WILDLAND FIRE MANAGEMENT PLAN

CONBOY LAKE NATIONAL WILDLIFE REFUGE

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EXECUTIVE SUMMARY

When approved, this document will become Conboy Lake National Wildlife Refuge's (NWR) Fire Management Plan. Major components include:

- updated policy for prescribed fires at Conboy Lake NWR.
- rewrites the 1982 Fire Management Plan
- will be tied to applicable National Environmental Policy Act (NEPA) documents an well as the future Comprehensive Conservation Plan (CCP).
- format changes under the direction of Fire Management Handbook.
- re-establishment of a Prescribed Fire Program to manage critical habitat, reduce the risk of unhealthy fuels buildup, and manage for specific silvicultural systems such as mature pine forest, aspen stands, oak savannahs, and mixed coniferous forest.

This plan is written to provide guidelines for appropriate suppression and prescribed fire programs at Conboy Lake NWR. Prescribed fires may be used to reduce hazard fuels, restore the natural processes and vitality of ecosystems, improve wildlife habitat, remove or reduce non-native species, and/or conduct fire management research.

INTRODUCTION

This document will establish a Fire Management Plan for Conboy Lake National Wildlife Refuge (NWR). Conboy Lake NWR was established in 1964 by the Migratory Bird Conservation Commission "as a Refuge and breeding ground for migratory birds and other wildlife" and "for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 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).

The development of this Fire Management Plan (FMP) was undertaken to (1) manage fire in a manner compatible with the purpose of the Refuge, (2) incorporate the latest fire management policy directives (DOI 1995), as delineated in the Federal Wildland Fire Management Policy and Program Review, Final Report - 12/18/95, and (3) satisfy the requirements of 910 DM 1-3 and 621 FW 1.1. It will also serve to update the FMP to meet present U. S. Fish and Wildlife Service policy requirements and Refuge management objectives. Service policy requires that Refuges with vegetation capable of sustaining a fire develop an FMP. In addition, all Service lands using prescribed fire must have an FMP in place (620 DM 1).

This plan is written as an operational guide for managing the Refuge's wildland fire and prescribed fire programs. It defines levels of protection needed to provide for 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 plan outlines both wildland fire suppression and prescribed fire activities for Conboy Lake NWR. Full suppression is the norm for all wildland fires to protect property, structures and resource values. Prescribed fire will be used to enhance native plant communities, improve wildlife habitat, reduce fuel loadings or unwanted vegetation, and provide research opportunities. A fire plan with components of both wildland suppression and prescribed fire helps to address the original mission of the Refuge – to provide an inviolate sanctuary for waterfowl. The more recent emphasis on nesting sandhill cranes (*Grus canadensis tabida*) and Oregon spotted frogs (*Rana pretiosa*) is also compatible with the development of a Fire Management Plan, especially one that includes a prescribed fire component relating directly to the local species and habitat.

There is no established on-site fire management organization at Conboy Lake NWR. A lead fire contact for the Refuge has been proposed, which would be a co-lateral position assigned from the Wildland-Urban Interface group of the Regional fire organization in Portland. The position would be field-based in close proximity to the Columbia River Gorge. The Prescribed Fire Specialist position will be shared with one at Willamette Valley National Wildlife Refuge Complex.

COMPLIANCE WITH USFWS POLICY

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 timber.
- < 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 (USO) 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.

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. NEPA compliance was met through a Categorical Exclusion and Environmental Action Statement (Appendix C). Section 7 compliance was met through a verbal “no effect” determination by the Refuge Biologist. 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.

The Department Manual, DM 910 (USDI 1997) states the in regards to wildland fires:

"Wildland fires may result in loss of life, have detrimental impacts upon natural resources, and damage to or destruction of man-made developments. However, the use of fire under carefully defined conditions is to be a valuable tool in wildland management. Therefore, all wildland fires within the Department will be classified either as wildland or as prescribed fires."

"Wildland fires, whether on lands administered by the department or adjacent thereto, which threaten life, man-made structures, or are determined to be a threat to the natural resources or the facilities under the Department's jurisdiction, will be considered emergencies and their suppression given priority over normal Departmental programs."

"Bureaus will give the highest priority to preventing the disaster fire - the situation in which a wildland fire causes damage of such magnitude as to impact management objectives and/or socio-economic conditions of an area. However, no wildland fire situation, with the possible exception of threat to human survival, requires the exposure of firefighters to life threatening situations. Within the framework of management objective and plans, overall wildland fire damage will be held to the minimum possible giving full consideration to (1) an aggressive fire prevention program; (2) the least expenditure of public funds for effective suppression; (3) the methods of suppression least damaging to resources and the environment; and (4) the integration of cooperative suppression actions by agencies of the Department among themselves or with other qualified suppression organizations."

"Prescribed fires may be used to achieve agency land or resource management objectives as defined in the Fire Management Plans. Prescribed fires will be conducted only when the following conditions are met:

A. Conducted by qualified personnel under written prescriptions.
B. Monitored to assure they remain within prescription.

Prescribed fires that exceed the limits of an approved prescribed fire plan and the assigned resources as well as the abilities of the contingency resources will be reclassified as a wildland fire. Once classified a wildland fire, the fire will be suppressed and will not be returned to prescribed fire status."

FIRE MANAGEMENT OBJECTIVES

The overall objectives for fire management at Conboy National Wildlife Refuge are (1) to promote a program to provide for firefighter and public safety, (2) to reduce human-caused fires, (3) to ensure appropriate suppression response, and (4) to increase the use of prescribed fire. Specific fire management objectives are:

- $ Promote a fire management program that includes both a prescribed fire program while suppressing all wildland fires.
- $ Protect life, property, and resources from wildland fires considering resource values at risk.
- $ Utilize prescribed fire to restore fire to fire-dependent ecological communities, enhance habitat and maintain cultural/historic landscapes where appropriate.
- $ Use appropriate suppression tactics and strategies that minimize long-term impacts of suppression actions.

DESCRIPTION OF REFUGE

PHYSICAL DESCRIPTION

Conboy Lake NWR is a member of the Ridgefield National Wildlife Refuge Complex (NWRC) in the Pacific Region (R1), and lies in the southern portion of Glenwood Valley in western Klickitat County, south-central Washington State. The approved future Refuge boundary covers approximately 10,000 acres; to date, only 5,812 has been acquired in fee title. The Refuge occupies the old Conboy and Camas lake beds and surrounding upland grass and forested areas. The valley in which the Refuge lies is approximately nine miles long.

CULTURAL RESOURCES

The Refuge and adjacent private lands were used extensively by local Native American tribes prior to Euro-American settlement, primarily by the Klickitat but also including the Yakama, Cannikins, and Interior Salish. There was at least one major encampment within the Refuge. This site was well known as a horse race track area, as a travel corridor to huckleberry fields and other hunting and gathering grounds, and as a place where tribal members gathered camas and other native plants and harvested large and small game. A basic cultural resource survey conducted in the 1980's found both prehistoric as well as historic sites scattered over most of the upland sites around the old lake bottom. Lithic scatters are present in those areas. The historic sites of Euro-American settlement were mostly old homestead, farm and ranch sites, and may contain can dumps, glass fragments and other articles relating to settlement period. Most of the cultural resources have been subjected to periodic fire over the years and there is little threat from future fires burning over the lithic scatters. There is however, considerable potential for damage to the sites due to suppression activities such as hand lines or dozer lines, heavy equipment traffic over the sites or mop-up with high-pressure techniques. Prescribed fire activities would need to address the same issues and concerns.

FISH AND WILDLIFE

The Refuge supports approximately 200 species of birds, many of which are dependent on the wet meadow-marsh-stream complex. Over 200,000 waterfowl utilize the Refuge during the spring and fall migrations. Bald eagles (*Haliaeetus leucocephalus*) and peregrine falcons (*Falco peregrinus*) can be found year-round on the Refuge. The Refuge supports approximately 80% (20 pairs) of the State's nesting greater sandhill cranes (*Grus canadensis tabida*), a Washington State Endangered Species.

Twelve species of reptiles and amphibians have been identified on the Refuge including the State's largest population of endangered Oregon spotted frogs (*Rana pretiosa*). Although the Refuge has not yet been fully surveyed for its wildlife species, 44 species of mammals and 4 species of fish are believed to utilize the Refuge seasonally. The elk herd exceeds 250 animals and the Refuge supplies critical calving areas for the local population. Appendix E lists the wildlife species known or suspected to occur on the Refuge.

VEGETATION

Approximately 1,500 acres of the refuge are forested, the majority of which is ponderosa pine (*Pinus ponderosa*) with some dense lodgepole pine (*Pinus contorta*) stands in the northwest corner and Douglas-fir (*Pseudotsuga menziesii*) along the southern flank. The forest ground floor has scattered stands of bitter brush (*Parsi*), serviceberry (*Amelanchier*), canthus (*Canthus*), ocean spray (*Holodiscus*), balsamroot (*Balsamorhiza*), sedges (*Carex* spp.) and fescues (*Festuca* spp.) Several stands of aspen (*Populus tremuloides*), cottonwood (*Populus*), and alder (*Alnus*) are found in the lake bottom area. These wet meadow areas also have rushes (*Juncus* sp.), sedges, buttercup (*Ranunculus* sp.), and various wild grasses. Ditches contain pondweeds and grasses. The lake bottom accounts for approximately 2,800 acres with reed canary grass (*Pharis arundinacea*) and native wetland grasses and forbs as the primary plant species. The remaining 1,500 acres reside in upland grass and forbs. With the advent of fire

suppression in the early 1900's, encroachment of conifers on meadow areas has occurred.

PHYSICAL RESOURCES

Elevations in the Refuge range from 1800' at the lake beds to approximately 2000' in the upland timber areas. Mt. Adams, at 12,276', is the most striking feature in the area. The summit lies 17 miles to the northwest of the Refuge. The surrounding hills rise abruptly to an elevation of 3000 feet.

As designated under the Clean Air Act, the Mt. Adams Wilderness is a Class 1 Area. The closest wilderness boundary is approximately 10 miles northwest of the Refuge. Due to the elevation as well as the proximity to Mt. Adams, early frost can set in during September and October with significant drying of fine fuels.

The Refuge averages 35-42 inches of precipitation annually, with much of that falling in the form of snow. The predominant wind is from the southwest, although strong diurnal winds coming off of Mt. Adams from the northwest and feeding into the Klickitat River Canyon occur. Snow usually remains until mid-spring with the remainder of spring being fairly wet followed by warm and dry summers. The Refuge lies within the Outlet Creek watershed. The adjacent areas have been highly manipulated by logging practices and farming.

During the typical summer fire season, July and August will be the most active periods due to, higher temperatures, lowering relative humidity, and curing grasses. Weather data from the manually operated station at Glenwood (#452402) approximately two miles from the Refuge are shown in Table 1. The mean high temperature during July and August is 88EF. The mean minimum relative humidity (RH) occurring during the June through August period is typically in the 25% - 27% range. By September, the mean low RH rises to 39%, indicating a major increase in diurnal recovery at that time. Early frosts can be expected.

The soils in the Conboy Series consist of poorly drained, medium textured soils developed from alluvium and composed primarily of pumice and ash. There is also a dark brown strata extremely high in organic matter, possibly sedge peat. These Conboy Series soils occur on nearly level topography under a vegetative cover of sedges, rushes and perennial grasses. The soils in the old lakebed typically have a high water table all year around. The upland areas have several different soil types, but are largely silt loams impregnated with organic matter. Timber areas surrounding the lake and bordering the upland areas generally have a duff layer of 3-6 inches.

STRUCTURES

There are a number of structures that are potentially threatened during periods of wildland or prescribed fire at Conboy Lake NWR. The full list of contact names and phone numbers of area neighbors can be found in Appendix I. Structure protection and initial attack responsibilities are detailed in “Interagency Operations” on page 14, and “Hazard Fuel Reduction for Structure Protection” on page 20.

The Refuge Headquarters is located on the western flank of the Refuge off of Trout Lake-Glenwood Road. The headquarters complex consists of the headquarters building/residence, two shop buildings, and the Whitcomb/Cole Hewn Log House. The log house is listed on the National Register of Historic Places. The area lacks in burnable vegetation and all structures in the vicinity should be easily protected by fire personnel with no additional maintenance other than seasonal mowing.

Immediately adjacent to the south boundary of the Refuge are several homes on Lakeside Road. There is also an old schoolhouse across Lakeside Road from the Refuge boundary. In the northeast portion of the refuge, there are several homes within a quarter mile of the Refuge along Troh Lane. To the north, there is a complex of shop buildings used for storage of heavy equipment by a small logging company. There

are also a number of homes on Kreps Road about half a mile from the southwest boundary of the Refuge. There is one older farmhouse directly adjacent to Refuge land on Laurel Road.

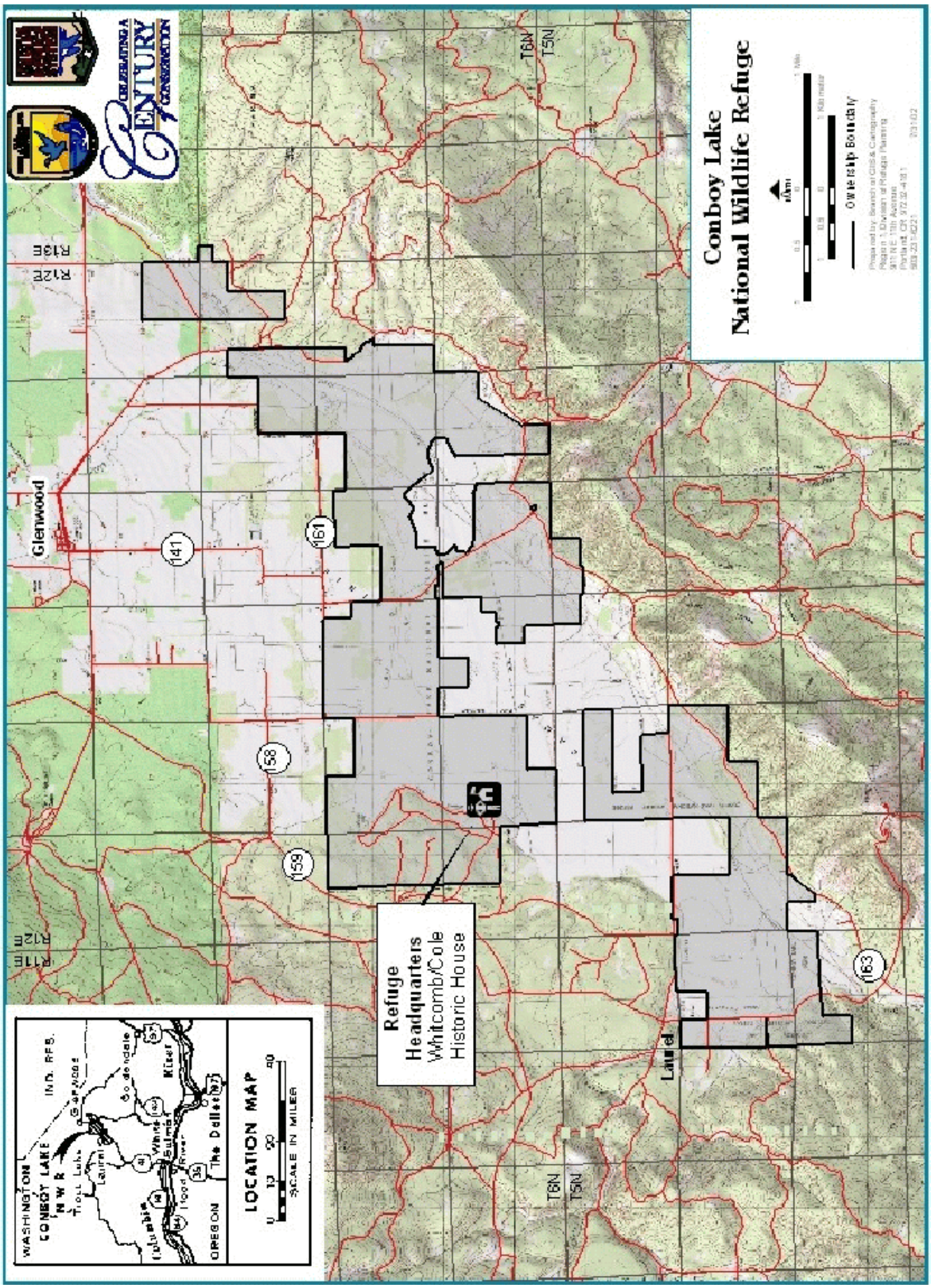


Figure 1. Vicinity Map of Conboy Lake National Wildlife Refuge.

WILDLAND FIRE MANAGEMENT SITUATION

HISTORIC ROLE OF FIRE

Pre-settlement Fires

Fire ecology on the Refuge was intertwined with the seasonal harvesting of roots and berries, ceremonies, horse racing and encampments for trade (Boyd 1999). Through readings of early explorers, it has been surmised that before fire exclusion began around about 1900, low intensity fires likely burned through the Ponderosa pine stands at intervals of eight to 20 years.

It is likely that fire was used in a prairie area of trade and harvest on a regular basis, if not an annual one. It is known that fire was used to dry berries and clear fields for camas harvest on a sustained basis. The elimination of undergrowth to enhance hunting grounds would most likely have been of great incentive to maintain. Boyd (1999) states that "at Tahk (Conboy Lake), Garry oak reappeared and the indigenous roots, wapato and camas, were found in abundance. Camas and wapato, as well as other vegetables and meats, were baked in earth ovens." James K. Agee, in *Fire Ecology of Pacific Northwest Forests* (1993), describes an area of mixed ponderosa pine, lodgepole pine, and other conifers as one with a fire frequency of over 25 years with a light to moderate surface fire and occasional crown fires within the lodgepole and mixed fir components.

Post-settlement Fire History

There is anecdotal evidence of settlers in the area continuing the practice of fire use through much of the past century. Although suppression of wildland fires probably began around 1900, early settlers continued to use fire to clean fields and remove stubble and slash. The valley has had a long history of fuel treatment which continues today in the burning of piles or block burning after logging. The vegetation in the area has been heavily manipulated up to and including the present time.

The natural burning period for this area is late summer and fall, after sufficient drying of the timber areas has taken place, grasses have begun to cure, and days become longer with lower relative humidity and higher temperatures.

Over the past 35 years, there have been three Class A (1/4 acre or less) fires, one Class B (1/4 acre to 10 acres), and one Class C (10 acres to 100 acres) fire on the Refuge. One of the Class A fires was lightning caused, another was started and immediately extinguished by an equipment operator, and one was ignited by vehicle exhaust. The Class B fire was caused by a vehicle fire during a haying operation. The Class C fire occurred in late July during the 2001 fire season. That fire was ignited when a beaver fell an aspen onto a power line near the center of the Refuge. It burned 80 acres of mostly wet meadow with some grass upland on the fringes. Helicopter bucket drops combined with aggressive hose deployments were successful in containing the active movement of the fire to the first burning period. Extensive mop-up was required to extinguish the fire over several days in very deep fuels.

Local fire managers who have been associated with the area for many years describe a localized fire regime that "typically" consists of several class A or B lightning fires within the drainage in a given fire season. Approximately every 10-12 years, the area near Mt. Adams will experience a lightning storm that may generate 50-60 fires within a few days. The last episode of that nature occurred in 1992. Fire managers recalled two class E fires during the 1950's within the drainage.

Records from the Mt. Adams District of the Gifford Pinchot National Forest indicate that approximately 25% of all fires that occur on the Forest are lightning-caused, with the remaining 75% human-caused and occurring mainly along roads and trails during the berry picking season. This is equivalent to approximately one fire per 60,000 acres per year. Conboy Lake NWR is approximately 6,000 acres in

size, and therefore should expect one lightning-caused fire per decade. All human-caused fires on the Refuge have occurred during refuge operations, and have not involved the general public.

Prescribed Fire History

The historical burning period was in late summer and fall to coincide with the drying of roots and berries and to clear fields and timberlands for hunting. The prescribed fire program on the Refuge has consisted of several burns over the past 25 years of small size and short duration. In 1989, a 60 acre understory burn was conducted within the timber area just west of the Refuge Headquarters for pine stand maintenance and to reduce fuels buildup near the entrance to the Refuge. There was another small prescribed understory burn of 30 acres in 1991. These burns were both conducted in the early spring just after winter snows had melted and prior to green-up. There has not been any prescribed fire activity since then.

RESPONSIBILITIES

Conboy Lake NWR does not have a dedicated fire management organization. The Project Leader is responsible for planning and implementing the fire management program on the Refuge. The Zone Fire Specialist is located in the Regional Office and is responsible for fire management program oversight. The Project Leader will assign fire management responsibilities as collateral duties to staff who possess appropriate training, experience, and incident qualifications. Pre-suppression planning and work is accomplished by Refuge staff in accordance with National and Regional fire management direction under guidance from the Zone Fire Specialist. Emergency fire management actions will be handled by Refuge staff according to training and incident qualifications. The Zone Fire Specialist will be immediately notified of all emergency actions. Additional information and direction is included in the Conboy Lake NWR Fire Dispatch Plan (Appendix H).

Project Leader (PL)

- Is responsible for implementation of all fire management activities within the Ridgefield NWRC and will ensure compliance with Department and Service policies.
- Selects the appropriate management responses to wildland fire.
- Approves all Prescribed Burn Plans.

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 Refuge Manager and Complex staff consider the fire management program during Refuge-related planning and project implementation.

Refuge Manager (RM)

- Identifies pre-suppression projects and biological objectives to the Zone Fire Specialist, notifies the Zone Fire Specialist of project constraints, and ensures that Refuge resources are available to accomplish pre-suppression projects.
- Acts as the primary Refuge Resource Management Specialist during Fire Management Planning and operations.
- Ensures fire-effects monitoring is being implemented; drafts wildland fire Burned Area Emergency Stabilization and Rehabilitation Plans for Deputy Project Leader; and is responsible for posting and enforcing fire restriction regulations.

Biologist

< Coordinates through Refuge Managers and Deputy Project Leader to provide biological input for the fire program with the Zone Fire Specialist and Zone Prescribed Fire Specialist.
< Assists in design and implementation of fire-effects monitoring, with the Zone Fire Specialist or Zone Prescribed Fire Specialist.
< Participates, as requested, in pre-suppression projects, fire suppression, and rehabilitation according to level of training.

Zone Fire Specialist

< 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 PL, RM, and Biologist.
< Supervises pre-suppression project planning.
< Coordinates fire related training.
< Coordinates with cooperators to ensure adequate resources are available for fire operation 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 each 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.

Zone Prescribed Fire Specialist

< Integrates Refuge biological objectives into all fire management planning and implementation.
< Solicits program input from the Project Leader.
< Supervises prescribed fire planning.
< Plans, coordinates and directs Refuge prescribed fire operations.

Resource Advisor (RA)

The RA is a technical specialist appointed by the Agency Administrator and reports to the IC or designee and provides guidance for natural and cultural resource protection from suppression operations. The RA provides input to the IC in the development of fire suppression strategies and tactics to minimize or mitigate the expected impacts of fire and fire and fire suppression actions upon natural and cultural resources. The RA also provides input required for the development of rehabilitation plans. Resource Advisor responsibilities include (NWCG 1996):

< Provides analysis, information, and advice to fire managers for areas of concern, including:
$ Critical watersheds, riparian areas, fisheries, and water sources
$ Threatened or Endangered species
$ Prehistoric and historic archaeological sites and cultural landscapes
$ Fuelbreaks – locations and specifications
$ Urban interface impact – structures and improvements
$ Hazardous materials
< Assists the planning function in developing fire maps and identifying areas of concern
< Determines environmental restrictions commensurate with FMP resource protection.
< Provides recommendations to fire management personnel and agency administrators for fire suppression rehabilitation needs
< Documents potential and actual suppression/fire-related resource impacts and the rationale for protection of priority areas.
< Provides resource information to local initial attack ICs, dispatchers, or other fire personnel during pre-season training and planning meetings.

Incident Commander

< Incident Commanders of any level use strategies and tactics as directed by the Project Leader or representative and the WFSA where applicable to implement selected objectives on a particular incident. A specific Limited Delegation of Authority (Appendix P) 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 Zone Fire Specialist.
< 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 MODULES

Initial attack modules will consist of qualified firefighters with appropriately carded supervision. A Type 5 IC (ICT5) or Single Resource Boss is the minimum requirement of leadership when responding to a fire with an organized suppression module, such as an engine. Modules will be prepared and equipped with hand and power tools as customary and will be dispatched with a day's supply of food and water, so they can continue initial attack work until additional resources and supplies arrive.

Employees participating in any wildland fire activities on U. S. Fish and Wildlife Service or cooperators' lands will meet fitness requirements established in PMS 310-1, except where agency 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 detail payment among cooperators, list of response areas, communications frequencies, and have been reviewed by a contract specialist and/or solicitor.

Initial attack responsibilities are covered under the Central Cascades Wildland Fire Operating Plan (Appendix F), an agreement under which the Pacific Region of the U. S. Fish and Wildlife Service is a cooperator. The plan states that "consistent with the National Interagency Agreement and the guiding principals of Closest Forces, Gifford Pinchot National Forest (GPF) will provide initial attack fire suppression services on lands managed by the U.S. Fish and Wildlife Service (FWS) at Conboy Lake National Wildlife Refuge." Under this agreement, the closest Federal fire forces are based at the Mt. Adams Ranger District in Trout Lake, Washington, with a response time of approximately thirty minutes. The Washington State Department of Natural Resources (DNR), is also a cooperator of the Central Cascades Wildland Fire Operating Plan and has protection responsibilities for forested lands immediately outside of the Refuge boundary. Discussions with the local DNR Fire Managers at the time this plan was written indicate that they will consider any fire at Conboy Lake NWR a threat to lands under their respective protection responsibilities. The DNR also had a 20 year history of providing formal initial attack services for the Refuge; this combined with potential threats to their protection areas will likely compel them to respond to any fires at the Refuge. The DNR maintains engine modules assigned to their local Klickitat Unit in Husum, Washington, with the closest assigned engine in Glenwood, two miles from the Refuge. The DNR engines will frequently be the closest initial attack forces for fires on the Refuge, and may be the lead resource under the Closest Forces and "most qualified" components of the Incident Command System. Likewise, overhead resources from the local Bureau of Indian Affairs (BIA) office in Glenwood may also be the first arrivals on an incident and may initiate appropriate suppression responses found in the Conboy Lake NWR Fire Dispatch Plan (Appendix H).

As agreed to by all parties of the Central Cascades Wildland Fire Operating Plan, dispatch services for Conboy Lake NWR will be handled by the Central Washington Interagency Communications Center (CWICC), located in Wenatchee, Washington. CWICC handles interagency dispatching for the areas surrounding the Refuge and will expedite fire reports that come in to the Klickitat County Sheriff's office 911 center. A copy of the Conboy Lake NWR Fire Dispatch Plan will be located at CWICC, the GPF dispatch office, BIA local office, Klickitat Unit DNR, Columbia Gorge National Scenic Area office in Hood River, Oregon and at the Mt. Adams Ranger District office. All of the listed parties will be invited to an annual on-site visit to the Refuge prior to July 1 of each year to discuss any specifics of the Conboy Lake NWR Fire Dispatch Plan.

Klickitat County Rural Fire District #8 , also referred to as the Glenwood Fire Department, will take the lead on structure protection both within and outside of the Refuge as well as protection of the county road right-of-ways within the area. The Fire District will be included in any annual visits and will be provided with a copy of the Dispatch Plan.

Under the Closest Forces concept as practiced within the Central Cascades Wildland Fire Operating Plan, any qualified resource covered under the plan may respond and take appropriate actions commensurate with their respective qualifications and experience level. Conboy Lake NWR will use the Incident Command System (ICS) as a guide for fireline organization. Qualifications for individuals are 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. The Central Cascades Wildland Fire Operating Plan is reviewed by the participating agencies every spring.

PROTECTION OF SENSITIVE RESOURCES

Heavy equipment and retardant are allowed to be utilized within the Forest Fire Management Unit, as detailed in (Appendix H). Dozer lines, retardant and foam should only be used, however, after careful assessment by the IC and after consultation with the Resource Advisor, or if the IC determines that the fire is threatening firefighter and/or public safety. In those instances, no further consultation is required, and the IC will make the determination on suppression tactics to be implemented. In many instances, this will not be an issue due to the general overall wetness of the area, the abundance of water and control lines in the form of ditches and dikes, favorable topographic features and the adjacency of roadways surrounding the Refuge. Overall firefighter safety will generally favor an attack plan that utilizes the dikes, wet ditches and roadways shown on the maps in (Appendix K). During the drier season however, fires will need to be caught with a direct attack tactic using engines to keep the fire from involving blocks of several hundred acres of cured grasses. Off-road engine utilization in the wet meadow areas during the wet season should only be undertaken after careful reconnaissance and coordination with the IC and/or Resource Advisor due to the danger of rollover or becoming stuck in boggy conditions with a fire approaching. Retardant drops should be avoided in areas which contain known cultural resources because the chemicals in the retardant may damage artifacts, and the force of the retardant hitting the ground may expose additional artifacts. All fire management strategies will consider Minimum Impact Suppression Techniques (MIST).

If new cultural resources are found during a wildland or prescribed fire operation, every reasonable attempt will be made to mitigate harmful tactics within the area. Resources on site should communicate immediately with the IC/Burn Boss and determine the appropriate tactics to be utilized within that specific area in light of the new finding.

RESOURCE ADVISOR

A Resource Advisor should be ordered for any fire within the Refuge. This position may be filled by the Refuge Manager, ordered through dispatch to come from one of the neighboring agencies or may be assigned from the Ridgefield NWRC Headquarters. If the Resource Advisor will be coming from the Complex headquarters, it is recommended that the initial attack IC order one from the closest location available to be on site until the Complex Resource Advisor arrives.

The Regional Archaeologist and/or his/her staff will work with fire staff, project leaders, and incident commanders to ensure that cultural resources are protected from fire and fire management activities. The "Request For Cultural Resource Compliance" form (Appendix D), 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 on or eligible to the National Register of Historic Places). 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 prescribed fires or wildland fire holding actions (Anderson 1983).

The following actions will be taken to protect archaeological and cultural resources:

Wildland Fires

< 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 resource impacts and will be submitted to the Regional Archaeologist using the RCRC (Appendix D).

Prescribed Fires

< The Zone Prescribed Fire Specialist will submit a completed RCRC to the Regional Archaeologist and/or his/her staff as soon as the burn area is identified and under reasonable time considerations.

< Upon receipt of the RCRC, the Regional Archaeologist and/or his/her staff will be responsible for consulting with the Zone Prescribed Fire Specialist and evaluating the potential for adverse impacts to cultural resources.

< When necessary, the Regional Archaeologist and/or his/her staff will coordinate with the State Historic Preservation Officer (SHPO). Submit the RCRC at least 30 days prior to the burn whenever possible. The SHPO has 30 days to respond. The Refuge will consider all SHPO recommendations.

< 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.

WILDLAND FIRE ACTIVITIES

Fire program management describes the operational procedures necessary to implement fire management at Conboy Lake NWR. Program management includes pre-planned actions such as fire prevention, preparedness, emergency preparedness, fire behavior predictions, step-up staffing plan, fire detection, fire suppression, rehabilitation, and documentation.

Local wildland firefighters describe the average local fire season as one that runs typically from mid June in forested areas and mid to late July in grasses after curing has taken place, through mid October. Depending on the specific weather of any particular year the seasons may be shorter or longer and, therefore, may start earlier or last longer.

All fires not classified as prescribed fires are wildland fires and will be appropriately suppressed. Normal suppression operations for this Refuge include initial attack resources arriving from the Gifford Pinchot National Forest (GPF) at Trout Lake, DNR resources assigned to the Klickitat Unit headquartered at Husum, BIA resources from Glenwood and local structure protection units responding from the Glenwood Fire Department.

Under most conditions, fires will be able to be effectively suppressed using the abundant water on site in the series of canals and dikes, which create good anchor and control lines. These improvements also serve to block the area off into much smaller and more manageable tracts of land for suppression resources to work with. Helicopter buckets are frequently used by the DNR, BIA and the Forest Service in the vicinity, and would be very effective in both the timber types and grass areas found on the Refuge. Bucket work with water will have no lasting impacts on resources or sensitive sites found within the Refuge. The preferred dip site for the Refuge is the Millpond located less than a mile to the northwest.

FIRE MANAGEMENT STRATEGIES

Although resource impacts of suppression alternatives must always be considered in selecting a fire management strategy, managing fire for resource benefit will not be the primary consideration. Appropriate suppression action will be taken to ensure firefighter safety, public safety, and protection of sensitive resources.

Critical protection areas such as Refuge structures, neighboring properties, wetlands and improvements will receive priority consideration in fire control planning efforts. In all cases, the primary concerns of fire suppression personnel shall be safety. If necessary, 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 the fullest extent possible and where fire and fuels conditions allow its practical usage. 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 the Conboy Lake NWR are:

< All wildland fires will be controlled using the appropriate suppression strategy which considers safety, property, natural resources, and economics.

< Mechanical treatment will be used to reduce hazardous fuels around structures and improvements annually.

< Prescribed fire will be utilized to restore the historic fire regime and meet the ecological

needs of the Refuge.

< Known cultural resource areas will be excluded from all fire management activities including fire line location, retardant drops, and adverse fire effects unless firefighter or public safety is imminently threatened.

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 Refuge. Preparedness efforts are to be accomplished in the time frames outside the normal fire season dates.

Historical Weather Analysis

Weather data extracted from manual station #452402 in Glenwood, Washington from 1991-2001 (Table 1) helps to quantify what a typical fire season at Conboy Lake NWR might be expected to look like.

In the grass component of the open wetland and drier upland grass communities, fire activity typically starts to increase by the beginning of July and drop off by the first of October, as indicated by trends in the Energy Release Component (ERC), Burning Index (BI), and 10-hour fuel moisture levels. In the grass and timber understory dominating the west flank of the Refuge, the seasonal picture is basically the same within the fine fuel moisture components but begins later and lasts longer in the heavier timber fuels.

In the forested areas, early season fires typically occur in the litter understory during June and July. As these areas continue to dry out during the summer, more serious timber fires may occur beginning in August, and may continue into the middle of October or whenever the season-ending weather event were to occur. The pine litter and grasses in the forested areas, as well as the drier upland grass areas without standing water, also show potential for early season flashy fires in the fine fuels prior to green-up conditions. This time period would typically be from late March until mid April. Fires during that season would not pose great risk and could coincide with conditions desired for a prescribed fire program.

The prevailing winds in the area are west/southwest and can be expected to be quite strong under the influence of local ridge winds flowing east down the Klickitat River drainage toward the desert areas to the east (thermal low). With Mt. Adams lying just to the northwest of the Refuge, strong downslope winds should be expected diurnally, including during the burning period. Mt. Adams is also a magnet for summer thunder head buildup. Fire managers and firefighters should be aware that strong downslope and erratic winds can be quite common during a given fire event.

Table 1. Summarized weather data from station #452402 in Glenwood, Washington, 1991-2001.

	April	May	June	July	August	September	October
10-Hour Fuel Moisture (%)							
mean	14	14	12.4	9.5	8.6	11.2	17.3
mean low	9.7	8.3	7.3	6	6.3	6.7	9
100-Hour Fuel Moisture (%)							
mean	19.6	21.5	21	20.1	18.2	17.2	17.6
mean low	16.3	20.1	17.9	19	16.6	14.5	15
1000-Hour Fuel Moisture (%)							
mean	25.8	26.6	24.7	22.2	20	18.9	20
mean low	22.6	26.1	23.1	21.3	19.2	17.2	17.7
Herbaceous Fuel Moisture (%)							
mean low	10.7	189.6	226.9	191.5	149.1	125.9	13.7
Dry Bulb Temperature (EF)							
mean high	69	78	81	87.7	88.3	84.7	70
Relative Humidity (%)							
mean low	35		25	25.5	27.3	39	43
Wind (mph)							
mean high	7.5	6	7	7	6.3	6	5.3
Burning Index							
mean high	147.7	138.7	144.5	165	180.7	164	139.5
Energy Release Component							
mean high	44.5	50.1	53.7	61.8	65.8	64.3	52.6

Fire Prevention
An active fire prevention program will be conducted, as needed, in conjunction with other agencies to protect human life and property, and to prevent damage to cultural and natural 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 regarding Refuge operations, or area closures may become necessary. Such restrictions, when imposed, will usually be consistent with those implemented by cooperators. The FWS through the Regional Office is a participating member of the Mid-Columbia Fire Prevention Council. Through the council, Conboy Lake NWR has the ability to share in school programs and community events, and can gain access to fire prevention materials in an interagency forum.

Hazard Fuel Reduction for Structure Protection
Hazard fuel reduction is conducted to prevent wildland fires from spreading to structures owned by the FWS. Mowing is conducted around Refuge structures on approximately a monthly schedule during the growing season and more frequently if needed during fire season. The fire break consists of an area at least 20 feet wide around the Whitcomb/Cole hewn log home and 50 feet wide around the Refuge Headquarters.

Hazard fuel reduction to protect non-Refuge structures may occur in the form of Wildland-Urban Interface projects where appropriate. No projects had been identified at the time this plan was written, but could be in the future. A buffer zone currently exists between the refuge boundary and structures to the north and northeast. There is a strip of fields between the timber and the houses, which under most circumstances would reduce the intensity of an approaching fire. The farmhouse on Laurel Road is relatively free of burnable material directly adjacent to it, but is located just across the road from a dense stand of timber. A Fire Education program has been proposed to educate landowners on treatments they can take on their lands to minimize threat from wildland fires, and WUI funds may be available in the future to support projects on private lands.

Staffing Priority Levels
The Central Washington Interagency Coordination Center (CWICC) will be the office determining daily fire danger ratings and appropriate staffing levels for the areas immediately adjacent to the Refuge. CWICC uses a number of area weather stations to compile data for the daily fire danger rating and staffing levels.

In conjunction with Local, Regional and National Preparedness Levels, Public and/or Industrial Fire Precautions Levels (IFPL) have been established. These levels are followed by State and Federal agencies and contractors working on agency lands. There are provisions within the IFPL rating system for waivers under certain mitigation measures and to declare areas of such low risk as to not warrant closure or mitigation measures. The Washington State Department of Natural Resources determines the IFPL ratings in coordination with other land management agencies, including the FWS, and CWICC will determine and broadcast the daily IFPL ratings within the fire zone. The daily IFPL is based on the National Fire Danger Rating System (NFDRS) as well as local factors relating to the levels of industrial activities.

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). Conboy Lake NWR will conform strictly to the requirements of the wildland fire management qualification and certification system and USFWS guidelines.

Basic wildland fire training refreshers are offered annually for carded firefighters and records kept in a centralized database. Additional training is available from surrounding agencies in pump and engine operation, power saws, firefighter safety, fire weather and fire behavior, helicopter safety and prescribed fire objectives and activities. 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 Fire Specialist will coordinate fire training needs with those of other nearby Refuges, cooperating agencies, and the RO.

The Refuge 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.

Fire suppression is an arduous duty. On prescribed fires, personnel may be required to shift from implementation/monitoring activities to suppression. Poor physical condition of crew members can endanger safety and lives during critical situations.

Personnel performing fire suppression duties will maintain a high level of physical fitness. This requires successful completion of a fitness pack test at the arduous level. Personnel must complete a three mile hike with a 45 pound pack in less than 45 minutes.

Supplies and Equipment

The GPF, which provides "initial attack suppression services" as found within the Central Cascades Wildland Fire Operating Plan, maintains two fire caches within reasonable proximity to Conboy Lake NWR. The AFMO for the Mt. Adams Ranger District maintains both fire caches for the area. Each cache has equipment available for both initial as well as extended attack needs. This includes mainline and lateral hose, fittings, pumps, hand tools, chainsaws, firing devices, and Personal Protective Equipment (PPE) (Appendix N). The GPF dispatch office would be contacted through CWICC for equipment and for expanding personnel needs. Each Forest Service initial attack engine carries 300 gallons of water with approximately 1000' of mainline, 1000' of lateral hose and enough gated wyes and nozzles to run at least six laterals each. The DNR engines typically carry slightly less equipment. The local BIA engine at Glenwood is not regularly staffed but is fully equipped as a Type 6X engine and has qualified personnel ready to respond as needed.

The local DNR engine assigned to Glenwood carries 500 gallons of water. Additional equipment and supplies are available through cooperators and the interagency cache system. Requests for additional personnel, equipment and spot weather forecasts will be made through CWICC.

DETECTION

Fires are typically reported by the public directly to Klickitat County 911 dispatch, or an attempt is made to contact the Refuge Manager directly. Signs should be posted in appropriate areas that clearly state where calls should be directed to. If calls continue to go to the 911 center first, then that center can in turn contact CWICC at their 24-hour number. CWICC will then be able to mobilize the local DNR forces directly as well as contacting the GPF dispatch office to mobilize initial attack resources from Mt. Adams Ranger District, the DNR which has protection responsibilities for forested lands outside of the Refuge boundaries, the BIA office in Glenwood, the Glenwood Fire Department for structure protection, the Campbell Group which has property directly adjacent to the Refuge, and to the Refuge Manager and Project Leader in Ridgefield.

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 signed Central Cascades Wildland Fire Operating Plan (Appendix F) has a provision within the communications portion relating to the use of radio frequencies. "Written authority for the use of licensed radio frequencies will be provided to one another by all parties to this Operating Plan." The signing agencies include the USDA Forest Service (Columbia River Gorge National Scenic Area, Mt. Hood and Gifford Pinchot National Forests), USDOI Bureau of Land Management (Spokane District), USDOI Bureau Of Indian Affairs (Yakama and Warm Springs Reservations), USDOI National Park Service (Mt. Rainier National Park), Oregon Department of Forestry (The Dalles and Clackamas-Marion Units), and the Washington Department Of Natural Resources (Central, Southwest and Southeast Regions).

PRE-ATTACK PLAN

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

1. The Incident Commander (IC) will locate, size-up, and coordinate suppression actions. The IC will complete the pre-attack planning checklist found in the Fire Dispatch Plan (Appendix H).
2. Provide for public, firefighter and emergency services safety.
3. Considering the current and predicted fire conditions, the Incident Commander 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.
4. The Incident Commander will assess the need for law enforcement personnel for traffic control, investigations, evacuations, etc., and make requests to the Zone Fire Specialist.
5. Document decisions and complete the fire report (DI-1202).
6. Should a wildland fire move into extended attack, a Delegation of Authority will be invoked. Once a Delegation of Authority has been authorized, the Incident Commander will make the final decisions pertaining to the fire. A copy of the Delegation of Authority is in Appendix P.

FIRE MANAGEMENT UNITS

Due to staff limitations, relatively small land management parcels, long response times, valuable resources, and values at risk on neighboring lands, this plan does not recommend wildland fire managed for resource benefit as an option for any of the units. Wildfires will be suppressed using the appropriate suppression response.

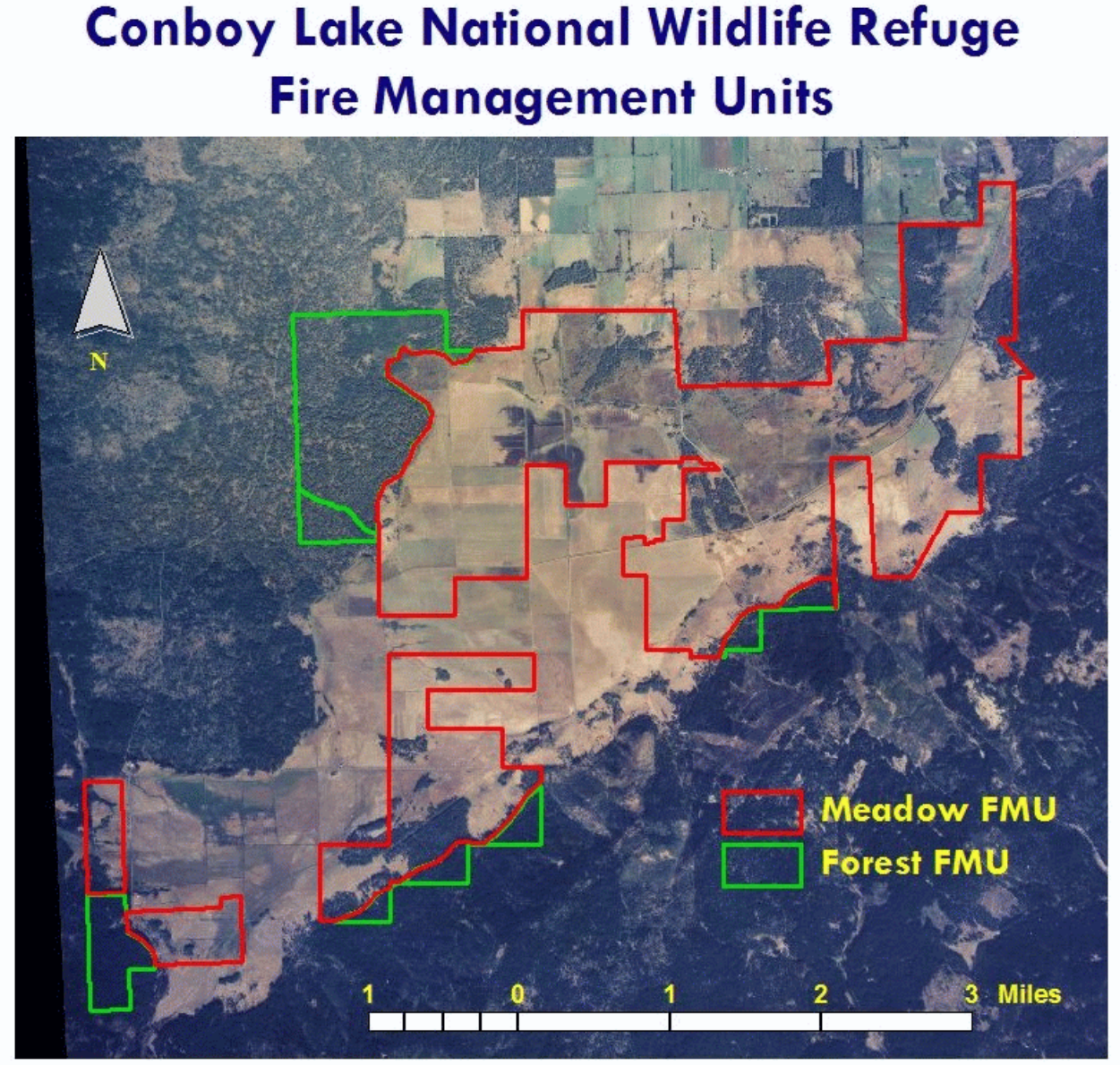
Fire Management Units (FMUs) are areas on a Refuge which have common wildland fire management objectives and strategies, are manageable units from a wildland fire standpoint, and can be based on natural or manmade fuel breaks. FMUs may coincide with a prescribed fire burn block or treatment area or unit, but this is not always the case. Roadways or significant waterways encircle most of the Refuge. Private land in holdings may dictate specific suppression tactics and access within the FMU's.

There are two primary FMUs located within the Refuge. The Forest FMU represents all of the forested areas on the Refuge. **The Forest FMU is comprised of extensive large timbered stands, primarily ponderosa pine with smaller stands of lodgepole pine and Douglas-fir also represented. Some dry**

upland meadow communities are interspersed within this FMU. Some areas of the Forest FMU areas are located substantial distances from roadways. Delivering water to some of these areas could be a problem. Overall however, the terrain is quite flat and the use of burnout tactics from roadways, open areas and the edge of the meadows could be very effective. While attention should be paid to the use of minimal impact standards, there are no prevailing restrictions within this FMU regarding overall suppression tactics. However, Minimum Impact Suppression Tactics (MIST) should be used whenever it is safe and practical to do so. For the most part, the Forest FMU lies adjacent to private lands along the outer fringe of the Refuge, and therefore has much closer overall proximity to structures.

The Meadow FMU represents both the wet meadows as well as the drier upland grass communities, which comprise the bulk of the Refuge. It is comprised principally of seasonally wet meadows, and uplands with scattered shrubs and some blocks of forested areas. This FMU consists of numerous subunits that are defensible at interior roadways, dikes and bodies of water. Burning out from these defensible areas with support from portable pumps and hose will usually be the safest, most practical, and cost effective tactic, while minimizing impact on meadow areas. The use of heavy equipment, should be undertaken only after consultation with a resource advisor except in cases where the IC determines that life or property are imminently threatened. Foam agents and retardant may be deemed necessary based on the time of day, time of season, weather parameters, ERC's and local staffing levels. Foams and retardant will have a much lesser impact during the latter season of August through October as the meadow areas dry up and seasonal water levels are either seriously reduced or disappear altogether. The use of those same agents during the nesting season of April through July should be avoided in all Oregon spotted frog and sandhill crane habitat. Every effort should be taken by the IC to consult both with the Refuge Manager and Resource Advisor, as well as with dispatch to convey the rationale for the actions to be taken.

Figure 2. Conboy Lake National Wildlife Refuge Fire Management Units.



Fire Effects
Fires can have a significant positive or negative impact on sensitive plants and wildlife depending on the timing and intensity of the burn. Wildfires during the nesting season (April-July) may reduce recruitment of many species, including the State endangered sandhill crane. During this time, young are unable to fly and are susceptible to wildfires. Fires may also have an indirect impact by eliminating hiding cover, thus exposing young cranes to predators. Fire suppression tactics may also have negative impacts on young cranes, as their instinct is to lay low as danger approaches. This may leave them susceptible to vehicles, trampling by firefighters, or the fire itself, and may cause separation from parents.

Fires can however, have beneficial impacts on crane habitat, particularly in areas where encroaching brush and lodgepole pine are eliminating crane forage and nesting habitat. Fires can also rejuvenate plant growth and invertebrate populations in otherwise decadent uplands and wetlands, although some small food sources may be reduced in the short term.

Oregon spotted frogs are a State listed endangered species. This species spends its entire life cycle in water, so direct impacts from fire tend to be minimal. Suppression tactics, however, such as the use of foam or retardant near waterways or the overuse of canal water, can have an adverse impact on the frog population.

Oregon spotted frogs utilize similar wetlands as sandhill cranes. Fires, either wild or prescribed, can have significant beneficial effects on frog habitat, particularly seasonal wet meadows. Decadent stands of reed canary grass, encroaching brush and trees reduce the amount of useable breeding and active season habitat. Fires would open this habitat, which then provides breeding frogs with a more suitable habitat to deposit egg masses. Fires may also improve the quality of habitat for invertebrates, the main food source of spotted frogs.

In the ponderosa pine areas fire is expected to provide understory openings and reduction of ladder fuels, with some degree of mortality expected in the overstory. Fires within the Douglas-fir community will normally be small, creeping fires which burn into the duff layers and may produce at least some isolated torching. In the lodgepole thickets in the northwest corner, the fire effects will be more stand-replacing in nature, creating gaps or openings in the stand.

In the upland grass communities, fire will likely prune back encroaching Douglas-firs and pines and further open the existing meadow and dry upland areas. Growth of reed canary grass in other areas has been stimulated by fire. It is widely believed that the grass community in the valley was regularly burned by Native Americans to revitalize the native grasses and forbs.

Fuel Types
The vegetation at Conboy Lake NWR can be broadly classified into four categories – agricultural (hayed fields), grassland, wetland, and forest. Fuel models were determined for the Refuge utilizing Hal Anderson's *Aids to Determining Fuel Models For Estimating Fire Behavior* (1982). The cultivated areas and the upland grasslands are best described by Fuel Model 1. The wet prairie and canary grass areas are best described by Fuel Model 3. Fuel Models 1 and 3 account for approximately 60% of the Refuge acreage. The forested areas of the Refuge are best described by Fuel Models 2, 8, 9 and 10 See Table 2 for a breakdown of the Refuge area by fuel model.

Table 2. Fuel models at Conboy Lake NWR, with represented vegetation types and acres.

Fuel Model	Vegetation Types	Acres	Percent
1	Agricultural, Upland Grasslands	1300	22
2	Ponderosa Pine/Grass Understory	1200	21
3	Wet Prairie, Sawgrass	2800	48
8	Douglas-fir/No Understory	300	5
9	Ponderosa Pine/Mixed Conifer/Hardwood with a Brush Understory	200	3
10	Dense Lodgepole Pine	30	.5
–	Administrative Sites, Roads, Water	30	.5

Water, roads and parking lots are the areas on the Refuge which do not contain burnable fuels. Buffer areas around the office, residences, shops and barns are mowed during the summer to reduce fuels and minimize chances that a fire could carry through the outlying fuels to the buildings.

Fire Behavior

Grass Fuels / **Meadow FMU**

Fires in this fuel type are surface fires and move rapidly through the cured grass. Seasonal changes from live to dead (cured) for the perennial and annual species are very important to potential fire behavior. Grass fuel beds transition throughout the growing seasons from green-up in the spring, curing in summer, to a fully cured stage in late-summer or fall, followed by a winter rain and snow compacting stage. These fuels respond rapidly to moisture changes and wind driven events. Although grass fuel models are less complex to suppress, the rates of spread and flame lengths can be deceptive if wind is present, especially when combined with even slight to moderate slopes. Fuel Model 1 best represents the grass areas in the dry upland communities found on the Refuge while Fuel Model 3 best represents a sawgrass type fuel that can carry fire even over standing water. Fuel Model 2 represents areas under mature ponderosa stands where a significant grass component is present and will be the prime carrier of fire.

Timber Fuels / **Forest FMU**

All three of the timber fuel models are found on the Refuge. Fuel Model 8 best represents a classic Douglas-fir short needle forest where there is little understory fuel to be consumed and the prime carrier of the fire is the standing trees. The forest floor layer is composed mainly of duff, fresh needles, and occasional twigs and branches. Little undergrowth is found in the stand. Slow burning ground fires with low flame lengths would be commonly found. Occasional "jackpots" of heavy fuel concentrations occur in this fuel type. During periods of severe fire weather (conditions involving high temperatures, low humidity, and high winds), these fuels can pose a much higher hazard than typically encountered. Fuel loadings average 5-10 tons per acre with duff loadings reaching as high as 12 tons per acre.

Fuel Model 9 is representative of those portions of the ponderosa pine forest where the main understory component is brush and other ladder fuels, rather than grass. This model can be found on the western flank of the Refuge where an understory layer of young trees is providing the ladder fuel component. Fires here burn hotter than in Fuel Model 8 with more torching, spotting and crowning.

Fuel Model 10 is located in a portion of the northwest corner of the Refuge where a stand of lodgepole pine is beginning to become jack strawed and will significantly contribute to both fire intensity and high rates of spread. Fires will burn in the surface and ground fuels with greater fire intensity than the timber litter models. Dead and down fuels in this model include greater quantities of 3 inch or larger limb wood that accumulates as a result from stand maturity or other events such as natural stand thinning, wind throw, or mortality from insects or disease. Small to medium height conifers in the stand understory contribute to a ladder fuel situation. Any forest vegetation type may be considered under this fuel model if heavy down material is present.

Anderson (1982), used a baseline supposition of 8 % dead fuel moisture, flat terrain and a wind of 5 miles per hour for comparisons of fuel models 1, 2, 3, 8, and 9. The following comparisons (Table 3) were made by Anderson to show relative fire behavior changes within the given fuel models. The commonly understood limit for firefighters working directly on the head of a fire is four feet. The generally recognized flame length limit for mechanized equipment working at the head is eight feet. Although Fuel Models 2 & 3 show flame lengths exceeding the four foot limit, engine crews are frequently successful in attacking these fires utilizing an inside/out approach where the attack is done safely from inside the black.

Table 3. Rates of spread and flame lengths that can be expected in the different fuel models at Conboy Lake NWR.

Fuel Model	Rate of Spread (ch/hr)	Flame Length (ft)
1	78	4
2	35	6
3	104	12
8	1.6	1.0
9	7.5	2.6
10	8	5

Records taken from the 1991-2001 time period by weather station #452402 were used to perform BEHAVE runs using variables representing the median, 90th percentile and 97th percentile weather as gathered through Fire family Plus during mid-August at the Refuge. The slope factor used was 5% to allow for terrain variation at the Refuge. Table 4 displays the inputs for the three percentile levels while Table 5 displays the outputs for each fuel model – rate of spread (ch/hr), fireline intensity (BTU/ft/s), and flame length (ft).

Table 4. BEHAVE inputs for the median, 90th, and 97th percentile weather at Conboy Lake NWR.

Percentile	10-hr Fuel Moisture (%)	100-hr Fuel Moisture (%)	Live Herbaceous Fuel Moisture (%)	Live Woody Fuel Moisture (%)	Midflame Windspeed (mph)
Median	12	18	225	200	6
90th %	7	16	200	150	6
97th %	5	14	100	125	6

Table 5. BEHAVE outputs by fuel model and weather percentile for Conboy Lake NWR. using a midflame windspeed of 6 MPH, which is commonly found at the Refuge during the summer months.

Fuel Model	Rate Of Spread (ch/hr)			Fireline Intensity (BTU/ft/s)			Flame Length (ft)		
	Median	*90th %*	*97th %*	*Median*	*90th %*	*97th %*	*Median*	*90th %*	*97th %*
1	65	142	171	70	241	323	3.2	5.6	6.4
2	28	38	59	209	326	594	5.3	6.4	8.5
3	110	162	201	1403	2322	3311	12.6	16	18.7
8	2	3	3	6	10	14	1	1.3	1.5
9	9	13	16	55	91	129	2.8	3.6	4.2
10	6	8	13	117	192	330	4.0	5.1	6.5

The tall grass community is the most flammable of the fuels at Conboy Lake NWR, and is best described by Fuel Model 3. Table 6 gives Fuel Model 3 Energy Release Component (ERC) and Burning Index (BI) values for mid-August from 1991-2001 BEHAVE runs. These comparisons show that although the median ERC and BI at Conboy Lake NWR for the driest part of the fire season fall below the 90th percentile, the interpolations for the median readings do fall at approximately the 80% range and can pose problems for firefighters, especially if a fire is wind driven. As shown on the chart below, reed canary grass which can be 3-5 feet high will react very similarly to sawgrass with very long flame lengths. The duration of the flaming front will be short but the flame lengths would exceed the ability for direct attack at the fire head.

Table 6. Fuel Model 3 Energy Release Component (ERC) and Burning Index (BI) values for mid-August from 1991-2001 BEHAVE runs.

Percentile	Energy Release Component	Burning Index
Median	60	130
90th	67	160
97th	70	190

The outputs from the BEHAVE runs for the Refuge are more severe than in the example Anderson uses (Table 3) in the technical report due to the drier conditions in the 10 hour size class. Firefighters arriving on scene at Conboy Lake NWR should be aware that under moderate winds, fires will have a tendency to "run," especially in the Fuel Model 3 tall canary grass. This model is the most susceptible to winds at the Refuge, and as indicated by the rate of spread and flame length from (Table 5), an indirect attack using burnout tactics along levees, dikes and canals will usually be the safest as well as the most effective method of attack. Direct attack can be effective especially on the flanks in the timber models, with the exception of a severe wind event in the Fuel Model 10 lodgepole areas. During a high wind event, fire activity is anticipated to be much more severe than indicated in (Table 5).

Suppression Tactics

Typical initial attack responses will include a qualified Type 5 or 4 Incident Commander or Engine Boss from the responding agency. The IC in many cases will arrive on the first initial attack engine. The ordering of a Resource Advisor, Fire Investigator and Type 3 Safety Officer is strongly recommended for most situations during primary fire season events. While there is an agreement stating that the GPF will provide "initial attack suppression services," that does not preclude the IC and resources coming from a different neighboring agency. In all cases, the identity of the IC should be made known to dispatch, all fireline personnel on scene and in travel mode, and to the FWS agency representative on scene. Changes in personnel will need to be immediately announced to dispatch, all personnel on the ground, and any incoming resources.

Suppression involves a wide range of possible tactics from 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 actions, which will minimize resource damage and limit smoke impacts to local communities.

Adjustments to resource ordering levels may be made at the discretion of the initial attack dispatcher based on local conditions or initial reports until an IC is on scene. All fires will be assessed by the first on scene IC and attacked utilizing MIST tactics wherever feasible. Roads and natural barriers will be used as much as possible to reduce fireline construction. Fireline and mop-up through riparian areas should consider long-term damage to vegetation. Unnecessary cutting and bucking with chainsaws should be replaced with alternative actions whenever possible. Back-fires and burnout operations should consider head fire intensities and attempt to avoid sterilizing 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 consultation with the Project Leader or their representative, a Resource Advisor should be assigned to the incident from the beginning to document rehabilitation needs and provide input to the IC and/or the incident team on potential effects of suppression strategies and mitigation measures.

There will be only one IC responsible to the Refuge Manager/Project Leader through dispatch and the Zone Fire Specialist. The IC will designate all overhead positions on fires requiring extended attack. Reference should be made to a Delegation of Authority (Appendix P).

Suppression Conditions

While there is not a lengthy recent fire history to build a plan from, there are enough indicators to help in developing an overall strategy. While the GPF has initial attack responsibilities for the Refuge, that agency may not have available resources to send off unit. For most conditions in the Conboy Lake NWR area, that should not be a problem. The Refuge does not have a history of multiple fire starts and the GPF typically does not have a high incidence of multiple starts. The Mt. Adams Ranger District, however, has had in recent years, including 2001, situations with both human and lightning caused fires where all of their engine resources were committed either locally or for large fire support actions elsewhere. Barring that type of episode, the most common response from either the GPF or DNR will be with an engine module with a relatively short estimated time of arrival of 20-40 minutes. Unless multiple fires occur in Klickitat County due to lightning or an unusual human-caused event, the DNR may be on scene sooner than the Forest Service. The DNR has protection for all wildland areas adjacent to the Refuge and will be a key partner in developing strategies and tactics. There will be times when the DNR person-in-charge is the most qualified person on site and would therefore be the logical choice as IC. These details will be addressed annually at the Central Cascades Wildland Fire Operating Plan meeting, which takes place each spring in the Columbia River Gorge.

A full suppression alternative for all wildland fires, which requires aggressive containment and control, was selected for this Refuge. Heavy equipment use will be restricted due to potential impacts to natural resources. Consultation with the Resource Advisor is necessary to insure appropriate suppression responses are utilized. However, as stated in FWS/RF95-00209 dated September 21, 1995 from the Director of the Fish And Wildlife Service to the Regional Directors, on the subject of wildfire suppression and candidate, threatened and/or endangered species, 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.”

When looking at the Refuge from a strategy standpoint, there are two very different sets of situations which may direct decision making. First, the overall setting of the Refuge is very conducive to controlling fires in the initial phase due to flat terrain, abundance of water, location of roads on the periphery, generally light fuels, and the extent to which the fuels on the outside of the Refuge boundaries have been treated. The second set of issues deals with public safety and complicates suppression efforts. These issues include the relatively small size of the Refuge, the terrain of the ground quickly changing outside the Refuge, proximity to developed areas, and the location of a Class 1 Area less than 15 miles away.

When suppressing fires on the Refuge, it will be important for the IC, Resource Advisor or agency representative and the firefighters on the ground to keep in mind the second set of issues at all times. Public safety concerns outside of the Refuge from the fire itself as well as from smoke will typically lead to a quick and aggressive strategy to keep fires from pushing toward the Refuge boundaries. This will need to be balanced with the preference to use MIST tactics whenever practical, with special attention paid to the Meadow FMU.

Standards and guidelines for use of heavy equipment, foam, retardant, and aircraft as described within the FMU’s, were developed using an interdisciplinary process. Guidelines have been developed to assist with the Refuge’s full wildfire suppression strategy and protect the Refuge from unnecessary damage (Appendix H). Heavy equipment and aircraft/retardant use is restricted due to cultural, wildlife, and

safety concerns. Unless life or property is determined to be in imminent danger by the IC, or due to high ERC's, or staffing level concerns, consultation with the Refuge Manager or representative prior to use is necessary. This decision is based on the fact that sandhill cranes and spotted frogs often inhabit the Refuge and may be breeding and/or feeding on the Refuge, on the cultural significance found within the Refuge, and on the likelihood that heavy equipment may get stuck in hidden water areas. At the Annual Operating Plan Review, issues of restrictions should be discussed with cooperators. Changes and areas of concern should be documented.

WILDLAND FIRE SITUATION ANALYSIS

For fires that cannot be contained in one burning period, a Wildland Fire Situation Analysis (WFSA) (Appendix Q), must be prepared by the Project Leader in conjunction with the Zone Fire Specialist. 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 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 models, 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

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. Safety will guide all phases of any aircraft operation. Planning for the unexpected should be a standard practice.

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. Improved helispots will be rehabilitated following a fire. Generally, helicopters within this area will be extremely effective, and relatively close by if available through the DNR or BIA. Bucket use will be less intrusive than other forms of firefighting tactics and the fuels and terrain are very conducive to that type of use. The preferred dip site for fires on the Refuge is the old millpond approximately 1 mile northeast.

As in all fire management activities, safety is the 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, *i.e*. cut fences, dozer lines, and campsites. Burned area rehabilitation and stabilization restores resources and property damaged or otherwise impacted from the fire, *i.e.* burned waterlines, denuded hillsides, etc.

Suppression Rehabilitation

In the event of a wildland fire, rehabilitation of fire suppression damage should be accomplished immediately. An appropriate time is within seven days after the fire is controlled unless the Regional Fire

Coordinator grants an extension. Funding for suppression rehabilitation is from the specific fire cost account as established by the Zone Fire Specialist. The Incident Commander, as agreed to by the Project Leader or Refuge Manager, 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:

1. Backfill control lines, scarify, and seed*.
2. Install water bars and construct drain dips on control lines to prevent erosion.
3. Restore natural ground contours that were altered.
4. Remove all flagging, equipment and litter.
5. Completely restore camping areas and improved helispots.
6. Revegetation to restore sensitive impacted areas due to 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 use 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 an ESR Team. An 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 an 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 an 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 Zone Fire Specialist 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 and all associated forms. The Zone Fire Specialist 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).

PRESCRIBED FIRE ACTIVITIES

PRESCRIBED BURN PROGRAM OBJECTIVES

Prescribed fire can be a useful tool for restoring and maintaining natural conditions and processes at Conboy Lake NWR. Several burns of small size and short duration have occurred at the Refuge over the past 25 years. In 1989, a 60 acre timber understory burn was conducted just west of the Refuge Headquarters in the proposed HQ South Unit. In 1991, a 30 acre understory burn was conducted in the proposed Chapman Creek North Unit. There has not been any prescribed fire activity since then.

The goals of a prescribed fire program are to:

1. Utilize prescribed fire to enhance wetland habitats by reducing encroaching woody species, especially lodgepole pine.
2. Reduce accumulated duff layers and ladder fuels in identified forested areas.
3. Restore fire into fire-dependent ecosystems and promote nutrient recycling to the soil.
4. Control non-native wetland vegetation while thinning and invigorating tall emergent wetlands.
5. Integrate prescribed fire with current management practices such as haying, mowing, thinning and water management.

Specific management needs for the Refuge as a whole and for specific areas will be determined annually. Specific burn objectives, fire frequency rotation, firing methodology, and prescriptions will vary from year to year. Burn plans will be updated to reflect any variations. The Project Leader must approve prescribed fire plans.

Prescribed burns use fire as a tool to achieve management objectives. Research burning may also be conducted when determined to be necessary for accomplishment of research project objectives. Actions included in the prescribed burn program include the selection and prioritization of prescribed burns to be carried out during the year, preparation of prescribed burn plans, development of burn prescriptions, burn operations, documentation and reporting, and burn critiques. The following measures will be taken to ensure the successful implementation of the prescribed fire program:

1. Conduct a safe prescribed fire program with the highest professional and technologic standards.
2. Identify the prescribed burn type most appropriate to specific situations and areas.
3. Efficiently accomplish resource management objectives through the application of prescribed fire.
4. Continually evaluate the prescribed fire program to better meet program goals by refining prescriptions, treatments, and monitoring methods, and by integrating applicable technical and scientific advancements.
5. Prepare prescribed burn plans with review by a qualified Prescribed Fire Manager/Prescribed Burn Boss, and approval by the Project Leader.
6. Conduct prescribed burns with an adequate number of qualified personnel to conduct the burn as well as to mop-up and to ensure the safety of the surrounding community.

The Refuge reserves the option to utilize an interagency team approach for any portion of the prescribed fire program, including data collection and surveys, pre-burn monitoring, preparation, ignition and mop-up phases, and any other post-burn activities. The most highly qualified and experienced personnel in the regional interagency community would be requested to serve on this team.

FIRE MANAGEMENT STRATEGIES

Prescribed fire will be used to reduce hazard fuel accumulation, restore fire to fire-dependent ecological communities, improve wildlife habitat, and to maintain cultural/ historic scenes where appropriate. All prescribed fire activity will comply with applicable Federal, State, and local air quality laws and regulations.

All prescribed fire projects will have a burn plan approved by the Project Leader. Each burn plan will be prepared using a systematic decision-making process and contain measurable objectives, predetermined prescriptions, and reference to the approved environmental compliance document found in Appendix C of this Fire Management Plan.

Prescribed Fire Burn Plans must include components such as a GO/No-Go Checklist, contingency actions to be taken in the event the prescription parameters are exceeded, and the need for alerting neighbors and appropriate public officials to the timing and the planing of the burn. A burn plan format meeting all required needs is located in Appendix O.

Fire monitoring will be used to evaluate the degree to which burn objectives are accomplished. Monitoring can assist managers in documenting success in achieving overall programmatic objectives and limiting occurrence of undesired effects. All prescribed fires should have a qualified Fire Monitor (FEMO) on duty.

PRESCRIBED FIRE PLANNING

Annual Activities

The Zone Fire Specialist 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.

Prescribed Fire activities will be reviewed annually. Necessary updates or changes to the Fire Management Plan 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.

Annual activities needed to prepare for and accomplish a successful prescribed fire program include:

1. Coordination with expected cooperators on the burn well in advance to share expectations and target dates.
2. Examination of weather patterns, seasonal drying trends and localized fire effects on neighboring lands.
3. Coordination with smoke management agencies involving predictions of smoke dispersal.
4. Notification of local communities and adjoining agencies and property owners.

Prescribed Burn Plan

The Prescribed Burn Boss will conduct a field reconnaissance of the proposed burn location with the Zone Fire Specialist, Prescribed Fire Specialist, Biologist, and/or Refuge Manager to discuss objectives and special concerns, and gather all necessary information to write the burn plan. After completing the reconnaissance, a qualified Prescribed Burn Boss will write the prescribed burn plan.

All prescribed fires will have a prescribed burn plan. The prescribed burn plan is a site-specific action plan describing the purpose, objectives, prescription, and operational procedures needed to prepare and safely conduct the burn. The treatment area, objectives, constraints, and alternatives will be clearly outlined. No burn will be ignited unless all prescriptions of the plan are met. Fires not within those parameters will be suppressed. Prescribed Burn Plans will follow the format contained in Appendix O. Each burn plan will be reviewed by the Refuge Manager, Biologist, Zone Fire Specialist, Prescribed Fire

Specialist, and Burn Boss. The Project Leader has the authority to approve the burn plan. The term Aburn unit@ refers to a specific tract of land to which a prescribed burn plan applies.

Strategies and Personnel
Prescribed burns will be executed only by qualified personnel. The Prescribed Burn Boss will fill all required positions to conduct the burn with qualified personnel. All personnel listed in the burn plan must be available for the duration of the burn or the burn will not be initiated.

Weather and fuel moisture conditions must be monitored closely in planned burn units to determine when the prescription criteria are met. When all prescription criteria are within the acceptable range, the Prescribed Burn Boss will select an ignition time based on current and predicted weather forecasts. A thorough briefing will be given by the Prescribed Burn Boss and specific assignments and placement of personnel will be discussed. An updated spot weather forecast will be obtained on the day of ignition and all prescription elements will be rechecked to determine if they are still within the approved ranges. If all prescription elements are met, a test fire will be ignited to determine on-site fire behavior conditions as affected by current weather. If conditions are not satisfactory, the test fire will be suppressed and the burn will be rescheduled. If conditions are satisfactory the burn will continue as planned.

The minimum required contingency resources outside of the assigned prescribed fire management personnel for the given burn would include two wildland fire engine modules with a Strike Team Leader within a two hour response time. A Safety Officer Type 3 or equivalent should be considered as soon as additional resources are ordered outside of the listed contingency resources.

If the prescribed burn escapes the predetermined burn area, all further ignition will be halted except as needed for suppression efforts. Suppression efforts will be initiated, as discussed in the pre-burn briefing. The Zone Fire Specialist will be notified immediately of any control actions on a prescribed burn. If the burn exceeds the initial suppression efforts, the burn will be declared a wildland fire and suppressed using guidelines established in this plan. A WFSA will be completed and additional personnel and resources ordered as determined by the Incident Commander. If the fire continues to burn out of control, additional resources will be called from the local cooperating agencies via the servicing dispatch. A management overhead team may be requested to assume command of the fire.

Monitoring and Evaluation
Monitoring of prescribed fires is intended to provide information for quantifying and predicting fire behavior and its ecological effects on Refuge resources while building a historical record. Monitoring measures the parameters common to all fires – fuels, topography, weather and fire behavior. In addition, ecological changes such as species composition and structural changes will be monitored after a fire. This information will be very useful in fine-tuning the prescribed burn program.
During prescribed burning, monitoring should include mapping, weather, fuel measurements, and direct observation of fire characteristics such as flame length, rate of spread and fire intensity. Operational monitoring provides a check to ensure that the fire remains in prescription and serves as a basis for evaluation and comparison of management actions in response to measured changing fire conditions, and changes such as fuel conditions and species composition. A qualified Fire Monitor (FEMO) should monitor fire behavior and weather conditions for the duration of the burn and alert the Burn Boss immediately if prescription parameters are exceeded or are in danger of being exceeded. The Fire Monitor may also document smoke production for the duration of the burn and notify the Burn Boss if any problems are evident.

Required Reports
All prescribed burn forms will be completed as outlined by the Prescribed Burn Boss. A monitor will be assigned to collect all predetermined information and complete all necessary forms prior to, during, and

after the burn. All records will be archived in the Refuge's fire records for future use and reference.

The Prescribed Burn Boss will prepare a final report on the prescribed burn. Information will include a narrative of the burn operation, a determination of whether objectives were met, weather and fire behavior data, map of the burn area, photographs of the burn, number of work hours, and final cost of the burn.

Prescribed Burn Critique
A report detailing the actual burn will accompany any recommendations or changes deemed necessary in the program. This report will be submitted to the Refuge Project Leader. A post-season critique of the fire management program, including the prescribed burn program, will be held each year at the conclusion of the fall fire season.

PRESCRIBED FIRE UNITS
The prescribed fire units are based closely on designated restoration or habitat management units. These units are primarily delineated by roads, trails, permanent waterways and dikes (fire breaks and/or defensible fire lines). The Prescribed Fire Units map (Figure 3) show the area and name for the various units. Suppression Access Route maps (Appendix K) delineate access and points of defense for prescribed fires. These units may be further delineated into prescribed fire subunits depending on the needs and objectives for the prescribed fire. Fuel models were determined using Anderson's (1982) NFFL models as a guide. Although the entire Refuge has been divided into potential Prescribed Fire Units, each Unit will be individually assessed to determine if prescribed fire is actually appropriate for use in that Unit. To date, fire managers at the refuge have not determined which units will be burned, how many acres will be burned, or what percentage of each unit will be burned.

Laurel PFU
This 145 acre unit is located in the southwest quadrant of the Refuge. It is bounded partially by Laurel Road on the east, private forest land to the south and west, and an easement dirt road to the north (adjoining additional Refuge land). The primary fuel breaks are to the east and north. The habitat type is mature ponderosa pine represented by (Fuel Model 2).

Laurel East PFU
This 165 acre unit is located in the southwest quadrant of the Refuge. It is bounded by Laurel Road to the west and private upland/wet meadow to the north, east and south. The primary fuel break is to the west. Habitats in this unit consist of 30 acres of upland meadow (Fuel Model 1), 55 acres of upland meadow with conifer/aspen overstory (Fuel Model 9), and 80 acres of tall emergent vegetation (Fuel Model 3). The latter is comprised of bulrushes, cattails, and reed canary grass.

Laurel West PFU
This 120 acre unit is located in the southwest quadrant of the Refuge. It is bounded by Laurel Road on the east, an easement dirt road to the south (adjoining additional Refuge land), and private wet meadow and forest land to the west and north. It is surrounded by natural and man-made fuel breaks on all sides. The habitat is primarily upland meadow in the north and wet meadow to the south (Fuel Model 1). A small stand of mature ponderosa pine exists on the southern boundary of the unit.

Chapman Creek South PFU
This 435 acre unit is located in the southwest quadrant of the Refuge. It is bounded by Kreps Lane (gravel) and a canal to the north, the Conifer SW PFU to the east and south, and private wet meadow to the west. Natural and man-made fuel breaks occur on all sides. The unit is comprised of 130 acres of upland meadow in the east (Fuel Model 1), and a wet meadow of 105 acres to the west (Fuel Model 3). About 200 acres of conifers occur along the east boundary and within the unit (Fuel Model 8).

Chapman Creek North PFU
This 310 acre unit is located in the southwest quadrant of the Refuge. It is bounded by Kreps Lane (gravel) to the south. This road contributes the only substantial fuel break in the unit. The remainder of the unit is contiguous with private lands. The habitat is seasonal wet meadow and hay fields (Fuel Models 3 and 1) as is the surrounding private lands. Three isolated clumps of aspen and a 20 acre stand of ponderosa pine (Fuel Models 9 and 2) also occur in the unit.

Conifer SW PFU
This 115 acre unit is located in the southwest quadrant of the Refuge. It is bordered by the Glenwood-BZ Road to the north and west but is contiguous with commercial timber lands to the south and east. The habitat is primarily mature mixed conifer forest (Fuel Model 8). The road provides the only fuel break for the unit, though much of the private timber land has been clear-cut in recent times.

Lakeside Southwest PFU
This 400 acre unit is located in the southwest quadrant of the Refuge. It is bordered by the Glenwood-BZ Road to the east and south, private land to the west and Camas Ditch to the north. Camas Ditch is a perennial waterway approximately 12 meters wide. Substantial fuel breaks occur on all sides except the west. The unit consists of 200 acres of wet meadow (Fuel Model 3) and 200 acres of upland meadow (Fuel Model 1). The private land has contiguous habitat types. This area is sensitive to chemical suppression measures.

Camas South PFU
This 119 acre unit is located in the southwest quadrant of the Refuge. It is bordered to the north by Camas Ditch but is contiguous with private agricultural lands on remaining sides. The habitat type is primarily wet meadow (Fuel Model 3), as are the surrounding lands. Camas Ditch provides the only fuel break in the unit.

HQ South PFU
This 74 acre unit is located in the northwest quadrant of the Refuge. It is bounded by the graveled Refuge entrance road to the north, the Refuge residence and shop area to the east, and private coniferous forest to the south and west. The road provides the only major fuel break in the unit. The habitat type is mature ponderosa pine (Fuel Model 2).

HQ North PFU
This 650 acre unit is located in the northwest quadrant of the Refuge. It is bounded by the graveled Refuge entrance road to the south, and private timber lands, which are partially bounded by a dirt road to the west, thinned private timberland to the north, and Cold Springs Ditch to the east. Cold Springs Ditch is a perennial waterway separating this timbered FMU from wet meadow and marsh habitats. Fuel breaks occur to the west, south and east. The habitat type is mature ponderosa pine (Fuel Model 2).

Willard PFU
This 65 acre unit is located in the northwest quadrant of the Refuge. It is bordered by Cold Springs Ditch along 75% of its perimeter. An elevated dike borders the remaining perimeter. Fuel breaks occur on all sides of the unit. This unit is typically a permanent wetland dominated by cattail, bulrush and reed canary grass (Fuel Model 3). Approximately 15 acres consists of encroaching lodgepole pine and spirea. This area is sensitive to chemical suppression measures

CSD North PFU
This 13 acre unit is located in the northwest quadrant of the Refuge. It is bordered on the south by Cold Springs Ditch, east by a dirt road, west by Refuge lodgepole pine stands, and north by private timberland and wet meadow. The habitat type is wet meadow comprised of medium to tall emergent vegetation

(Fuel Model 3).

C&H West PFU
This 40 acre unit is located in the northwest quadrant of the Refuge. It is bounded on the north by Cold Springs Ditch, the west by an elevated dike and a permanent water body, south by seasonal wet meadow and east by Lake Road, a county graveled road. Fuel breaks occur on all but a portion of the southwest boundary where it is contiguous with additional Refuge meadow lands. The habitat is principally wet meadow vegetation (Fuel Model 3) with a 5 acre stand of aspen (Fuel Model 9) in the southeast corner.

C&H East PFU
This 95 acre unit is located in the northwest quadrant of the Refuge. It is bounded on the north by Hansen Road (paved), on the east by Bird Creek, on the south by a partially elevated berm, and west by Lake Road. Fuel breaks occur on all but the south side. The habitat is dominated by seasonal wet meadow vegetation (Fuel Model 3) with small clumps of aspen and pine (Fuel Model 9) in the center of the unit. A permanent waterway also borders the north and meanders partially through the interior of the unit. This unit is sensitive to chemical suppression measures and heavy equipment use. Archaeological sites occur along the south boundary of the unit.

Bird Creek West PFU
This 285 acre unit is located in the northwest quadrant of the Refuge. It is bounded by Hansen Road to the north, the Glenwood-BZ Road to the east, and Bird Creek to the south and west. Substantial fuel breaks occur on all sides of the unit. The habitat is primarily wet meadow and permanent tall emergent (cattail) marsh (Fuel Model 3). However, 65 acres of mixed coniferous/aspen forest with a high dead fall content occurs in the center of the unit (Fuel Model 10). A residence is located near the northeast corner of the unit. This unit is sensitive to chemical suppression measures.

Camas Prairie East PFU
This 320 acre unit is located in the northwest quadrant of the Refuge. The unit is bounded on the north by Bird Creek, east by the Glenwood-BZ Road, south by Camas Ditch and private lands, and west by Lake Road. Fuel breaks occur around the unit, however, no fuel breaks occur between the private in-holdings. Additional fuel breaks occur within the unit via the old Bird Creek channel and a north-south drainage canal. This unit is comprised primarily of wet meadow and hayed lands (Fuel Models 3 and 1).

Camas Prairie West PFU
This 600 acre unit is located in the northwest quadrant of the Refuge. The unit is bounded on the west by Cold Springs Ditch, northwest by an elevated dike and the Willard Unit wetland, north by the C&H West unit, east by Lake Road and south by Camas Ditch. Fuel breaks occur on all but the north, however the Cold Springs Ditch affords protection in this direction for wildfire suppression. The unit is dominated by seasonally inundated wet meadow (Fuel Model 3).

Frazier Meadow PFU
This 120 acre unit is located centrally within the Refuge. It is bounded on the south by Camas Ditch, east by the Glenwood-BZ Road and the north and west by private meadows. A small, north-south drainage ditch bisects the unit on the west, while an east-west access road bisects the northern portion of the unit. The unit is primarily mature aspen, pine, spirea shrub land, (Fuel Model 9) and upland/wet meadow (Fuel Model 3) on the western portion.

Bird Creek East PFU
This 60 acre unit is located in the north central quadrant of the Refuge. The unit is triangular and is bordered by Bird Creek on the south and east, the Glenwood-BZ Road on the west and a small private woodlot on the north. It is principally a tall emergent marsh (Fuel Model 3) with some scattered pine on the north edge.

Lakeside Northeast PFU
This 357 acre unit is located in the north central quadrant of the Refuge. It is bounded on the west by the Glenwood-BZ Road, Bird Creek on the north, Camas Ditch on the south, and the partially timbered Troh Unit to the east. The habitat consists primarily of seasonally-flooded wet meadow (Fuel Model 3), but has a considerable amount of encroaching species such as willow, spirea, and lodgepole pine on the north (Fuel Model 9).

Lakeside Southeast PFU
This 465 acre unit is located in the north central quadrant of the Refuge. It is bordered by Camas Ditch to the north, the Glenwood-BZ Road to the west, Lakeside Road to the south, and Refuge timber to the east. It is bisected north-south by a private meadow. The unit is comprised of approximately 150 acres of wet meadow (Fuel Model 3), 235 acres of upland meadow (Fuel Model 1), and 80 acres of conifer and aspen (Fuel Model 9).

Conifer East PFU
This 70 acre unit is bordered to the northwest by the Glenwood-BZ and Lakeside Roads. The remaining boundary abuts commercial timber lands, much of which has been logged in recent years. There is a one acre in-holding within the unit supporting a seasonally utilized residence. The habitat is primarily ponderosa pine with a mixed deciduous understory (Fuel Model 9).

Troh PFU
This 352 acre unit is located in the northeast quadrant of the Refuge. It is bounded on the northwest by private timber and meadow, with Bird Creek separating the unit on the north and northwest. Refuge-owned wet meadows are located to the southwest and Camas Ditch borders the east. The unit is comprised of a mix of habitats, including 105 acres of aspen and mixed pine (Fuel Model 9), and 247 acres of seasonal wet meadows (Fuel Model 3).

Arena PFU
This 300 acre unit is located in the northeast quadrant of the Refuge. It is bordered on the west by Camas Ditch, and on the northeast and southwest by Refuge and private timber. Lakeside Road separates the southern and eastern portions of the unit from private timber lands.. Private residences and meadows are located on the east boundary within the roadway. The unit is comprised of 120 acres of ponderosa pine (Fuel Model 2), 40 acres of wet meadow (Fuel Model 3), and 140 acres of upland meadows (Fuel Model 1).

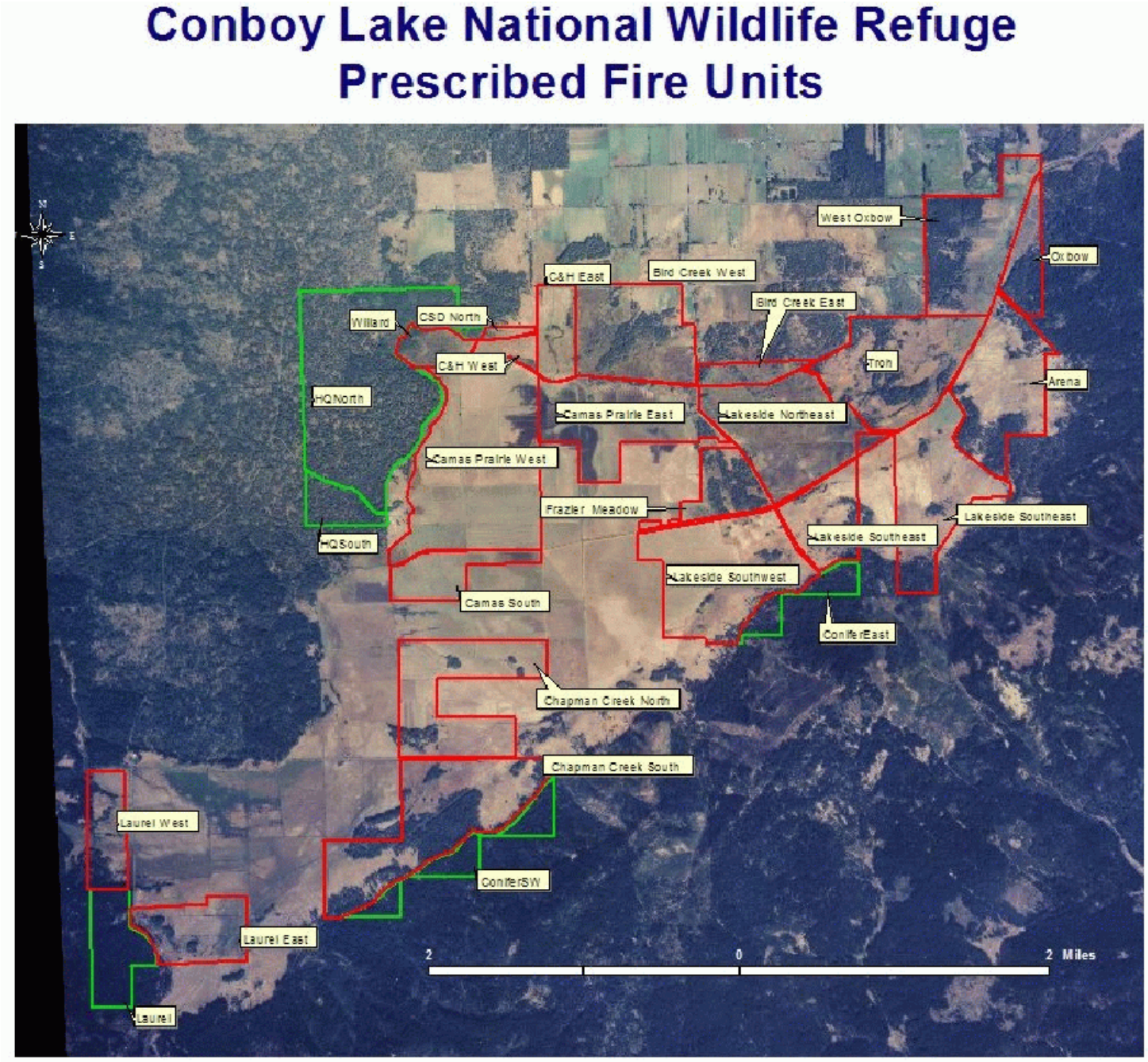
Oxbow PFU
This 100 acre unit is located in the northeast quadrant of the Refuge. The unit is triangular and is bordered on the east by Lakeside Road, west by Camas Ditch and on the southwest by the Arena unit. There are 45 acres of wet meadow (Fuel Model 3) and 55 acres of mature ponderosa pine (Fuel Model 2) in the unit. A seasonally-flooded oxbow winds throughout this unit.

West Oxbow PFU
This 300 acre unit is located in the northeast quadrant of the Refuge. It is bounded on the east by Camas ditch, south by Bird Creek, west and northwest by Troh Lane, and private meadow/woodlots to the north. Frazier Creek bisects the northern portion, partially separating it from the private lands. The unit is comprised of 80 acres of cattail marsh and wet meadow (Fuel Model 3), 145 acres of upland (Fuel Model 1), and 75 acres of ponderosa and lodgepole pine (Fuel Model 2 and 10).

Kelley North PFU
This 215 acre unit is located in the extreme northeast portion of the Refuge. It lies at the furthest downstream end of the Refuge straddling Outlet Creek. The unit is bisected southwest to northeast by a gravel entrance road and Outlet Creek. To the northeast lies commercial timber land and private land to the north and west; an adjoining Refuge unit abuts the southeast edge. The habitat is primarily wet meadow (Fuel Model 3) south of the entrance road and dry upland pasture (Fuel Model 1) to the north. A 9 acre stand of conifers (Fuel Model 8) lies within the northwest quarter of the unit.

Kelley South PFU
This 115 acre unit adjoins the Kelley North unit on its north boundary. Commercial timber land surrounds the remainder of the unit. A 9 acre patch of dry meadow (Fuel Model 1) exists in the northern part of the unit where it is bounded by Outlet Creek and wet meadow/marshland of the Kelley North Unit. The remainder of the unit consists of mixed coniferous/deciduous forest (Fuel Model 9). Fire lines exist just outside the boundary on the west and south via dirt and paved roads, Outlet Creek to the north. There are no containment lines to the east.

Figure 3. Conboy Lake National Wildlife Refuge Prescribed Fire Units.



AIR QUALITY / SMOKE MANAGEMENT GUIDELINES

The proximity to a Class 1 Area at Mt. Adams requires careful planning in the development and maintenance of a prescribed fire program at Conboy Lake NWR. Washington State has had a Smoke Management Plan in effect since 1969. It states under the revised 1995 version that, "Federal agencies that do outdoor burning on forest lands must participate in and abide by the requirements of this plan under the direction of the Federal Clean Air Act. These agencies include, but are not limited to, the Forest Service (USFS), Park Service (NPS), Fish and Wildlife Service (F&WS), Bureau of Land Management (BLM), and the Department of Defense (DOD)." Agricultural burning for non-silvicultural needs is not covered by the state plan, although the plan states in the glossary that "sagebrush and grass areas east of the summit of the Cascade Mountains may be considered forest lands when such areas are next to or intermingled with, areas supporting tree growth." This definition will apply to Conboy Lake NWR.

All burning must be approved prior to ignition. Washington State DNR does not issue burning permits on weekends and holidays between June 15 and September 30. Burning outside of that time period is encouraged. Large burns are those that consume 100 tons or more of fuel in a 24-hour period. A simple formula based on Anderson's (1982) report can be used to determine how much fuel a prescribed fire is expected to consume:

$$\text{Expected Fuel Consumption} = \left[\frac{0.74 \text{ tons}}{\text{acre}} \times \text{FM 1 acres}\right] + \left[\frac{4.0 \text{ tons}}{\text{acre}} \times \text{FM 2 acres}\right] + \left[\frac{3.0 \text{ tons}}{\text{acre}} \times \text{FM 3 acres}\right] + \left[\frac{3.75 \text{ tons}}{\text{acre}} \times \text{FM 8 acres}\right] + \left[\frac{2.63 \text{ tons}}{\text{acre}} \times \text{FM 9 acres}\right] + \left[\frac{9.0 \text{ tons}}{\text{acre}} \times \text{FM 10 acres}\right]$$

Simply estimate the acreage of each fuel model for a burn and input these numbers into the above equation. Anderson provides total fuel load numbers for each fuel type in his report; these numbers were modified in the equation based on an assumption of 100% consumption for Fuel Models 1, 2, and 3, and 75% consumption for Fuel Models 8, 9, and 10. For projects expected to consume over 100 tons, approval will be given through the DNR's Resource Protection Division, Smoke Management Section after the responsible Land Manager where the burning is taking place has concurred. When a project is expected to burn less than 100 tons of material, the Zone Prescribed Fire Specialist must call the 1-800-323-BURN number to obtain a set of applicable instructions that apply for the day of the proposed burn. Coordination with adjacent agencies and land owners is still required for all burns, regardless of size or expected fuel consumption.

The Refuge Manager is "responsible for ensuring that the requirements and operating procedures of the plan are met as they apply to burning on Federal lands under their control." As described in WAC 332-24-205 (7), burning is allowed if there are no prohibited materials contained in the area. "Smoke from burning must not obscure visibility on public roads and highways," and, "smoke from burning must not cause a nuisance as defined in WAC 332-24-205 (8)." "Burns will not be approved if: there is likelihood of an "intrusion" of smoke into "designated areas," which includes air space 2,000 feet above the ground, or "sensitive areas," such as population centers. There is any likelihood of an over-flight of smoke above

a designated area." However, "over-flights of smoke may be approved over designated areas on days when visibility would be reduced naturally by clouds, fog, rain, snow, etc." Other factors which would not allow a burn to occur include non-compliance with the State Implementation Plan (SIP) of the Federal Clean Air Act regarding visibility protection of Class I Federal areas or if smoke will not significantly dissipate within approximately eight hours of ignition and be fully dispersed by 1200 the next day. That does not include residual smoke within the immediate burn area.

Wildland fire managers, especially those in the extended attack mode, will need to keep smoke management near the top of the daily objectives list within the Incident Action Plan. Smoke management will be of significant importance throughout both the active burning periods as well as during the mop-up phase. A qualified Fire Monitor (FEMO) should monitor smoke production for the duration of a prescribed burn operation and relay any concerns to the Burn Boss.

FIRE RESEARCH

There are no ongoing or planned fire research projects at the time this plan was submitted. There is interest however, in determining long and short term effects of fire on both the sandhill crane populations as well as the Oregon spotted frogs on the Refuge.

PUBLIC SAFETY

Conboy Lake NWR is dedicated to ensuring the safety of each visitor and all residents and property adjacent to the Refuge's boundary.

The majority of the Refuge is closed to the public for most of the year. The exceptions include the public hunting and fishing areas, which are both open to limited use during designated seasons Also open to the public is the Willard Springs Trail and adjacent areas around the headquarters office, which is open year around. All or portions of the areas listed above can be closed to public use in the event of a wildfire or during a prescribed burn activity. Visitor use at this Refuge is generally low and closures of the trail and hunting areas can be accomplished by posting at trail heads, the entrance roads, parking areas and key locations in Glenwood. County roads bisecting or adjacent to the Refuge could be closed or managed through the Klickitat County Sheriff's Office.

Areas of fire activity may be clearly signed at visitor centers and bulletin boards. Residents adjacent to the Refuge will be notified in advance of any prescribed burn. The Sheriff's Office will make contacts on any fire which poses a threat to burn outside the Refuge boundaries. The contact list for adjoining neighbors and landowners can be found in Appendix I.

During prescribed burns at least one burn team member will have first aid training. A first aid kit will be on-site for prescribed burns as well as wildland fires. The local police, fire, and emergency medical services will be notified prior to the ignition of any prescribed burn. They will also be notified of the location 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. The Refuge will use the most appropriate and effective means to explain the overall fire and smoke management program. This may include supplemental handouts, signing, personal contacts, auto tour routes, or media releases. When deemed necessary, interpretive presentations will address the fire management program and explain the role of fire in the environment.

The public information program will be developed as follows:

1. Concepts of the prescribed burn program will be incorporated, as appropriate, in publications, brochures, and handouts.
2. During periods when prescribed burns are ignited, handouts will be prepared and distributed to all visitors entering areas of fire activity.
3. The fire management program may be incorporated into visitor contacts. Particular attention will be given when fires are conspicuous from roads or visitor use areas.
4. News releases will be distributed to the media as appropriate.
5. The public information outlets of neighboring and cooperating agencies and the Regional Office will be provided with all fire management information.
6. The fire management program will be discussed in informal talks with all employees , volunteers, residents, and neighbors.

Prior to the lighting of any planned ignition, information will be made available to visitors, local residents, and/or the press about what is scheduled to happen and why. On-site information will be provided to alleviate visitor concern about the apparent destruction of resources by fire or the impairment of views due to temporary smoke. This information will include prescribed burn objectives and control techniques, current fire location and behavior, effects caused by the fire, impacts on private and public facilities and services, and restrictions and closures.

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 Zone Fire Specialist will retain a copy for the Refuge files.

ANNUAL FIRE SUMMARY REPORT

The Zone Fire Specialist 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 (prescribed burns and wildland fires), 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 Refuge Manager 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:

Mary Anderson, Cartographer, Pacific Region, USFWS, Portland, OR.

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

Joseph Engler, Wildlife Biologist, Ridgefield NWRC, Ridgefield, WA.

Harold Cole, Refuge Manager, Conboy Lake NWR, Glenwood, WA.

Brian Gales, Zone Prescribed Fire Specialist, Willamette Valley, Ridgefield & Willapa National Wildlife Refuge Complexes, USFWS.

Al Lawson, Fire Operations, WA. Dept. of Natural Resources, SE Region, Klickitat Unit, Husum, WA.

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

Pete Nelson, Engine Leader, Gifford Pinchot NF, Mt. Adams Ranger District, Trout Lake, WA.

Greg Page, Fire Prevention Technician, Gifford Pinchot NF, Mt. Adams Ranger District, Trout Lake, WA.

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

Rebecca Young, Deputy Project Leader, Ridgefield NWRC, Ridgefield, WA.

APPENDICES

APPENDIX A: REFERENCES CITED

Agee, J.K. 1993. Fire Ecology of Pacific Northwest Forests. Island Press, Washington, D.C.

Anderson, H.E. 1982. Aids to Determining Fuel Models For Estimating Fire Behavior. Gen. Tech. Rep. INT-122. 22 p. USDA Forest Service, Intermountain Research Station, Ogden, UT.

Andrews, P.L. and C.H. Chase. 1989. BEHAVE: fire behavior prediction and fuel modeling system-BURN subsystem, part 2. Gen. Tech, Rep. INT-260. 93 p. USDA Forest Service, Intermountain Research Station, Ogden, UT.

Boyd, Robert 1999. Indians, Fire and The Land In The Pacific Northwest. Oregon State University Press, Corvallis, Oregon.

Rothermel, Richard C. 1983. How to Predict the Spread and Intensity of Forest and Range Fires. Gen. Tech. Rep. INT-143. 161 p. USDA Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT.

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, Park 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 (square foot) 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 effect on fuels. The ERC incorporates thousand hour dead fuel moisture and live fuel moisture; 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 fire under prescribed conditions 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 are burned in a fire; primarily grass, surface litter, duff, logs, stumps, brush, foliage, and live trees.

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

Hazard fuels. Those vegetative fuels which, when ignited, threaten public safety, structures and facilities, cultural resources, natural resources, natural processes, or to 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 US 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 US 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 realize 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: NEPA COMPLIANCE DOCUMENTS

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 Conboy Lake NWR.

__X__ Is a categorical exclusion as provided by 516 DM 6 Appendix1. No further NEPA documentation will be made (Exclusion 1.4 B. (5)00 relating to Fire Management activities, including prevention and restoration measures, when conducted in accordance with departmental and Service procedures).

_____ 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): ESA-Intra Service Section 7 Consultation.

*_____
Project Leader Date

(1)_____
Initiator Date

*Approving official: Project Leader for Categorical Exclusions; Assistant Regional Director for EA/FONSIs; Regional Director for Environmental Impact Statements.

Categorical Exclusion
for the
Implementation of the Wildland Fire Management Plan
Conboy Lake National Wildlife Refuge
Ridgefield National Wildlife Refuge Complex

Objectives
The Fire Management Plan (FMP) for Conboy Lake National Wildlife Refuge will help achieve resource management objectives of reducing fuel accumulations to decrease the potential for large wildland fires. The Department of the Interior policy requires that all refuges with vegetation that can sustain fire must have a Fire Management Plan that details fire management policies, the use of prescribed fire for attaining resource management objectives. At this time, it is anticipated that prescribed fire will be used to obtain management objectives. Fuel accumulations of reed canary grass, dry upland grasses and understory grasses and ladder fuels within the forested areas will be reduced through mechanical as well as prescribed fire.

This plan is written as an operational guide for managing the refuge's wildland fire program. It defines levels of protection needed to ensure 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 FMP outlines procedures for wildland fire suppression. The fire plan furthers the mission of the Refuge by providing increased protection for Refuge resources. Increasing coordination and preparedness to suppress wildland fires will help to ensure quick responses to fires which have the potential to be devastating to Refuge resources,

There is no dedicated fire staff at Conboy Lake NWR or the Ridgefield NWRC. All wildland fires will be suppressed by local cooperating agencies with the oversight of the Project Leader, Refuge Manager and Zone Fire Specialist.

Recommendations
It is our determination that this project succeeds in fulfilling the U.S. Fish and Wildlife Refuge mission to protect and enhance endangered species populations through the implementation of preventative wildland fire measures and documentation of strict fire suppression guidelines to protect critical habitat. This Plan qualifies as a Categorical Exclusion because it directly relates to Fire Management activities, including prevention, suppression, and restoration measures, while adhering to departmental and Service procedures.

APPENDIX D: 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: (if not obvious)	
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)?
Area of Potential Effects (APE):	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.

Environmental and Cultural Setting:	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?

APPENDIX E: SPECIES LISTS

Wildlife Species of Conboy Lake National Wildlife Refuge

BIRDS

Common Name	Scientific Name
Grebes	
Pied-billed Grebe	*Podilymbus podiceps*
Red-necked Grebe	*Podiceps grisegena*
Western Grebe	*Aechmophorus accidentalis*
Cormorants	
Double-crested Cormorant	*Phalacrocorax auritus*
Bitterns, Herons and Egrets	
American Bittern	*Botaurus lentigthosus*
Great Blue Heron	*Ardea herodia*
Great Egret	*Casmerodius albus*
Green Heron	*Butorides virescens*
American Vultures	
Turkey Vulture	*Cathartes aura*
Swans, Geese and Ducks	
Greater White-fronted Goose	*Anser albifrons*
Snow Goose	*Chen caerulescens*
Ross's Goose	*Chen rossii*
Canada Goose	*Branta canadensis*
Tundra Swan	*Cygnus columbianus*
Trumpeter Swan	*Cygnus buccinator*
Wood Duck	*Aix sponsa*
Gadwall	*Anas strepera*
American Wigeon	*Anas americana*
Mallard	*Anas platyrhynchos*
Blue-winged Teal	*Anas discors*
Cinnamon Teal	*Anas cyanoptera*
Northern Shoveler	*Anas clypeta*
Northern Pintail	*Anas acuta*
Green-winged Teal	*Anas falcata*
Canvasback	*Aythya valisineria*
Redhead	*Aythya americana*
Ring-necked Duck	*Aythya collaris*
Lesser Scaup	*Aythya affinis*
Bufflehead	*Bucephala albeola*
Common Goldeneye	*Bucephala clangula*
Barrow's Goldeneye	*Bucephala islandica*
Hooded Merganser	*Lophodytes eucullatus*
Common Merganser	*Mergus merganser*

Ruddy Duck	*Oxyura jamaicensis*

Osprey, Kites, Hawks and Eagles

Osprey	*Pandion haliaetus*
Bald Eagle	*Haliaeetus leucocephalus*
Northern Harrier	*Circus cyaneus*
Sharp-shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperii*
Red-tailed Hawk	*Buteo jamaicensis*
Red-shouldered Hawk	*Buteo lineatus*
Rough-legged Hawk	*Buteo lagopus*
Golden Eagle	*Aquila chrysaetos*

Falcons

American Kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
Peregrine Falcon	*Falco peregrinus*
Prairie Falcon	*Falco mexicanus*

Gallinaceous Birds

Ring-necked Pheasant	*Phasianus colchicus*
Blue Grouse	*Dendragapus obscurus*
Ruffed Grouse	*Bonasa umbellus*
Wild Turkey	*Meleagris gallopavo*
California Quail	*Callipepla californica*

Rails, Coots and Cranes

Virginia Rail	*Rallus limicola*
Sora	*Porzana carolina*
American Coot	*Fulica americana*
Sandhill Crane	*Grus canadensis*

Plovers

Black-bellied Plover	*Pluvialis squatarola*
Killdeer	*Charadrius vociferus*
Semipalmated Plover	*Charadrius semipalmatus*

Stilts and Avocets

Black-necked Stilt	*Himantopus mexicanus*
American Avocet	*Charadrius vociferus*

Sandpipers, Phalaropes

Long-tilled Curlew	*Numenius americanus*
Greater Yellowlegs	*Tringa melanoleuca*
Lesser Yellowlegs	*Tringa flavipes*
Spotted Sandpiper	*Tringa erythropus*
Least Sandpiper	*Calidris minutilla*
Pectoral Sandpiper	*Calidris melanotos*
Dunlin	*Calidris alpina*
Long-billed Dowitcher	*Limnodromus scolopaceus*
Common Snipe	*Gallinago gallinago*

Wilson's Phalaropes	*Phalaropus tricolor*
Gulls and Terns	
Bonaparte's Gull	*Larus philadelphia*
Ring-billed Gull	*Larus delawarensis*
California Gull	*Larus californicus*
Glaucous-winged Gull	*Larus glaucenscens*
Forster's Tern	*Sterna forsteri*
Black Tern	*Chlidonias niger*
Pigeons and Doves	
Rock Dove	*Columbia livia*
Band-tailed Dove	*Columbia fasciata*
Mourning Dove	*Zenaida macroura*
Owls	
Western Screech-Owl	*Otus kennicottii*
Great Homed Owl	*Bubo virginianus*
Northern Pygmy Owl	*Glaucidium gnoma*
Short-eared Owl	*Asio flammeus*
Northern Saw-whet Owl	*Aegolius acadicus*
Nightjars	
Common Nighthawk	*Chordeiles minor*
Swifts	
Vaux's Swift	*Chaetura vauxi*
Hummingbirds	
Black-chinned Hummingbird	*Archilochus alexandri*
Calliope Hummingbird	*Stellula calliope*
Rufous Hummingbird	*Selasphorus rufus*
Kingfishers	
Belted Kingfisher	*Ceryle alcyon*
Woodpeckers	
Lewis' Woodpecker	*Melanerpes lewis*
Red-naped Sapsucker	*Sphyrapicus nuchalis*
Red-breasted Sapsucker	*Sphyrapicus ruber*
Williamson's Sapsucker	*Sphyrapicus thyroideus*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
White-headed Woodpecker	*Picoides albolarvatus*
Northern Flicker	*Colaptes auratus*
Pileated Woodpecker	*Dryocopus pileatus*
Larks	
Homed Lark	*Eremophilia alpestris*
Tyrant Flycatchers	

Western Wood-Pewee	*Contopus sordidulus*
Willow Flycatcher	*Empidonax traillii*
Pacific-slope Flycatcher	*Empidonax difficilis*
Say's Phoebe	*Sayornis saya*
Western Kingbird	*Tyrannus verticalis*
Eastern Kingbird	*Tyrannus tyrannus*
Olive- sided Flycatcher	*Contopus borealis*
Hammond's Flycatcher	*Empidonax hammondii*
Dusky Flycatcher	*Empidonax oberholseri*
Gray Flycatcher	*Empidonax wrightii*
Shrikes	
Loggerhead Shrike	*Lanius ludovicianus*
Northern Shrike	*Lanius excubitor*
Vireos	
Cassin's Vireo	*Vireo cassinii*
Warbling Vireo	*Vireo gilvis*
Crows, Jays and Magpies	
Steller's Jay	*Cyanocitta stelleri*
Western Scrub-Jay	*Aphelocoma coerulescens*
American Crow	*Corvus brachyrhyncos*
Gray Jay	*Perisoreus canadensis*
Black- billed Magpie	*Pica pica*
Common Raven	*Corvus corax*
Swallows	
Purple Martin	*Progne subis*
Tree Swallow	*Tachycineta bicolor*
Violet-green Swallow	*Tachyniceta thalessina*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Bank Swallow	*Riparia riparia*
Cliff Swallow	*Hirundo pyrrhonota*
Barn Swallow	*Hirundo rustica*
Chickadees	
Black-capped Chickadee	*Parus atricapillus*
Chestnut-backed Chickadee	*Parus rufescens*
Mountain Chickadee	*Parus gamblei*
Bushtits	
Common Bushtit	*Psaltriparus minimus*
Dippers	
American Dipper	*Cinclus mexicanus*
Nuthatches	
Red-breasted Nuthatch	*Sitta canadensis*
White-breasted Nuthatch	*Sitta carolinensis*
Pygmy Nuthatch	*Sitta pygmaea*

Creepers

Brown Creeper	*Certhia americana*

Wrens

Bewick's Wren	*Thryomanes bewickii*
House Wren	*Troglodytes aedon*
Winter Wren	*Troglodytes troglodytes*
Marsh Wren	*Cistothorus palustris*

Kinglets

Golden-crowned Kinglet	*Regulus satrapa*
Ruby-crowned Kinglet	*Regulus calendula*

Thrushes

Western Bluebird	*Sialia mexicana*
Swainson's Thrush	*Catharus ostulatus*
Hermit Thrush	*Catharus guttatus*
American Robin	*Turdus migratorius*
Varied Thrush	*Ixaoreus naevius*
Mountain Bluebird	*Sialia currucoides*
Townsend's Solitaire	*Myadestes townsendi*

Mimic Thrush

Gray Catbird	*Dumetella carolinensis*
Sage Thrasher	*Oreoscoptes montanus*

Starlings

European Starling	*Sturnus vulgaris*

Pipits

American Pipit	*Anthus rubescens*

Waxwings

Cedar Waxwing	*Barnbycilla cedrorum*

Warblers

Orange-crowned Warbler	*Vermivora celata*
Nashville Warbler	*Vermivora ruficapilla*
Yellow Warbler	*Dendroica petechia*
Yellow-rumped Warbler	*Dendroica coronata*
Black-throated Gray Warbler	*Dendroica nigrescens*
Townsend's Warbler	*Dendroica townsend*
MacGillivray's Warbler	*Oporornis tolmiei*
Common Yellowthroat	*Geothlypis trichas*
Wilson's Warbler	*Wilsonia pusilla*

Tanagers

Western Tanager	*Piranga ludoviciana*

Towhees, Sparrows

Spotted Towhee	*Pipito maculatus*
Fox Sparrow	*Passerella iliaca*
Song sparrow	*Melospiza melodia*
Lincoln's Sparrow	*Melospiza lincolnii*
Savannah Sparrow	*Passerculus sandwichensis*
White-crowned Sparrow	*Zonotrichia leucophrys*
Golden-crowned Sparrow	*Zonotrichia atricapilld*
Dark-eyed Junco	*Junco hyemalis*
Chipping Sparrow	*Spizella paaerina*
Lark Sparrow	Chondestes grammacus
American Tree Sparrow	*Spizella arborea*

Grosbeaks, Buntings

Black-headed Grosbeak	*Pheucticus melanocephalus*
Lazuli Bunting	*Passerina amoeba*

Blackbirds, Meadowtards, Orioles

Red-winged Blackbird	*Agelaius phoeniceus*
Western Meadowlark	*Steamily neglecta*
Yellow-headed Blackbird	*Xanthocephalus Xanthocephalus*
Brewer's Blackbird	*Euphagus cyanocephalus*
Brown-headed Cowbird	*Molothrus ater*
Bullock's Oriole	*Icterus bulockii*

Finches

Purple Finch	*Carpodacus purpureus*
House Finch	*Carpodacus mexicanus*
Red Crossbill	*Loxia curvirostra*
Pine Siskin	*Carduelis pinus*
American Goldfinch	*Carduelis tristis*
Evening Grosbeak	*Coccothraustes vespertinus*
Pine Grosbeak	*Pinicola enucleator*
Cassin's Finch	*Carpodacus cassinii*
Common Redpoll	*Carduelis flammea*

Weaver Finches

House Sparrow	*Passer domesticus*

MAMMALS

Shrews

Montane shrew	*Sorex monticolus*
Vagrant shrew	*Sorex vagrans*
Bendire's shrew	*Sorex bendirii*
Trowbridge shrew	*Sorex trowbridgii*

Moles

Shrew-mole	*Neurotrichus gibbsii*

Bats

Little brown myotis	*Myotis lucifugus*

California myotis	*Myotis californicus*
Big brown bat	*Eptesicus fuscus*
Hoary bat	*Lasiurus cinereus*
Yuma myotis	*Myotis yumanensis*
Silver-haired bat	*Lasionycteris noctivagans*
Long-legged myotis	*Myotis volans*
Long-eared myotis	*Myotis evotis*
Townsend's big- eared bat	*Plecotus townsendii*

Rabbits

Snowshoe Hare	*Lepus americanus*

Rodents

Yellow-bellied marmot	*Marmota flaviventris*
California ground squirrel	*Spermophilus beecheyi*
Cascade golden-mantled ground squirrel	*Spermophilus saturatus*
Yellow pine chipmunk	*Tamias amoenus*
Douglas squirrel	*Tamiasciurus douglasii*
Townsend's chipmunk	*Tamias townsendii*
Northern flying squirrel	*Glaucomys sabrinus*
Northern pocket gopher	*Thomomys talpoides*
Beaver	*Castor canadensis*
Bushy- tailed wood rat	*Neotoma cinerea*
Deer mouse	*Peromyscus maniculatus*
Long- tailed vole	*Microtus longicaudus*
Muskrat	*Ondatra zibethicus*
Pacific jumping mouse	*Zapus trinotatus*
Porcupine	*Erethizon dorsatum*

Carnivores

Coyote	*Canis latrans*
Black Bear	*Ursus americanus*
Racoon	*Procyon lotor*
Marten	*Martes americana*
Mink	*Mustela vison*
Long-tailed weasel	*Mustela frenata*
Striped skunk	*Mephitis mephitis*
River otter	*Lutra canadensis*
Mountain lion	*Felis concolor*
Bobcat	*Lynx rufus*
Badger	*Taxidea taxus*

Ungulates

Black-tailed deer	*Odocoileus hemionus*
Elk	*Cervus elaphus*

AMPHIBIANS/REPTILES

Northwestern salamander	*Ambystoma gracile*
Long-toed salamander	*Ambystoma macrodactylum*
Rough-skinner newt	*Taricha granulosa*
Pacific treefrog	*Hyla regilla*
Bullfrog	*Rana catesbeiana*
Oregon Spotted Frog	*Rana pretiosa*
Western Toad	*Bufo boreas*
Western Skink	*Eumeces skiltonianus*
Northern alligator lizard	*Elgaria coerulea*
Rubber boa	*Charina bottae*
Western yellow- bellied racer	*Coluber constrictor*
Northwestern garter snake	*Thamnophis ordinoides*
Valley (common) garter snake	*Thamnophis sirtalis*

FISH

Rainbow trout	*Salmo gairdneri*
Brook Trout	*Salvelinus fontinalis*
Brown bullhead	*Ictalurus nebulosus*
Speckled Dace	*Rhinichthys osculus*

CENTRAL CASCADES WILDLAND FIRE OPERATING PLAN

Between

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Columbia River Gorge National Scenic Area
Mt. Hood National Forest
Gifford Pinchot National Forest

UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT

Spokane District

UNITED STATES FISH AND WILDLIFE SERVICE

Pacific Region

OREGON DEPARTMENT OF FORESTRY

The Dalles Unit
Clackamas-Marion Unit

BUREAU OF INDIAN AFFAIRS

Yakama
Warms Springs

NATIONAL PARKS SERVICE

Mt. Rainier

WASHINGTON DEPARTMENT OF NATURAL RESOURCES
Central Region
Southwest Region
Southeast Region

TABLE OF CONTENTS

CENTRAL CASCADES WILDLAND FIRE OPERATING PLAN

PREAMBLE

This Operating Plan is prepared pursuant to the Master Cooperative Fire Protection Agreement signed and dated October 14, 1998 and the 1999 Northwest Operating Plan.

Terms, Exhibits, and Conditions in this Operating Plan are consistent with those in the Master Cooperative Fire Protection Agreement and those Terms, Exhibits, and Conditions are incorporated by reference.

This Operating Plan is between the parties listed on the signature pages and is intended to clarify procedures for fire suppression, preparedness, and prevention in all areas designated as reciprocal. Each party to this Operating Plan may have an appendix page which states the needs and restrictions specific to that agency.

This Operating Plan supersedes and cancels all previous operating plans, agreements, and MOU's between these parties signed before January 18, 2000, including but not limited to:

- < Columbia River Gorge Wildland Fire Operations Plan
- < Memorandum of Concurrence between GPF and SPD #1278 (OR130)
- < Cooperative Engine Operations agreement between SES and GPF
- < Fire Protection Agreement between FWS and SES # 14-16-0001 -3143
- < Revision of Reciprocal Fire Protection Services Operating plan between CES and GPF
- < Collection Agreement between CES and GPF
- < Cooperative Engine Operations Agreement between CES and GPF
- < Cooperative Engine Operations Agreement between SWS and GPF

INTERAGENCY COOPERATION

Interagency Resources:

The Columbia River Gorge National Scenic Area (CGF) will provide and fund one crew person each for Cooperative Fire Engines operated by the Oregon Department of Forestry, The Dalles Unit (ODF), the Washington Department of Natural Resources, Southwest (SWS), and the Washington Department of Natural Resources, Southeast (SES). These positions will be filled from mid June through mid September. In return, the "Coop Engines" will be available to respond as a reciprocal fire suppression resource to all incidents occurring on lands protected by the USDA Forest Service, within the confines of the Columbia River Gorge National Scenic Area (see Exhibit A, Engine Operation Plan).

The Gifford Pinchot National Forest (GPF) will provide and fund one crew person for the Cooperative Fire Engine, provided and operated by Washington Department of Natural Resources Southeast (SES). This position will be filled normally from mid June through mid September. In return, the "Coop Engine" will be available for reciprocal fire suppression response as well as daily working projects on lands protected by the USDA Forest Service and DNR (see Exhibit A).

The GPF will provide and fund one crew person each for Cooperative Fire Engines, provided and operated by Washington Department of Natural Resources, Southwest (SWS). The GPF will provide and

fund two people for staffing the Cooperative Fire Engine provided and operated by the Washington Department of Natural Resources, Central (CES). SWS will provide and fund one crew person for the Cooperative Fire Engine, provided and operated by the GPF. These positions will be filled normally from mid June through mid September. In return the "Coop Engines" will be available for reciprocal fire suppression response as well as daily working projects occurring on lands protected by the USDA Forest Service and DNR (see Exhibit A).

The Oregon Department of Forestry, The Dalles Unit (ODF, The Dalles) will provide and fund one engine leader and one crew person each for a Cooperative Fire Engine with the Mt. Hood National Forest (MHF). These positions will be filled from mid June through mid October. In return, the "Coop Engine" will be available to respond as a reciprocal fire suppression resource to all incidents occurring on lands protected by ODF, The Dalles and the MHF (see Exhibit A). Fire suppression services required beyond the first 24 hours shall be considered "Off Set".

GPF and Mt. Rainier National Park (MRP) will share Type 3 1C as needed to cover MRP Duty Officer needs and/or GPF minimum draw down need.

Fire Management Services:

Consistent with the National Interagency Agreement and the guiding principals of Closest Forces, CGF will provide fire protection and suppression services on lands managed by the U.S. Fish and Wildlife Service (FWS) within the boundaries of the Columbia River Gorge National Scenic Area. This includes; Steigerwald Lake National Wildlife Refuge, Franz Lake National Wildlife Refuge, Pierce National Wildlife Refuge, Little White Salmon National Fish Hatchery, Willard National Fish Hatchery, and Spring Creek National Fish Hatchery and involves approximately 4180 acres.

Also, CGF will provide fire protection and suppression services for lands managed by the U.S. Department of Interior, Bureau of Land Management, Spokane District, in the Klickitat River drainage. The area includes BLM ownership from the mouth of the Klickitat River to a point three miles east of the community of Klickitat at T4N, R14E, sec. 17 and involves approximately 1000 acres of scattered ownership.

Consistent with the National Interagency Agreement and the guiding principals of Closest Forces, GPF will provide initial attack fire suppression services on lands managed by the FWS at Conboy Lake National Wildlife Refuge.

PREPAREDNESS

Protection Areas and Boundaries: The geographic areas covered under the terms of this Operating Plan include all lands within the protection areas of each administrative unit which is a party to this plan.

Reciprocal Fire Assistance: Parties to this Operating Plan agree to provide reciprocal fire assistance within their designated initial attack zones. Designated initial attack zones include the lands within one mile of the aforementioned protection boundaries or within the confines of dispatch blocks/systems, whichever is greater. Specific reciprocal fire assistance shall be determined unit by unit and be consistent with predetermined dispatch systems.

Acquisition of Services: All costs associated with incident operations and support not identified as reciprocal shall be considered reimbursable costs. Agencies will bill one another at established "cost to agency" rates for personnel and equipment (see Exhibit B, Billing Locations).

Fire Prevention Policies: Parties to this Operating Plan will coordinate and implement prevention programs through the appropriate fire prevention cooperative or interagency association. Each unit will provide a representative to attend and participate in appropriate fire prevention activities.

Industrial Restrictions: Industrial restrictions will be administered by the protecting agency and coordinated between other protecting agencies which may be affected.

Burning Permit Procedures: Burning permits will be issued and maintained by the protecting agency, unless otherwise agreed (see Exhibit D, Burning Permits).

Prescribed Fire and Fuels Management: Parties to this Operating Plan will notify neighboring protection agencies of dates, times, sizes and locations of prescribed fires and or industrial slash bums in excess of 100 tons or field bums of more than ten acres when the aforementioned information is available or within 24 hours of planned ignition, whichever is sooner.

OPERATIONS

Fire Notification: Where direct communications is available, lookouts will attempt to report fires to the protecting agency first.

Dispatch centers will coordinate to ensure that adjacent protection agencies are kept informed of fire activity which could involve them.

Detection: Parties to this Operating Plan recognize that the fire detection resources maintained by each participating unit are adequate and appropriate.

Parties to this Operating Plan routinely use aerial detection to supplement fixed coverage and will provide this service to cooperators on a reciprocal basis (nonreimbursable) when it can be accomplished in conjunction with scheduled flights over their respective protection areas. Should supplemental flights be requested the cost will be reimbursed by the requesting agency at current aircraft contract rates. Requests for supplemental detection flights will be placed with the responsible dispatch center. Dispatch centers will coordinate with each other to ensure adequate coverage and reduce flight duplication.

Escaped Fire: When fires escape initial attack a supplemental fire suppression agreement will be negotiated between all agencies with protection responsibilities. This written agreement will designate divisions of operational responsibility as well as responsibility for services such as fire camp, food, and other activities essential to the fire control effort.

Supplemental Fire Suppression Agreements: Such agreements may be negotiated under any combination of the following terms: Unified Command with division of responsibilities based on ownership, access or threat. Multiple agency ICS organization with one Incident Commander. One agency assumes the total fire effort as the other agencies maintain full liaison including cost negotiations.

Delegation of Authority: On all Escaped Fires involving lands protected by two or more Parties to this Operating Plan, written Delegations of Authority will be exchanged by each agency with protection responsibility.

Type III Resource Pool: Parties to this Operating Plan are encouraged to maintain and utilize a Type III Resource Pool for the interim management of escaped fires that may transition to a Type I or Type II

Incident Management Team. Members of the Type III resource pool may be utilized on a reciprocal basis.

Fire Equipment: Parties to this Operating Plan realize that different fire engine configurations exist between agencies. Each agency will work with qualified personnel from assisting agencies in the orientation of initial attack engines and equipment so that such personnel can operate that equipment in emergency situations.

Suppression Coordination: On fires escaping initial attack, or as requested by the protecting agency, the assisting agency will furnish an Agency Representative.

Communications: Parties to this Operating Plan recognize that interagency communications are essential for effective cooperation. Written authority for the use of licensed radio frequencies will be provided to one another by all parties to this Operating Plan.

Dispatching: Parties to this Operating Plan will use Closest Forces in accordance with Planned Area Dispatch Systems (dispatch blocks, EXHIBIT C).

Each agency will dispatch its own resources, unless otherwise agreed.

Parties to this Operating Plan will dispatch their resources, including aircraft, in accordance with a Planned Area Dispatch System and their associated boundaries.

Responsible Agencies will meet annually to review Planned Area Dispatch Systems.

Based upon availability, each agency will provide, on request, those resources identified, through the dispatch system.

Reciprocal fire protection will be provided yearlong, based upon availability, to the level identified through the dispatch system. The designated dispatch block, card, and/or system identified for low fire danger will be used during that time of year that is traditionally considered to be "outside" of fire season.

Parties to this agreement will notify each other daily, or as situations dictate, regarding the status of resources identified through Planned Area Dispatch Systems.

Variances from Planned Area Dispatch Systems may occur when a responsible party from the protecting agency deems it necessary.

Should an agency be unable to furnish a resource listed in any Planned Area Dispatch System, that agency will notify other affected agencies immediately.

Parties to this Operating Plan, when acting as the assisting agency, reserve the right to commit only those resources which are deemed reasonably available in the judgment of the responsible individual. Parties to this Operating Plan recognize that for operations during multiple fire scenarios, dispatch plans cannot be too rigid. Current fire situations and availability offerees may dictate reductions and expansions in staffing. Resource and dispatching adjustments will be coordinated between responsible representatives, as designated by each party to this Operating Plan.

Use of aerial delivered retardant is approved for use by the Incident Commander, first load only, on lands protected by Washington Department of Natural Resources; Southwest Region, Southeast Region, Central Region, Oregon Department of Forestry; The Dalles Unit, Clackamas/Marion Unit, United States Forest Service; Gifford Pinchot National Forest, Columbia River Gorge National Scenic Area, United States

Department of Interior: National Park Service; Mt. Rainier, Fort Vancouver National Historic Site, Fort Clatsop National Monument, Fish and Wildlife Service; Conboy Lake National Wildlife Refuge, Nisqually National Wildlife Refuge, Ridgefield National Wildlife Refuge, Willapa National Wildlife Refuge, Bureau of Land Management; Spokane District, Bueam of Indian Affairs; Yakama Nation, Confederated Tribes of Warm Springs. Continued use of retardant is dependent upon the approval of the jurisdictional agency.

Fire Reports: Protecting agencies will complete required fire reports. Assisting agencies will provide all requested information regarding their involvement to the protecting agency in a timely fashion.

FIRE INVESTIGATIONS

Parties to this Operating Plan will conduct detailed fire investigations to determine the cause of all fires. Each agency has trained fire investigators available to assist the other. The use of interagency fire investigation teams is encouraged on all interagency fires.

Nothing herein shall be understood to impair the right of any agency to recover the costs of suppression and damages due to fires resulting from negligent, willful, or illegal acts of any forest landowner, timber operator, or other person or corporation; or to impair any other rights of similar nature under state or federal laws. In those cases where costs have been recovered from a third party, reimbursement of initial attack costs (to the extent included in the recovery) will be made to the parties taking initial attack action.

MEDIA COORDINATION

Press Releases: News releases related to regulated industrial and public use restrictions will be coordinated between parties to this Operating Plan and, where appropriate and practicable, will be joint press releases.

Media contact and news releases regarding specific fires is the responsibility of the protecting agency and will not be conducted or released by assisting agencies without the permission of the protecting agency.

PLAN REVIEW

At least annually, or as needed, parties to this Operating Plan will meet to review the previous fire season and adjust this plan if needed. This plan shall remain in force and effect unless canceled by not less than 30 days' written notice from one party to the others. In the event of cancellation, financial liability of the parties hereto will be determined on the basis of services rendered at the time of cancellation.

SIGNATURES

IN WITNESS WHEREOF, the parties hereto have executed this Wildland Fire Operating Plan.

CLACKAMAS-MARION DISTRICT
OREGON DEPARTMENT OF FORESTRY

District Forester
Date:_____

CENTRAL OREGON DISTRICT
OREGON DEPARTMENT OF FORESTRY

District Forester
Date:

WASHINGTON DEPARTMENT OF NATURAL RESOURCES

Resource Protection Division
Date:

MT. HOOD NATIONAL FOREST
USDA FOREST SERVICE

Forest Supervisor
Date:

GIFFORD PINCHOT NATIONAL FOREST
USDA FOREST SERVICE

Forest Supervisor
Date:

COLUMBIA RIVER GORGE NATIONAL
SCENIC AREA
USDA FOREST SERVICE

Area Manager
Date:

UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF INDIAN AFFAIRS (Warm Springs)

Superintendent
Date:
CONFEDERATED TRIBES OF WARM SPRINGS

Chief Operations Officer
Date:

UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF INDIAN AFFAIRS (Yakama)

Superintendent
Date:

YAKAMA INDIAN NATION

Chief Operations Officer
Date:

UNITED STATES DEPARTMENT OF INTERIOR
NATIONAL PARK SERVICE
MT. RAINIER NATIONAL PARK

Superintendent
Date:
UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
SPOKANE

District Manager
Date:

UNITED STATES DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
PACIFIC REGION

Geographic Assistant Regional Director, North Coast
Date:

CENTRAL CASCADES WILDLAND FIRE OPERATING PLAN
EXHIBIT A

INTERAGENCY ENGINE OPERATION PLAN

The assigned agency will provide an engine equipped to their standards, as the primary engine. Repairs, break downs, and maintenance that occur during the operational use when performing work under the terms of this operating plan will be borne by the assigned agency.

The cooperators agree to have shared work projects on each agency's protection. Length and duration will be negotiated and agreed to by the agency representatives.

The cooperators agree to participate in joint training on a weekly basis. Day of week and location will be agreed to and scheduled by agency representatives.

Response areas will be reviewed on an annual basis and identified in the local operating plan. Response areas will be reviewed by each agency's Fire Management Officer.

Clear and routine communication between the cooperators dispatch centers will occur on a daily basis regarding resource status, and general fire situation. Once an interagency resource is committed to an incident, notification will be made to the other dispatch center(s).

Engine #	Engine Provided By	Engine Size	Leader Provided By	FF #1 Provided By	FF#2 Provided By	Engine Location	Agency Representative
E-263	SWS	650 g T-5	DNR	DNR	CGF	Ft. Rains	Evans/Kennedy
E-47	ODF	500 g T-5	ODF	ODF	CGF	The Dalles	Jacobs/Kennedy
E-45	ODF	200 g T-4	ODF	ODF	MHF	Rock Creek	Gard/Jacobs
E-621	SES	300 g T-6	DNR	DNR	CGF	Husum	Lawson/Kennedy
E-302	GPF	300 g T-6	GPF	GPF	DNR	Wind River	Lawson/Bouchard
E-622	SES	650 g T-5	DNR	DNR	GPF	Husum	Lawson/Bouchard
E-761	CES	650 g T-5	DNR	GPF	GPF	Morton	Hutchins/Myers
E-262	SWS	650 g T-5	DNR	DNR	GPF	Battle Grnd.	Evans/Walker

CENTRAL CASCADES WILDLAND FIRE OPERATING PLAN
EXHIBIT B

BILLING LOCATIONS

Gifford Pinchot National Forest
Resources
10600 NE 51st Circle
Vancouver, WA 98682
Attn: Fire Billings

Mt. Hood National Forest
16400 Champion Way
Sandy, OR 97055
Attn: Financial Manager

Columbia River Gorge National Scenic Area
902 Wasco Ave. #200
Hood River, OR 97031
Attn: Financial Manager

National Park Service
Seattle Support Office
909 First Avenue
Seattle, WA 98104-1060
Attn: Contracting Division

Oregon Department of Forestry
The Dalles Unit
3701 W. 13th St.
The Dalles, OR 97058
Attn: Office Manager

Oregon Department of Forestry
Clackamas-Marion District
14995 S. Highway 211
Molalla, OR 97038
Attn: Office Manager

Washington Department of Natural Resources
Southeast Region
713E Bowers Rd
Ellensburg, WA 98926
Attn: Financial Manager

Washington Department of Natural Resources
Southwest Region
P.O. Box 280
Castle Rock, WA 98632
Attn: Fire Operations Coordinator

Washington Dept. of Natural Resources
Central Region
1405 Rush Rd.
Chehalis, WA 98532
Attn: Financial Manager

Bureau of Land Management
Spokane District
1103 North Fancher
Spokane, WA 99212
Attn: FMO

Bureau of Indian Affairs
Warm Springs
P.O. Box 1239
Warm Springs, OR 97761
Attn: FMO

Bureau of Indian Affairs
Yakama
P.O.Box 151
Toppenish,WA 98948
Attn: FMO

CENTRAL CASCADES WILDLAND FIRE OPERATING PLAN
EXHIBIT C

DISPATCH BLOCK B, Klickitat Unit WDNR/SE

CENTRAL CASCADES WILDLAND FIRE OPERATION PLAN
EXHIBIT D

BURNING PERMITS
2000

The GPF will issue burning permits for less than 100 tons on private lands under DNR jurisdiction east of State Highway 133 (Forest Rd. 25) and on private lands intermixed with national forest lands in the Cispus area. This area is bordered on the north, south and east by national forest lands.

The GPF will instruct permittees to mail in fees with the permit in the provided envelopes The GPF will not collect fees.

The GPF will maintain a DNR Warden bum permit log and send a copy to DNR Central Region monthly.

The GPF will issue a Bill of Collection for reimbursement of service rendered to DNR Central Region The annual cost is estimated to be $70.00 per permit based on 2.5 hours of labor, an average of 18 miles of travel, and a Forest Service overhead rate of 30% per permit. The bill will be issued at the end of the federal fiscal year (Sept. 30).

The CES will provide Ranger Commission training for designated GPF employees.

The CES will provide bum permit forms, postage, and return envelopes as well as public information explaining the burn permit process.

The CES will validate permits and send copies to the permittee and the Cowlitz Valley Ranger District.

The CES will, upon receiving the Bill of Collection from the Forest Service, reimburse the Forest Service for services rendered.

The CES hereby agrees to defend and hold harmless the USDA Forest Service, its representatives, or its employees from any damage incident to the performance of the work resulting from, related to, or arising from this agreement.

The principle contacts for this attachment are:

USDA Forest Service
Fire Management Officer
Cowlitz Valley Ranger District
Packwood, WA 98361
(360)494-5515

DNR Central Region
Resource Protection District Manager
1405 Rush Rd.
Chehalis, WA 98531
(360) 40-6800

APPENDIX G. WEATHER ANALYSES

The Fireline Handbook PMS-410-1 fire behavior sub-section contains the following pertinent information regarding generally accepted fire behavior interpretations. The following table shows the relationships between flame lengths, fireline intensity and resistance to control.

Flame Length	Fireline Intensity BTU/ft/s	Interpretations
0-4	0-100	Fires can generally be attacked at the head or flanks by persons using hand tools. Handline should hold the fire.
4-8	100-500	Fires are too intense for direct attack on the head by persons using hand tools. Handline is not effective. Dozers, engines, and retardant can be effective.
8-11	500-1000	Fires may present serious control problems such as; torching, crowning, and spotting. Control efforts at the head will probably be ineffective.
11+	1000+	Crowning, spotting, and major runs are common. Control efforts at the head of the fire are ineffective.

Fuel Model 3 with 0% Slope where ROS = rate of spread (chains/hr) and FL = flame length (ft) and where Fuel Model 3 represents the most extreme fire behavior found on the Refuge. This table illustrates the rapid changes wind has on a grass fuel model, which best represents dried canary grass.

1hr fuel moisture (%)	wind speed 0 mph	wind speed 2 mph	wind speed 4 mph	wind speed 6 mph	wind speed 8 mph	wind speed 10 mph	wind speed 12 mph
Rate of Spread (ch/hr)							

3	6	52	121	201	290	387	490
6	5	39	89	148	214	286	361
9	4	32	73	122	176	234	296
				Flame Length (ft)			
3	3.8	10.1	14.8	18.7	22.2	25.3	28.2
6	3.0	8.0	11.8	14.9	17.7	20.2	22.5

9	2.6	7.0	10.3	13.0	15.4	17.6	19.6

This table serves as a basic fire behavior safety checklist regarding relative humidity, fuel moisture in the 1 and 10 hour size classes and the resulting expected fire behavior.

Relative Humidity %	**Fuel Moisture 1hr**	**Fuel Moisture 10 hr**	**Relative ease of ignition, spotting & burning conditions**
>60	>20	>15	little ignition, some spotting w/high winds
45-60	15-19	12-15	“low” ignition hazards, brands cause ignition when RH <50%

30-45	11-14	10-12	medium ignition hazard, “easy” burning conditions
26-40	8-10	8-9	high ignition hazards, occasional crowning, “moderate” burning conditions
15-30	5-7	5-7	Quick ignition, rapid buildup, extensive crowning, long distance spotting, “dangerous” burning conditions.
<15	<5	<5	Aggressive burning, spot fires rapidly ignite, extreme fire behavior, “critical” burning conditions

Figures 4-10 represent the weather parameters found at the Glenwood weather station located approximately two miles from the Refuge at the same elevation. The readings were taken manually

daily from April through October for the years 1991-2001 for timber fuel model 8.

Figure 4. Burning Index BEHAVE run from Glenwood, WA weather station data, 1991-2001.

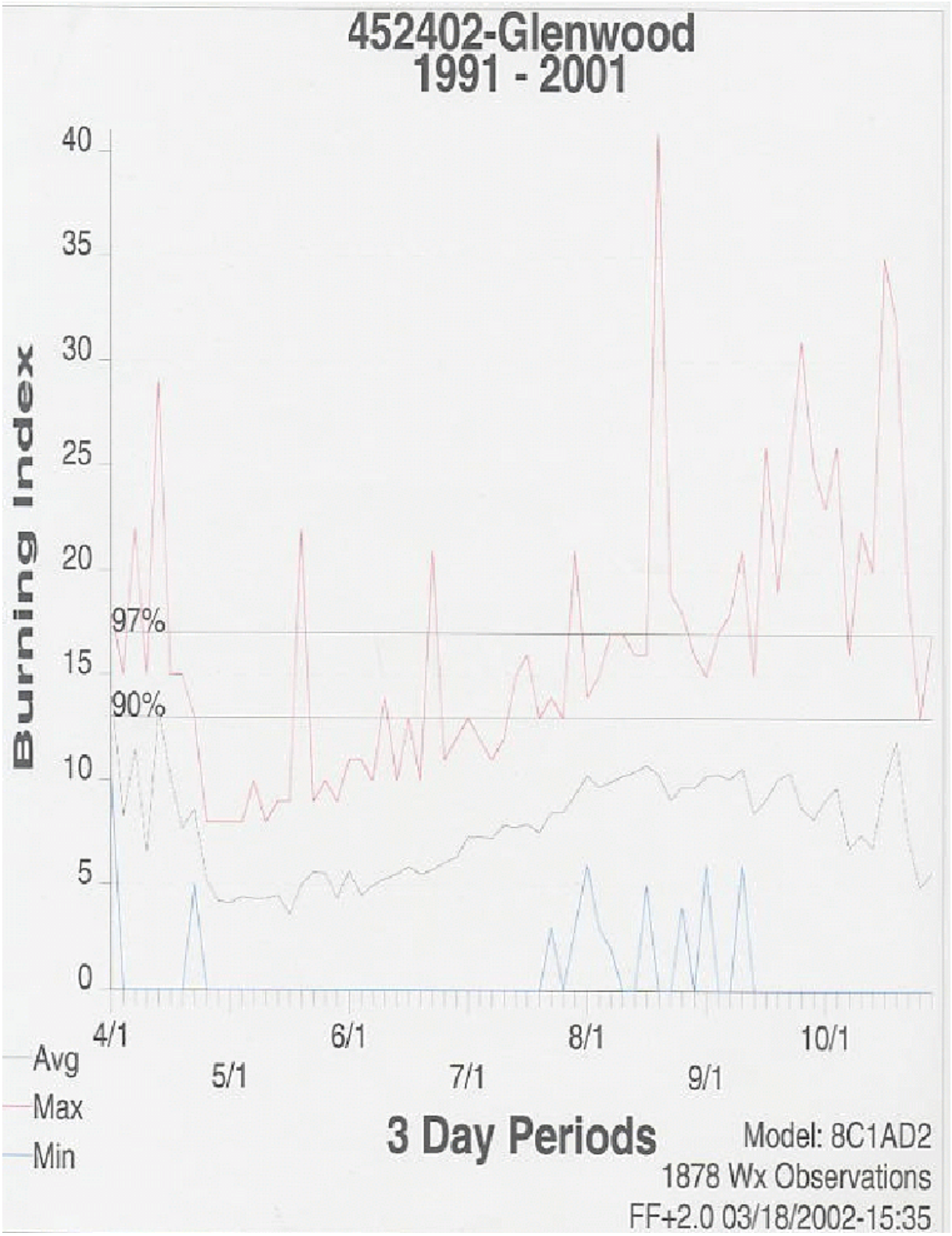


Figure 5. Energy Release Component BEHAVE run from Glenwood, WA weather station data, 1991-2001.

Figure 6. 10-hour Fuel Moisture BEHAVE run from Glenwood WA, weather station data, 1991-2001

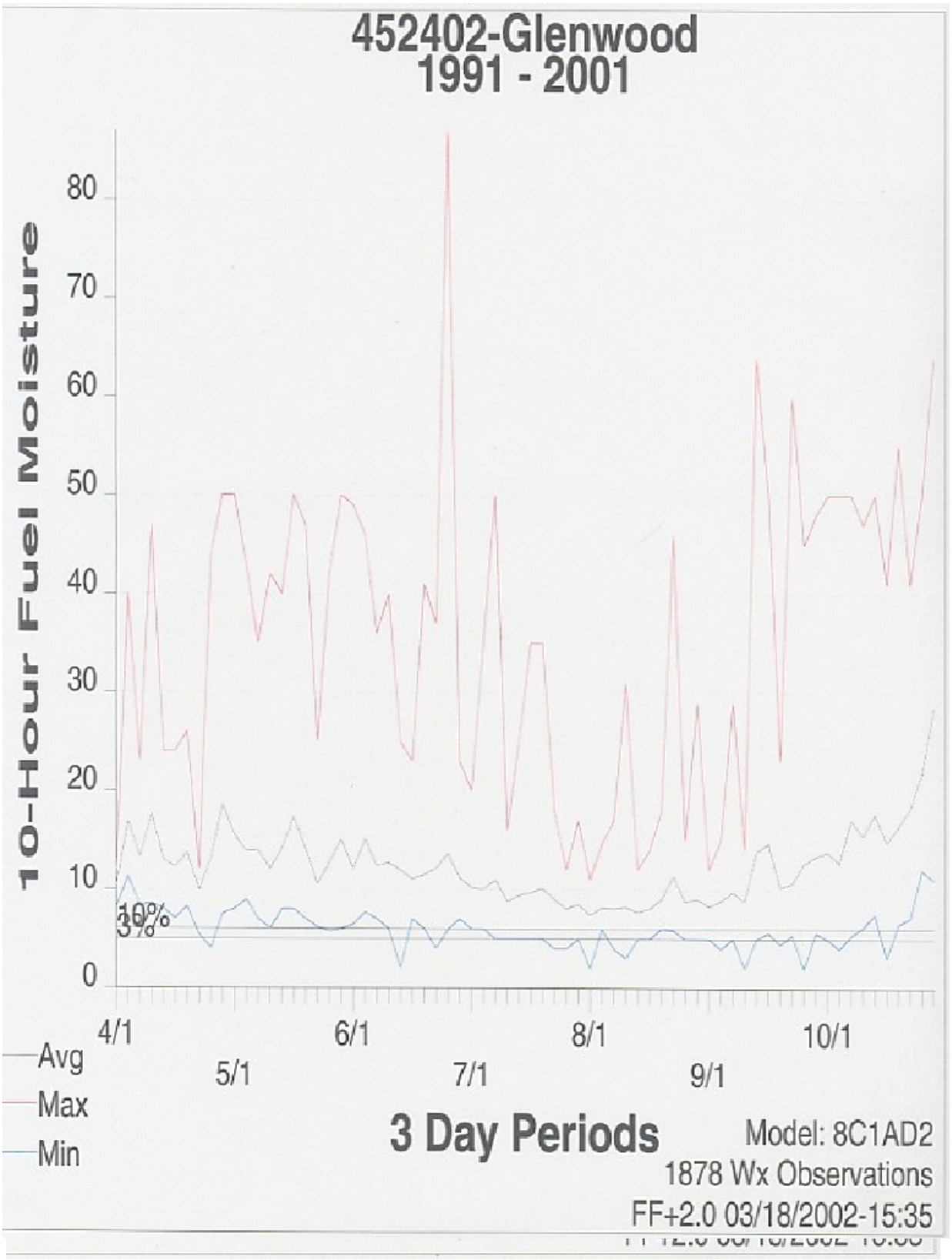


Figure 7. 100-hour Fuel Moisture BEHAVE run from Glenwood WA, weather station data, 1991-2001

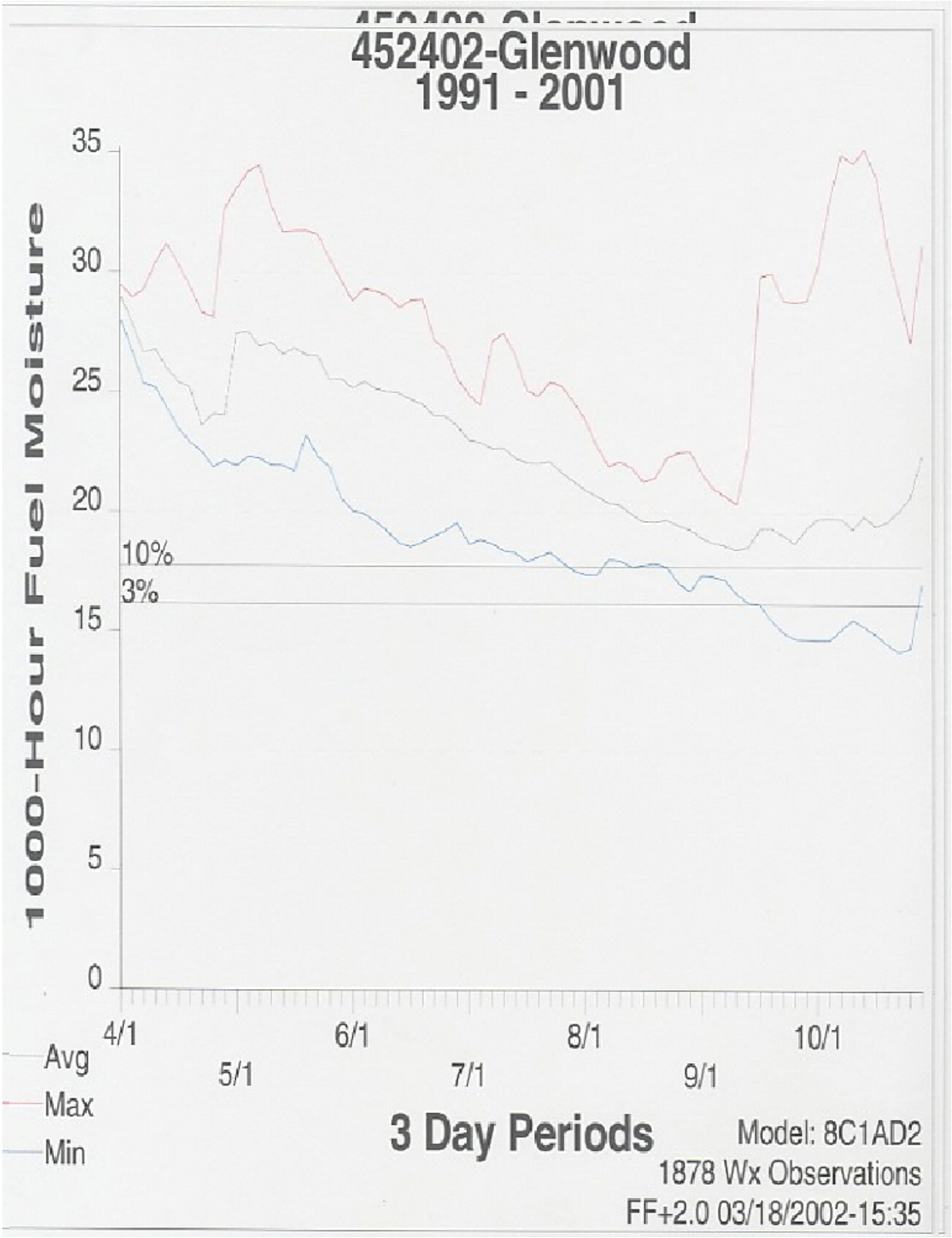
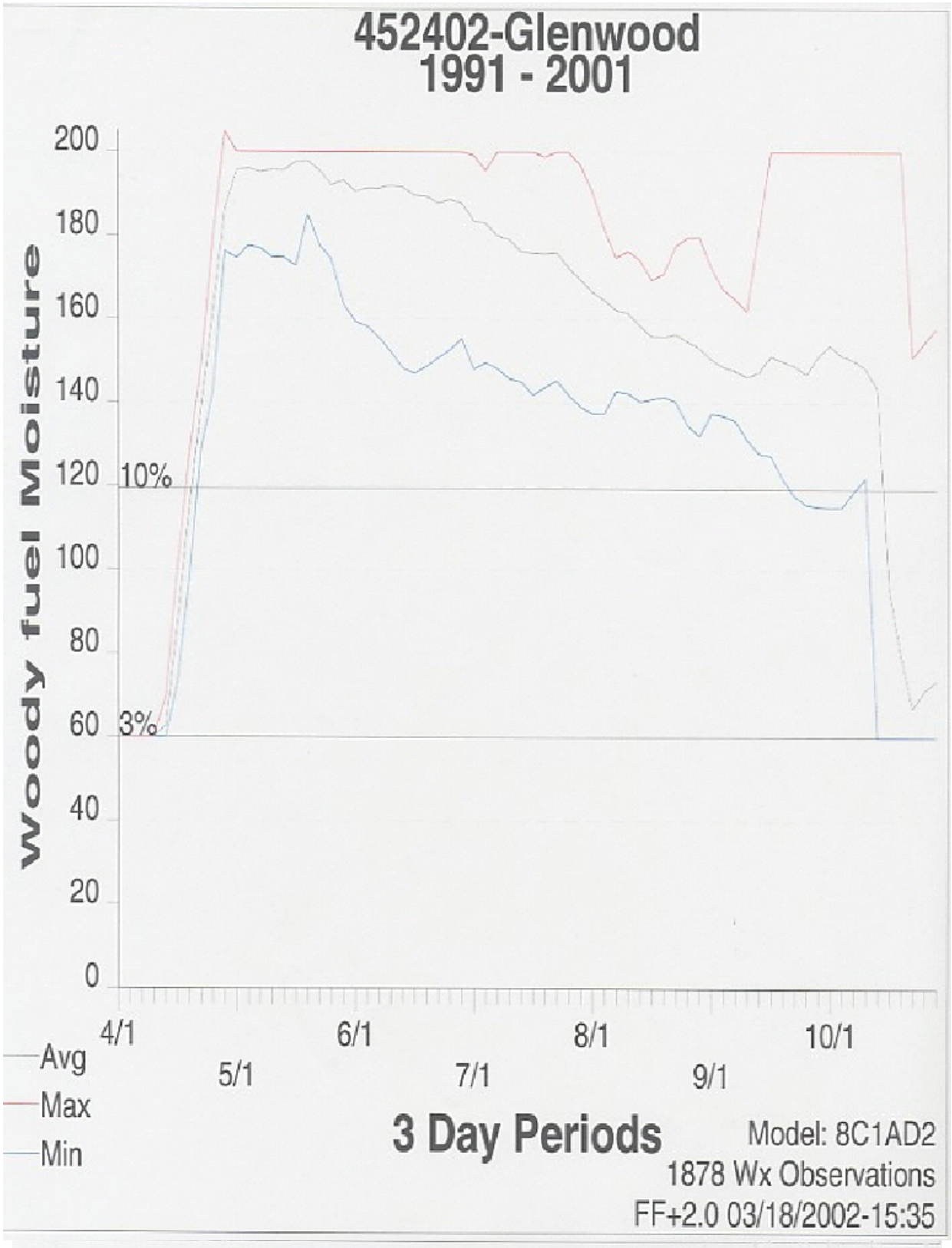


Figure 8. 1000-hour Fuel Moisture BEHAVE run from Glenwood WA, weather station data, 1991-2001.

Figure 9. Herbaceous Fuel Moisture BEHAVE run from Glenwood WA, weather station data, 1991-



2001

Figure 10. Woody Fuel Moisture BEHAVE run from Glenwood WA, weather station data, 1991-2001

APPENDIX H: CONBOY LAKE NWR FIRE DISPATCH PLAN

Fire Dispatch Plan 2002
Conboy Lake NWR

1. Fire Size-Up: use the following or the card, pocket guide, fireline handbook or red book guides.
   - Reporting party and time discovered
   - Location of smoke or fire: (plot on map if possible) legal and lat/long if possible
   - Fire Behavior: (1) Smoldering (2) Creeping (3) Running (4) Crowning (5) Spotting
   - Estimated size: (1) Spot (2) 1/4-1/2 (3) 1/2-3/4 (4) 1 acre (5) 1-5 acres (6) 5 plus acres
   - Weather:
   - Wind: midflame speed & direction
   - Dry Bulb:
   - RH:
   - Fuel Type: (1) Grass (2) Brush (3) Timber (4) Slash
   - Adjacent Fuels: same as above
   - Aspect:
   - % slope:
   - resources needed:
   - special considerations:

2. Notification: see Appendix I for attached for full contact list

Rico George - Zone Fire Specialist	Home:	509 538-2672
	Work:	503 231-6170
	Cell:	503 703-5949
Harold Cole - Refuge Manager	Work:	509 364-3410
Rebecca Young - Deputy Project Leader	Work:	360 887-4106
Tom Melanson - Complex Project Leader	Work:	360 887-4106
Joe Engler - Resource Advisor Ridgefield NWRC	Work:	360 887-4106
	Cell:	360 609-0326
CWICC (spot weather forecast)		509 663-8575
GPNF-		360 896-FIRE, 360 891-5140
Klickitat Co Sheriff		509 773-4547
Glenwood Fire Dept. Klickitat Co. #8		509 364-3481

Contact one of the following Regional Fire Duty Officers

Pam Ensley - USFWS R1 Fire Management Coordinator	Work:	503 231-6170
	Cell:	503 731-7978
Andy Anderson - USFWS R1 Fire Management Officer	Work:	503 231-6170
	Cell:	503 805-1312
Roddy Bauman - USFWS R1 Prescribed Fire Specialist	Work:	503 231-6170
	Cell:	503 784-8348
Bruce Babb - USFWS R1 Fire Specialist	Work:	503 231-6234

Established Suppression Guidelines for the Refuge:

Table 7. Suppression guidelines for use of certain tactics within the Forest and Meadow Fire Management Units.

Suppression Tactic	**Forest** Fire Management Unit	**Meadow** Fire Management Unit
Foam	IC Discretion	If Life/Property Threatened Or Based on ERC and Staffing Levels
Retardant	IC Discretion	If Life/Property Threatened Or Based on ERC's and Staffing Levels
Dozer Line	IC Discretion with Resource Advisor Consultation	If Life/Property Threatened Or with Resource Advisor Concurrence

Handline	IC Discretion	Wetline whenever possible
Off -road travel	IC Discretion	IC w/ Resource Advisor Direction
Bucket Drops	Approved/utilize designated dips	Approved/utilize designated dips
Use of Hoselays	Approved	Approved
Burn Out From Control Points	Group Leader Direction w/IC	Group Leader Direction w/IC

A full suppression strategy is the selected method for this Refuge due to the proximity of private lands, town, a Class 1 Area and the relatively small size of the Refuge itself. The maps found within the Fire Management Plan and in the Fire Dispatch Plan delineate the FMU boundaries, control points, access roads, dikes, canals and structures. 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 inhabited Refuge or private structures, which are threatened, the second priority will go to 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 CWICC, even those being supplied by the GPNF. 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 county roads and the safety of the public as well as to emergency personnel is paramount.

The fuels on the Refuge range from very flashy grass to lodgepole thickets. Firefighters should be constantly aware that wind will have a major influence on the grass fuels and that a substantial run can take place even over standing water. There are numerous wet areas that could cause an engine to rollover or be caught by the approaching fire front. Utilize the Resource Advisor and Refuge Manager whenever possible before making tactical decisions.

Remember that as stated in FWS/RF95-00209 from September21, 1995 from the Director of the U.S. Fish and Wildlife Service that 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."

Records taken from the 1991-2001 time period at Glenwood, Wa. weather station #452402, were used to perform BEHAVE runs using variables representing the median, 90th percentile and 97th percentile weather during mid-August at the Refuge. The slope factor used was 5% to allow for terrain variation at the Refuge. The first chart displays the inputs from the three percentile levels while the later chart displays the outputs for each fuel model in rate of spread in chains per hour, fireline intensity in BTU's per foot per second, and in flame lengths**.** The weather data also shows that in August 3H days are the norm with some 4 days usually present during a given season.

Table 8. BEHAVE inputs for the median, 90th, and 97th percentile weather at Conboy Lake NWR.

Percentile	10-hr Fuel Moisture (%)	100-hr Fuel Moisture (%)	Live Herbaceous Fuel Moisture (%)	Live Woody Fuel Moisture (%)	Midflame Windspeed (mph)
Median	12	18	225	200	6
90th %	7	16	200	150	6
97th %	5	14	100	125	6

Outputs for the varying fuel models using the inputs from above are shown in the Table 9.

Table 9. BEHAVE outputs by fuel model and weather percentile for Conboy Lake NWR. Using 6 mph winds.

Fuel Model	Rate Of Spread (ch/hr)			Fireline Intensity (BTU/ft/s)			Flame Length (ft)		
	Med	*90th*	*97th*	*Med*	*90th*	*97th*	*Med*	*90th*	*97th*
1	65	142	171	70	241	323	3.2	5.6	6.4
2	28	38	59	209	326	594	5.3	6.4	8.5
3	110	162	201	1403	2322	3311	12.6	16	18.7
8	2	3	3	6	10	14	1	1.3	1.5
9	9	13	16	55	91	129	2.8	3.6	4.2
10	6	8	13	117	192	330	4	5.1	6.5

For the grass fuel model 3 which is the most flammable on the Refuge, Table 10 shows the relative differences in ERC and BI to be expected at the height of the fire season during mid-August:

Table 10. Fuel Model 3 Energy Release Component (ERC) and Burning Index (BI) values for mid-August from 1991-2001 BEHAVE runs.

Percentile	Energy Release Component	Burning Index
Median = Staffing Level 3High	**60**	**130**
90th = Staffing Level 4	**67**	**160**
97th = Staffing Level 5	**70**	**190**

These comparisons show that although the median ERC and BI at Conboy Lake NWR for the driest part of the fire season fall below the 90th %, the median readings do fall within the 80% range and can pose problems for firefighters especially if wind driven.

1. E-301 Type 6X 300 gal. with foam; Duty Station Mt. Adams R.D. Trout Lake, WA.

< Engine Leader + Assistant and 1 crewmember staffed 7 days.

< Engine cell # (541) 490-4693

2. E-302 Type 6X 340 gal.with foam; SW DNR CO-OP, Duty Sta. Wind River RD.

< Engine Leader + Asst. and 1 DNR employee, staffed 5 days.

< Engine cell # (541) 490-4694 (509) 395-3450

3. E-303 Type 6X 320 gal. with foam: Duty Sta. Mt. Adams R.D. Trout Lake, WA.

< Engine Leader + Hazardous fuel crew. staffed 5 days.

< Engine cell # (541) 490-4695

4. P-304 Type 6X 200 gal. with foam; Duty Sta. Mt. Adams R.D.Trout Lake, WA.

< Engine Leader + 2 crew members; staffed 7 days.

< Engine cell #

5. P-305 Type 7X 80 gal. Duty Sta. Wind River R.D. Hemlock, WA.

< Staffed 5 days.

Response Times

Mt. Adams R.D. To:			Wind River R.D. To:
30 min.		Glenwood, WA	70 min.
75 min.		Goldendale, WA	90 min.
50 min.		Dallesport, WA	60 min.
25 min.		White Salmon, WA	25 min.
45 min.		Home Valley, WA	20 min.

55 min.		Stevenson, WA	25 min.
35 min.		Hood River, OR	35 min.
75 min.		Dufur, OR	75 min.
60 min.		Parkdale, OR	75 min.

Phone List

Gifford Pinchot N. F. Headquarters Dispatch:	(360)891-5140 24hr.-360-896-FIRE
Mt. Adams R. D. Front Desk	(509) 395-3400
Wind River Work Center Front Desk	(509) 427-3200
Mt. Adams Dispatch	(509) 395-3457
Gail Bouchard-AFMO	(509) 395-3360 Cell: (541) 490-2534
Gerry Harding-Engine Leader/Wind River	(509) 395-3436
Pete Nelson-Engine Leader/Trout Lake	(509) 395-3450
Greg Page-Prevention Tech./Trout Lake	(509) 395-3452 Cell: (541) 490-2986

Other Mt. Adams Positions 2002 - contact through CWICC to GPF dispatch:

Bob Gavenas - DIVS, SITL (T)
Dave Allaway - DIVS, SOFR2 (T)
Roger Lembrick - DIVS, SOFR2 (T)
Richard Morgan - DIVS, SOFR2, LSC2,
Lawnie Morgan - FSC2
Betty Transtrom - PTRC
Laura Backlund - FACL, PTRC
Eric Plimmer - WHSP, BCMG,
Jon Nakae - FOBS

Ed Bridgeman - ORDM, RCDM, SUPL (T)
Dave Duron - ORDM, RCDM, SUPL (T)
Shildes Kellum - ORDM, RADO
Dan Farhni - SECM
Cheryl Mack - TESP (Archaeologist)
Joseph Esteves - HRSP
Bruce Holman - DOZB
Winston Rall - FELB, STAM
Bob Gross - SEC2
James Umtuch - DPRO

APPENDIX I: CONTACT LIST

Table 8. Contact List for Conboy Lake NWR, neighboring agencies, and adjacent landowners.

Law Enforcement and Fire		
Klickitat County Sheriff's Office	Goldendale, WA.	509 773-4547
Glenwood Fire Dept/Klickitat #8	Glenwood, WA.	509 364-3481
U.S. Fish and Wildlife Service Contacts		
US Fish & Wildlife Service	Ridgefield, WA	360 887-4106
US Fish & Wildlife Service	Portland, OR	503 736-4750 or 503 231-6170
Conboy Lake NWR	Glenwood, WA	509 364-3410
Tom Melanson/Ridgefield NWRC Project Leader	Ridgefield, WA	Work 360 887-4106 Cell 360 609-0326
Rebecca Young/Ridgefield NWRC Deputy Project Leader	Ridgefield, WA	360 887-4106
Harold Cole/Refuge Manager	Glenwood, WA	509 364-3410
Rico George/Zone Fire Specialist Ridgefield NWRC	Stevenson, WA	Work 503 231-6170 Cell 503 703-5949
Brian Gales/Zone Prescribed Fire Specialist, Ridgefield NWRC	Salem, OR	Work 541-757-7236 Cell 541 740-8865
Cooperating Agencies		
Central Washington Interagency Communications Center	Wenatchee, WA	509 663-8575
Gifford Pinchot National Forest	Vancouver, WA	360 896-FIRE or 360 891-5140
Bureau of Indian Affairs	Glenwood, WA	509 364-3327

Washington Department of Natural Resources	Ellensburg, WA	Fire 800 562-6010 Bus 800 527-3305
Yakama Indian Agency	Toppenish, WA	509 865-6537

Hospitals/Emergency Services		
Skyline Hospital	White Salmon, WA	509 493-1000 emergency
Providence Hospital	Hood River, OR	541 387-6325 emergency
Emmanuel Hospital/Burn Center	Portland, OR	503 280-4128 life flight
Yakima Valley Memorial	Yakima, WA	509 575-8100 emergency
St. Elizabeth Medical Center	Yakima, WA	509 575-5060 emergency
Skyline Ambulance	White Salmon, WA	509 493-1101
Skamania County Ambulance	Stevenson, WA	911
Weather Services		
Pendleton Fire Weather	Pendleton, WA.	541-276-4493
Adjacent Landowners/Residents		
Cemetary Road		
Samuelson's via Jim Clemmer	All Glenwood, WA unless noted	509 364-3474
Gary Harter		
C&H Logging		509 364-3420
Hansen Road		
Gwen Gamble		509 364-3567
Troh Lane		
H. W. Byas		509 364-3549
Doug Troh		509 364-3304

Lakeside Road (North to South)		
Bill Valdez		509 364-4166
Ray Hemley		509-364-3556
Dave Holly		509 364-3428
Jack House		509 364-3516
Les Blair		509 364-3319
Gordon Roth		509 364-3454
Cloy Sykes		509 364-3484
Vance Effinger		509 364-3536
Jeff Haley	Seattle, WA	206 232-1798
Stacie Baker		509 364-3582
Chris Krueger		509 364-3386
Glenwood/BZ Road (South from Hansen Road)		
Loraine Durham	Lake Oswego, OR	503 636-3347
Mary Mullens		509 364-3497
Laurie Cross		509 364-3578
Marty Gaddis		509 364-3360
Laurel Road (North from Glenwood/BZ Road)		
Bill Giersch		509 364-3570
Kathleen Ohnemus		509 364-3448
Kreps Lane		
John Jorgenson		509 364-3598

Additional Land Owners		
Campbell Timber Group	Glenwood, WA	509 364-3331
Boise Cascade	Goldendale , WA	509 773-4343
Harry Miller	Glenwood, WA	509 364-3427
Gail Castle	Lyle, WA	509 365-4063
Jerry Bertschi	Lyle, WA	509 365-3054
Don Lyle	Salem, OR	509 370-7089
Kreps Ranch	White Salmon, WA	509 493-2840
Local Support Contacts		
Engine Repair		
Joe's Valley Service	Trout Lake, WA	509 395-2211
Water Tenders		
Champion (Rich Potter) E-364 – 1600 gal. Tender #200 – 3600 gal.	Glenwood, WA	509 364-3331
Bill Valdez Logging – 5000 gal.	Glenwood, WA	509 364-3693
Appleton Tree Farm (Bruce Lewis) – 3600 gal.	Appleton, WA	509 365-3324
Dozers		
Tom Arnold Logging	BZ Corners, WA	509 493-3133
Bill Valdez Logging	Glenwood, WA	509 364-3693
Fred Newman	Carson, WA	509 427-5864
Tom Escene	Home Valley, WA	509 427-8522
Fallers		
Frank Backus – SDS	Bingen, WA	509 493-2155
Mike Flood	White Salmon, WA	509 493-2815
Dave Rosander	Carson, WA	509 427-4661

Groceries		
White Salmon Thriftway	White Salmon, WA	509 493-9494
Trout Lake Grocery	Trout Lake, WA	509 395-2777
BZ Corner Grocery	BZ Corners, WA	509 493-2441
Meals		
KJ's Bear Creek Café	Trout Lake, WA	509 395-2525
Time Out Pizza	Trout Lake, WA	509 395-2767
The Logs	BZ Corners, WA	509 493-1402
Bird Creek Inn	Glenwood, WA	509 364-3636
Shade Tree Inn	Glenwood, WA	509 364-3471
Hardware		
Little Mountain Hardware	Trout Lake, WA	509 395-2773

APPENDIX J: COMMUNICATIONS PLAN

"Gorge Group" of radio frequencies for use on multi-agency incidents as agreed to by parties of the Central Cascades Wildland Fire Operating Plan.

Table 9. Radio frequencies for use on multi-agency incidents.

Channel	Rx Frequency	C Guard	Tx Frequency	C Guard	Comments
1-Command	168.550		168.550		
2-Tac 1	166.150		166.150		
3-Tac2	168.200		168.200		
4-Tac3	159.240		159.240		
5-Tac4	154.280		154.280		
6-Tac5	151.415		151.415		
7-Air to Ground	168.650		168.650		
8-Air to Ground	151.310		151.310		
9-Air to Ground	159.270		159.270		
10-GP-Mt. Defiance	172.325	192.8	168.750	192.8	
11-DNR-D	159.450	141.3	159.450	141.3	
12-DNR-A	159.375	103.5	159.375	103.5	
13-ODF Stacker	151.220	151.4	151.490	151.4	
14-FS Flag Pt.	169.925	103.5	168.675	103.5	

APPENDIX K: SUPPRESSION MAPS

Figure 11. Suppression access routes (Map 1).

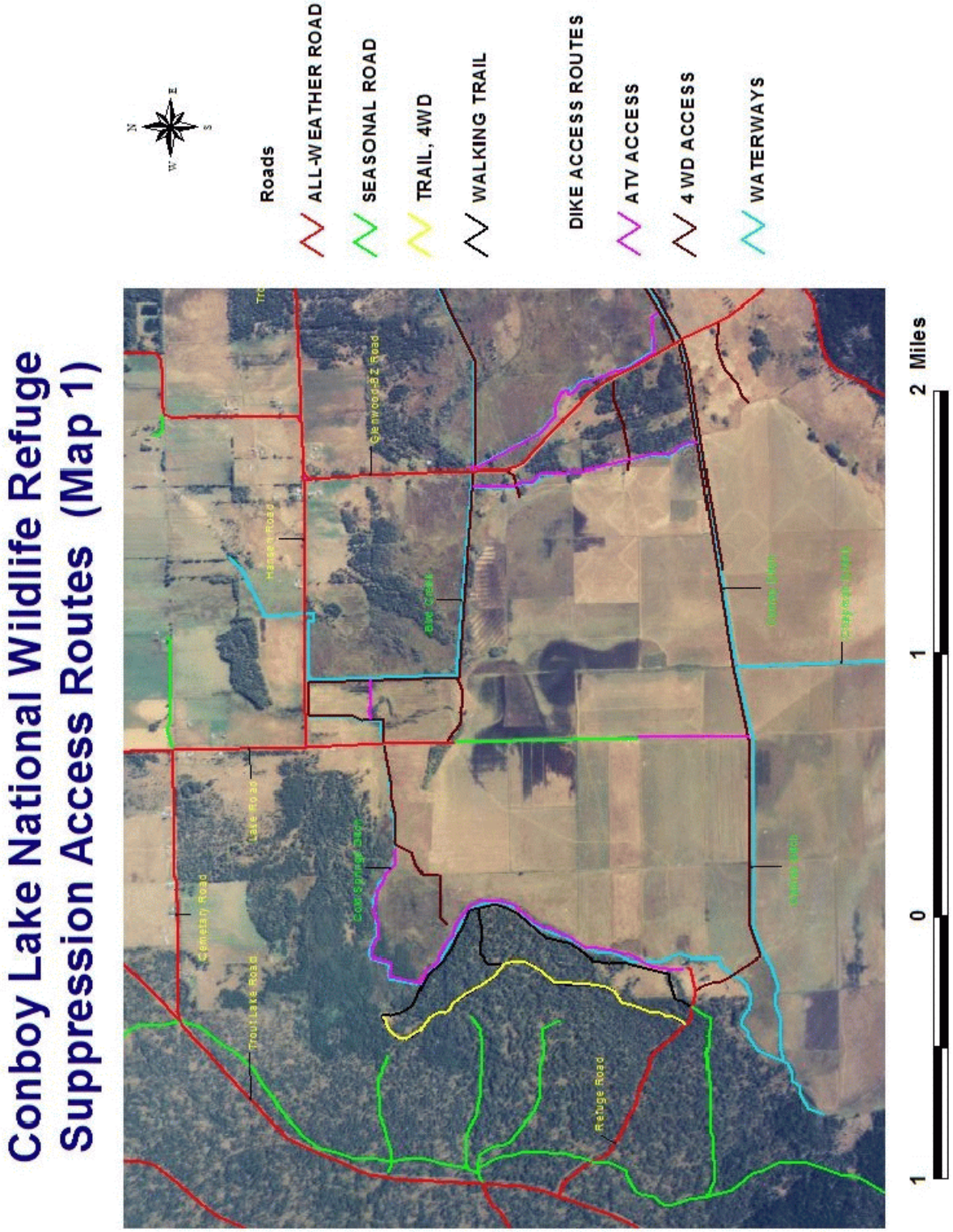
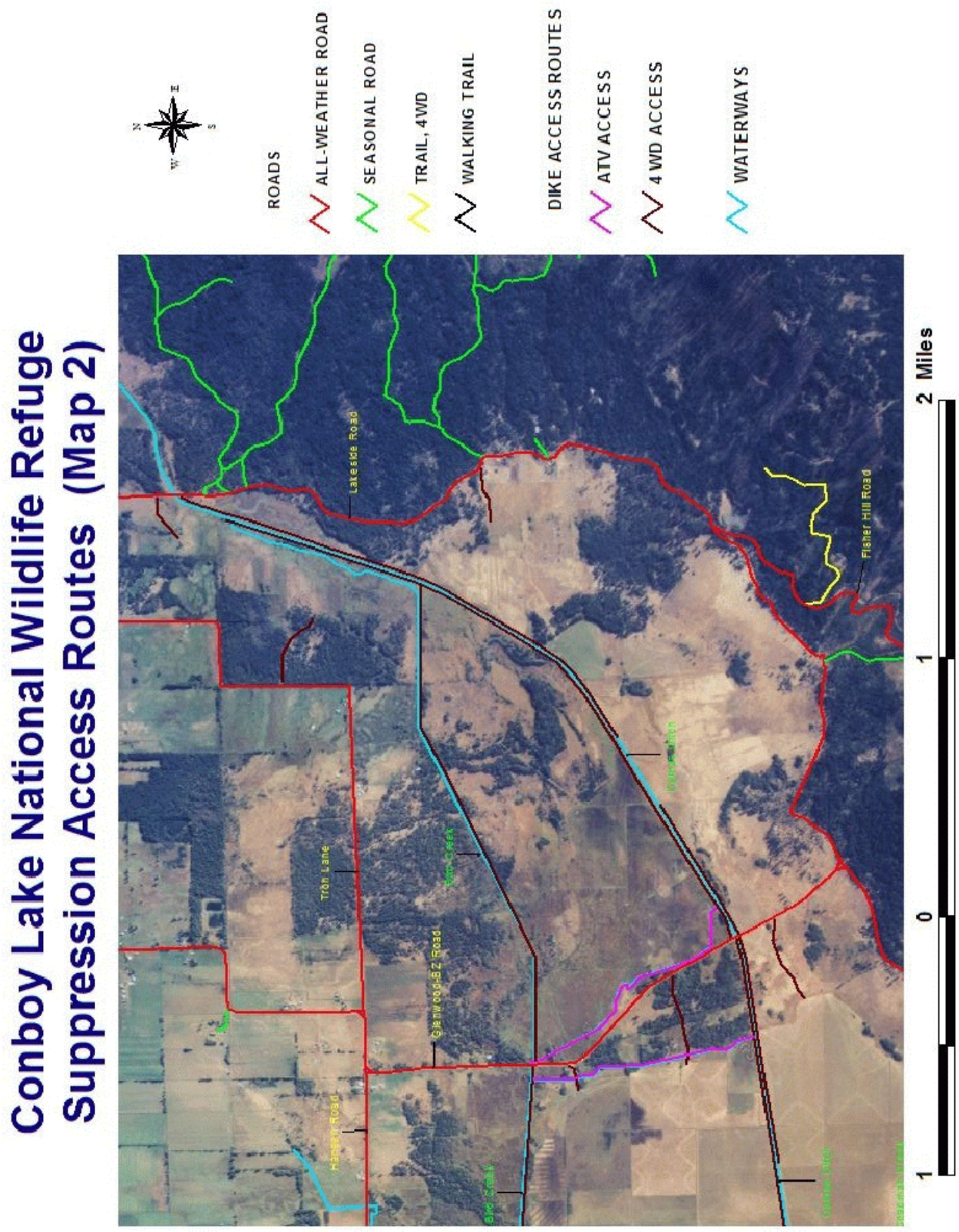
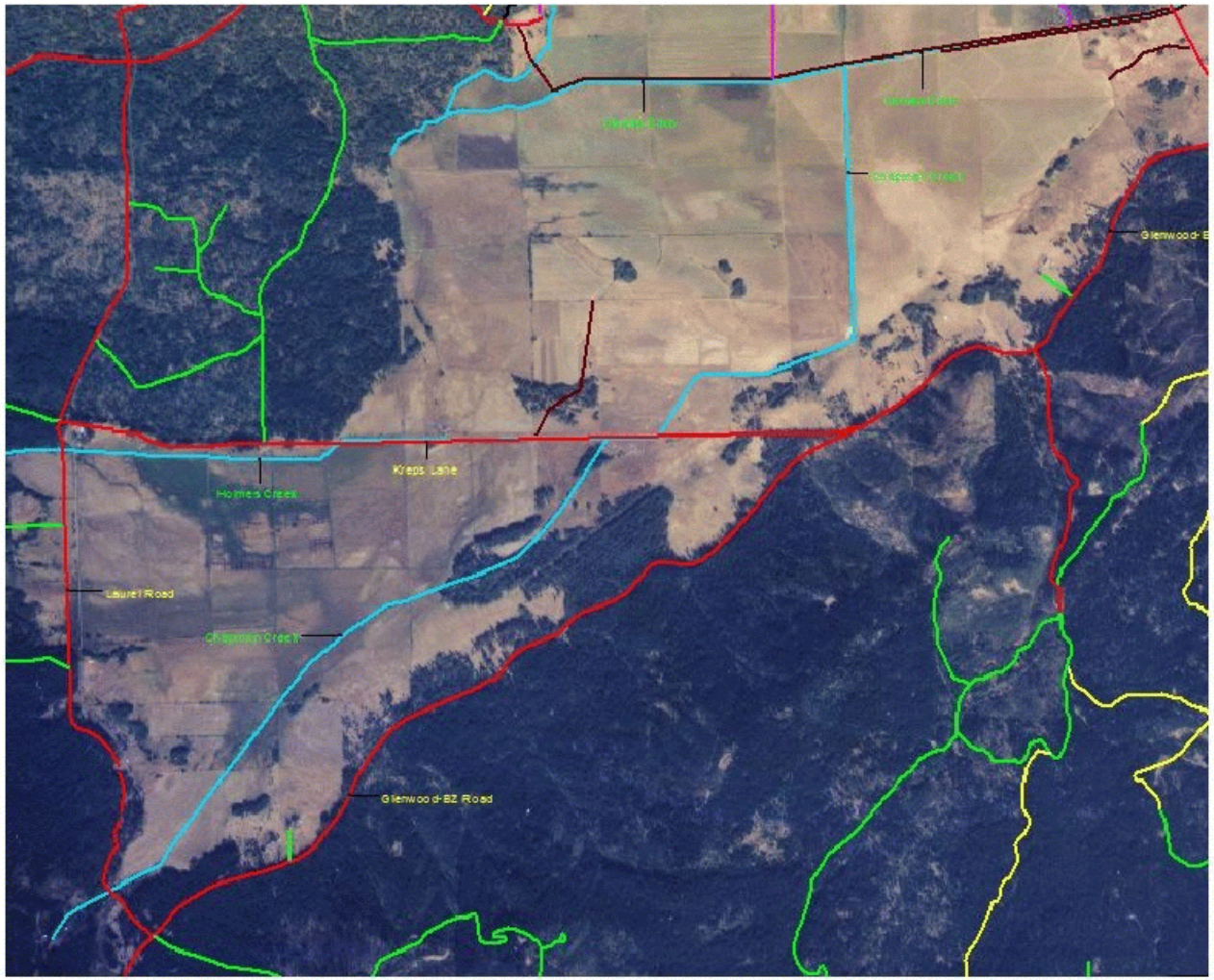


Figure 12. Suppression access routes (Map 2).



Conboy Lake National Wildlife Refuge
Suppression Access Routes (Map 3)



N
W E
S

ROADS

ALL-WEATHER ROAD

SEASONAL ROAD

TRAIL, 4WD

WALKING TRAIL

DIKE ACCESS ROUTES

ATV ACCESS

4WD ACCESS

WATERWAYS

1 0 1 2 3 Miles

Figure 13. Suppression access routes (Map 3).

APPENDIX L: STEP-UP PLAN

Table 10. Step-up staffing plan for Conboy National Wildlife Refuge

Resources	FIL 1 (ERC/0-8 in FM G-timber)	FIL 2 (ERC/9-16 FM G-timber)	FIL 3 (ERC/7 & > FM G-timber)	Remarks
	Staffing Level/AC 1-2	Staffing Level/AC 3L-3-H	Staffing Level/AC 4&5	
Engines	2	3	4	
Type 4 IC	X	X	X	

Fire Investigator	X	X	X	
Overhead		2	4	
Water Tenders		1	2	
Dozers		1	2	
Type 2 Helicopter		1	2	
Time/Check-in		1	1	

Staging Area Manager		1	1	
Safety Officer		1	1	
Resource Advisor	contact	X	X	
Consider Additional Resources Under FIL 2 & 3.			**Coordination through CWICC & GPF w/FWS**	
Additional Overhead		2	4	KCSO
Handcrews		1	1-2	Glenwood Fire

Engines		2	3	BIA Dispatch
Tenders		2	4	Refuge Manager
Air Attack		X	X	Ridgefield NWRC
Air Tankers		X	X	Zone Fire Spec.
Type 3 Team		X	X	Regional FMO

APPENDIX M: SAFETY GUIDELINES

TEN STANDARD FIRE ORDERS

THE FIRE

Know what the FIRE is doing at all times
Base all action on current and expected FIRE BEHAVIOR
Keep informed on FIRE WEATHER conditions and forecasts

FIRELINE SAFETY

Have ESCAPE ROUTES & SAFETY ZONES and make them known
Post a LOOKOUT when there is a possible danger
Be ALERT, keep CALM, THINK clearly, and ACT decisively

ORGANIZATIONAL CONTROL

Give clear INSTRUCTIONS and make sure they are UNDERSTOOD
Maintain COMMUNICATION with your CREW, BOSS, & ADJOINING FORCES
Maintain CONTROL of your CREW at all times

ENGAGE

Fight fire aggressively but provide for SAFETY first

SAFETY BRIEFING

INCIDENT ORGANIZATION
The IC, and their organization.

SAFETY INFORMATION
LCES: Where are the Lookouts.
Communications – command, tactical, air-to-ground.
Where are the Escape Routes & Safety Zones.
Area Hazards
Medical Plan – any EMT's

OBJECTIVES & OPERATIONAL PLAN
The plan (IAP), and the anchor point.

WEATHER
Temperature, RH, Wind speed & Direction
Forecast, Warnings, Local influences.
Take readings often.
Need for a SPOT WEATHER FORECAST?

FIRE BEHAVIOR / DANGER
The current conditions and expected fire behavior.
Rate of spread and Flame length.

FUELS
Flashy, heavy loading, dry fuel moistures,
dense canopy, snags present, state of health.

TOPOGRAPHY
Steep slopes, steep draws, chimneys, saddles.

DOWNHILL / INDIRECT ATTACK
Discuss all elements of the Downhill / Indirect
Fireline Construction Guidelines to assure
the operation is understood and safe.

AVIATION SAFETY
Work spacing, Communications, Target, Effective Use.

APPENDIX N: NORMAL UNIT STRENGTH (NUS)/ EQUIPMENT INVENTORY

There is no assigned fire equipment cache located on the Conboy Lake NWR. Initial attack equipment will come from a variety of locations with the closest fully operational cache located at the Mt. Adams Ranger District compound in Trout lake, WA. Attached is the Mt. Adams Fire Cache inventory list as well as the inventory for a Type 6X engine. Mt. Adams Has another fire cache located approximately 70 minutes one way from the Refuge in Carson, WA. Mt. Adams has 4 engines and prevention modules that meet Type 6X configuration. Equipment will also be available from the DNR Work Centers in Husum and Goldendale as well as from the DNR engines arriving on scene. The BIA office located in Glenwood has some fire equipment on site as well as the unstaffed Type 6X engine.

Type 6 Engine Inventory – Mt. Adams District, Gifford Pinchot National Forest

General Supplies

Winch Remote
Whisk Broom
Bungee Cords
Tool Kit
Fence Pliers
Flat File
Grease Gun
Thin Wall Socket
Hammer
Crescent Wrench
Funnel
Rags
Extra PPE (2 shirts, 2 pants, 2 headlamps, hard hat 5 gloves, chin straps, ear plugs, 2 goggles, small first aid kit, fire shelter)
Case of MREs
Four 1-gallon Canteens
Tarp
Case of Fusees
Extra E1000 Pump Grease
Sign Hanging Material (stapler, staples, screwdriver, pliers)
Tape Measure
Weather Kit
216 AA Batteries
TP
14 Light Sticks
Rubber Bands
2 Cans Beebop
Insect Repellent
Parachute Cord
Ear Plugs
24 D Batteries
Duct Tape
Strapping Tape
10 Rolls of Flagging
3 Bladder Bags
Warning Markers
Jeep Spout
4 Sig Bottles
5/8" Oil Plug
Slash Fuel

Tools

2 Combis
2 Reinhards
3 Pulaskis
4 Shovels
2 Falling Axes

Fire Fighting Fittings

6 Spanners
Hose Clamp
Hydrant Wrench
5 - 1" Gated Wyes
1 Cam Lock
4 - 3/4" Wyes
DNR (2-1½" Male, 2-1½" Female, 1-1" Male, 1-1" Female)
1 Check Valve
Increasers (3/4" to 1", 1" to 1½", 1" to 1½" Double Female)
2 - 1" Double Male
2 - 1" Double Female
6 - 1" Reducers
4" to 3" Reducer
3" to 1½" Reducer
2" to 1½" Reducer
2 - NPSH NH
2 - NH NPSH
2 - 1½" Double Male
2 - 1½" Double Female
5 - 1½" Reducers
4 - 1½" Wyes
1½" in-line T w/ shut off and 1" take off
3 - 1" Sierra Nozzles
7 - Forester Nozzles
1 - Trombone Nozzle
1 - 1" Bubble Cap Foam Nozzle
1 - 1½" Bubble Cap Foam Nozzle
1 - Combination Nozzle
4 - Toy Hose Nozzles
3 - Spray Tips
4 - Straight Tips
2 - 3/4" Gated Wyes

Chainsaw Equipment

046 Chainsaw
034 Chainsaw
046 Saw Pack
034 Saw Pack
2 Dolmars

Hose

3/4" Toy Hose – 800'
1" Hose – 1,000' (8 rolls 100', 4 rolls 50'; of this, 250' is Sta-Flo (if available) – two 100' sections, one 50' section)
1½" Hose – 1,000' (8 rolls 100', 4 rolls

Bolt Cutters
2 Mop-up Wands with Barrel Tips
Standpipe Shutoff Handle

Pump Supplies
Reel Remote
BB4 Plugs – 2 Champion RJ19LM
Miscellaneous Pump Bolts
Foam Wand
Pump Gas Additive
Pump Oil Filter
Pump Air Filter
Oil
Hose for Oil Drain BB4 Pump
Collapsible Bucket
Rags
Tarp
Mark III Pump
Mark III Pump Kit
Mark III Gas
Mark III Plugs – 2 Champion L82C
Stihl Pump
Stihl Plugs
Marayuma Pump Plugs – 2 Champion CJ8 or NGK
Assorted Gaskets
Gravity Sock
Stihl 2 Cycle

First Aid Supplies
10-person First Aid Kit
Ivy Block
Technu
Mole Skin
2nd Skin
Mole Foam
Emergency Personal Protection Kit
Burn First Aid Kit

50')

Truck Supplies
Truck Air Filter
Spare Tire
Choker
Jack Block
Rags
Oil
Window Cleaner

APPENDIX O: PRESCRIBED FIRE BURN PLAN

Refuge or Station
Unit

Prepared By:_____ Date:
Prescribed Fire Specialist

Reviewed By:_____ Date:
Refuge Biologist

Reviewed By:_____ Date:
Prescribed Fire Burn Boss

Reviewed By:_____ Date:
Fire Management Officer

Reviewed By:_____Date:
Biological Investigation Unit

Reviewed By:_____ Date:
Refuge Manager

The approved Prescribed Fire Plan constitutes the authority to burn, pending approval of Section 7 Consultations, Environmental Assessments or other required documents. No one has the authority to burn without an approved plan or in a manner not in compliance with the approved plan. Prescribed burning conditions established in the plan are firm limits. Actions taken in compliance with the approved Prescribed Fire Plan will be fully supported, but personnel will be held accountable for actions taken which are not in compliance with the approved plan.

Approved By:_____ Date:
Complex Project Leader

PRESCRIBED FIRE PLAN

Refuge:_____ Refuge Burn Number:

Sub Station:_____ Fire Number:

Name of Area:_____ Unit No.

Acres To Be Burned:_____ Perimeter Of Burn:
Legal Description: Lat._____ Long._____ T__R__S
County & State:

Is a Section 7 Consultation being forwarded to Fish and Wildlife Enhancement for review ? Yes__No___ (check one).

(Page 2 of this PFP should be a refuge base map showing the location of the burn on Fish and Wildlife Service land)

The Prescribed Fire Burn Boss/Specialist must participate in the development of this plan.

I. GENERAL DESCRIPTION OF BURN UNIT

Physical Features and Vegetation Cover Types (Species, height, density, etc.):

Primary Resource Objectives of Unit (Be specific. These are management goals):

1)

2)

3)

Objectives of Fire (Be specific. These are different than management goals):

1)

2)

3)

Acceptable Range of Results (Area burned vs. unburned, scorch height, percent kill of a species, range of litter removed, etc.):

1)

2)

3)

[*Attach Project Map Here*]

[*Attach Project Pre-Burn Photos Here*]

II. PRE-BURN MONITORING

Vegetation Type	Acres	%	FBPS Fuel Model
	Total		

Habitat Conditions (Identify with transect numbers if more than one in burn unit.):

Type of Transects:

Photo Documentation (Add enough spaces here to put a pre-burn photo showing the habitat condition or problem you are using fire to change/correct. A photo along your transect may reflect your transect data.):

Other:

III. PLANNING AND ACTIONS

Complexity Analysis Results: (Attach a completed copy of the Complexity Analysis worksheet to this plan.)

Site preparation (What, when, who & how. Should be done with Burn Boss):

Weather information required (who, what, when, where, how, and how much):

Safety considerations and protection of sensitive features (Adjacent lands, visitors, facilities, terrain, etc., and needed actions. Include buffer and safety zones. Be specific, indicate on a burn unit map. Map should be a USGS quadrangle if possible, so ridges, washes, water, trails, etc. can be identified.)

Special Safety Precautions Needing Attention (Aerial ignition, aircraft, ignition from boat, etc.):

Media Contacts (Radio stations, newspaper, etc., list with telephone numbers):

Special Constraints and Considerations (Should be discussed with Burn Boss):

Communication and Coordination on the Burn (Who will have radios, frequencies to be used, who will coordinate various activities.):

IV. IGNITION, BURNING AND CONTROL

	Planned or Proposed	Actual
Scheduling: Approx. Date(s)		

Time of Day

	Acceptable Range		
FBPS Fuel Model:	Low	High	Actual
Temperature			
Relative Humidity			
Wind Speed (20' forecast)			
Wind Speed (mid-flame)			
Wind Direction			
ENVIRONMENTAL CONDITIONS			
Soil Moisture			
1 hr. Fuel Moisture			
10 hr. FM			
100 hr. FM			
Woody Live Fuel Moisture			
Herb. Live Fuel Moisture			
Litter/Duff Moisture			
FIRE BEHAVIOR			
Type of Fire (H,B,F)	B	H	
Rate of Spread (ch/hour)			
Fireline Intensity			
Flame Length			
Energy Release Component NFDRS Fuel Model __L_____			

Note: Attach BEHAVE Runs as an appendix to the end of this plan.
Cumulative effects of weather and drought on fire behavior:

Ignition Technique (Explain and include on map of burn unit. Use of aerial ignition must be identified in this plan. Last minute changes to use aircraft will not be allowed and will

be considered a major change to the plan. This will require a resubmission):

Prescribed Fire Organization (See Section VII, Crew and Equipment Assignments. All personnel and their assignments must be listed. All personnel must be qualified for the positions they will fill.)

Other (If portions of the burn unit must be burnt under conditions slightly different than stated above, i.e., a different wind direction to keep smoke off of a highway or off of the neighbors wash, detail here.)

Prescription monitoring (Discuss monitoring procedure and frequency to determine if conditions for the burn are within prescription):

V. SMOKE MANAGEMENT

Make any Smoke Management Plan an attachment. Also attach pertinent smoke variances (if any) and all SASEM runs.

Permits required (who, when):

Distance and Direction from Smoke Sensitive Area(s):

Necessary Transport Wind Direction, Speed and Mixing Height (Explain how this information will be obtained and used):

Visibility Hazard(s) (Roads, airports, etc.):

Actions to Reduce Visibility Hazard(s):

Residual Smoke Problems (Measures to reduce problem, i.e., rapid and complete mop-up, mop-up of certain fuels, specific fuel moistures, time of day, etc.):

Particulate emissions in Tons/Acre and how calculated (This should be filled in after the burn so more precise acreage figures can be used):

VI. FUNDING AND PERSONNEL

Activity Code:

Costs

	Equipment & Supplies	Labor	Overtime	Staff Days	Total Cost
Administration (planning, permits, etc.)					
Site Preparation					
Ignition & Control					
Travel/Per Diem					
Total					

VII. BURN-DAY ACTIVITIES

Public/Media Contacts on Burn Day (List with telephone numbers):

Crew & Equipment Assignments (List all personnel, equipment needed, and assignments. The following is not an all inclusive list for what you may need.)

Crew Briefing Points (Communications, hazards, equipment, water sources, escape fire actions, etc. To be done by Burn Boss. Refer to Safety Considerations in Planning Actions and points listed below):

Ignition Technique (Methods, how, where, who, and sequence. Go over what was submitted in Section IV and any changes needed for the present conditions.) Attach ignition sequencing map if necessary:

Personnel Escape Plan:

Special Safety Requirements:

Go-No-Go Checklist:
GO-NO-GO CHECKLIST

_____

Unit

_____ Is burn plan complete and approved?

_____ Are all fire prescriptions specifications met?

_____ Are all smoke management prescriptions met?

_____ Is the current and projected fire weather forecast favorable?

_____ Have all air quality considerations and smoke requirements been met?

_____ Have all required cultural resource protection objectives been met?

_____ Are all personnel required in the prescribed burn plan on-site and are they all qualified for their assigned duties?

_____ Have all personnel been briefed on the prescribed burn plan requirements?

_____ Have all personnel been briefed on safety hazards, escape routes, and safety zones?

_____ Is all required equipment in place and in working order?

_____ Are available (including back-up) resources adequate for containment of escapes under the worse-case conditions?

_____ Are answers to all of the above questions “YES”?

_____ In your opinion, can the burn be carried out according to the plan and will the burn meet planned objectives?

_____ Is there an adequate contingency plan developed and proofed?

All 14 questions have been answered “YES”.

_____ _____
Burn Boss Date

_____ _____
Refuge Manager or Designee Date

Holding and Control:

Critical Control Problems:

Water Refill Points:

Other:

Contingency Plan for Escaped Fire (Are there crews standing by to initial attack or will people doing other jobs be called upon to do initial attack, who must be called in case of an escape, what radio frequencies will be used, etc.)

Mop Up and Patrol:

Rehabilitation Needs:

DI 1202 Submission Date:

Special Problems:

VIII. CRITIQUE OF BURN

Were burn objectives within acceptable range of results? (Refer to Section I):

What would be done differently to obtain results or get better results?

Was there any deviation from plan? If so, why?

Problems and general comments:

IX. POST-BURN MONITORING

Date:_____ Refuge Burn Number:
Length of Time after Burn:
Vegetative Transects:

Comments on Habitat Conditions, etc.:

Photo Documentation:

Other:

X. FOLLOW-UP EVALUATION

Date:_____ Refuge Burn Number:
Length of Time after Burn:

Vegetative Transects:

Comments on Habitat Conditions, etc.:

Photo Documentation:

Other:

DAILY FIRE BEHAVIOR MONITORING SHEET

Refuge:
Project Name:_____ RX Fire Number:
Date of Burn:
Ignition Time: Start:_____ Finish:

Weather Observations During Burn:
Time of Weather Observations

Dry Bulb Temp							
Wet Bulb Temp							
RH							

Wind Speed							
Wind Direction							
Cloud Cover %							

Comments Concerning Weather:

Last Live Fuel Moisture Measurement:

1-Hour Fuel Moisture:

10-Hour Fuel Moisture (from fuel stick):

Haines Index:
Test Fire Results:

Firing Pattern:

Fire Behavior Characteristics (Rate of Spread, Flame Length, Fire Spread Direction, etc.):
Acres Treated:

Smoke Dispersal Narrative (venting height, transport wind speed & direction, visibility, holding problems, problem spots, complaints, etc.):

Burn Severity

Effects to Vegetation Narrative:

Ground Char (%):Unburned_____ Light_____ Moderate_____ Deep

Soil Moisture on Day of Burn:

Were Resource Objectives Met? (If burn was successful, what conditions made it possible, *i.e*: low live fuel moisture, high winds, etc.)

Photos of Fire Area: Preburn Yes_____ No
During Burn Yes_____ No
Postburn Yes_____ No

Daily Burn Cost: Vehicles Used:
Personnel Cost: $
Equipment Cost: $
Fuel Cost: $

Total: $
Cost per Acre: $

Burn Organization:

Burn Boss:

Ignition Specialist:_____ Holding Specialist:
Lighting Crew:_____ Holding Crew:

Burn Evaluation Prepared By:_____ Date:

**Attach pertinent Spot Weather Forecast,WIMS/NFDRS, Smoke Mgt Variance, etc. information for burn day to back of sheet.

APPENDIX P: DELEGATION OF AUTHORITY

DELEGATION OF AUTHORITY

Region 1, U.S. Fish and Wildlife Service

Conboy Lake National Wildlife Refuge

_____, you are assigned as Incident Commander of the _____ Incident, on the Conboy Lake National Wildlife Refuge. You have full authority and responsibility for managing the fire suppression operation on this incident within the framework of legal statute, current policy, broad direction, and the Wildland Fire Situation Analysis (WFSA). Your primary responsibility is to achieve complete control of the fire by organizing and directing the fire suppression organization in an effective, efficient, economical and most importantly, safe manner.

You should be guided in your duties by the fire job descriptions relating to Incident Commander, as found in the Fireline Handbook. Strongly consider long-term ecosystem health, and the effects of suppression actions in the development of appropriate suppression responses. These issues are to be addressed and documented in the WFSA.

You are accountable to the Complex Manager _____ of the Ridgefield National Wildlife Refuge, who is the Line Officer. _____ may serve as the Line Officer Designee for this incident.

You will immediately notify me in person in the event of:
(1) a serious injury or fatality,
(2) threat to private property,
(3) if the incident exceeds the limits of the selected alternative of the WFSA.

Your job as Incident Commander is critical, as you must minimize damage to the habitats, as well as provide for fire fighter and public safety. Minimum environmental suppression tactics shall be used, commensurate with forecasted and threatened resource values. Unless there are immediate threats to life and/or property, you must receive approval from the Complex Manager or Designee to use heavy equipment (dozers, tractors, etc.).

You are to be guided by the Wildland Fire Situation Analysis, approved by _____, Project Leader.

The Resource Advisor assigned to your incident will be _____.

_____ Date: _____
Complex Manager

APPENDIX Q: WILDLAND FIRE SITUATION ANALYSIS

WILDLAND FIRE SITUATION

ANALYSIS

Incident Name:
Jurisdiction:

Date and Time Completed:

Section I, WFSA Information Page

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.

I. Wildland Fire Situation Analysis	
To be completed by the Agency Administrator(s)	
A. Jurisdiction(s)	**B. Geographic Area**
C. Unit(s)	**D. WFSA #**
E. Fire Name	**F. Incident #**
G. Accounting Code:	
H. Date/Time Prepared _____@_____	
I. Attachments	

- Complexity Matrix/Analysis *	_____	
- Risk Assessment/Analysis *	_____	
Probability of Success *	_____	
Consequences of Failure *	_____	
- Maps *	_____	
- Decision Tree **	_____	

- Fire Behavior Projections *	_____	
- Calculations of Resource Requirements *	_____	
- Other (specify) * Required ** Required by FWS	_____	

This page is completed by the Agency Administrator(s).
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.

II. Objectives and Constraints

To be Completed by the Agency Administrator(s)

A. Objectives (Must be specific and measurable)

1. *Safety*

   - Public

   - Firefighter

2. *Economic*

3. *Environmental*

4. *Social*

5. *Other*

B. Constraints

This page is completed by the Fire Manager and/or Incident Commander.

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 park 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.

III. Alternatives (To be completed by FMO / IC)

[redacted]	A	B	C

A. Wildland Fire Strategy			
B. Narrative			
C. Resources needed Handcrews Engines Dozers Airtankers Helicopters			

D. Final Size			
E. Est. Contain/ Control Date			
F. Costs			
G. Risk Assessment - Probability of success - Consequence of failure	_____ _____	_____ _____	_____ _____
H. Complexity			

I.	Attach maps for each alternative

This page is completed by the Agency Administrator(s), FMO and/or Incident Commander.
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.)

IV. Evaluation of Alternatives			
To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander			
A. Evaluation Process	**A**	**B**	**C**
Safety Firefighter Aviation Public			

Sum of Safety Values			
Economic Forage Improvements Recreation Timber Water Wilderness Wildlife Other (specify)			
Sum of Economic Values			
Environmental Air Visual Fuels T & E Species Other (specify)			

Sum of Environmental Values			
Social Employment Public Concern Cultural Other (Specify)			
Sum of Social Values			
Other			

This page is completed by the Agency Administrator(s) and Fire Manager and/or Incident Commander.

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 WFSA is 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.

V. Analysis Summary			
To be Completed by the Agency Administrator(s) and Fire Manager / 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 & Geographic
Preparedness Level

_____

Incident Priority

_____

Resource Availability

_____

Weather Forecast
(long-range)

_____

Fire Behavior Projections

_____

VI.	Decision
The Selected Alternative is: _____	
Rationale:	
_____ Agency Administrator's Signature	_____ Date/Time

This Section is completed by the Agency Administrator(s) or designate.

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 WFSA 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 "WFSA Valid" to continue use of this WFSA. A "no" indicates this WFSA is no longer valid and another WFSA 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 WFSA are met.

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

			PREPAREDNESS LEVEL	INCIDENT PRIORITY	RESOURCE AVAILABILITY	WEATHER FORECAST	FIRE BEHAVIOR PROJECTIONS	WFSA VALID
Date	**Time**	**By**						

If WFSA is no longer valid, a new WFSA will be completed!

VIII. Final Review

The elements of the selected alternative were met on: _____ _____
Date Time

By:_____
(Agency Administrator(s)

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 IN STRATEGY **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 _____

Signature _____

Date _____ **Time** _____