets.
- 2) Minimum impact suppression techniques will be used on all wildland fires.
- 3) Water drops will not be allowed in the interior of the northern unit during the bald eagle nesting season (March 1 through August 31) to reduce the likelihood of disturbance from low flying aircraft during critical nesting periods and of a direct hit from a water or retardant drop on the nest.
- 4) Mechanical control and equipment, vehicular traffic, and fire retardants will only be allowed at the Refuge boundary and at established roadways and within a 20-foot buffer zone from these features, and not in the interior of the refuge, where bald eagle and marbled murrelet habitat occurs.
- 5) Snags, which are important perching and nesting sites for bald eagles, will be protected from burning when possible, and unburned snags will not be felled along fire lines, except when necessary to protect human life and property.

Based on the information provided in the Biological Evaluation, we concur with your “May affect, but is not likely to adversely affect” determination for the bald eagle and marbled murrelet. The requirements established under section 7(a)(2) and 7(c) of the Endangered Species Act of 1973, as amended (16 USC 1531 *et. seq.*), have been met, thereby concluding the consultation process. If you have any questions or need more information, please contact Rachel Rounds or Rollie White at (503) 231_6179.

APPENDIX F: REQUEST FOR CULTURAL RESOURCE COMPLIANCE FORM

REQUEST FOR CULTURAL RESOURCE COMPLIANCE

U.S. Fish and Wildlife Service, Region 1

Project Name:					Program: (Partners, Refuges, JITW, WSECP, etc.)	
State: CA, ID, HI, NV, OR, WA		EcoRegion: CBE, IPE, KCE, NCE			FWS Unit: Org Code:	
Project Location:	County	Township	Range	Section	FWS Contact: Name, Tel#, Address	
USGS Quad:					Date of Request:	
Total project acres/linear ft/m:		APE Acres / linear ft/m (if different)			Proposed Project Start Date:	
MAPS Attached		Check below				
Copy of portion of USGS Quad with project area marked clearly (required)				Project (sketch) map showing Area of Potential Effect with locations of specific ground altering activities (required)		
Photocopy of aerial photo showing location (if available)				Any other project plans, photographs, or drawings that may help CRT in making determination (if available)		
Directions to Project: <small>(if not obvious)</small>						
Description of Undertaking:	Describe proposed project and means to facilitate (e.g., provide funds to revegetate 1 mile of riparian habitat, restore 250 acres of seasonal wetlands, and construct a 5-acre permanent pond). How is the project designed (e.g., install 2 miles of fence and create approximately 25' of 3' high check dam)?					

<p>Area of Potential Effects (APE):</p>	<p>Describe where disturbance of the ground will occur. What are the dimensions of the area to be disturbed? How deep will you excavate? How far apart are fenceposts? What method are you using to plant vegetation? Where will fill be obtained? Where will soil be dumped? What tools or equipment will be used? Are you replacing or repairing a structure? Will you be moving dirt in a relatively undisturbed area? Will the project reach below or beyond the limits of prior land disturbance? Differentiate between areas slated for earth movement vs. areas to be inundated only. Is the area to be inundated different from the area inundated today, in the recent past, or under natural conditions? Provide acres and/or linear ft/m for all elements of the project.</p>
<p>Environmental and Cultural Setting:</p>	<p>Briefly describe the environmental setting of the APE. A) What was the natural habitat prior to modifications, reclamation, agriculture, settlement? B) What is land-use history? When was it first settled, modified? How deep has it been cultivated, grazed, etc.? C) What is land use and habitat today? What natural agents (e.g., sedimentation, vegetation, inundation) or cultural agents (e.g., cultivation) might affect the ability to discover cultural resources? D) Do you (or does anybody else) know of cultural resources in or near the project area?</p>

APPENDIX G: COOPERATIVE AGREEMENTS

There are currently no cooperative agreements for wildland fire suppression in place for Cape Meares NWR. Formal agreements will be drafted and amended to this Fire Management Plan as they are approved.

APPENDIX H: HISTORICAL WEATHER DATA

The following data were extracted from a Remote Automated Weather Station (RAWS) at Tillamook, Oregon (Station #350208). These data are only from 2002 and 2003 and do not represent a true historical condition; caution must therefore be used when interpreting these data for use in fire management decisions. Graphs of the data were produced using Fire Family Plus version 3.0.1.

Figure 2. Energy Release Component and Burning Index, 2002-2003 .

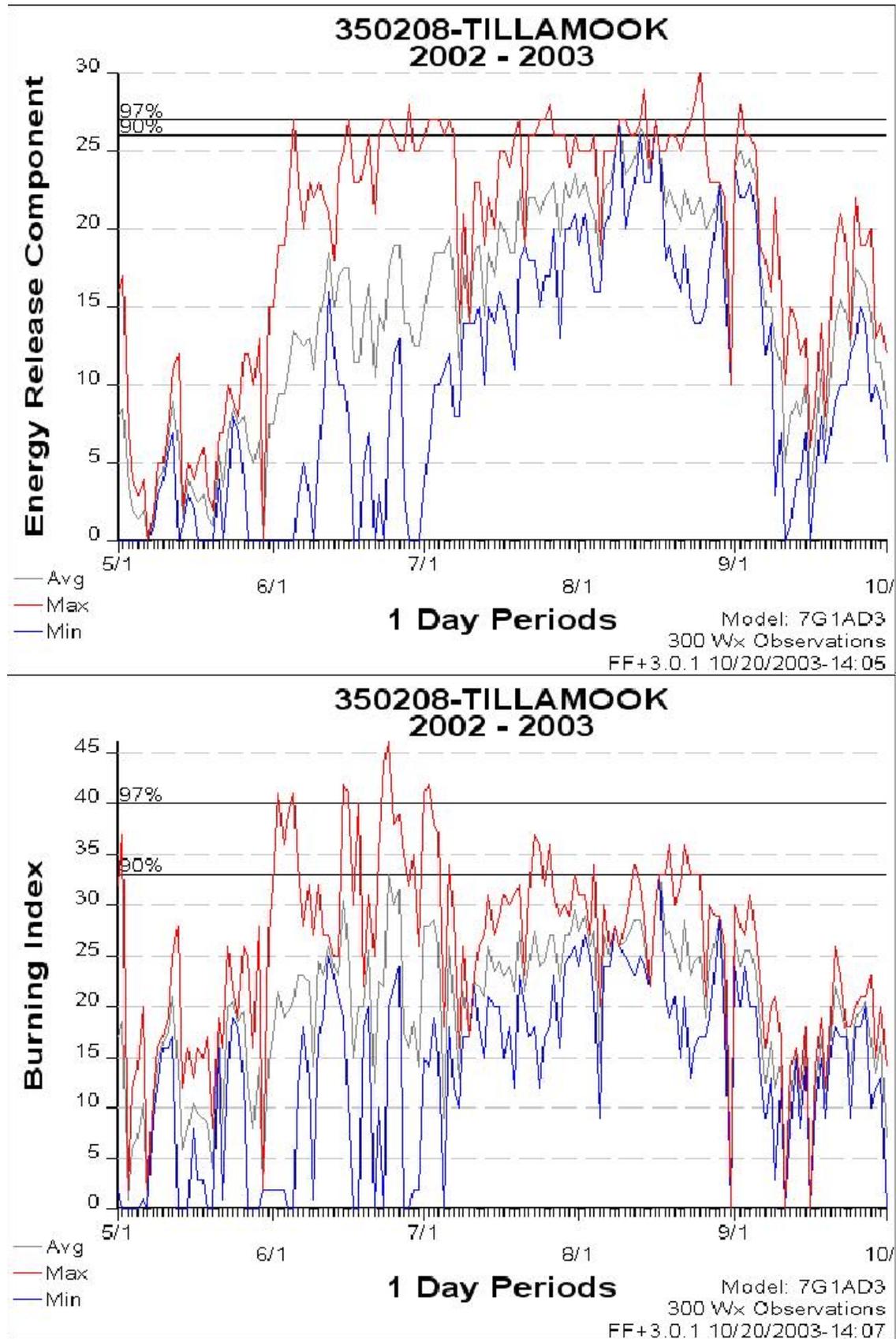
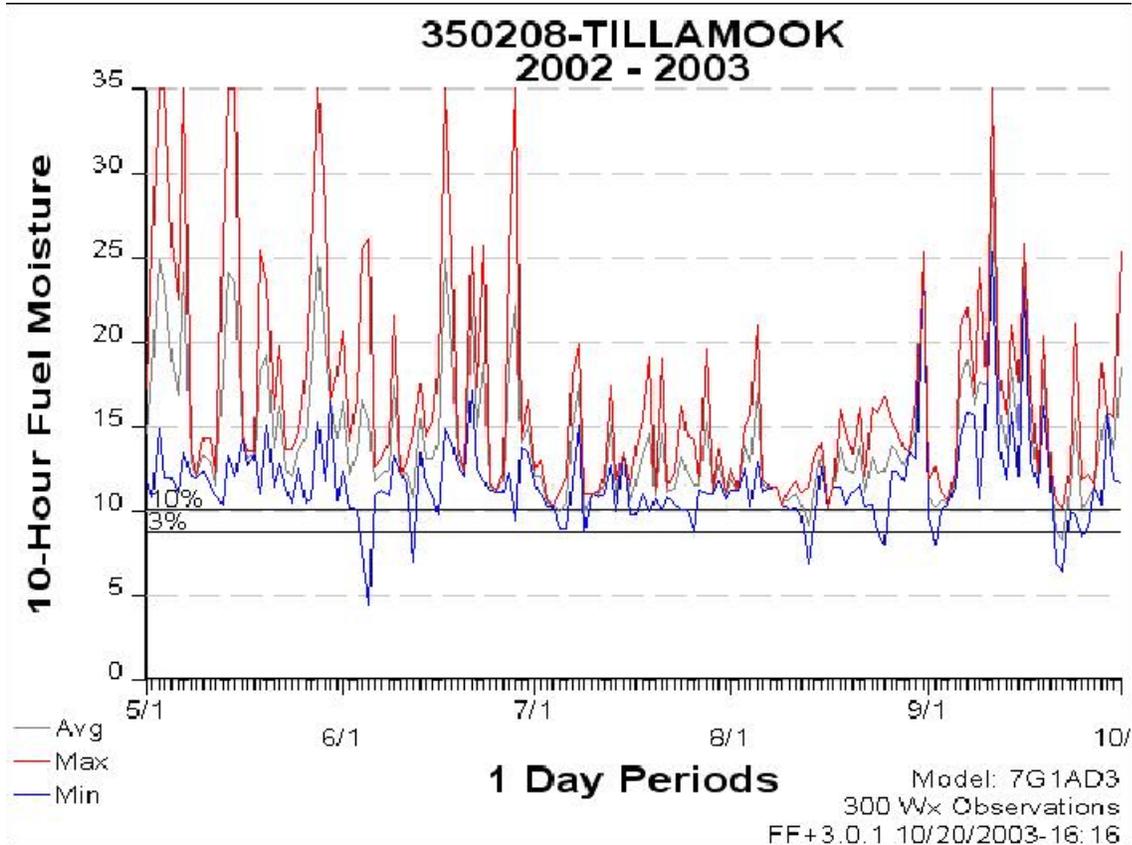
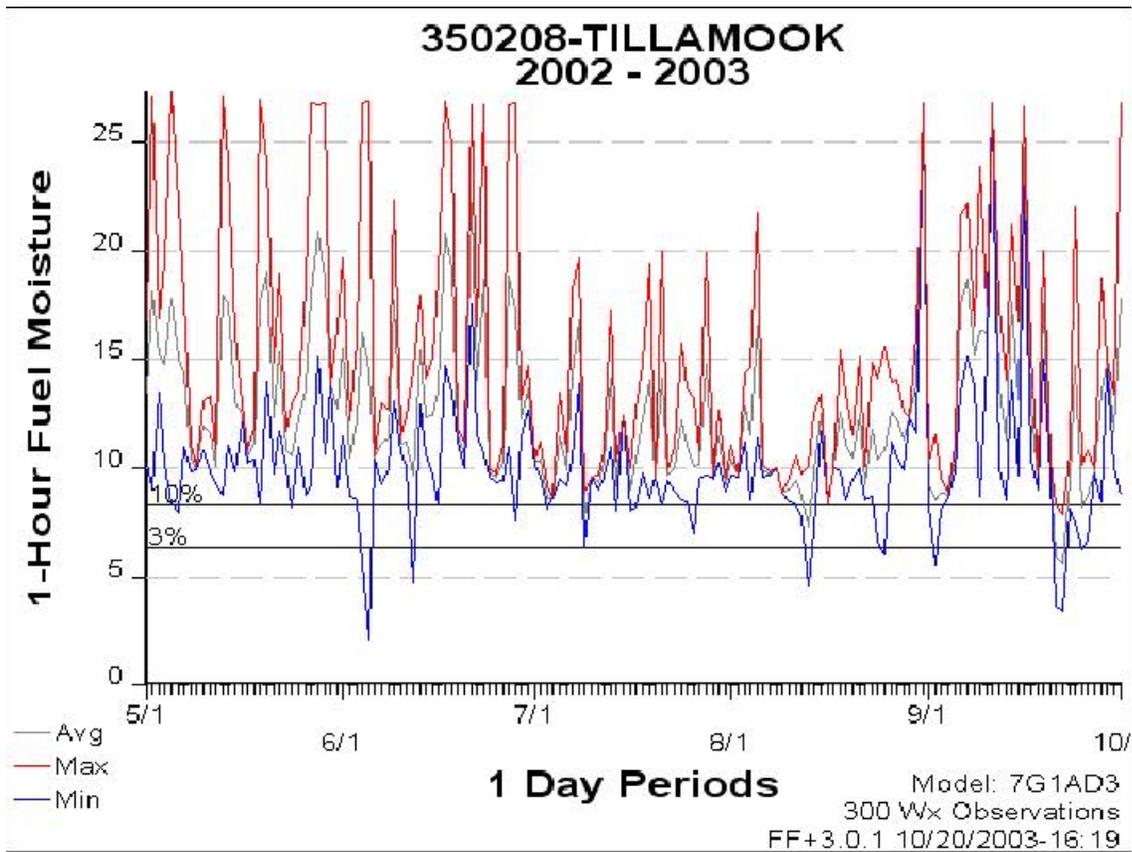


Figure 3. 1- and 10-Hour Fuel Moisture, 2002-2003 .



APPENDIX I: DELEGATION OF AUTHORITY

There are no employees identified for wildland firefighting training and/or duty. Due to the lack of experienced fire management officials at Oregon Coast National Wildlife Refuge Complex, the Refuge Manager delegates all Incident Commander authority to trained fire officials from other Fish and Wildlife Service Units (i.e., Willamette Valley NWRC) or neighboring agencies. The first qualified fire professional on the scene of the incident would assume the responsibility of Incident Commander until relieved by a more experienced fire official.

DELEGATION OF AUTHORITY
Cape Meares National Wildlife Refuge
Oceanside, OR

for

_____ Incident

As of (month) (day) , 2003, I have delegated authority to manage the _____ Incident on the Cape Meares National Wildlife Refuge of Oregon Coast National Wildlife Refuge Complex to Incident Commander _____ and his/her Management Team. You have full authority and responsibility for managing the fire suppression activities within the framework of laws, Agency policy, and direction provided in the Escaped Fire Situation Analysis and the Agency Administrator Briefing.

Your primary responsibility is to organize and direct your assigned resources for efficient and effective suppression of the fire. You are accountable to the Agency Administrator or the representatives designated below.

Specific direction for this incident covering management and environmental concerns are:

- Protection of life and private property is your highest priority task.
- Give special consideration to firefighter safety, especially with respect to aviation operations, working around dozers, snags, and entrapments. Avoid sensitive environmental areas such as Oregon State Parks historical structures and the interior of the refuge. When in doubt, sacrifice acres not people in your strategic and tactical decisions.
- You are authorized to utilize helicopters, chainsaws, hoselays and portable pumps at Cape Meares NWR. Foam and retardant may be used only if life or property is at risk or after consultation with my representative or myself. Utilize wetline before chainsaw. Off road travel and dozer line construction in the interior of the refuge is prohibited.
- Manage human resources assigned to the fire in a manner that promotes mutual respect and is consistent with the enclosed U.S. Fish & Wildlife Service "Harassment-Free Workplace" policy.
- Be cost effective; Final costs should be no more than 120% of the preferred WFSA alternative.
- Manage equipment and supplies to ensure losses are within Acceptable Fire Loss/Use Rates.

You should take over management of the incident on or before _____.

As Incident Commander, you are accountable to me for the overall management of this incident including its control and return to local forces. I expect you to adhere to relevant and applicable laws, policies and professional standards. While suppression of the fire is your primary task, you are expected to do so in a manner that provides for the safety and well being of personnel involved. Consideration for the needs of local residents and communities is essential for successful management of the incident. I expect daily briefings as shift plans are developed.

I am assigning ____ (Name) ____, ____ (Position) ____ as the line officer representative to act as liaison and provide any help you need. He/She is authorized to speak for me in the event a decision is needed.

Request Federal forces as soon as possible to reduce cost to the USFWS as well as to release resources to local fire protection district duties.

The fire, which ignited on _____, 200__ is burning in the _____ area of Cape Meares National Wildlife Refuge. My concerns for managing this fire are:

1. Provide for firefighter safety.
2. Use existing roadways, previous fire breaks, and natural barriers to contain the fire.
3. Minimize burned acreage.
4. Minimize use of ground disturbing equipment using minimum impact suppression tactics and avoiding its use in the refuge interior beyond a 20 foot barrier from road edges.
5. Do not disturb sensitive plant populations.
6. Do not disturb known archeological sites.
7. Prevent the spread of fire onto adjacent landowners' property.
8. Protect private, State, and Complex property to the extent possible.
9. Manage the fire cost commensurate with the values at risk.

Additional Concerns:

Deputy Refuge Manager Rebecca Chuck will represent me if I am not immediately available.

Roy W. Lowe, Refuge Manager _____ Date _____
Oregon Coast National Wildlife Refuge Complex

WILDLAND FIRE SITUATION ANALYSIS

Incident Name: _____

Jurisdiction: _____

Date and Time Completed: _____

I. Wildland Fire Situation Analysis

To be completed by the Agency Administrator(s)

A. Jurisdiction(s):

B. Geographic Area:

C. Units:	D. WFSA#:
E. Fire Name:	F. Incident #:
G. Accounting Code:	
H. Date and Time Prepared:	
I. Attachments:	
<ul style="list-style-type: none"> – Complexity Matrix/Analysis * _____ – Risk Assessment/Analysis * _____ <ul style="list-style-type: none"> Probability of Success * _____ Consequences of Failure * _____ – Maps * _____ – Decision Tree ** _____ – Fire Behavior Projections * _____ – Calculations of Resource Requirements * _____ – Other (specify) _____ 	
* Required	
** Required by FWS	

II. Objectives

To be completed by the Fire Manager and/or Incident Commander

A. Objectives (must be specific and measurable):

1. Safety

– Public:

– Firefighter:

2. Economic

3. Environmental

4. Social

5. Other

B. Constraints

III. Alternatives

To be completed by Agency Administrator(s) and Fire Manager and/or Incident Commander

Alternatives	A	B	C
A. Wildland Fire Strategy			

B. Narrative			
C. Resources Needed <ul style="list-style-type: none"> – Handcrews – Engines – Dozers – Air Tankers – Helicopters 			
D. Final Size			
E. Est. Control/ Contain Date			
F. Costs			
G. Risk Assessment <ul style="list-style-type: none"> – Probability of Success – Consequence of Failure 			
H. Complexity			
I. Attach maps for each alternative			

IV. Evaluation of Alternatives

To be completed by Agency Administrator(s) and Fire Manager and/or Incident Commander

A. Evaluation Process	A	B	C
------------------------------	----------	----------	----------

- Safety Firefighter Aviation Public			
<i>Sum of Safety Values</i>			
- Economic Forage Improvements Recreation Forest Water Wilderness Wildlife Other (specify)			
<i>Sum of Economic Values</i>			
- Environmental Air Visual Fuels T & E Species Other (specify)			
<i>Sum of Environmental Values</i>			
- Social Employment Public Concern Cultural Other (specify)			
<i>Sum of Social Values</i>			
- Other			

V. Analysis Summary

To be completed by the Agency Administrator(s) and Fire Manager and/or Incident Commander

Alternatives	A	B	C
--------------	---	---	---

A. Compliance with Objectives – Safety – Economic – Environmental – Social – Other			
B. Pertinent Data – Final Fire Size – Complexity – Suppression Cost – Resource Values – Probability of Success – Consequences of Failure			
C. External/Internal Influences – National and Geographic Preparedness Level – Incident Priority – Resource Availability – Weather Forecast (long range) – Fire Behavior Projections	<hr/> <hr/> <hr/> <hr/> <hr/>		

VI. Decision

To be completed by Agency Administrator(s) or Designate

The Selected Alternative Is: _____

Rationale:

Agency Administrator's Signature

Date/Time

VII. Daily Review

To be completed by the Agency Administrator(s) or Designate
 Selected to be reviewed daily until containment or control to determine if still valid

- A. Jurisdiction(s): Assign the agency or agencies that have or could have fire protection responsibility, e.g., USFWS, BLM, etc.
- B. Geographic Area: Assign the recognized "Geographic Coordination Area" the fire is located in, e.g., Northwest, Northern Rockies, etc.
- C. Unit(s): Designate the local administrative unit(s), e.g., Hart Mountain Refuge Area, Flathead Indian Reservation, etc.
- D. WFSA #: Identify the number assigned to the most recent WFSA for this fire.
- E. Fire Name: Self-explanatory.
- F. Incident #: Identify the incident number assigned to the fire.
- G. Accounting Code: Insert the local unit's accounting code.
- H. Date/Time Prepared: Self-explanatory.
- I. Attachments: Check here to designate items used to complete the WFSA. "Other" could include data or models used in the development of the WFSA. Briefly describe the "other" items used.

Section II. Objectives and Constraints

- A. Objectives: Specify objectives that must be considered in the development of alternatives. Safety objectives for firefighter, aviation, and public must receive the highest priority. Suppression objectives must relate to resource management objectives in the unit resource management plan.

Economic objectives could include closure of all or portions of an area, thus impacting the public, or impacts to transportation, communication, and resource values.

Environmental objectives could include management objectives for airshed, water quality, wildlife, etc.

Social objectives could include any local attitudes toward fire or smoke that might affect decisions on the fire.

Other objectives might include legal or administrative constraints which would have to be considered in the analysis of the fire situation, such as the need to keep the fire off other agency lands, etc.
- B. Constraints: List constraints on wildland fire action. These could include constraints to designated wilderness, wilderness study areas, environmentally or culturally sensitive areas, irreparable damage to resources or smoke management/air quality concerns. Economic constraints, such as public and agency cost, could be considered here.

Section III. Alternatives

- A. Wildland Fire Management Strategy: Briefly describe the general wildland fire strategies for each alternative. Alternatives must meet resource management plan objectives.
- B. Narrative: Briefly describe each alternative with geographic names, locations, etc., that would be used when implementing a wildland fire strategy. For example: "Contain within the Starvation Meadows' watershed by the first burning period."
- C. Resources Needed: Resources described must be reasonable to accomplish the tasks described in Section III.B. It is critical to also look at the reality of the availability of these needed resources.
- D. Final Fire Size: Estimated final fire size for each alternative at time of containment.
- E. Estimated Contain/Control Date: Estimates of each alternative shall be made based on predicted weather, fire behavior, resource availability, and the effects of suppression efforts.
- F. Cost: Estimate all incident costs for each alternative. Consider mop-up, rehabilitation, and other costs as necessary.
- G. Risk Assessment - Probability of Success/Consequences of Failure: Describe probability as a percentage and list associated consequences for success and failure. Develop this information from models, practical experience, or other acceptable means. Consequences described will include fire size, days to contain, days to control, costs, and other information such as Scenic Viewpoint closures and effect on critical habitat. Include fire behavior and long-term fire weather forecasts to derive this information.
- H. Complexity: Assign the complexity rating calculated in "Fire Complexity Analysis" for each alternative, e.g., Type II, Type I.
- I. A map for each alternative should be prepared. The map will be based on the "Probability of Success/Consequences of Failure" and include other relative information.

Section IV. Evaluation of Alternatives

- A. Evaluation Process: Conduct an analysis for each element of each objective and each alternative. Objectives shall match those identified in Section II.A. Use the best estimates available and quantify whenever possible. Provide ratings for each alternative and corresponding objective element. Fire effects may be negative, cause no change, or may be positive. Examples are: 1) a system which employs a "-" for negative effect, a "0" for no change, and a "+" for positive effect; 2) a system which uses a numeric factor for importance of the consideration (soils, watershed, political, etc.) and assigns values (such as -1 to +1, - 100 to +100, etc.) to each consideration, then arrives at a weighted average. If you have the ability to estimate dollar amounts for natural resource and cultural values, this data is preferred. Use those methods which are most useful to managers and most appropriate for the situation and agency. To be able to evaluate positive fire effects, the area must be included in the resource management plan and consistent with prescriptions and objectives of the Fire Management Plan.

Sum of Economic Values: Calculate for each element the net effect of the rating system used for each alternative. This could include the balance of: pluses (+) and minuses (-), numerical rating (-3 and +3), or natural and cultural resource values in dollar amounts. (Again, resource benefits may be used as part of the analysis process when the wildland fire is within a prescription consistent with approved Fire Management Plans and in support of the unit's Resource Management Plan.)

Section V. Analysis Summary

- A. Compliance with Objectives: Prepare narratives that summarize each alternative's effectiveness in meeting each objective. Alternatives that do not comply with objectives are not acceptable. Narrative could be based on effectiveness and efficiency. For example: "most effective and least efficient," "least effective and most efficient," or "effective and efficient." Or answers could be based on a two-tiered rating system such as "complies with objective" and "fully complies with or exceeds objective." Use a system that best fits the manager's needs.
- B. Pertinent Data: Data for this Section has already been presented, and is duplicated here to help the Agency Administrator(s) confirm their selection of an alternative. Final Fire Size is displayed in Section III.D. Complexity is calculated in the attachments and displayed in Section III.H. Costs are displayed on page 4. Probability of Success/Consequences of Failure is calculated in the attachments and displayed in Section III.G.
- C. External and Internal Influences: Assign information and data occurring at the time the WFSAs are signed. Identify the Preparedness Index (1 through 5) for the National and Geographic levels. If available, indicate the Incident Priority assigned by the MAC Group. Designate the Resource Availability status. This information is available at the Geographic Coordination Center, and is needed to select a viable alternative. Designate "yes," indicating an up-to-date weather forecast has been provided to, and used by, the Agency Administrator(s) to evaluate each alternative. Assign information to the "Other" category as needed by the Agency Administrator(s).

Section IV. Decision

Identify the alternative selected. Must have clear and concise rationale for the decision, and a signature with date and time. Agency Administrator(s) is mandatory.

Section VII. Daily Review

The date, time, and signature of reviewing officials are reported in each column for each day of the incident. The status of Preparedness Level, Incident Priority, Resource Availability, Weather Forecast, and WFSAs validity is completed for each day reviewed. Ratings for the Preparedness Level, Incident Priority, Resource Availability, Fire Behavior, and Weather Forecast are addressed in Section V.C. Assign a "yes" under "WFSAs Valid" to continue use of this WFSAs. A "no" indicates this WFSAs is no longer valid and another WFSAs must be prepared or the original revised.

Section VIII. Final Review

This Section is completed by the Agency Administrator(s). A signature, date, and time are provided once all conditions of the WFSAs are met.

A GUIDE FOR ASSESSING FIRE COMPLEXITY

The following questions are presented as a guide to assist the Agency Administrator(s) and staff in analyzing the complexity or predicted complexity of a wildland fire situation. Because of the time required to assemble or move an Incident Management Team to wildland fire, this checklist should be completed when a wildland fire escapes initial attack and be kept as a part of the fire records. This document is prepared concurrently with the preparation of (and attached to) a new or revised Wildland Fire Situation Analysis. It must be emphasized this analysis should, where possible, be based on predictions to allow adequate time for assembling and transporting the ordered resources.

Use of the Guide:

1. Analyze each element and check the response "yes" or "no."
2. If positive responses exceed, or are equal to, negative responses within any primary factor (A through G), the primary factor should be considered as a positive response.
3. If any three of the primary factors (A through G) are positive responses, this indicates the fire situation is, or is predicted to be, Type I.
4. Factor H should be considered after all the above steps. If more than two of these items are answered "yes," and three or more of the other primary factors are positive responses, a Type I team should be considered. If the composites of H are negative, and there are fewer than three positive responses in the primary factors (A-G), a Type II team should be considered. If the answers to all questions in H are negative, it may be advisable to allow the existing overhead to continue action on the fire.

GLOSSARY OF TERMS

Potential for blow-up conditions - Any combination of fuels, weather, and topography excessively endangering personnel.

Rate or endangered species - Threat to habitat of such species or, in the case of flora, threat to the species itself.

Smoke management - Any situation which creates a significant public response, such as smoke in a metropolitan area or visual pollution in high-use scenic areas.

Extended exposure to unusually hazardous line conditions - Extended burnout or backfire situations, rock slide, cliffs, extremely steep terrain, abnormal fuel situation such as frost killed foliage, etc.

Disputed fire management responsibility - Any wildland fire where responsibility for management is not agreed upon due to lack of agreements or different interpretations, etc.

Disputed fire policy - Differing fire policies between suppression agencies when the fire involves multiple ownership is an example.

Pre-existing controversies - These may or may not be fire management related. Any controversy drawing public attention to an area may present unusual problems to the fire overhead and local management.

Have overhead overextended themselves mentally or physically - This is a critical item that requires judgment by the responsible agency. It is difficult to write guidelines for this judgment because of the wide differences between individuals. If, however, the Agency Administrator feels the existing overhead

cannot continue to function efficiently and take safe and aggressive action due to mental or physical reasons, assistance is mandatory.

FIRE COMPLEXITY ANALYSIS

A. FIRE BEHAVIOR: Observed or Predicted	YES/NO
1. Burning Index (from on-site measurement of weather conditions) predicted to be above the 90% level using the major fuel model in which the fire is burning.	_____
2. Potential exists for "blowup" conditions (fuel moisture, winds, etc.)	_____
3. Crowning, profuse or long-range spotting.	_____
4. Weather forecast indicating no significant relief or worsening conditions.	_____
Total	_____

B. RESOURCES COMMITTED	
1. 200 or more personnel assigned.	_____
2. Three or more divisions.	_____
3. Wide variety of special support personnel.	_____
4. Substantial air operation which is not properly staffed.	_____
5. Majority of initial attack resources committed.	_____
Total	_____

C. RESOURCES THREATENED	
1. Urban interface.	_____
2. Developments and facilities.	_____
3. Restricted, threatened, or endangered species habitat.	_____
4. Cultural Sites.	_____
5. Unique natural resources, special designation zones, or wilderness.	_____
6. Other special resources.	_____
Total	_____

D. SAFETY

YES/NO

- 1. Unusually hazardous fire line conditions. _____
- 2. Serious accidents or fatalities. _____
- 3. Threat to safety of visitors from fire and related operations _____
- 4. Restricted and/or closures in effect or being considered. _____
- 5. No night operations in place for safety reasons. _____

Total _____

E. OWNERSHIP

- 1. Fire burning or threatening more than one jurisdiction. _____
- 2. Potential for claims (damages). _____
- 3. Conflicting management objectives. _____
- 4. Disputes over fire management responsibility. _____
- 5. Potential for unified command. _____

Total

F. EXTERNAL INFLUENCES

- 1. Controversial wildland fire management policy. _____
- 2. Pre-existing controversies/relationships. _____
- 3. Sensitive media relationships. _____
- 4. Smoke management problems. _____
- 5. Sensitive political interests. _____
- 6. Other external influences. _____

Total

G. CHANGE

YES/NO

1. Change in strategy to confine/contain to control.

2. Large amount of unburned fuel within planned perimeter.

3. WFSA invalid or requires updating.

Total _____

H. EXISTING OVERHEAD

1. Worked two operational periods without achieving initial objectives.

2. Existing management organization ineffective.

3. IMT overextended themselves mentally and/or physically.

4. Incident action plans, briefings, etc. missing or poorly prepared.

Total

Name and Title

Signature: _____

and Time

Date