

WILDLAND FIRE MANAGEMENT PLAN
KOOTENAI NATIONAL WILDLIFE REFUGE



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EXECUTIVE SUMMARY

When approved, this document will become the Kootenai National Wildlife Refuge's Fire Management Plan. Major components include:

- updated policy for prescribed fires at Kootenai.
- fire management objectives that comply with objectives described in the Kootenai National Wildlife Refuge Management Plan, Parts I & II.
- updated format and content changes under the direction of Fire Management Handbook .
- development of a Prescribed Fire Program to manage critical habitat and reduce hazardous fuels.
- a program of full suppression of all wildland fires using appropriate management strategies.

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

INTRODUCTION

This plan will establish a fire management objectives and strategies for Kootenai National Wildlife Refuge (NWR). This plan will meet the requirements of the National Environmental Protection Act (NEPA) and the National Historic Preservation Act (NHPA). A Categorical Exclusion for Fire Management activities is in Appendix C. Section 7 consultation was completed as part of the FMP and a may affect, not likely to adversely affect determination was made (Appendix C).

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 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).

Fire management at Kootenai will include the use of prescribed fire and suppression of all wildland fires using appropriate management strategies.

This plan will include cooperative efforts in wildland fire and prescribed fire with the Idaho Panhandle National Forest, Idaho Department of Lands, and other federal, state, and private wildland fire organizations.

COMPLIANCE WITH USFWS POLICY

Kootenai NWR was established August 3, 1964 when the first tract of land was purchased. The refuge was acquired under the Migratory Bird Conservation Act 16 U.S.C. 715-715r for the purpose of "... use as an inviolate sanctuary, or for any other management purpose, for migratory birds."

The Fire Management Plan is an extension of the Kootenai National Wildlife Refuge Management Plan, Parts I & II. It describes in detail fire management programs, activities and methods that will be undertaken by the U.S. Fish and Wildlife Service in meeting the wildland fire suppression objectives and fire management strategies which utilize prescribed fire to attain the habitat management goals established for Kootenai NWR. The plan also assesses the potential environmental effects of the proposed fire management program in relation to refuge resources, the local environment as well as impacts to the public, adjacent landowners and surrounding communities.

The Department Manual, DM 910 (USDI 1997) states the following regarding wildland fires:

"Wildfires 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 wildfires within the Department will be classified either as wildfire or as prescribed fires.

Wildfires, 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 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."

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 Reciprocal Fire Protection Act of May 27, 1955 (42 USC 815a; 69Stat 66) provides Authorities to enter into agreements with other Federal bureaus and agencies; with state, county, and municipal governments; and with private companies, groups, corporations, and individuals regarding fire activities. Authority for interagency agreements is found in "Interagency Agreement between the Bureau of Land Management, Bureau of Indian Affairs, National Park Service, US Fish and Wildlife Service of the United States Department of the Interior and the Forest Service of the United States Department of Agriculture" (1996).

FIRE MANAGEMENT OBJECTIVES

The three major goals of the Kootenai NWR are:

1. to preserve, restore and enhance in their natural ecosystem all species of animals and plants that are endangered or threatened with becoming endangered;
2. to protect, enhance, and restore diverse habitats for migratory birds and other native wildlife species, with special emphasis on waterfowl; and
3. to provide quality, wildlife-oriented educational and recreational opportunities to enhance public appreciation, understanding and enjoyment of fish, wildlife and the environment.

These goals have been broken down into eight operational objectives:

1. provide reproductive and maintenance habitat for naturally occurring species designated as endangered or threatened with extinction or regionally sensitive;
2. meet migratory waterfowl maintenance objectives as defined in the Regional Resource Plan by providing adequate habitat for waterfowl during migration;
3. provide habitat to meet reproduction requirements for key waterfowl species;
4. provide habitat to meet reproduction and maintenance requirements for other migratory birds including key species of water, marsh, shorebirds and raptors;
5. enhance wildlife diversity through habitat management within constraints of other goals;
6. provide on-refuge education opportunities for school groups;
7. provide opportunities for the public to increase their understanding, appreciation and enjoyment of wildlife on the refuge; and
8. provide quality waterfowl hunting opportunity with maximum administrative efficiency.

The objective of fire management in the National Wildlife Refuge System is to protect and enhance habitat and ecosystems for the benefit of fish and wildlife on Service lands. Objectives of the fire management program at Kootenai NWR are to:

1. Protect human life and property both within and adjacent to refuge areas.
2. Utilize prescribed fire to perpetuate, restore, replace or replicate natural processes where appropriate.
3. Employ strategies to suppress all wildland fires which minimize costs and resource damage, consistent with values at risk.
4. Promote an interagency approach to managing fires on an ecosystem basis and manage all wildland fires using the Incident Command System.
5. Develop and implement a process to ensure the collection, analysis and application of high quality fire management information needed for sound management decisions.
6. Prevent unplanned human-caused ignitions and Promote public understanding of fire management programs and objectives.
7. Encourage research to advance understanding of fire behavior, effects, ecology, and management.
8. Integrate fire management with all other aspects of refuge management.

We combined/pared these down to avoid repetitiveness. Nonetheless, they don't really relate the fire objectives specifically to the resource objectives (above).

DESCRIPTION OF REFUGE

Kootenai NWR is located on the flood plain of the Kootenai River (Figure 1 & Figure 1a). Most of the refuge lies on the valley floor with an elevation of 1,750 feet. Deep Creek and the Kootenai River are the form the eastern and most of the northern boundary of the Refuge. The western boundary ascends into the foothills of the Selkirk Mountains.

CULTURAL RESOURCES

Although the refuge has not had a complete cultural survey, there have been project specific surveys to determine the possibility of cultural resources. The refuge barn is a historical structure. No other cultural resources are known.

FISH AND WILDLIFE

Federally listed endangered species that occupy the general area of Kootenai NWR include:

- < Gray wolf (*Canis lupus*); unconfirmed sightings only.
- < Grizzly bear (*Ursus arctos*); No reported sightings on the refuge, but is well documented nearby.

The only federally listed threatened species that occupies the Refuge is the Bald eagle (*Haliaeetus leucocephalus*). The bald eagle is a year-round resident and has one known nesting site on the refuge.

VEGETATION

The 2,774 acre refuge is composed of a mosaic of diverse vegetative types. There are approximately 800 acres of wetlands, 625 acres of grasslands, 615 acres of croplands, 225 acres of deciduous trees and shrubs, 435 acres of coniferous forest, and 74 acres of administrative lands (Figure 2).

Wetlands

Wetlands on Kootenai Refuge are primarily human-made impoundments (permanent/semi-permanent). However, some natural low areas are flooded annually to create seasonal wetlands. Most of these seasonal wetlands are dried out in the spring to allow moist soil plants to grow or crops are planted and are then flooded in the fall for food for migrating birds, primarily waterfowl. These wetlands total approximately 800 acres.

The refuge wetlands are the most productive habitat type for wildlife found on the refuge. The impoundments and seasonal wetlands are important to waterfowl, shore and water birds, and many other water dependent species such as painted turtles, river otters, frogs, and moose. They contain several species of fish that provide food for birds such as herons, bald eagles and osprey. Wetlands perform functions important to the health and well being of humans as well, including water purification, groundwater recharge, flood water retention and sediment entrapment. They also provide tremendous aesthetic, recreational and educational opportunities.

Most of the human-made impoundments receive water from Myrtle Creek. The seasonal wetlands and Dave's Pond receive water from the Kootenai River by way of the Kootenai River pump station.

The emergent vegetation in the human-made, permanent and semi-permanent impoundments consist primarily of cattail (*Typha latifolia*), hardstem bulrush (*Scirpus microcarpus*), rushes (*Juncus* spp.) and sedges (*Carex* spp.). Cattail is the dominant species in and surrounding the impoundments. Submerged aquatic macrophytes also provide important food for waterfowl and the invertebrate species that some species of waterfowl and shorebirds utilize.

Some of the impoundments are also used to maintain natural moist soil plants such as nodding smartweed (*Polygonum* sp.) and wild millet (*Echinochloa* sp.). When flooded in the fall, these moist soil units provide outstanding feeding area for waterfowl. Occasionally these units need to be manipulated to remove the encroachment of cattails. Immediately after manipulation these units may be planted in millet for waterfowl.

The seasonal wetlands are usually dried out in the spring and planted with grain or alternate crop to provide food for waterfowl during the fall and spring migration.

Wetlands are very dynamic ecosystems that change with water levels, seasons, and time. Sediments from erosion in uplands continually fill in wetland impoundments making them more shallow. Eventually, vegetation encroaches upon areas of open water, growing thicker and decomposing each year. The deposition of sediment may ultimately lead to the conversion of the wetland to upland vegetation.

Ecosystems of Kootenai NWR, were historically maintained and renewed by the force of annual flooding from the Kootenai River. After construction of the river dike (1920's and 1930's) and completion of Libby Dam, flooding of the area has become almost non-existent.

Research has indicated that optimal conditions for waterfowl nesting and brood habitat maintain mosaic conditions in a 50:50 ratio between open water and areas of emergent vegetation (Murkin et. al, 1982). Habitat management strategies providing optimal wetland habitat conditions for nesting waterfowl at Kootenai NWR therefore call for maintaining a balance of 50% open water to 50% emergent vegetation.

Deciduous Woodland and Shrub Communities

Cottonwood and shrub communities (riparian areas) comprise only a small portion of the habitat types at Kootenai NWR (approximately 225 acres), but are important for a wide variety of wildlife. This habitat type grows primarily on the transition zone between open water (Myrtle Creek, Kootenai River and Deep Creek) and the uplands.

The riparian communities are generally occur in a variety of successional stages throughout their range, depending on location and local environmental factors (fire, flooding, grazing). On the refuge, cottonwood occurs in a variety of associations with grasses, forbs, shrubs and other tree species. The riparian area along Myrtle Creek is made up of a mixture of cottonwood, alder, and birch with a few fir, pine and cedar. The understory consists of willows, red-osier dogwood, snowberry, wild rose, and several species of grasses (reed canary is the most dominate). The transitional zone between the refuge dike and the Kootenai River and Deep Creek is a strip of primarily cottonwood, with a few willows, red-osier dogwood, chokecherry, wild rose, and other shrub species and reed canary grass. These riparian areas are important nesting and feeding habitat for many species of migratory birds including passerines, raptors, etc. These areas are also important to moose, deer and other species of wildlife.

There is a small amount of riparian habitat along the Kootenai River and scattered throughout the refuge that consists of chokecherry, red-osier dogwood, wild rose, snowbrush and other shrubs and grasses. This habitat is maturing and is becoming less productive and wildlife use is reducing.

Grasslands

Approximately 625 acres of refuge vegetation is classified as grassland. Grassland associations range from upland areas dominated by wheat grasses, quackgrass, reed canary grass interspersed with willows, red-osier dogwood, wild rose and other shrub species with cottonwood and other tree species mixed in.

Since construction of the dike system and the dam in the 1920's and 1930's, most of the Kootenai Valley was converted to agricultural cropland or pastures. Since quackgrass and reed canary grass was introduced, these two species dominate the grassland areas in the valley that are not farmed. Historically, most of the valley's habitat was seasonally flooded wetlands with vegetation consisting mainly of cottonwood with an understory of shrub species, cattails, bulrush, sedges, Equisetum, and rushes.

Croplands

Approximately 200-400 acres of crops (primarily grain) are currently grown on the refuge. All farming is completed using refuge staff. The refuge provides about 200 acres of grain crops primarily for migrating waterfowl. Approximately 200 acres are planted in alternative and other rotational crops and green manure, such as clover, alfalfa, peas and annual grasses. This will help reduce fertilizers and is expected to interrupt some weed species life cycles thus reducing the amount of herbicides used on the refuge.

These crops are primarily consumed by migrating waterfowl during the fall migration; however, the remaining grain is consumed during the smaller spring migration. The grain is also consumed by white tail deer and elk during the winter.

Coniferous Forest

Coniferous forest comprises approximately 435 acres. Vegetation is dominated by Douglas fir, red-cedar, and hemlock with an understory of ocean spray, devils club, snowbrush, fern, Oregon grape, and thimbleberry. Most of this habitat will be difficult to suppress because of the steepness of the terrain, no natural firebreaks before the fire would leave the refuge, and the heavy buildup of heavy fuels and ladder fuels.

ENDANGERED/THREATENED SPECIES

Endangered/Threatened species using the refuge include threatened bald eagles and Canadian lynx. Bald eagles are present as nesters and migrants. One pair of bald eagles nests in a cottonwood tree on the west side of Dave's Pond (Figure 3). A "no disturbance" zone, 1/4 mile radius around the nest tree, prohibits human use between late February (beginning of nest attendance) and early July (fledging of young). Burning in that area would be prohibited during that period. Migrant bald eagles are present from October through March with peak numbers of 10-15 eagles.

Ute ladies'-tresses (*Spiranthes diluvialis*), an orchid that is federally listed as threatened, is known to be present in northern Idaho. There hasn't been adequate survey's conducted on the refuge so it is considered to be potentially present in on the refuge.

CLIMATE

The valley's climate is basically mild. Winter temperatures seldom drop below 0° Fahrenheit and summer can be persistently cool and wet or hot and dry. Average annual precipitation is 25 inches with most of it accumulating as snow, although rain falls throughout the summer. Afternoon thundershowers are frequent. A great deal of wind funnels through the valley.

AIR QUALITY

Air quality in Kootenai Valley is generally good December through August. Atmospheric conditions during this time of year are conducive to good air movement and mixing, and rapid dispersion of smoke and other air pollutants caused by fire. However, September through November is the time of year when temperature inversions are common resulting in poor air mixing and smoke dispersal.

SOILS

Soils in Boundary County were mapped during 1970-1973. The bottom land soils on the refuge are the Schnoorson-Ritz-Farnhampton association. They are level to gently sloping, very deep silty clay loams and silt loams. They have moderate to slow water permeability. The steep foothills of the refuge have a Crash-Artnoc soil complex. It is composed of layers of silt loam and silt on slopes of 45% to 75%. Permeability is moderately slow with severe erosion hazard.

STRUCTURES AND FACILITIES

Refuge facilities consist of office, living quarters, equipment/vehicle and material storage buildings, environmental education building, maintenance shop, fuel storage facilities, vehicles, heavy equipment, domestic water system, two water pump stations, water control structures, and other accountable property.

There is little private property surrounding the refuge. The east boundary of the refuge is protected to a large degree by natural physical features including the Kootenai River and Deep Creek. Fire escaping the refuge to the south would advance onto a large section of wet meadows owned by the State of Idaho. No facilities are located on this land and suppression efforts would be minimal. The north boundary is mostly protected from escaping fire by the Kootenai River. However, there is a 20 acre parcel of private property on the west side of the north boundary that receives special consideration for fire exclusion. The houses and out building have a high dollar value (Figure 3). Fire escaping to this property is unlikely as there is a large pond (Cottonwood Pond) on the refuge and adjacent to the private land. The most troublesome area to exclude fire from is the west refuge boundary. Once a fire crosses or starts on the west side of the County Road, the terrain is steep and heavily forested. The Refuge holds title to some of this land but would rapidly advance to U.S. Forest Service and private timber company land.

Figure 1: Vicinity Map



Figure 1a: Vicinity Map

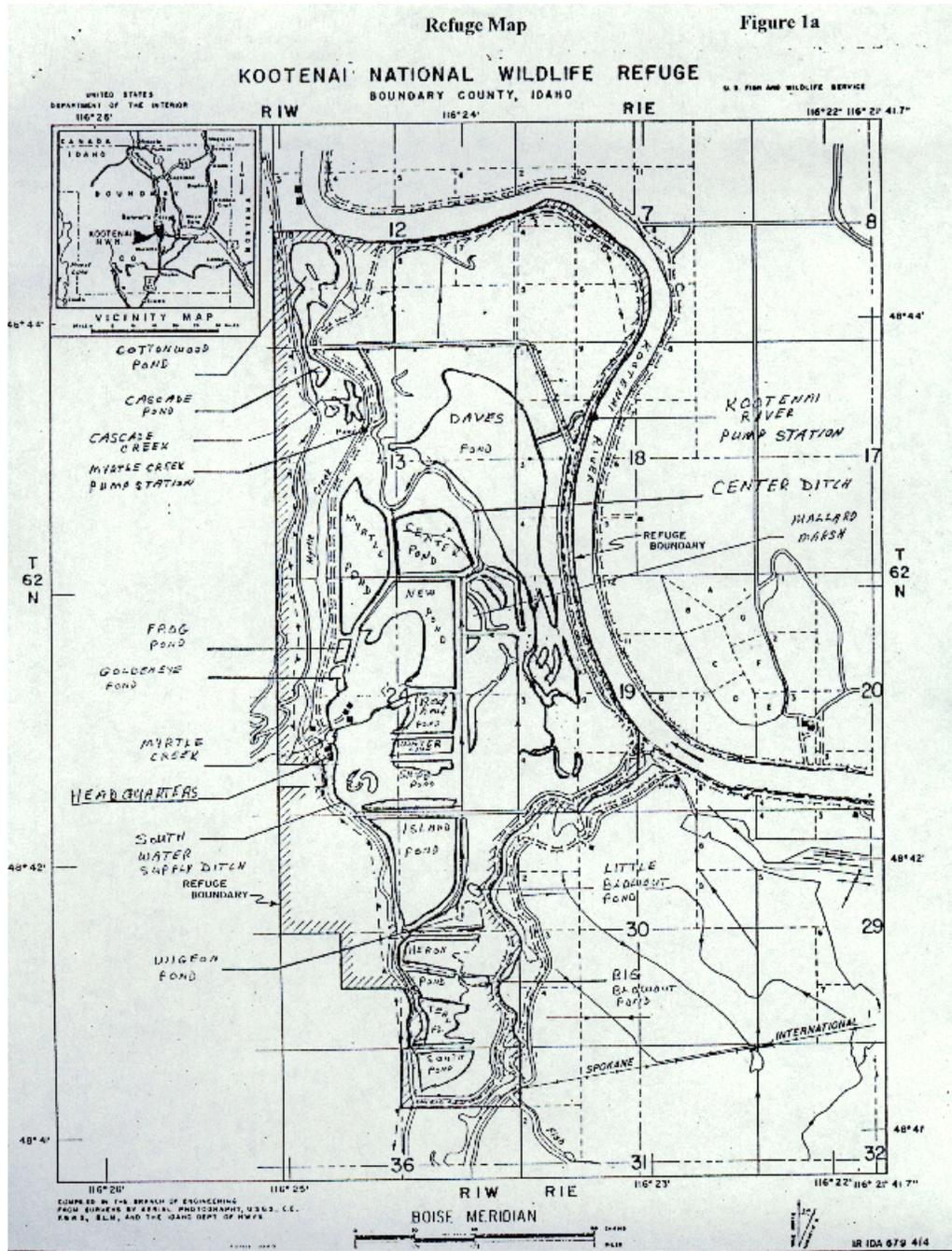


Figure 2: Vegetation Map

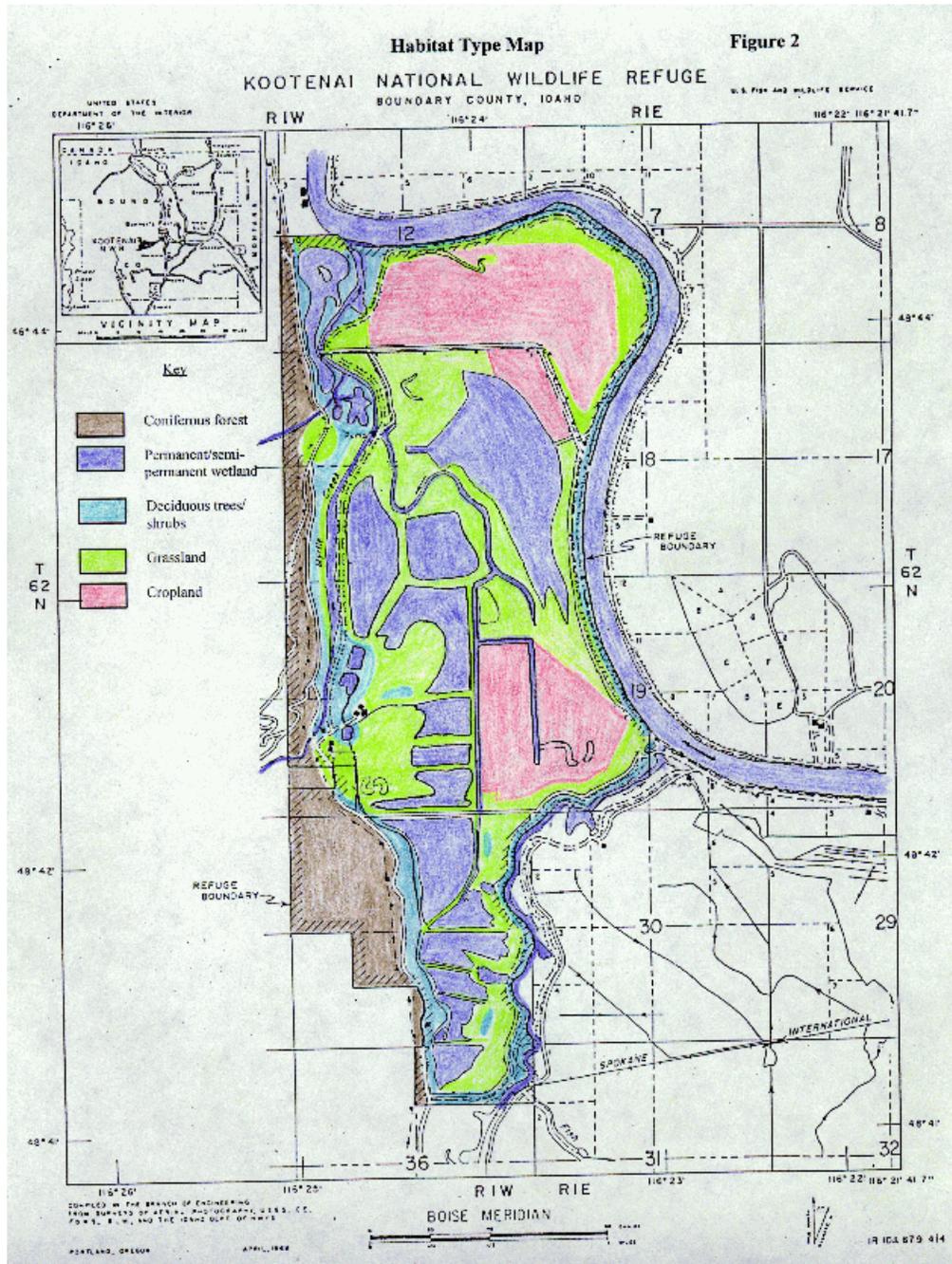
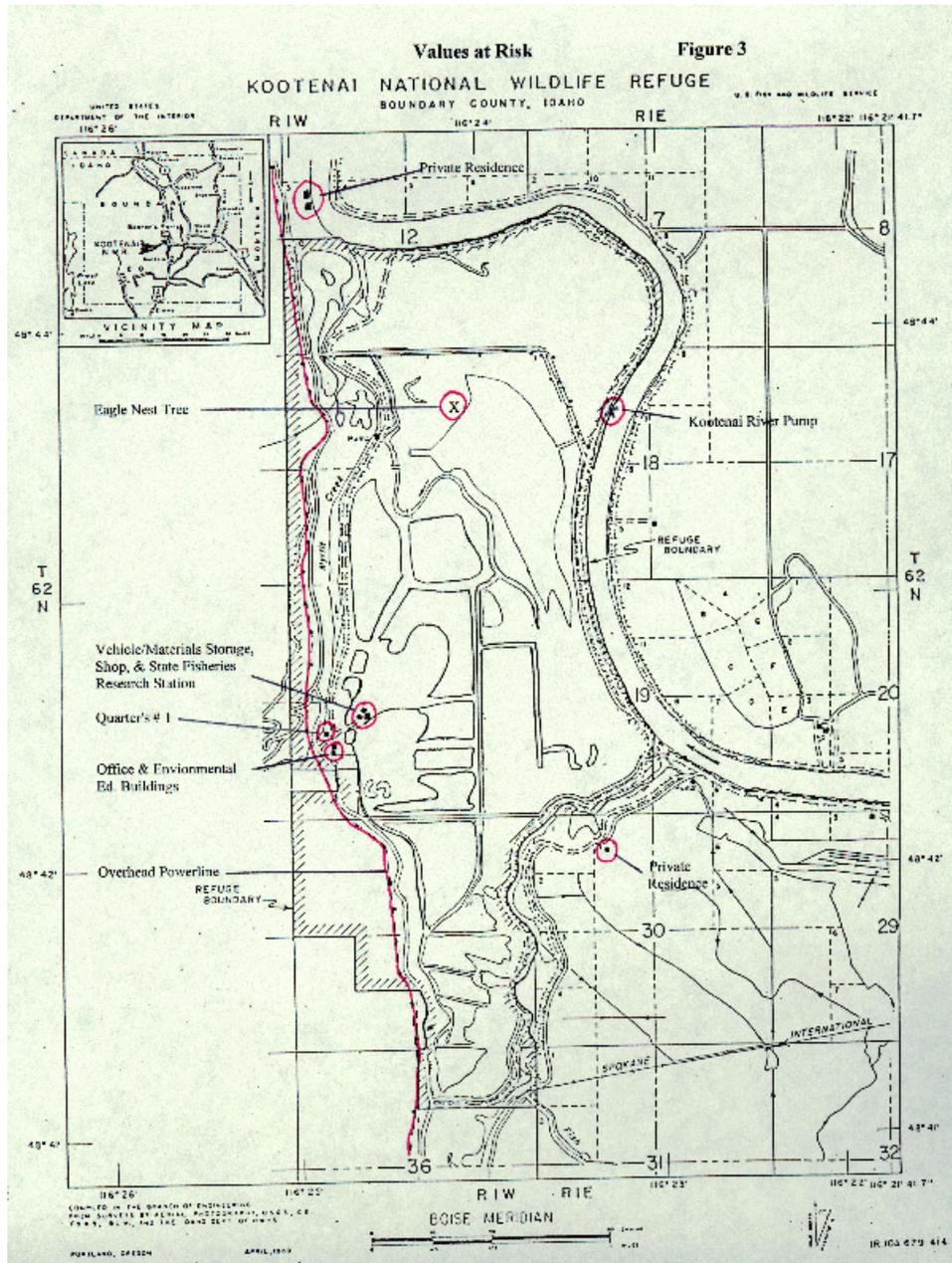


Figure 3: Values at Risk



WILDLAND FIRE MANAGEMENT SITUATION

HISTORIC ROLE OF FIRE

Pre-settlement fires

Historical fire history of the refuge is not well documented. In large part, natural fire was suspended from running its normal course in the early 1900's when the refuge was being cleared and settled. Prior to homesteading, there is little specific information concerning the refuge environment. Nonetheless, the Refuge was historically dominated by ponderosa pine and dry Douglas-fir/grand fir habitat and probably had a fire return interval of 5 to 25 years.

Post-settlement Fire History

Between 1960 and 1998 four (4) wildland fires burned on the refuge and nine (9) prescribed burns were ignited. **Note: only 3 in table below are wildland fires; this says 4. Are all the rest prescribed fires?**

YEAR	FIRE NAME	ACRES
1995	Field 15E	1.0
1994	Eastdike	.5
1994	Southdike	.5
1988*	Koo R Dike	5.2
1987*	Koordike	48.0
1987	Exper lot	3.0
1987	Wigeon Fld	15.0
1986	Island Pd	33.0
1986	Myrtle Fld	6.0
1986	South PDFD	14.0
1985	FieldS14	14.2
1982*	Stubblefld	11.0

* (wildland fires)

On August 1986, a lightning strike in the forest near headquarters caused a tree to catch fire. Fire extinguished around tree by U.S. Forest Service hand crew. Another incident occurred in August 1989. An osprey nested on a power pole (Bonners Ferry Power Company) in SE1/4 of SW1/4, Section 7. Wind blew nesting material onto the power line causing ignition. The top of the pole and cross arms burned, shorting out electricity, but the fire never reached the ground. No known wildland fires have occurred adjacent to the refuge in recent years.

Prescribed fire history

The prescribed fire season is expected to be from March through May in the spring and late September to early November in the fall. Prescribed fire history is listed in the Table above. **How long have we been conducting prescribed fires?**

RESPONSIBILITIES

Refuge fire staff stationed at Kootenai NWR are collateral duty fire fighters. Included are the Refuge Manager, Refuge Operations Specialist, Maintenance Worker, and a career seasonal Tractor Operator. Administrative functions are handled by the Administrative Support Assistant. Because of the transitory nature of refuge employees, the following program responsibilities may vary depending on qualifications and availability.

Project Leader

- < Responsible for development and implementation of fire management program
- < Initiates formal, written limited delegation of authority to Incident Commanders (IC's) for suppression of project wildland fires (Appendix D).
- < Approves Cooperative and Interagency agreements.
- < Approves all prescribed fire plans.
- < Approves all WFSAs.
- < Authorizes all purchases of fire equipment.
- < As qualified and requested, acts as a collateral duty fire fighter for prescribed and wildland fires both on-refuge and off-refuge.

Zone Fire Management Officer

The Zone Fire Management Officer provides technical and operational guidance for all aspects of the implementation of the refuge fire management program in accordance with policies, procedures and guidelines including:

- < Develops annual budgets for fire management operations.
- < Determines fire equipment needs and initiates procurement requests.
- < Determines staffing levels.
- < Develops seasonal fire crew duties, initiation of personnel actions, and selects seasonal fire staff.
- < Responsible for the training of all fire staff to the standards established.
- < Conducts training for staff from other refuges, as requested.
- < Responsible for overseeing all aspects of fire management planning including the development of the refuge Fire Management Plan, Pre-Attack Plans, Escaped Fire Contingency Plans, Prescribed Fire Plans.
- < May serve as Incident Commander on refuge fires.

Refuge Operations Specialist

The Refuge Operations Specialist may be called upon as a collateral duty fire fighter for prescribed and wildland fires both on-refuge, and off-refuge, as qualified and requested.

Maintenance Worker

The Maintenance Worker will maintain coordination with the Zone Fire Management Officer. The Maintenance Worker is responsible for maintenance and repair of all fire equipment and for maintaining Normal Unit Strength (NUS) supplies. The Maintenance Worker may be called upon as a collateral duty fire fighter for prescribed and wildland fires both on-refuge, and off-refuge, as qualified and requested.

Prescribed fire planning is also the responsibility of the Maintenance Worker. Objectives for prescribed fire implementation for habitat management purposes are developed in conjunction with the Refuge Manager, Refuge Operations Specialist and Zone Fire Management Officer. Really? The maintenance folks determine when burning is needed, or is this a reflection of a person who happens to be in this position? Perhaps this is a delegated responsibility (i.e., it is the responsibility of the Refuge manager or refuge ops specialist, and would be listed under their responsibilities...).

Collateral Duty Firefighters

- < May be called upon as a collateral duty fire fighter for prescribed and wildland fires both on-refuge, and off-refuge, as qualified and requested.
- < May serve as a member of an engine crew.
- < Participates in prescribed fire and suppression operations.

Administrative Support Assistant

The Refuge Administrative Support Assistant performs administrative functions of the fire management program including process orders for supplies and contractual repairs, time keeper and assist with communications.

Incident Commander

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

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

Initial attack teams

Initial attack teams will consist of experienced, fully- qualified firefighters, those on their first fire, and well-qualified leadership. Teams will be prepared and equipped with hand and power tools as needed and will be dispatched with a day's supply of food and water, so they can continue work for 24 hours without additional support.

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

Exceptions to fitness requirements on Initial attack activity are available from the Regional Fire Management Coordinator per guidelines in Chapter 1.5 of the Fire Management Handbook (USFWS 2000).

INTERAGENCY OPERATIONS

Interagency cooperation is vital to Kootenai NWR's fire management program. The Interagency Fire Agreement (No. 83-SIE; Appendix E) provides the basis for cooperation between the agencies of the Departments of Interior and Agriculture on all aspects of wildland fire management and facilitates the cooperative use of fire related resources during national or regional non-fire emergencies. It is most cost effective and in the public interest to provide specifically coordinated action between federal agencies by sharing their firefighting resources. The agreement specifically states in section VI.(11) "Upon request, any authorized agency shall render assistance in fire suppression to another, both within and outside zones

of mutual interest, with its regular firefighting personnel and fire suppression facilities (equipment), when assistance is available and when such action shall not leave areas in its own protection unit unduly exposed to fire danger.”

Kootenai NWR has entered into a specific mutual aid agreement (operating plan) with the local U.S. Forest Service (Forest Service), Idaho Panhandle National Forest. The Forest Service is the primary public land agency in northern Idaho. The Forest Service and Idaho Department of Lands are responsible for fire suppression on wildlands. The interagency operating plan defines cooperative roles of each agency to suppress wildland fires on or near the refuge. It also defines mutual assistance for prescribed burning, when possible. The parties of this plan are not obligated to make expenditures of funds or reimbursements of expenditures under terms of the plan unless such funds are appropriated for the purpose, by the Congress of the United States or are otherwise legitimately available.

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

PROTECTION OF SENSITIVE RESOURCES

Heavy equipment such as crawlers, tractors, dozers, or graders will not be used within the refuge boundaries unless their use is necessary to prevent a fire from destroying privately-owned and/or government buildings and historic resources. The use of any heavy equipment requires the approval from the Refuge Manager or delegate.

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 (RCRC, Appendix F) will be used to inform the Regional Archaeologist of impending activities, thereby meeting the regulations and directions governing the protection of cultural resources as outlined in Departmental Manual Part 519, National Historic Preservation Act (NHPA) of 1966, Code of Federal Regulations (36CFR800), the Archaeological Resources Protection Act of 1979, as amended, and the Archaeological and Historic Preservation Act of 1974. The NHPA Section 106 clearance will be followed for any fire management activity that may affect historic properties (cultural resources 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 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 will be limited in areas known to harbor surface artifacts.
- § Mechanized equipment should not be used in areas of known cultural significance.

- § The location of any sites discovered as the result of fire management activities will be reported to the Regional Archaeologist.
- § Rehabilitation plans will address cultural resources impacts and will be submitted to the Regional Archaeologist using the RCRC.

Prescribed Fires

- § The Refuge Fire staff will submit a completed RCRC to the Regional Archaeologist and/or his/her staff as soon as the burn area is identified (i.e., as soon as feasible).
- § Upon receipt of the RCRC, the Regional Archaeologist and/or his/her staff will be responsible for consulting with the FMO 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). The SHPO has 30 days to respond. The Refuge will consider all SHPO recommendations.
- § Mechanized equipment should not be used in areas of know 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 Kootenai NWR. Program management includes: fire prevention, preparedness, emergency preparedness, fire behavior predictions, step-up staffing plan, fire detection, fire suppression, minimum impact suppression, minimum impact rehabilitation, and documentation.

All fires not classified as prescribed fires are wildland fires and will be appropriately suppressed. Fire suppression strategies for Kootenai NWR will place primary emphasis on the development of a fire suppression program that is capable of suppressing wildland fires quickly, before significant resource damage can occur. Meeting this objective will require a refuge fire management program with an initial attack capability of equipment and personnel and cooperative or reimbursable agreements with local federal and state land management agencies with firefighting capabilities. Fire suppression capabilities will be augmented by fire prevention programs and hazard fuel reduction projects. Hazard fuel reduction will involve both manual removal of fuels in critical areas and the systematic application of prescribed fire to gradually reduce accumulations of dead fuels with low intensity prescribed burns under carefully controlled conditions.

what records? Weather record, then from where? Based on fire occurrence? Records show that fire season is typically from July-October.

FIRE MANAGEMENT STRATEGIES

Due to the small geographical area of Kootenai NWR, heavy fuel loading, proximity to private and other government agency property, potential for resource damage and air quality considerations within local communities, all unplanned fire ignitions on the refuge will have immediate fire suppression response utilizing the closest available resources. Tactical fire suppression operations will include both direct and indirect attack based upon considerations of firefighter safety, minimum impact to refuge resource values and cost effectiveness.

Program Objectives:

- 1) Protect the lives of refuge visitors, employees, and firefighter during fire activities.
- 2) Protect refuge resources and improvements from wildland fire.
- 3) Suppress all wildland fires, utilizing suppression strategies and tactics that will provide the lowest level of impact to natural and cultural resources.
- 4) Whenever possible, provide assistance to other local, state and federal firefighting agencies during local, regional and national fire emergencies.
- 5) Enact a fire prevention program on the refuge by reducing the opportunities for fires to start in areas around visitor use facilities and refuge operations facilities via the manual/mechanical removal of dead vegetation and grass.
- 6) Provide for a hazard fuel reduction program using refuge staff and equipment for the reduction and removal of hazardous accumulations of dead vegetation.

Although resource impacts of suppression alternatives must always be considered in selecting a fire management strategy, resource benefits will not be the primary consideration. Appropriate suppression action will be taken to ensure firefighter safety, public safety, and protection of the resources. Critical protection areas, such as eagle nesting area and the private property at the northwest boundary will receive priority consideration in fire control planning efforts. In all cases, the primary concerns of fire suppression personnel shall be safety, and individuals not involved in the suppression effort may 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 strategies will be employed to protect all resources. Natural and artificial barriers will be used as much as possible for containment. When necessary, fire line construction will be conducted in such a way as to minimize long-term impacts to resources. Care should be taken when using retardant near Myrtle Creek and Deep Creek.

Vehicle access to normally closed areas of the refuge will be made using existing fire roads when possible. Heavy equipment such as crawlers, tractors, dozers, or graders will not be used within the refuge boundaries unless their use is necessary to protect life and/or property. The use of heavy equipment and off-road travel require approval from the Refuge Manager or delegate. The Incident commander may authorize any actions deemed necessary if threats to life and/or property exist.

Sites impacted by fire suppression activities or by the fire will be rehabilitated as appropriate, based on an approved course of action for each incident.

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

Historical weather analysis

The weather station used for historical weather was the Bonner's Ferry, station number 100101. The US Forest Service maintains this weather station. A data set from 1970 to the present exists for this station. KCFASST was used to download the data onto a PC and then FIREFAMILY Plus was used to analyze the data.

A cumulative frequency distribution on the burning index yields staffing classes. The 97th percentile establishes staffing class 5, the 90th percentile establishes staffing class 4. Staffing classes 2 and 3 are based upon 1/4 and 1/2 of the 90th percentile value, respectively.

The break points of the burning index for Fuel Model C were used in the step-up plan and were:

- Staffing class 1 = 0-4
- Staffing class 2 = 5-9
- Staffing class 3 = 10-18
- Staffing class 4 = 19-25
- Staffing class 5 = 26 and greater

Fire Prevention

An active fire prevention program will be conducted in conjunction with other agencies to protect human life and property, and prevent damage to cultural resources or physical facilities. A program of internal and external education regarding potential fire danger will be implemented. Visitor contacts, bulletin board materials, handouts and interpretive programs may 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. Closures will be authorized by the Refuge Manager.

Hazard fuel reduction refers to the removal of dead vegetation (grasses, needles, branches, and logs) and is an important fire prevention tool. The primary hazard fuel reduction techniques to be used at Kootenai NWR include manual reduction of fuel accumulation in critical areas (by hand and with refuge equipment), utilizing contractors or economic use permittees for salvage logging of blow-down, and large prescribed fire.

Refuge personnel will accomplish annual hazard fuel reduction in critical areas of the refuge using hand tools, weed whips, and mowing equipment. Work elements include the cutting, raking, clean-up and removal of dead vegetation from areas adjacent to refuge facilities, residences and other improvements. Trails and parking areas, and interior access roads are mowed at least twice during the fire to reduce the chances of ignition of fuels from vehicles and to retard the spread of wildland fire. This work is undertaken after grasses have cured to prevent regrowth and accomplished before the high fire danger season begins. Areas that will be given priority attention for manual hazard fuel reduction work will include:

1. refuge buildings, shops, and equipment and materials storage areas
2. refuge residences (including State's Fisheries Research Station/housing)
3. refuge roads, parking areas and auto-tour road mowing
4. fuel facilities

what about boundaries (to protect neighboring structures?)

These areas have been identified as priorities due to high potential for fire ignitions resulting from human activity or values at risk to damage and loss from a wildland fire.

Staffing Priority Levels

Kootenai NWR has only collateral duty fire fighters (no permanently funded fire staff on site) and the close proximity (5 miles) of the Forest Service and Idaho Department of Lands fire teams, step-up plans will not be developed for the refuge. The small staff of the refuge limits the use of refuge staff on project fires. If the fire season stretches regional or national resources refuge staff will be dispatched. However, refuge operations and maintenance programs may need to be delayed until the staff return to the refuge.

Then why is there a staffing class developed in the weather analysis section above?

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). Kootenai 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 red-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 FMO 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) 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. Personnel performing fire management duties will maintain a high level of physical fitness. This requires successful completion of a fitness pack test. Personnel must complete a three mile hike with a 45 pound pack in less than 45 minutes.

Supplies and Equipment

The refuge maintenance worker maintains the fire cache and equipment. The fire cache is located in a heated garage and the fire engine which is maintained with refuge funds. Appendix I lists refuge fire equipment.

Additional equipment and supplies are available through cooperators and the interagency cache system. Requests for additional personnel and equipment are made through Bonners Ferry Ranger District. The contact list can be found in the Dispatch Plan in Appendix J.

DETECTION

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.

The Fire Dispatch Plan (Appendix J) Provides guidelines and operational procedures for refuge personnel and cooperators to follow in the event of a wildland fire occurring within refuge boundaries or threatening to move into Kootenai NWR. The Dispatch Plan also provides information for mutual-aid dispatch to cooperating state and local fire agencies as well as procedures for inter-agency dispatch to assist other federal firefighting efforts.

COMMUNICATIONS

Currently the refuge utilizes one Fish and Wildlife frequency with a repeater that is scheduled to be installed this year. The refuge also has an agreement to share frequencies with the Forest Service and Idaho Department of Fish and Game (Appendix E). Radio frequencies and normal channels used are in appendix K.

PRE-ATTACK PLAN

Prescribed fire is one of the primary habitat management techniques used to manipulate vegetation succession in uplands and wetlands within the refuge. Because of the refuge's small size, all wildland fires will be suppressed using appropriate management strategies.

Fire suppression should utilize minimum impact suppression tactics (MIST) when possible, taking advantage of the many natural and man-made features on and adjacent to the refuge. MIST strategies should be given high priority when fire spread and intensity is minimal. These same natural and man-made features provide excellent access to fires on the refuge as well as anchor points, safety zones and escape routes.

Wildland fire Control Objectives:

1. Provide for firefighter and public safety first.

2. Keep damage to refuge resources from suppression effort to a minimum
3. Initial Attack: Contain and control the fire within the refuge boundary and east of the West Side Road.

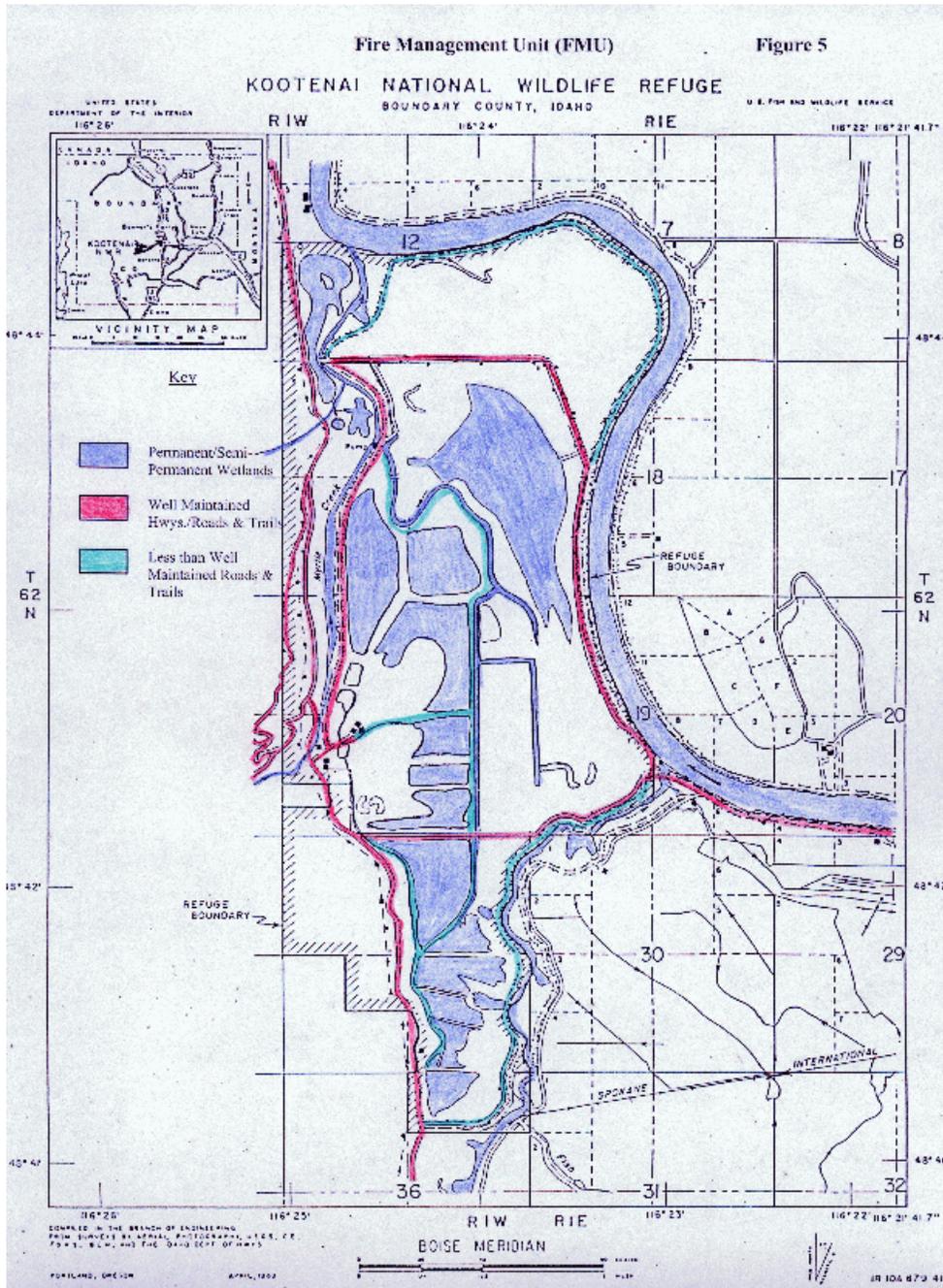
Extended Attack:

4. Keep the fire south of the north boundary to protect the private residence to the north.
5. Keep the fire east of West Side Road.
6. Keep the fire north of the south boundary dike road.

Suppression Strategies and Techniques:

1. Utilize existing roads, wetlands and other features as primary control lines, anchor points, escape routes and safety zones. (See Figure 4 - Fire Management Unit Map).
2. Use burnouts/blackline techniques to stabilize and strengthen primary control lines.
3. If mechanical equipment must be used, construct control lines on existing roads where possible. This will not be possible on the west boundary of the refuge, in the thick forest on the steep toe of the Selkirk Mountains.
4. Plow lines or disc lines are more practical and expedient and should be used instead of dozer on interior of the refuge.

Figure 4: Fire Management Units



FIRE MANAGEMENT UNITS

Fire Management Units (FMUs) are areas on a refuge which have common wildland fire management objectives and strategies. Due to Kootenai NWR's small size it will be one FMU. The pre-attack suppression plan is intended for use in developing control/containment strategies for wildland fire that escape initial attack and begin to attain significant size (100+ acres) and require some level of indirect attack. The pre-attack plan identifies perimeters where initial indirect attack efforts can be implemented using existing fuel breaks. Secondary containment perimeters are also identified for use on fires which escape initial control efforts and require contingency implementation. All containment perimeters are located in areas that have good ingress/egress for fire suppression equipment and provide potential escape routes and safety zones.

Figure 4 displays detailed information pertaining to the refuge as a single Fire Management Unit.

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. Wildland fires will be suppressed using appropriate suppression strategies.

Fire Effects

Wildlife

The effects of fire on wildlife include injury and mortality resulting from exposure to the fire or alteration or destruction of habitats utilized by wildlife. Mortality resulting from fire is low; most wildlife escape the lethal effects of a fire by selecting an insulated micro-environment (burrows, dens, wetlands), or by rapidly emigrating from the path of the fire by running or flight.

Cooper (1961), and Lawrence (1966) found that most small mammals with burrowing habits can survive the direct effects of wildland fire by waiting for the fire to pass over in the insulated protection of their burrows. Some wildlife are attracted by fire. Birds of prey have been observed hunting within burned areas while active combustion is still occurring, seeking out small mammals fleeing into open areas. Red-tailed hawks have been observed hunting within prescribed fire units on the refuge during mop-up operations for small mammals and snakes exposed within the burned area. Invertebrate populations have shown susceptibility to fire, particularly those which inhabit soil organic and duff layers.

Overall, the major effect of fire on wildlife populations occurs indirectly through alteration of habitat. Impacts to wildlife habitat following a fire are primarily due to modification of the structure and composition of the vegetation communities within the burned area.

Fire effects on large mammals are primarily due to changes in habitat structure, increases in biomass and vegetation species diversity which occur as a result of fire. Many studies have been conducted on the effects of fire on white-tail deer habitat and indicate that white-tails will preferably utilize burned areas over adjacent unburned habitat (Orme 1976, Keay 1980, Freedman 1983).

Fire effects on small mammals is dependent on the primary habitat of the species. Burrowing mammals such as mice, moles and gophers can escape harm from a fire by remaining within a burrow where temperatures are cooler due to the upward convection of radiant heat. Tree dwelling mammals such as squirrels and chipmunks have a tendency to escape from harm in the canopies of trees where radiant heat is concentrated causing significant mortality during hot fires (to the benefit of raptors and coyotes). Numerous studies have indicated positive benefits resulting from fire which generally increase the

abundance of small mammal populations (Bock and Bock 1985). The increase in abundance is attributed to increased food supplies, particularly in relation to seed production and availability.

Fire effects on waterfowl primarily involve habitat alteration. Fire in wetlands can remove accumulations of emergent vegetation biomass creating more open water areas for successful waterfowl brooding. Nutrient input following fire in and around wetlands can increase the productivity of submerged aquatic vegetation but also invertebrate populations which are important food sources for many species of waterfowl. Removal of thick stands of brush can be detrimental to species of birds that utilize these habitats for nesting and escape cover from predators. Some species of ducks, such as mallards, American wigeon and green-winged teal utilize dense brush as nesting cover in uplands near wetlands.

Neotropical migratory songbirds are found within the cottonwood/shrub, riparian habitat types. Fire effects on neotropical migrants occur primarily through the alteration of the structural composition of cottonwood and other shrub habitats. Fire management objectives for cottonwood and shrub habitats will consider maintaining these communities in various stages of successional status. Young recently burned cottonwood and shrub communities have vigorous stands of re-sprouting trees and shrubs which will provide excellent forage opportunities for the insects that various species depend upon in the herbaceous understory and short canopy.

Water Quality and Hydrology

The primary influence of fire on hydrologic regimes and water quality involve increases in water yield, sedimentation, organic nutrient levels and water temperature. The removal of forest cover resulting from a wildland fire will increase annual water yields. Water yields gradually decrease as the forest regrows utilizing more soil moisture in evapotranspiration (Helvy 1980). The most dramatic effects on hydrology and water quality occur after severe burns that remove overstory forest vegetation. Low intensity burns that only remove understory vegetation do not alter hydrologic output or water quality.

Besides increasing water yield, the removal of overstory forest vegetation adjacent to streams or wetlands can increase water temperature. The removal of the vegetation increases the amount of direct solar insolation to the water body resulting in increased water temperature (Levno and Rothacher 1969). Increased stream temperatures can influence aquatic flora and fauna. Increased water temperatures in small seasonal forested wetlands could benefit migrating waterfowl and early season nester with additional early season food sources.

Studies have indicated increased levels of nitrate-nitrogen and phosphorus in post-fire water quality analysis (Tidemann 1978). These increases have been found to produce concurrent increases in stream flora and fauna. Inorganic and organic chemical increases have been found at levels that generally do not exceed water quality standards. These increases are temporary and generally do not exceed one hydrologic cycle following the application of fire.

Soils

Fire can affect the chemical and physical properties of soil. Many important soil nutrients can be increased through the decomposition of dead organic matter on the soil surface during a fire. Low intensity fires facilitates the cycling of important organic nutrients such as nitrogen, phosphorus, potassium, calcium and magnesium. Infusion of these nutrients in the post-fire environment benefits plant communities with vigorous regrowth of herbaceous species, shrubs and trees. Removal of dead organic surface litter can expose soil surfaces which helps to promote natural seed regeneration of the site from sources stored in the soil or imported to the site by wind dispersal or by wildlife. Intense wildland

fires can volatilize organic nutrients causing net loss from a site of important nutrients. Nitrogen, one of the most important soil nutrients is easily volatilized by fire.

Fire can alter the physical properties of soils through the removal of organic components which bind soil particles. Loss of organic matter can increase the erodability of soils, particularly in areas with steep slopes. Where organic soil layers are consumed by fire, soil water storage capacity and infiltration rates are reduced (Campbell et al. 1977). As soil aggregates held together by organic matter are destroyed by fire, smaller particles fill soil pores between larger particles reducing water infiltration, increasing runoff and subsequently increase erosion (Vogl and Ryder, 1969). Fire can also create water repellent layers in soils resulting from the distillation and subsequent hardening of organic matter and sinks into the soil creating impermeable subsurface layers which increase the potential for sheet erosion (Debano, L. 1974).

Another important aspect of fire effects on soils involves soil microorganisms. These microorganisms consist of fungi and bacteria which live within soil organic layers and interact with the roots systems of trees, shrubs and other plants in positive, often symbiotic relationships, or negative parasitic relationships. Studies have shown that fire can reduce the incidence of some forest tree root pathogens such as fomes root rot (*Fomes annosus*) (Froelich, R. 1979). In other cases, beneficial soil fungi called mycorrhizae, which grow as fine hairs on small roots, and help trees take up additional nutrients and moisture from the soil, are adversely affected by intense fires (Tarrant 1956).

Fuel Types and Fire Behavior

For fire management purposes, fuels are classified at their greatest burning potential during the fire season. They are classified into the following fuel models and designated by colors on the following map (Figure 5).

Fuel Model	Color Code	Acres	Vegetation Types
1	Green	275	Dense continuous quack grass 1-2 feet tall.

3	Brown	1,200	Planted stands of tall and intermediate grass, 2-3 feet tall.
			Expanses of reed canary grass or sweet clover, 3-4 feet tall.
			Crops of wheat and barley, 2-3 feet tall.
			Cattail and hardstem bulrush, 3-5 feet tall.
5	Blue	165	Stands of cottonwood trees, golden willow or alders with grass understory, 1-2 feet tall.

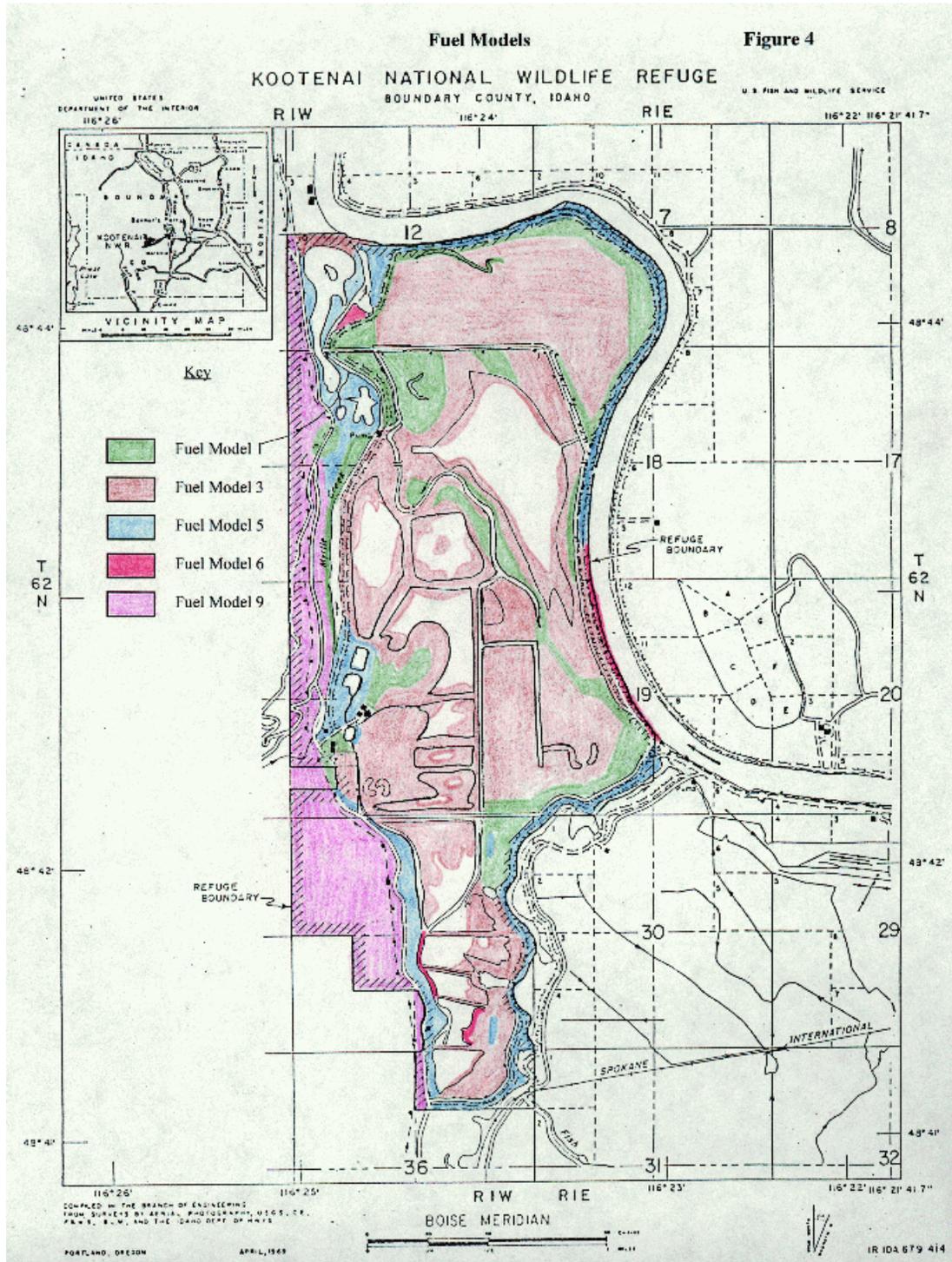
6	Red	80	Thickets of willow, alder, red osier, black hawthorne, chokecherry, roses, 5-8 feet tall with grass understory 1-2 feet tall.
9	Pink	435	Dense stands of red cedar-hemlock and Douglas fir with understory of fern, Oregon grape, thimbleberry, and snowberry. Some areas with dead-down wood.

Total Burnable Acres 2,155
Non-burnable Acres 619 includes open water, roads, trails, and parking areas.
Total Refuge Acres 2,774

Fuel loading (dead branches, and logs and buildup of dead grasses) in the coniferous forest has accumulated over the years and could lead to extreme fire behavior, especially if the fire occurs during an extreme fire danger. Blow-down has been a common occurrence, especially during the high snow-fall years of 1996 and 1997. Methods of reducing fuel loads in the coniferous forest west of West Side Road will include developing special use permits to “salvage log” these areas to local loggers. Prescribed burns in these forest areas will be done in cooperation with the U.S. Forest Service, private corporations and/or landowners.

Cottonwood habitats with understory of shrubs, grass and other trees have considerable fuel loading. Catastrophic fires running through this habitat would cause a significant loss of this important habitat for many years until the cottonwood forests could regenerate. Fuel reductions in these areas will consist mainly of using prescribed burning.

Figure 5: Fuel Models



A vegetative type may vary between fuel models, depending on time of year or management practice. Examples are standing barley or wheat would be Model 3, while grain stubble would be Model 1. Grasslands would be Model 1 or 3 but may not burn at all if seasonally flooded.

Temperature from July through September can be 85-95 with frequent winds. Dew is heavy in the mornings but fuels are dry by afternoon. The normal fire season declared by the State of Idaho is May 10th through October 20th. Prescribed burning during that period requires a permit from Idaho Department of Lands.

The last infamous wildland fire that nearly reached the refuge was the Sundance Fire in the Selkirk Mountains. It began as a lightning strike on August 23, 1967 and was fought by the state and local fire protective association until August 29th when the fire jumped the line and was out of control. The U.S. Forest Service then took charge of control. By August 31st the fire burned over 2,000 acres. On September 1st it made a spectacular run, consuming over 50,000 acres. By 220 hours a spot fire started in the Myrtle Creek drainage less than ½ mile from refuge headquarters. The manager's residence was evacuated but winds died down and control was achieved. Large fire-brands fell miles from the fire but no fires started on the refuge. This fire resulted from conditions which seldom occur simultaneously - prolonged dry period, persistent high temperatures, sustained winds during the fire run, and a 4-mile fire front.

SUPPRESSION TACTICS

The purpose of the wildland fire suppression program at Kootenai NWR is to provide the equipment and personnel necessary to assist in suppression of wildland fires that occur within or near the refuge boundaries. Interagency agreements with the Forest Service and Idaho Department of Lands provide assistance with suppression operations on the Refuge. It is also the intention of the U.S. Fish & Wildlife Service to provide cooperative wildland fire suppression assistance to local, state and other federal firefighting agencies in the suppression of wildland fires when requested through the provisions of various mutual-aid agreements, cooperative agreements, and as mandated by federal law.

Wildland fires will be suppressed in a prompt, safe, and cost-effective manner to produce fast, efficient action with minimum damage to resources. Suppression involves a range of possible actions and all wildland fires will be suppressed.

Personnel and equipment must be efficiently organized to suppress fire effectively and safely. To this end, the FMO assumes the command function on major or multiple fire situations, setting priorities for the use of available resources and establishing a suppression organization. Really?

There will be only one Incident Commander responsible to the refuge manager. The Incident Commander will designate all overhead positions on fires requiring extended attack. Reference should be made to a Delegation of Authority (Appendix D).

Suppression Conditions

Kootenai NWR has limited capability in personnel and equipment for fire suppression. The Forest Service has a sizeable, trained fire suppression organization because of its larger suppression responsibility. Due to its major role as a local fire suppression agency, the Forest Service will assist the Refuge in suppression activities.

Under the 1987 Interagency Agreement between the Bureau of Land Management/Bureau of Indian Affairs/National Park Service/U.S. Fish and Wildlife Service/U.S. Forest Service (Appendix E) and the Interagency Operating Plan Between Kootenai National Wildlife Refuge and the Idaho Panhandle National Forest Service (Appendix E), refuge personnel will initiate initial attack on wildland fires on or adjacent to the refuge. If it can be controlled and extinguished, no assistance from the Forest Service will be necessary.

The Forest Service will provide extended attack suppression on refuge lands, taking charge as the incident commander, where appropriate. Refuge personnel will provide resource advisor/agency representative and work under the Forest Service assigned incident commander.

Where fires burn or threaten to burn on lands of both agencies, each agency will cooperate to the fullest extent in suppression and/or managing the fire. Either agency may initiate action in this case and the first qualified incident commander initiating action will remain incident commander until an agreement on management of the fire is reached. The protecting agency will provide a resource advisor to the incident commander on all extended attack fires. This advisor, if not the agencies line officers, i.e., Refuge Manager, or District Ranger, will have written delegation of authority to make decisions about fire suppression as it pertains to the protecting agency's land. Equipment limitations and suppression tactics will be determined by the protecting agency's resource advisor.

A joint decision by the line officer, or line officer's representative, and the incident commander will determine if an extended attack situation exists. Under this extended attack situation, the line officer may decide to either extend attack or order an overhead strike team to manage the fire.

Fire suppression strategies employed at Kootenai NWR will include a range of suppression techniques in order to provide for firefighter and public safety, protection of values at risk, natural resources, and cost efficiency. Suppression strategies and tactics will be unique to each wildland fire, predicated by weather parameters, fuel conditions, safety considerations, resources and threats to improvements. Determination of strategies and tactics will be made by the Incident Commander on scene utilizing guidance from pre-attack plans (see Fire Management Units section) for individual areas of the refuge, knowledge of refuge fire management objectives, input from refuge resource advisors if available.

Heavy equipment such as crawlers, tractors, dozers, or graders will not be used within the refuge boundaries unless their use is necessary to prevent a fire from destroying privately-owned and/or government buildings and historic resources. The use of any heavy equipment requires the approval from the Refuge Manager or delegate.

Wildland Fire Situation Analysis

For fires that cannot be contained in one burning period, a WFSA must be prepared. In the case of a wildland fire, the Incident Commander, in conjunction with the FMO, will prepare the WFSA. Approval of the WFSA resides with the Refuge Manager.

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 complexes, in the control of wildland fire. Rehabilitation efforts will concentrate on the damages done by suppression activities rather than on the burned area itself.

Aircraft Operations

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.

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 the fire.

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

EMERGENCY STABILIZATION AND REHABILITATION

When suppression action is taken, rehabilitation is appropriate. The most effective rehabilitation measure is prevention of impacts through careful planning and the use of minimum impact suppression techniques.

Rehabilitation will be initiated by the Incident Commander, FMO, or Refuge Manager. 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. Install check dams to reduce erosion potential in drainages.
4. Restore natural ground contours.
5. Remove all flagging, equipment and litter.
6. Consider and plan more extensive rehabilitation or revegetation to restore sensitive impacted areas.

If revegetation or seeding is necessary, only native plant species will be used.

If Emergency Stabilization and Rehabilitation (ESR) measures are needed or if rehabilitation is needed to reduce the effects of a wildland fire then the Refuge can request appropriate funding through the burned area ESR fund. The ESR fund is administered through the Service's ESR coordinator at the National Interagency Fire Center.

Fire rehabilitation will be as prompt as possible to prevent erosion and spread of non-native plants. This will be developed by the Refuge staff and submitted to the Regional Fire Management Coordinator for review within 90 days of the unplanned ignition being declared out.

REQUIRED REPORTING

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

FIRE INVESTIGATION

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

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

The overall objective in the use of prescribed fire in refuge resource management programs will be to introduce fire to implement specific habitat management strategies and reduce hazardous accumulations of dead fuels. Refuge staff will carefully analyze the needs of each habitat management unit within the refuge in relation to treatment with prescribed fire. Variables to be considered in each prescribed fire include habitat management objectives, vegetation type, fire history, natural role of fire, hazard fuels, endangered species, and previous treatments with prescribed fire.

Prescribed fire will not directly support the recovery of a threatened or endangered species, however, improving habitat for prey species may indirectly benefit nesting and wintering bald eagle population.

Refuge management staff will develop annual prescribed fire objectives and target specific burn units prior to the prescribed burn season. Burns may be conducted during any season of the year depending on the specific management objectives of the burn. Burn Units identified for implementation will have a Prescribed Burn Plan written that identifies the geographic area to be burned, the specific resource objectives of the burn, the environmental conditions under which it will be burned, staff roles and responsibilities, containment actions, safety consideration, public and media contacts, smoke management, monitoring procedures, cost estimates and escaped fire contingencies.

Upon completion of the written Prescribed Burn Plan, it is submitted to the Zone Fire Management Officer stationed at Little Pend Oreille for review, then to the Refuge Manager for approval. The approved plan is also provided to local agencies with jurisdictional interests within or in areas adjacent to the proposed burn. This would include the U.S. Forest Service and Idaho Department of Lands.

Upon approval of the prescribed burn plan, preparation of the prescribed burn unit for implementation of the burn is initiated. Prescribed fire preparation activities include checking out all refuge suppression equipment to insure readiness for the prescribed burn. Specialized equipment for the burn such as portable pumps will be checked and put in place on the burn site. All drip torches will be checked for safety and operational effectiveness. All fire staff, refuge personnel and cooperators participating in the prescribed burn will be informed of specific responsibilities and assignments in a briefing held the day before the burn if possible or in the morning prior to burning. Prescribed fire operations will usually require containment lines. These lines will utilize existing roads as appropriate.

Important historical sites, biological sites and physical improvements within the burn unit will be identified and protected prior to, or during the burn.

Prescribed fires involve the use of 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, prescribed burn plans, burn prescriptions, burn operations, documentation and reporting, and burn critiques.

The refuge reserves the option to utilize an interagency team approach for complex burns carried out on the boundaries and close to developed areas or burns of large acreage. The most highly qualified and experienced personnel in the regional interagency community would be requested to serve on this team.

The prescribed burning program will be conducted in five fuel model types: Fuel Model 1 - dense continuous quackgrass 1-2 feet tall; Fuel Model 3 - includes tall and intermediate wheatgrasses 2-3 feet tall, reed canary grass or sweet clover 3-4 feet tall, and cattails and hardstem bulrush 3-5 feet tall; Fuel Model 5 - stands of cottonwood trees, golden willow or alders with grass understory 1-2 feet tall; Fuel Model 6 - thickets of willow, alder, red osier dogwood, chokecherry, black hawthorne, roses 5-8 feet tall with grass understory 1-2 feet tall; and Fuel Model 9 - dense stands of re cedar/hemlock and Douglas fir with understory of fern, snowberry, thimbleberry, and Oregon grape. Stand of 25 years old or older with some areas of dead and down wood.

Wetlands

Large, dense monotypic stands of cattails reduces the value of a wetland. Burning used in conjunction with water manipulations or mechanical disturbance creates a more desirable interspersion of open water and cover. Experience in prescribed fires conducted in emergent vegetation communities over the years at Kootenai and elsewhere indicate that the burns are effective in reducing dead biomass, but reduction in total cover lasts less than one year if water management capability is not available to keep resprouting vegetation from emerging, since cattail is capable of withstanding extended periods of inundation. In order to achieve effective reduction of emergent vegetation with prescribed fire, the burn must either be accompanied by flooding a wetland for a period of time to a depth exceeding 18 inches over emergent vegetation to prevent resprouting of the emergent vegetation (Nelson, N., Dietz, R., 1966) or regrowth must be either chemically or mechanically treated to maintain the 50:50 ratio.

Deciduous Woodlands

Black cottonwood is highly susceptible to fire damage because of its thin bark and relatively shallow root system. After 10-20 years, the bark may become thick enough to afford some fire protection. Most of the cottonwood stands on the refuge are older trees with very little regeneration. Care shall be used when burning in cottonwood habitat. Hot fires should be avoided and wildland fires should be controlled as soon as possible.

Prescribed burning of the riparian areas will also reduce dead and down tree and shrub material to reduce fuel load and potential fire hazards. Burning understory decadent grass litter will also improve the grass and forb understory by increasing plant productivity.

Grasslands

The primary objective of the grassland is to provide nesting and feeding habitat for nesting waterfowl and other migratory birds, and to provide habitat for small mammals. Utilizing prescribed burning in the grasslands will remove litter buildup and improve plant vigor. In some areas, quackgrass and reed canary grass will be burned prior to converting to more desirable grass, forb, shrub and tree species.

Wheatgrass has been established to provide more robust stands of grassland for nesting cover. After 4-5 year, excessive litter retards plant growth. Burning the accumulated thatch rejuvenates the stand and enhances plant growth.

Croplands

Prescribed burning is also used to prepare seed beds prior to planting. Quackgrass and reed canary grass is burned, new growth sprayed to kill it then the land is tilled and seeded either to better quality grasses or forbs, or converted to grainfields for wildlife.

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 Refuge Manager. Each burn plan will be prepared using a systematic decision-making process, and contain measurable objectives, predetermined prescriptions, and using an approved environmental compliance document. Appropriate NEPA documentation (Appendix C) exists for this Fire Management Plan. Therefore, additional NEPA documentation will be necessary only for prescribed fire projects not meeting the criteria outlined in this 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 is 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 L.

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.

PRESCRIBED FIRE PLANNING

Annual Activities

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

Prescribed burning seasons are generally the spring and fall months, (February 15-May 1 and September 1-November 1) depending on weather conditions. Spring burning and late fall burning may be hampered by wet conditions. Therefore, fall burning provides more beneficial results but spring burns during years of low precipitation can also provide good benefits especially for seed bed preparation. During years of critical fire hazards, the U.S. Forest Service and Idaho Department of Lands may ban burning into October. During the fire season of May through October, a burning permit is required from Idaho Department of Lands.

Prescribed Fire activities will be reviewed annually by the refuge Manager and Zone FMO. 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 Refuge Manager to determine if such alterations warrant a re-approval of the plan.

Prescribed Burn Plan

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

All prescribed fires will have prescribed burn plans. 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 L.

Each burn plan will be reviewed by the Refuge Manager, Biologist, FMO/AFMO, PFS, and Burn Boss. The Project Leader has the authority to approve the burn plan. The term ‘burn unit’ refers to a specific tract of land to which a prescribed burn plan applies.

Strategies and Personnel

Execution of prescribed burns will only be executed 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.

Prior to fire season, refuge staff that will be involved in prescribed burning will be required to take and pass the “Pack test” to determine physical endurance. All personnel participating in prescribed burning operations shall have S-130 (Basic Firefighter) and S-190 (Fire Behavior) training. All prescribed burning operations will have at least one Burn Boss qualified person in charge of burning operations.

Weather and fuel moisture conditions must be monitored closely in planned burn units to determine when the prescription criteria are met. A belt weather kit may also be utilized to augment monitoring. Fuel moisture samples of 10-, 100-, and 1000-hour down and dead logs (where applicable) and of live plants may be monitored each week and percent moisture contents figured to help 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. The Go/ No-Go checklist will be completed to determine if all required conditions are met. 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 all elements 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.

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 FMO 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 (Appendix M) 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.

All wildland fires will be appropriately suppressed. However, monitoring wildland fires may be appropriate and potentially valuable in mapping and documenting the growth of the fire, measuring on-site weather and fuel loading to provide the fire staff with present and expected fire behavior and effects.

During prescribed burns, monitoring can serve as a precursor to invoking suppression action by determining if the fire is in prescription, assessing its overall potential, and determining the effects of the prescribed burn.

During prescribed burning, monitoring should include mapping, weather, site and fuel measurements and direct observation of fire characteristics such as flame length, rate of spread and fire intensity. Operational monitoring provides a check to insure 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.

Monitoring of fire behavior will be performed by visually observing fire behavior during burning operations. Fire weather will be monitored periodically (about every ½ hour) with a fire weather kit, prior to and during burning. In most cases, the objective of burning at Kootenai Refuge is to remove residual cover. This is where fire evaluation should end. Further evaluations or monitoring should be considered as habitat management, not fire management. For example, habitat management may identify a need for increased interspersion of open water in a solid stand of cattail. This may require several actions to accomplish:

1. Drying the pond for a length of time.
2. Burning to remove vegetation and kill some roots.
3. Mechanical disturbance of pond bottom or chemical application to set back plant succession.

Evaluation of habitat management would consider the degree of burning success related to the drying period of the pond bottom. Longer term monitoring of cattail regrowth and response by wildlife use would be more appropriate for habitat management. Evaluation of the treatment in the Annual Burn Plan will address only how well fire removed cattail vegetation.

All fires may be monitored regardless of size. The FMO will establish specific fire information guidelines for each fire to update intelligence about the fire. Highest priority for monitoring will be assigned to large fires or fires which threaten to leave the refuge.

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. 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.

AIR QUALITY / SMOKE MANAGEMENT GUIDELINES

Fire effects on air quality fall into three classifications, visibility, particulates and pollutants. All three classes can affect human health and safety. Both wildland fire and prescribed fire can cause impairment of air quality in the above mentioned categories, but prescribed fire can mitigate those impacts through regulations, timing and techniques of application.

Wildland fires, as demonstrated during the historic fires of 1994 in the northwest, have the capability of affect air quality not only in the vicinity of the fire, but hundreds of miles downwind. Air quality deterioration during large wildland fires can last for weeks or months. These events affect visibility on roads and airports, often requiring closures. The particulates and pollutants have been demonstrated to be hazards to human health, with over 130 known carcinogenic substances found in forest fire smoke including, formaldehyde, methane, carbon monoxide, benzene, to name a few. These particulates and pollutants are particular hazards to local residents, individuals with existing breathing problems to the firefighters, who must endure extreme exposure for weeks at a time. These air pollution problems are exacerbated by the extreme levels of fuel loading that have accumulated in forests of the northwest with 60 years of fire exclusion policies. Many forests have changed from light grass fuel understory which burn clean (rapid oxidation, low levels of particulates) to heavier forest fuels under closed canopies which, with higher moisture levels retained in the woody fuels burn slower and liberate more particulates and other pollutants.

Personal communications with Dan Redline, Air Quality Analyst for Idaho Department of Health and Welfare, Division of Environmental Quality stated the pollutant of greatest concern for a prescribed burning program is PM 2.5. Communications with Kootenai Tribe Environmental Biologist, Ron Lowney, at the current time there are no monitoring devices in Kootenai Valley that can monitor less than PM10.

No specific air pollution standards are established for northern Idaho other than the national standards. However, prescribed burning should be done under conditions that promote rapid dispersal of smoke to prevent hazardous visibility on the county roads that bisects the refuge both east and west, and north and south. Local field burning and timber slash burning is a common occurrence in the Kootenai Valley and as of yet has caused no controversy. The town of Bonners Ferry is approximately 5 miles east of the refuge. Fire effects on air quality resulting from prescribed fire can be mitigated by utilizing weather, fuel moisture conditions and burning techniques which promote rapid combustion of fuels and dispersion of smoke. Low humidities and fuel moisture promote rapid and complete combustion of fuels. More complete combustion prevents lower levels of particulates and toxic gas combustion byproducts from being emitted into the atmosphere. Burning with proper windspeeds both at the surface level and aloft promotes dispersal and mixing of smoke particulates and gases throughout the air column to reduce effects downwind and on-site. Utilization of proper wind direction can minimize smoke effects on populated areas and in areas where visibility/air quality is a concern from a safety/public health standpoint such as roads, highways, airports, schools and hospitals. Most of the prescribed burns on Kootenai NWR will also be relatively small in size that will also cause less smoke to be emitted during the burn.

Prescribed burning on Kootenai NWR should be conducted in compliance with the requirements of the Montana/North Idaho State Airshed Group's (Group), "Montana/North Idaho Smoke Management Program (Program) to help minimize smoke pollution. The airshed group is comprised of entities which conduct a major amount of prescribed burning in their state, or health agencies which regulate this burning.

The intent of the Group is to minimize or prevent smoke impacts to communities while using fire to accomplish land management objectives or fuel hazard reductions.

Compliance with the Program is mandatory for Montana but is currently voluntary for North Idaho. However, the refuge should adhere to the Group's restriction procedures which enables the Monitoring Unit in Missoula, Montana to reduce burning, stop burning in specific areas, or cease burning entirely when meteorological or existing air quality conditions so warrant.

During the months of September through November, the Monitoring Unit is responsible for the daily monitoring of meteorological data, air quality information, and planned burning. It is also responsible for notifying local airshed coordinators when acceptable limits of smoke accumulation are threatened to be exceeded.

The U.S. Fish and Wildlife Service (FWS) is a signator of the Montana Group but not the North Idaho Group. Effort should be initiated to sign the FWS onto this Plan. Although there is a per acre charge for prescribed burning by being a member of the Group, the effort to reduce smoke and related pollutants is becoming more important in the ecoregion. Until the FWS is a signator on the plan, relevant burning information can be obtained from Idaho Department of Lands or the local U.S. Forest Service Office (both are members of the Group).

FIRE RESEARCH

Currently there are no fire research projects being conducted on the refuge. If opportunities were to arise then the refuge would welcome having research occur.

PUBLIC SAFETY

Kootenai National Wildlife Refuge is dedicated to ensuring the safety of each visitor and to all residents and property adjacent to the refuge's boundary. As conditions require, areas that are being burned will be closed until it is safe to allow the public back in the area.

Areas of fire activity will be clearly signed at visitor centers and bulletin boards. Residents adjacent to the refuge will be notified in advance of any prescribed burn and if any fire poses a threat to burn outside the refuge boundaries. A list of people to notify is in Appendix N.

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 and options may be included 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 Refuge Manager will retain a copy for the refuge files.

ANNUAL FIRE SUMMARY REPORT

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

Susan Audet, Fish and Wildlife Biologist, Ecological Services, Upper Columbia Office.

Scott Bacon, District Manager, Idaho Department of Lands.

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

Aaron Drew, Assistant Refuge Manager, Kootenai Natinal Wildlife Refuge.

Dennis Macomber, Fire Management Consultant, Portland, OR.

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

Don Voros, Refuge Supervisor, Columbia Basin Ecoregion.

Kirk Westfall, Fire Management Officer, US Forest Service, Bonner's Ferry Ranger District.

APPENDICES

APPENDIX A: REFERENCES CITED

there are reference in the text.... where are they?

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 - 1/4 acre or less.

Class B - more than 1/4 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 moistures and live fuel moistures; day to day variations are caused by changes in the moisture content of the various fuel classes. The ERC is derived from predictions of (1) the rate of heat release per unit area during flaming combustion and (2) the duration of flaming.

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

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

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

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

Fire management. All activities related to the prudent management of people and equipment to prevent or suppress wildland fire and to use 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 (1) Actions to limit the adverse effects of suppression on soils, watershed, or other values, or (2) actions to 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: COMPLIANCE

ENVIRONMENTAL ACTION STATEMENT
CATEGORICAL EXCLUSION
FOR
AMENDMENT
TO
1982 FIRE MANAGEMENT PLAN
KOOTENAI NATIONAL WILDLIFE REFUGE
BONNERS FERRY, IDAHO

Within the spirit and intent of the Council on environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) and other statutes, orders, and policies that protect fish and wildlife resources; I have established the following administrative record and have determined that the following proposed actions are categorically excluded from NEPA documentation requirements (i.e., preparation of an EA or EIS) consistent with guidance provided in 516 DM 2, Appendix 1 and 516 DM6, Appendix 1.4.

Proposed Actions

To amend the 1982 Fire Management Plan for Kootenai National Wildlife Refuge.

Categorical Exclusions

Amending the Fire Management Plan can be considered "routine and continuing government business, including such things as supervision, administration, operations, maintenance, and replacement" (516 DM 2 Appendix 1.7). Amending the Plan could be considered "administration", while wildland fire suppression and prescribed burning can be considered "operations". Service actions that are designated as categorical exclusions in 516 DM 6 Appendix B (5) "The issuance of new or revised site, unit, or activity-specific management plans for public use, land use, or other management activities when only minor changes are planned. Examples could include an amended public use plan or fire management plan." (516 DM 6 Appendix 1.4 B (10). Wildland fire suppression can be considered as "Fire management activities, including prevention and restoration measures, when conducted in accordance with departmental and Service Procedures." (516 DM 6 Appendix 1.4 B (5), and prescribed burning is covered under categorical exclusion 516 DM 6 Appendix 1.4 B (4) "The use of prescribed burning for habitat improvement purposes, when conducted in accordance with local and State ordinances and laws."

Insert /s/name and date

Dan Pennington, Refuge Manager

Date

BIOLOGICAL EVALUATION

Based on the limited scope of the proposed action, we have determined that the proposed action is not a “major federal activity” thus, a formal Biological Assessment will not be prepared. However, we are providing the following biological evaluation for your consideration pursuant to the informal consultation procedures found at 50 CFR Part 402.13.

Proposed Action: Provide wildfire suppression actions and prescribed burning activities on Kootenai National Wildlife Refuge, Bonners Ferry, Idaho (Amend 1982 Fire Management Plan).

Project Purposes:

Wildfire Suppression: Protect life, and refuge resources and improvements from wildfires.

Prescribed Burning: The overall objective in the use of prescribed fire in refuge resource management programs will be to introduce fire under controlled conditions in order to implement specific habitat management strategies and reduce hazardous accumulations of dead fuels.

1. Bald eagle (*Haliaeetus leucocephalus*). The bald eagle is federally listed threatened species (downlisted from endangered as of August 11, 1995) in Idaho. There is a nesting site on the Refuge. Successful reproduction at this nest occurred for ten seasons prior to the destruction of the nest by wind during the 1994 nesting seas, resulting in the mortality of both young. During the 1995 season, the nesting pair rebuilt and re-occupied the nest site, and one young was successfully fledged. Observations by refuge staff indicate that fledging has occurred no later than mid-July each year since the nest was initially established. Wildfire suppression would be conducted any time of the year when a fire could burn, and the eagles nesting site is a high priority for protection. Prescribed burning near the eagle nest would occur only after the young of the year have fledged (August through November). A high degree of protection would be provided to reduce the chances of the nest tree from being burned down. During the months of late-March and early-April while the eagles are making repairs to their nest in preparation for nesting and begin nesting, prescribed burning in riparian areas and forested areas of the Refuge may occur. However, during these months, burning would not occur within 1/3 mile of the eagle nest site.

Effects: Because prescribed burning would be conducted outside the nesting season or over 1/3 mile away (March 15 to April 15 and from August 15 through November 15) there would be minimal disturbance to eagles. March 15 to April 1 is the only time that prescribed burning would take place on the refuge and that eagles would be present (except transitory birds).

Prescribed burning would increase biodiversity and biological integrity of the refuge, thus providing positive benefits for eagles as they would have a more abundant food source. Thus, we find that prescribed burning action is “not likely to adversely affect” federally listed threatened bald eagles.

Effects of wildfire suppression may have a negative effect on bald eagles, especially if suppression efforts are conducted near the eagles nest during nesting, incubation and the rearing of young.

However, the disturbance would be expected to be short-term where as a wildfire burning down the tree the eagles nest in would be long term.

2. Ute Ladies'-tresses (*Spiranthes diluvialis*). The Ute Ladies'-tresses (ULT) is a federally listed threatened species. Although the only know occurrence of ULT in the Columbia River Basin is in the Okanogan Valley of Washington, potential habitat is located in northern Idaho, including Kootenai Refuge. The ULT is a lowland species, typically occurring beside or near moderate gradient medium to

large streams and rivers in the transition zone between the mountains and plains. It is not found in steep mountainous parts of the watershed, nor along slow meandering streams out in the flats. ULT is endemic to mesic or wet meadows and riparian/wetland habitats near springs, seeps, lakes, or perennial streams. The communities where it is often found tend to be typically of riparian habitat in the area. The species tend to occupy graminoid dominated openings in shrubby areas. It occasionally occurs in spring-fed wetlands in broad valleys isolated from watercourses. Soil moisture must be at or near the surface throughout the growing season. The species tolerates periodic flooding, but does not occupy constantly inundated areas. This species is tolerant of alkaline substrates. However, there are certain habitat types that are “not suitable” (disqualified habitat) for the ULT. These include:

- § appropriate hydrology not present, typically indicated by: a) area composed of mostly upland vegetation, and/or b) area dries up by mid-July, with water table lower than 12 inches below the surface
- § site heavily disturbed
- § stream banks channelized and stabilized by heavy riprap
- § highway right-of-way build on filled or compacted soil or rock material
- § construction sites where construction has either stripped the topsoil or where construction has been completed within the last 5 years but the area has not been revegetated
- § Note: ULT has been found in some heavily disturbed sites where hydrology is appropriate, such as revegetated gravel pits, grazed riparian edges and pastures, and along well-traveled trails developed on old berms
- § steep stream banks; where the transition from stream margin to upland areas is abrupt
- § site characterized by standing water with cattails, bulrushes, and other aquatic vegetation (note that the margins of such areas may be suitable habitat, and ULT has been found in areas that are temporarily inundated)
- § riparian areas or stream banks vegetated by dense rhizomatous species such as reedgrass (*Phalaris arundinacea*), tamarisk (*Tamarix ramosissima*), teasel (*Dipsacus sylvestris*), common reed (*Phragmites australis*), or saltgrass (*Distichlis spicata*)
- § riparian areas overgrazed or managed such that the vegetation is composed of upland native or weedy species or is unvegetated; in some cases, ULT may tolerate overgrazing as long as it has not resulted in a drop of the water table or conversion of the community to upland or weedy species
- § potential habitat has been converted to agricultural uses and is now plowed and cropped, or has been converted to lawns or golf courses
- § wetland is a brackish playa or pothole not fed by springs, or not in the floodplain of or hydrologically connected with a riparian system or other source of fresh water

Effects: Most of the habitat on the Refuge has been determined to be disqualified habitat for the occurrence of ULT. Many of the wetland areas on the Refuge are characterized by standing water with cattails, bulrushes, and other aquatic vegetation. The margins of these areas are mostly populated with thick stands of reed canary grass. Although there are very few wet meadows on the Refuge, they are also typified by thick stands of reed canary grass. Most of the impoundments on the Refuge are artificially manipulated and are drawn down approximately every 5 years to increase aquatic plant and animal production. During these draw downs, the water table in the surrounding meadows are drawn down to over 12 inches below the surface.

The higher elevation grassland is characterized as primarily quackgrass, with a water table greater than 12 inches below the surface.

The farm fields (approximately 600 acres) are cultivated mostly on an annual basis. However, some cover crops are left in for 3 years. Groundwater in the farm land is over 12 inches below the surface.

The riparian habitats on the Refuge is the most likely habitat for the ULT. However, almost all of the riparian areas are infested with high population of reed canary grass. If the reed canary grass is not there, then the water table is over 12 inches from the surface.

If there are areas on the Refuge that have the potential to contain ULT, then suppressing wildfires would probably be a benefit to the ULT. Wildfire are usually very hot and kills the plants.

Little is known about the effects of prescribed burning on ULT. However, it is expected that since it is a native species, it probably evolved in a fire regime.

Because of the conditions described above, we find that the proposed action is “not likely to adversely affect” federally listed Ute Ladies’tresses.

Resource Conservation Measures

- 1) Wildfire suppression would put a high priority on protecting the eagle nest site.
- 2) Prescribed burning would be conducted March 15 to April 15 and from August 15 through November 15. The March 15 to April 15 period could overlap the beginning of the nesting activities for eagles. During this time period, burning would be confined to over 1/3 mile from the nest site. From August 15 through November 15, eagles may be present on the Refuge but not involved in nesting activities.
- 3) Prior to prescribed burning activities in the vicinity of the eagle nest, fire-breaks will be installed around the tree and special attention will be given to assure its protection.

Intra-Service Section 7 Evaluation Form for Region 1

was this returned signed from ES?

Initiating _____ Date
Officer

Concur (mark one) Do not concur

Comments:

ES
Field Office _____ Date
Supervisor

Concur (mark one) Do not concur

Comments:

APPENDIX E: AGREEMENTS

Still trying to get a copy of this.

APPENDIX F: RCRC

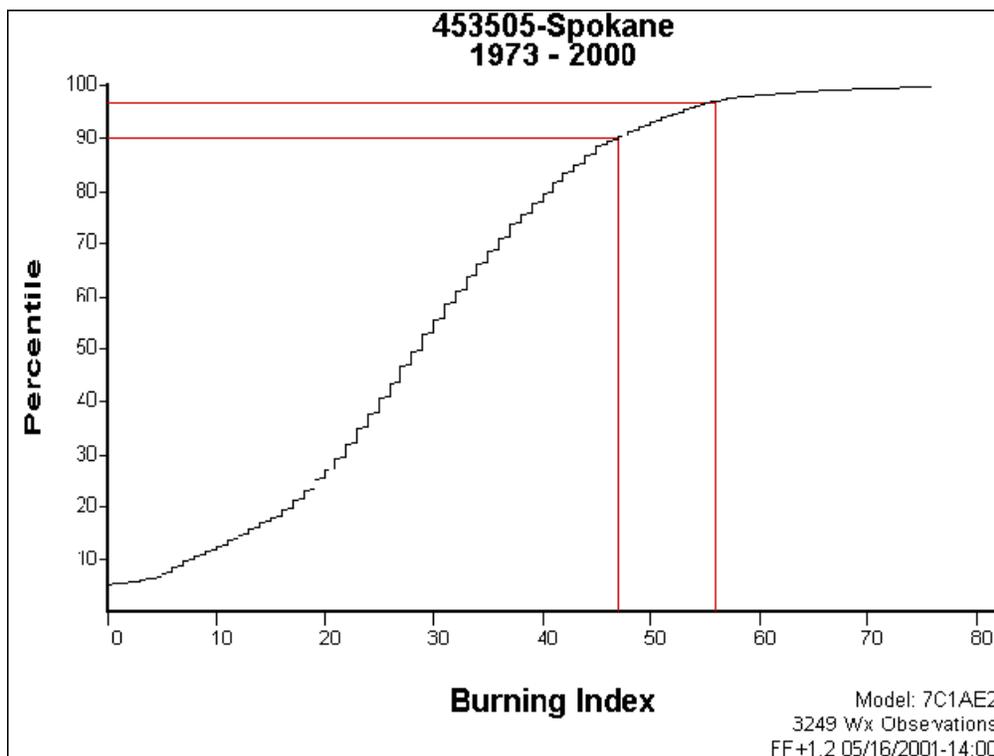
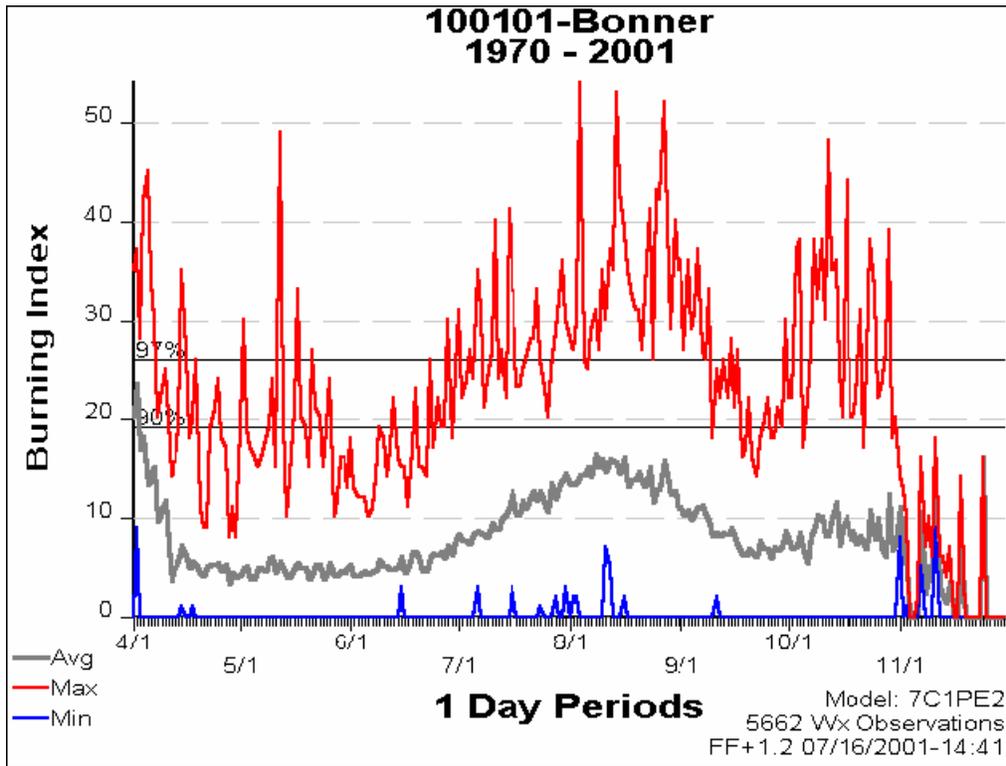
REQUEST FOR CULTURAL RESOURCE COMPLIANCE
 U.S. Fish and Wildlife Service, Region 1

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

Appendix G: Weather Analysis

Weather Station used for weather analysis was Bonner's Ferry #100101 for years 1970-2000
The graphs below show the Burning Index for this data set.



APPENDIX H: STEP-UP PLAN

The purpose of this Plan is to provide Refuge staff, particularly fire personnel, the guidance necessary to maintain an appropriate level of readiness for initial attack suppression operations. Furthermore, it may be used to provide a basis on which to justify Emergency Pre-suppression funding as a bridge to Severity Funding.

It is not intended that the indices shown below be the sole justification for requesting emergency support money since many other factors related to available resources, seasons, local conditions and weather may have to be considered.

This step-up plan uses weather data collected from the Colville Airport. The Washington Department of Natural Resources maintains this weather station. A data set from 1970 to the present exists for this station. KCFAST was used to download the data onto a PC and then FIREFAMILY Plus was used to analyze the data. An analysis of fuel model C resulted in the following step-up plan. A cumulative frequency distribution on the burning index yields staffing classes. The 97th percentile establishes staffing class 5, the 90th percentile establishes staffing class 4. Staffing classes 2 and 3 are based upon 1/4 and 1/2 of the 90th percentile value, respectively. Staffing class 1 is the remaining days.

Staffing Class	Burning Index	Actions
1-Low	0-4	Working hours for all fire personnel; 0730-1600. Service uniforms may be worn for routine work activities. Initial attack packs kept with fire personnel. Weekly equipment checks on engines and pumps. Cache to be cleaned and maintained weekly. Maintain Prevention Signs.

2-Moderate	5-9	<p>Working hours for all fire personnel; 0730-1600. Service uniforms may be worn for routine work activities. Initial attack packs kept with all fire personnel. Weekly equipment checks on engines and pumps. Cache to be cleaned and maintained weekly. Inspect refuge vehicles for inclusion of serviceable fire tools. Maintain Prevention Signs.</p>
3-High	10-18	<p>Working hours for all fire personnel; 0730-1600 (or as required on a daily basis). PPE worn when on duty. Initial attack packs kept with all fire personnel. Daily equipment checks on engines and pumps. Cache to be cleaned and maintained weekly. Raise to level 4 for national holidays (Memorial Day, Independence Day, Labor Day). Maintain Prevention Signs.</p>
4-Very High	19-25	<p>Working hours for all fire personnel; 0930-1800 (or as required on a daily basis). PPE worn when on duty. Initial attack packs kept with all fire personnel. Daily equipment checks on engines and pumps. Cache to be cleaned and maintained weekly. Raise to level 5 for national holidays (Memorial Day, Independence Day, Labor Day). Maintain Prevention Signs. Aerial Detection Flights for lightning.</p>

5-Extreme	26 and greater	<p>Working hours for all fire personnel; 0900-2000 (or as required on a daily basis).</p> <p>PPE worn when on duty.</p> <p>Initial attack packs kept with all fire personnel.</p> <p>Daily equipment checks on engines and pumps.</p> <p>Cache to be cleaned and maintained weekly.</p> <p>Project leader will consider closure of refuge roads.</p> <p>FMO to prepare fire complexity analysis and WFSAs by 1600 each day.</p> <p>Request emergency preparedness support from Regional office.</p> <p>Maintain Prevention Signs.</p> <p>Aerial Detection Flights for lightning.</p>
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APPENDIX I: EQUIPMENT INVENTORY

Kootenai Fire Cache Inventory				
LOCATION	ITEM	QUANTITY	S/N	COST
FIRE CACHE	EXTRA LARGE FIRE SHIRTS			
FIRE CACHE	LARGE FIRE SHIRTS			
FIRE CACHE	MEDIUM FIRE SHIRTS			
FIRE CACHE	SMALL FIRE SHIRTS			
FIRE CACHE	36 X 34 FIRE PANTS PAIRS			
FIRE CACHE	34 X 34 FIRE PANTS PAIRS			
FIRE CACHE	32 X 34 FIRE PANTS PAIRS			
FIRE CACHE	RED DUFFLE BAGS			
FIRE CACHE	CHEST HARNESSSES (RADIO HOLDERS)			
FIRE CACHE	CHAIN SAW BAR COVERS			
FIRE CACHE	TENTS			
FIRE CACHE	THERMO-REST MATTRESS			
FIRE CACHE	GAS CAN			
FIRE CACHE	HOMELITE 9,000			
FIRE CACHE	HOSEWASHER			
FIRE CACHE	MARK III PUMP			
FIRE CACHE	STIHL P840			
FIRE CACHE	PULASKI			
FIRE CACHE	COMBI TOOLS			
FIRE CACHE	BRUSH RAKE			
FIRE CACHE	ROUND POINT SHOVELS			
FIRE CACHE	ROLLS OF 50 FT 1 ½"			
FIRE CACHE	ROLLS OF 100FT 1 ½"			
FIRE CACHE	ROLLS OF 50FT 1"			
FIRE CACHE	LENGTHS OF 1 ½" HARD SUCTION			
FIRE CACHE	LENGTHS OF 2 ½" HARD SUCTION			
FIRE CACHE	BOXES OF EAR PLUGS			

Kootenai Fire Cache Inventory				
FIRE CACHE	PAIRS OF SAFETY GOGGLES			
FIRE CACHE	BELT WEATHER KIT			
FIRE CACHE	PAIR OF FIRE GOGGLES			
FIRE CACHE	FIRE SHELTERS			
FIRE CACHE	EXTRA FIRE SHELTER HOLDERS			
FIRE CACHE	HELMET SHROUDS			
	WATER BOTTLES			
FIRE CACHE				
FIRE CACHE	WATER BOTTLE			
FIRE CACHE	LANTERN BATTERIES			
FIRE CACHE	BOX D CELL BATTERIES			
FIRE CACHE	BOX AA BATTERIES			
FIRE CACHE	CASES OF MRES			
FIRE CACHE	FIELD FIRST AID KITS			
FIRE CACHE	PAIR OF SMALL GLOVES			
FIRE CACHE	PAIR OF MEDIUM GLOVES			
FIRE CACHE	PAIRS OF LARGE			
FIRE CACHE	PAIR OF LARGE GLOVES			
FIRE CACHE	COLEMAN LANTERN			
FIRE CACHE	COLEMAN STOVE			
FIRE CACHE	EAGLE FIRE PACK			
FIRE CACHE	BACKPACK			
	FIELD PACKS			
FIRE CACHE				
FIRE CACHE	BACKPACK PUMP			
ENGINE 1	EXTRA LARGE FIRE SHIRT			
ENGINE 1	GOGGLES			
ENGINE 1	PAIR OF EXTRA LARGE GLOVES			
ENGINE 1	FIRE SHELTER			
ENGINE 1	FIRST AID KIT			
ENGINE 1	HEAD LAMP OLD STYLE			

Kootenai Fire Cache Inventory				
ENGINE 1	FIELD PACK			
ENGINE 1	STIHL 026 CHAIN SAW			
ENGINE 1	SAW KIT			
ENGINE 1	PAIR CHAPS			
ENGINE 1	STIHL 036			
ENGINE 1	SAW BAR GUARD			
ENGINE 1	ONE GALLON CANTEENS			
ENGINE 1	LENGTHS OF 50FT 1" HOSE			
ENGINE 1	LENGTHS OF 100FT 1" HOSE			
ENGINE 1	LENGTHS OF 50FT 1 ½" HOSE			
ENGINE 1	LENGTHS OF 100FT 1 ½" HOSE			
ENGINE 1	ROUND POINT SHOVELS			
ENGINE 1	McLOUDS RAKE			
ENGINE 1	BRUSH RAKE			
ENGINE 1	PULASKI			
ENGINE 1	FALLING AXE			
ENGINE 1	PRY BAR			
ENGINE 1	CLAW BARS			
ENGINE 1	ONE GAL. GAS CAN			
ENGINE 1	DOLMAR			
ENGINE 1	DRIP TORCH			
FIRE CACHE	1 ½" GATED WYE'S			
FIRE CACHE	1" GATED WYE'S			
FIRE CACHE	2 ½" DOUBLE FEMALE			
FIRE CACHE	2 ½" DOUBLE MALE			
FIRE CACHE	1 ½" DOUBLE FEMALE			
FIRE CACHE	1 ½" DOUBLE MALE			
FIRE CACHE	1" TO ¾" REDUCERS			
FIRE CACHE	1 ½" TO 1" REDUCER			

Kootenai Fire Cache Inventory				
FIRE CACHE	GRAVITY SOCK			
FIRE CACHE	COLLAPSIBLE BUCKET			
FIRE CACHE	3/4" LINE NOZZLES			
FIRE CACHE	FORESTER NOZZLE			
FIRE CACHE	1" FOG NOZZLE			
FIRE CACHE	1 ½" FOG NOZZLE			
FIRE CACHE	PISTOL GRIP BBLE CUP			
FIRE CACHE	HYDRANT WRENCH			
FIRE CACHE	TOOL BOX			
FIRE CACHE	1 ½" IN LINE T'S			
FIRE CACHE	HOSE CLAMP			
FIRE CACHE	SPANNER WRENCHES			
FIRE CACHE	1 ½" SHUT OFF'S			
FIRE CACHE	1 SHUT OFF			

APPENDIX J: DISPATCH PLAN

1. Refuge Fire Dispatch:

When report of smoke or fire is received, determine the following information:

- Location of smoke or fire.
- Location of informant.
- Name & telephone number of informant.
- Color of smoke.
- Size of fire.
- Type of fuel.
- Character of fire (running, smoldering, etc.).
- Anyone fighting the fire?
- Did informant see anyone in vicinity or vehicles leaving the area?
- Weather at fire location.

a. NOTIFY KOOTENAI REFUGE if fire is ON or THREATENING Refuge at 267-3888. Kootenai NWR fire qualified personnel will make initial attack on fires on or adjacent to the refuge. If fire escapes initial attack on refuge, Bonners Ferry Ranger District will be called for support.

Priority	Position	Home Phone
Kootenai Refuge	Headquarters Office	267-3888
Dan Pennington	Refuge Manager/Firefighter	267-0614
Aaron Drew	Asst. Manager/Firefighter	267-0975
Wayne Wilkerson	Maint. Worker/Firefighter	267-2839
Jim Tucker	Tractor Operator/Firefighter	267-2044
Janet Satchwell	Admin. Support Asst.	267-1482

b. NOTIFY BONNERS FERRY RANGER DISTRICT (who supports wildfire suppression on Kootenai Refuge) to inform them of fire's location. Dispatcher: 1-208-772-3283

Priority	Position	Home Phone	Pager
Tammy Glen	Prevention Tech/Dispatcher	267-7086	---
Mike Stevenson	Crew Leader/Dispatcher	263-3874	57
Kirk Westfall	Fire Management Officer	263-2996	97
Will Parker	Forestry Tech	267-3858	87
Steve Kozel	District Ranger	267-6374	---

c. NOTIFY IDAHO DEPARTMENT OF LANDS office who has wildfire suppression responsibility east of the West Side Road (except for Kootenai Refuge) to inform them of fire's location. Office: 267-5577

Priority	Position	Home Phone	Pager
Scott Bacon	District Manager	267-3603	299
Eric Haase	Sr. Resource Manager-Fire	267-7197	299
Tom Fleer	Sr. Resource Manager-Timber	265-5277	----
Loretta Hunsaker	Office Secretary	267-5787	299
Ken Nelson	Crew Foreman	267-3606	266
Jim Thompson	Resource Aid II	267-3421	266
Marcus Kelly	Resource Aid II	267-2569	266
Steve Jamsa	Resource Aid II	267-2569	266
Jerry Garten	Forest Products Advisor	267-7778	299

d. FWS FIRE EQUIPMENT & TOOLS

- 1 - Truck mounted 200 gallon slip on pumper & hand tools
- 1 - Large farm tractor with large plow and disk
- 1 - Small tractor with rotary, side-mounted mowers; and rotary-tiller
- 1 - 4-wheel ATV

Fire Cache appropriate to maintain a 3-person firefighter crew, with appropriate personal protective equipment (PPE).

e. DISPATCH Refuge pumper and hand tools if:

- a. Fire is on Refuge
- b. Fire is threatening refuge property
- c. Dispatched by Federal or State suppression Agency
- d. Lives or neighboring dwellings are in jeopardy from wildfire
- e. DO NOT ATTACK structural fires

f. NOTIFY Refuge neighbors and cooperators as appropriate.

- a. Steve Schwilling - 267-8117
- b. Wayne Tucker - 267-2194 (shop)
-267-2195 (home)
- c. Jim Tucker - 267-2044 (home)
- d. Larry Peterson - 267-2303
- e. Wally Davidson - 267-2497
- g. Directory Assistance: - 411

Regional Office

Regional Fire Management Coordinator	Pam Ensley	(503) 231-6174
Asst. Fire Management Coordinator	Andy Anderson	(503) 231-6175
Zone Fire Management Officer	Keith Satterfield	(509) 684-8384 (work) (509) 738-2934 (home)

NIFC

FWS Fire Management Coordinator		(208) 389-2595
Logistics Support		(208) 389-2400
Boundary County Sheriff's Office	911	267-3151

APPENDIX K: COMMUNICATIONS

Frequencies and Tones Programed in Phoenix Radios

Channel #	Agency	RX	TX	Tone	Repeater	Use
1	FWS	164.775	164.775		Local	Refuge Operations
2	USFS	168.775	168.775		Local	Fire & Emergency
3	USFS	168.775	168.175	131.8	Saddle Mtn	Fire & Emergency
4	IDF&G	151.315	151.315		Local	LE & Emergency

5	IDF&G	151.390	151.355	114.8	Schweitzer	LE & Emergency
6	IDF&G	151.390	151.355	100.0	Wardner	LE & Emergency
7	IDF&G	151.390	151.355	127.3	Mica	LE & Emergency
8	IDF&G	151.390	151.355	136.5	Sisters	LE & Emergency
9	ID of Lands	151.145	151.145		Local	Fire & Emergency

APPENDIX L: BURN PLAN TEMPLATE

do you have a complete one?

PRESCRIBED FIRE PLAN

Refuge: _____ Refuge Burn Number:

Sub Station: _____ Fire Number:

Name of Area: _____ Unit No.

Acres To Be Burned/Maximum Manageable Area (MMA): _____ Perimeter Of Burn:

Legal Description: Lat. ___ Long. ___ T ___ R ___ S

County:

Is a Section 7 Consultation being forwarded to Fish and Wildlife Enhancement for review ? Yes No (circle).

(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)
- 4)

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

- 1)
- 2)
- 3)
- 4)

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

- 1)
- 2)
- 3)
- 4)

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:

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			
Cloud Cover (%)			
ENVIRONMENTAL CONDITIONS			
Soil Moisture/KBDI			
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)			
Rate of Spread			
Fireline Intensity			
Flame Length			
Energy Release Component NFDRS Fuel Model			

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.

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 (INCIDENT ACTION PLAN)

Activity Code:

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

Costs

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.)

Burn Boss/Manager -

Ignition Specialist -

Ignition Crew -

Holding Specialist -

Holding Crew -

Aircraft Manager -

FWBS -

Dispatcher-

Other -

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:

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:

APPENDIX M: SAMPLE WFSA

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