WILDLAND FIRE MANAGEMENT PLAN

SOUTHEAST IDAHO NATIONAL WILDLIFE REFUGE COMPLEX

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EXECUTIVE SUMMARY

This plan is written to provide guidelines for appropriate suppression and prescribed fire programs at Southeast Idaho National Wildlife Refuge Complex (Complex).

Wildland fire suppression is necessary during summer and fall when dry conditions can lead to catastrophic and uncontrolled fires in sensitive habitat types potentially threatening refuge facilities and neighboring private lands and structures. The habitat type that is especially susceptible to wildland fire is the sagebrush steppe habitat along the Snake River Plain on Minidoka and Camas NWR's. Uncontrolled wildland fire in the marshes of Camas, Grays Lake and Bear Lake NWR's during the same time period could lead to destruction of neighboring ranches and farms.

Prescribed fires may be used to reduce hazard fuels, restore the natural processes and vitality of ecosystems, improve wildlife habitat, remove or reduce non-native species, and/or conduct research. Prescribed fires are conducted primarily during March (Camas and Bear Lake NWR's) and October (Grays Lake NWR).

This document summarizes key indices that support fire management decisions, such as weather, fire history, resource values at risk, facilities, cultural resources, and fuel types. The intent of this plan is to provide decision makers a consolidated source for key fire related support documents.

Appendices contain relevant documents such as contact lists, prescribed fire burn plans, go/no go checklist, definition of terms, cultural resource reviews, maps of units and copies of cooperative agreements.

This plan also provides the basic analysis needed for a finding under the National Environmental Protection Act that fire suppression and prescribed fire will not adversely affect the environment on the Complex.

INTRODUCTION

This plan establishes a Fire Management Plan for Southeast Idaho National Wildlife Refuge Complex (Complex). The Complex includes four refuges: Grays Lake, Bear Lake, Camas, and Minidoka and one waterfowl production area: Oxford Slough. This plan will meet the requirements of the National Environmental Protection Act (NEPA) and the National Historic Preservation Act (NHPA). A categorical exclusion forms the basis for the decision that wildland fire suppression and prescribed burning (Appendix 15). Section 7 Consultation is not required as part of this FMP (i.e., the Project Leader made a "no effect" determination).

This plan is written as an operational guide for managing the Complex'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, found in 620 DM 1, that refuges with burnable vegetation develop a fire management plan.

This plan will implement a Fire Management Program which will continue full suppression of all wildland fires and will utilize prescribed fire for habitat management purposes. Fires on the Complex will be managed to meet refuge goals of providing productive habitat for aquatic migratory birds, manage for the conservation and recovery of threatened and endangered species, and restore and maintain native ecological communities of the Greater Yellowstone Ecosystem (Grays Lake and Bear Lake) and the Snake River Plain (Camas and Minidoka).

The Complex has a Fire Management Officer (FMO) and authority to hire one engine crew. Once activated, this crew will be available for prescribed burning, fire prevention activities, and initial attack of wildland fires. The East Idaho Interagency Fire Center (Grays Lake, Bear Lake, Camas, and Oxford Slough) and Southern Idaho Interagency Fire Center (Minidoka) are contacted when resource are needed for suppression beyond the capability of the Complex staff.

COMPLIANCE WITH USFWS POLICY

Grays Lake NWR was established on June 17, 1965 by a combination of Migratory Bird Commission action and Executive Order. The stated purposes from 16 U.S.C. 715d (Migratory Bird Conservation Act) for the refuge are "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds."

Bear Lake NWR was established in 1968 by Public Land Orders 4415 and 4545. The land was set aside to protect and improve the habitat for the western Canada goose and other waterfowl as well as the greater sandhill crane.

Camas National Wildlife Refuge was established by Executive Order 7720 on October 12, 1937. The stated purpose is ". . .a refuge and breeding ground for migratory birds and other wildlife."

Minidoka NWR was established by Executive Order in 1909 as a breeding ground for birds and other wildlife as a part of the construction of the Minidoka Dam in 1906.

Management strategies for the Complex include:

- Manage for productive populations of migratory birds.
- Manage for the conservation and recovery of threatened and endangered species.
- Restore and maintain native ecological communities.
- Provide opportunities for wildlife dependent recreation when compatible with refuge purposes.
- Maintain the full array of wildlife.
- Minimize human disturbance to wildlife populations.

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 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 wildfire causes damage of such magnitude as to impact management objectives and/or socio-economic conditions of an area. However, no wildfire situation, with the possible exception of threat to human survival, requires the exposure of firefighters to life threatening situations. Within the framework of management objectives and plans, overall wildfire 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 wildfire. Once classified a wildfire, 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 the 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 overall objectives for fire management are to promote a program to ensure firefighter and public safety, aimed at reducing human-caused fires, to ensure appropriate suppression response capability to meet expected wildland fire complexity, and to increase use of prescribed fire. Fire will be managed as a tool in conjunction with grazing, haying, weed control, and limited water management to attain refuge objectives. Specific fire management objectives are:

1. Promote a fire management program and control all wildland fires.

2. Protect life, property, and resources from wildland fires at costs commensurate with resource values at risk. This includes all administrative facilities, residences, and buildings, utility and irrigation lines, equipment storage areas, and refuge signs. Where applicable, water control structures, bridges and grainfields will receive protection. Fire threatening areas used by threatened and endangered species will be aggressively fought. Private lands adjacent to the refuge will be protected from fires originating on the refuge.

3.Use prescribed fire to reduce hazard fuel accumulation, restore fire to fire-dependent ecological communities, and to manage wildlife habitat. Prescribed fire will be used to increase vigor of flora, restore natural processes, increase interspersion of vegetation/ water, reduce cover of decadent or monotypic stands, recycle nutrients, provide areas which green-up faster in the spring, remove noxious weeds, and stimulate grass seed production.

4. Use appropriate suppression tactics and strategies that minimize long-term impacts of suppression actions.

DESCRIPTION OF REFUGE

The Complex Office is located in Chubbuck, Idaho, and serves as the administrative headquarters for Bear Lake, Camas, Grays Lake, and Minidoka National Wildlife Refuges (NWR) and Oxford Slough Waterfowl Production Area (WPA). This office also coordinates management activities dealing with trumpeter swans throughout eastern Idaho and surrounding portions of Wyoming and Montana.

BEAR LAKE NWR

Bear Lake Refuge is located in southeast Idaho, 7 miles south of Montpelier. Surrounded by mountains, it lies in the Bear Lake Valley at elevations ranging from 5,925 feet on the marsh to 6,800 feet on the rocky slopes of Merkley Mountain. The Refuge is comprised of two units; the Bear Lake Unit near Montpelier (18,060 acres) and the Thomas Fork Unit 20 miles east of Montpelier on US Highway 30 (1,015 acres). The Bear Lake unit consists mainly of a bulrush marsh, open water, and flooded meadows of sedges, rushes, and grasses. The main unit of Bear Lake NWR encompasses what is locally referred to as Dingle Swamp or Dingle Marsh. Along with Bear Lake proper, the marsh was once part of a larger prehistoric lake that filled the valley. As it drained and receded, Dingle Marsh was reduced from 25,000 acres to less than 17,000 acres.

The interspersion of bulrush, open water, and uplands provides ideal habitat for numerous waterfowl species. Common nesting species include the Canada goose, redhead, canvasback, mallard, gadwall, cinnamon teal, and northern shoveler. In a typical breeding season, the refuge will produce 4,500 ducks and 1,800 geese. Trumpeter swans are also beginning to nest on the refuge.

The refuge provides valuable habitat for 12 species that nest in colonies in bulrush. These include the white-faced ibis, snowy egret, black-crowned night heron, great blue heron, double-crested cormorant, California gull, Franklin's gull, Caspian tern, Forster's tern, black tern, western grebe, and eared grebe. Sandhill cranes are frequently observed on the refuge. The refuge's shallow water and mudflat areas provide habitat for willets, avocets, and stilts. The refuge supports a rich variety of other migratory birds such as hawks, owls, and many species of songbirds. Hundreds of mule deer winter along Merkley Mountain, and one or two moose are present during most seasons in refuge willows. Smaller mammals often seen are muskrats, skunks, and cottontail rabbits.

Because the refuge and surrounding area had always provided excellent goose nesting habitat, management originally emphasized Canada geese. Today, priorities have shifted to four other species whose populations have declined from historic levels: redhead and canvasback ducks, trumpeter swans, and white-faced ibis.

Since 1900, two factors have led to the degradation of the quality of wildlife habitat on the refuge; namely, muddy water caused by carp feeding and silt deposition from the Bear River. These factors have reduced water quality and resulted in a decline in wildlife use on the refuge. To correct some of these problems, diked units have been constructed to stabilize water levels for duck nesting, reduce the amount of silt deposited by the Bear River, and exclude carp.

The refuge cuts hay to provide short cover that is flooded in the spring to create feeding sites and rearing areas for waterfowl, sandhill cranes, and ibis. The refuge also cultivates several fields around the edge of the marsh to provide food crops of barley and alfalfa for waterfowl and sandhill cranes. They are planted on a rotation schedule to reduce the need for chemical fertilizers and herbicides. Up to 1,000 geese and 500 sandhill cranes use these crops during the spring, summer, and fall. These farming operations also help reduce off-refuge crop damage caused by migratory birds.

Control of non-native, invasive weeds is another key management operation. Noxious weeds have few natural controls and can quickly replace native plants. The refuge uses selected herbicides to keep these problem species under control. The refuge also maintains abundant habitat in an undisturbed, natural state. These areas provide tall, dense vegetation for species that require dense nesting cover. It also provides escape cover from predators, such as striped skunks, raccoons, red foxes, and mink. Prescribed fire is used periodically in the more densely vegetated areas of the marsh. It creates open water ponds in the marsh after reflooding and recycles nutrients which increase plant growth, resulting in improved habitat and markedly increased use by waterfowl.

Spring at Bear Lake comes late, with some ice still on the refuge marsh through late April in most years. The early migrants such as Canada geese, mallards, and northern pintails arrive in early March. From mid-March to early April, spring migration peaks as the ice slowly recedes and open water begins to show in the ponds. Ducks, including canvasbacks, redheads, and lesser scaup are abundant at this time. Sandhill cranes can easily be seen, usually in pairs preparing to nest. April and May see the arrival of thousands of Franklin's gulls and white-faced ibis. Large numbers of herons, egrets, bitterns, terns, and grebes establish nesting sites in the marsh. Shorebirds such as the American avocet and black-necked stilt are some of the last to arrive.

During June, the early duck broods of mallards and canvasbacks are already hatching out, quickly followed by redheads, ruddy ducks, cinnamon teal, shovelers, and gadwalls. As June progresses into July, marsh vegetation grows taller, making it harder to see the various bird species. White-faced ibis nest on the refuge in large numbers. Black and Forster's terns, as well as Franklin's gulls, are frequently seen overhead feeding on insects and diving for small fish. Grebes (western, Clark's, pie-billed, and eared) are commonly seen on the canals and ponds. Double-crested cormorants, California gulls, and white pelicans are also frequently observed within the refuge marsh.

Fall comes early in the high-elevation Bear Lake Valley. September brings hundreds of sandhill cranes, which gather to feed in refuge grain fields. Young ducks learn to fly by late September. Waterfowl, mostly from Canada, pass through the valley on fall migration from mid-September through mid-November. Freeze-up of marshes is early, usually by mid-November. Most birds leave the valley after freeze-up to avoid the snowy winters--notable exceptions are rough-legged hawks and bald eagles, which winter in the area.

Cultural Resources

Prior to the settlement of the Bear Lake Valley in the 1860's, the Shoshone and possibly the Bannock Indians used the valley for grazing horses and hunting. Buffalo herds used the valleys lush meadows and took refuge in the old Dingle Swamp’s bulrush stands in winter. Two small Indian hunting camp sites of minimal archeological significance have been identified along the edge of the marsh and buffalo bones and skulls are found from time to time in the marsh and along eroded canal banks.

The Thomas Fork Unit (TFU), where many of pioneers crossed Thomas Fork Creek, was an important part of the Oregon Trail. An archeological investigation of most of the Thomas Fork Unit was completed in 1996 finding no archeological sites.

Fish and Wildlife

The expansive marsh and adjacent drier habitats of Bear Lake NWR are home to some 165 species of birds, mostly aquatic types. Canada geese are an abundant nester as well as 12 species of other waterfowl. The refuge is important habitat to such notable duck species as the redhead and canvasback duck,

trumpeter swans are beginning to nest here again. A key wildlife species to this refuge is the white-faced ibis, which nests in a large colony of 4,000 ibis along with several other heron, egret, gull and tern species in the Mud Lake Unit. Other shorebird and marsh bird species abound as well.

The TFU provides important greater sandhill crane nesting and staging habitat in its wetlands and four small grain fields. The TFU also provides important riparian habitat along 2.8 miles of meandering stream bank for sensitive Bonneville cutthroat trout and in the willows, for neo-tropical birds such as the flycatcher species. Bobolinks inhabit the meadow lands and ducks and geese frequent the various sloughs and wetlands.

Vegetation

The Bear Lake NWR is dominated by an extensive marsh consisting primarily of bulrush (*Scirpus acutus*), cattail (*Typha spp*.), as well as submergents such as sago pondweed (*Potamogeton pectinatus*) and watermilfoil (*Myriophyllum spp.*). The fringe around the marsh consists of seasonally flooded meadows dominated by rushes (*Juncus spp*.), spike rushes (*Eleocharis spp.*), and grasses such as reedgrass (*Calamagrostis spp*.). The drier upland sites consist of saltgrass (*Distichlis stricta*), bluegrass (*Poa spp*.), western wheatgrass (*Agropyron smithii*), and alkali cordgrass (*Spartina gracilis*), as well as numerous forbs. Some refuge lands extend to Merkley Mountain which is dominated by sagebrush (*Artemesia spp*.), rabbitbrush (*Chrysothamnus spp*.), and bluebunch wheatgrass (*Pseudoroegneria agropyron spicatum*).

Table 1: Vegetation at Bear Lake NWR

Habitat	**Acres**	**Fuel type**
Marsh	13,900 (40% is open water)	3
Wet Meadow	2,450	1 (mowed), 3 (unmowed)
Upland grass	1,280	1
Upland Shrub	320	5

The Thomas Fork Unit (1,015 acres) is characterized vegetatively by its extensive wet meadows, central marsh area, its western riparian zone along 2.8 miles of meandering Thomas Fork Creek, and the western third of the unit consisting of farm fields, shallow wetlands, drier meadows and shrub habitat. Wetlands, mostly of a seasonal nature, comprise 926 acres of the TFU.

Soils

Soils are fairly uniform throughout the refuge with three to five feet of clayey sediments overlaying very deep sandy sediments. Layers of peat are found in the marshes and are typically eighteen inches to three feet in thickness.

The open water areas contain recent silt deposits, or muck, varying from one to eight feet deep. Most of the soils vary in pH from 7.6-9.0. The soils along Merkley Mountain are mainly colluvium (outwash and talus) and are medium-textured, extremely stony loam.

Climate

The mean annual precipitation for the Bear Lake NWR is 13 inches. Precipitation between May and September makes up approximately 50% of total moisture, on average. Summer precipitation occurs in

the form of frequent, often severe thunderstorms. The remainder of the moisture generally falls in the winter as snow. Summer temperatures seldom rise above 90°F .

The Thomas Fork Unit is located at a little higher elevation (6,060' MSL) in the Raymond Valley which is usually 2-3 weeks later in snow and ice melt.

Hydrology
Although the USFWS has ownership of land within the refuge boundary, nearly all the water on the refuge is operated by PacifiCorp-Utah Power and Light (UP&L) under the Bear River Compact. The flow of the Bear River is diverted from its natural channel into the Rainbow Canal by UP&L. The water flows down Rainbow Canal, into the refuge area, and finally into Bear Lake. The water is stored in Bear Lake until needed for irrigation and power generation. Nearly 16,500 of the refuge acres lie within the high water meander and would be flooded at UP&L's maximum storage elevation of 5926.40 feet MSL. The Alder and Dingle Marsh units are flooded with deeded and purchased water while the Rainbow and Salt Mweadow Units are flooded under agreement with UP&L.

The Thomas Fork Unit is a very wet unit in the spring, drying considerably by August. The TFU receives its water from flood irrigation flows to the north and the from an irrigation canal in which we own shares.

Structures and Facilities
The Bear Lake NWR does not have extensive field facilities and consists of a leased GSA office and shop in the town of Montpelier. The field site does have a 40' X 60' metal storage and shop building in a large graveled compound where equipment and materials are stored. Other structures include several water control structures of metal and/or concrete, a 25 mile exterior wood and metal boundary fence, a large entrance sign, a cedar informational kiosk, and cedar restrooms. The refuge also has a wide assortment of vehicles and heavy equipment stored out at the field compound. The Thomas Fork Unit has a 6.5 mile wooden boundary fence, but no other structures or facilities of note.

CAMAS NWR
Camas NWR is in southeastern Idaho, 36 miles north of Idaho Falls, at about 4,800 feet. The Refuge provides vital habitat for a variety of migratory birds. About half of the refuge's 10,578 acres are lakes, ponds, and marshlands. The remainder consists of grass-sagebrush uplands and meadows. Camas Creek flows for 8 miles through the length of the refuge and is the source of water for many lakes and ponds. Several wells on the refuge also provide water for wildlife during the summer.
Songbird numbers peak in May-June during spring migration. After feeding and gaining energy, they continue on their way to nest in the surrounding mountains or nesting areas farther north. They peak again in August-September as they pass through on their way south.

Waterfowl numbers peak in March-April and October-November. Trumpeter swans nest on the refuge nearly every year. They are present at all seasons, but along with tundra swans, are most abundant during spring and fall migrations. At times, 50,000 waterfowl may be present. As ducks and geese move north in the spring, some find the refuge an ideal place to build nests and raise young. During June-August, broods of ducklings and goslings can be seen swimming near refuge shorelines. Duck species produced in great numbers are redheads, mallards, gadwalls, shovelers, lesser scaup, and ruddy ducks. The marshes attract colonies of nesting waterbirds, including the great egret, snowy egret, cattle egret, great blue heron, black-crowned night-heron, and white-faced ibis.

Refuge uplands support a rich variety of other migratory birds, including hawks and owls. Long-billed curlews and short-eared owls are common in the sagebrush grasslands. Non-migratory birds present year-round include the ring-necked pheasant and sage grouse.

Clean and abundant water is the key to a healthy wetland community of plants and animals. The water supply at Camas has decreased over the years due to natural drought cycles and agricultural development, which have lowered the water table. Camas Creek and Beaver Creek do not flow long enough to provide as much water as they once did and cannot sustain the refuge's wetlands at certain times of the year. To remedy this problem, the refuge has constructed wells and ditches to provide additional water.

While a significant portion of the refuge remains in an essentially natural condition, some lands have been intensively developed. In the 1930s, crews from the Works Progress Administration constructed the refuge headquarters buildings, water control structures, and bridges. Over the years, an extensive system of canals, dikes, wells, ponds, and water control structures have been constructed to manipulate water for the benefit of wildlife. Today, water facilities maintained by the refuge include 12 miles of dikes, 31 miles of canals, 9 wells, 8 bridges, and 25 water control structures.

The refuge grows crops to supplement the natural foods available to wildlife. A grain crop of wheat or barley raised and left standing provides feed for migrating ducks. Alfalfa hay is grown for fall goose food. Similarly, wild hay is cut and removed on some refuge units to encourage green regrowth for goose food. When ample food sources are available on the refuge, waterfowl are less likely to feed on farmers' crops off refuge where they may not be welcome.

Cultural Resources

The headquarters buildings, including residential Quarters No. 1 were built in 1937 by the WPA and are constructed of lava rock masonry. Some bridge abutments and two concrete and stone culverts were also built in this era. Quarters No. 2 was built in 1939. The Sandhole Lake stage coach stop of the late 1800's is located on the refuge but very little evidence remains. Several old homesteads were present on the refuge and a small, one room log barn - the Brindley barn - still remains.

The existing headquarters area was a ranch headquarters prior to the refuge establishment in 1937. The old blacksmith shop was photographed and documented prior to its removal in the early 1980's. Old horseshoes and other ranch debris are still located along the Camas Creek channel. No sites on Camas NWR have been nominated for inclusion on the National Historic Register.

American Indian artifacts have been found scattered around the refuge but no encampments or other concentrations have been found. Several cultural resource inventories have been conducted prior to various construction projects but nothing of significance has been found. No comprehensive cultural resource inventory of the refuge has been conducted.

Fish and Wildlife

Over 200 species of birds are found on the refuge. The trees around headquarters are used extensively by migrating songbirds and are a popular bird watching area during May and June. Black headed grosbeaks and northern orioles are two of the songbirds that stay to nest. Bald eagles use the trees for roosting in the winter months with 10 to 12 being present during an average winter. Bald eagle use peaks about March 1 with up 25 to 30 birds present while the most observed was 85.

Several hundred tundra swans are present during spring and fall migration and 50 to 75 trumpeter swans. Trumpeter swans stay to nest with one or two nests being present most years.

A nesting colony of white-faced ibis, Franklin's gulls, snowy egrets, black-crowned night herons, and great blue herons is present in the Center Marsh. Waterfowl and sandhill cranes nest throughout the Refuge's upland and wetland complex. Redtailed, Swainson's, ferruginous, northern harrier, American kestrel, peregrine falcon, and great horned, short eared, and long eared owls are among the raptors that nest on the refuge.

White-tailed deer, mule deer, moose, pronghorn, and elk are present and all use the refuge for fawning/calving and raise their young in the diverse habitats. Coyote, badger, bobcat, red fox, beaver, muskrat, and numerous other small mammals are also present on the refuge.

Vegetation

Plant communities range from sagebrush/grass rangelands, dry and wet meadows, shallow and deep marshes, to open-water lakes with little or no emergent vegetation. About half the refuge is various wetland types. The remaining acres are upland rangeland types. Approximately 120 acres are used for producing cereal grains and alfalfa to provide food for migrating waterfowl.

The Soil Conservation Service completed a resource inventory of the refuge in 1988 which describes 5 major ecological sites. Several minor sites are also recognized but are not considered significant in fire management decisions.

Table 2: Vegetation at Camas NWR

DESCRIPTION	SIZE	DOMINANT FUEL TYPE
Sandy 8-12"	3,600 acres	Sagebrush/native grass
Wet Meadow	3,000 acres	Baltic rush/sedges
Saline Wet Meadow	900 acres	Saltgrass
Marsh	2,400 acres	Hardstem bulrush/cattail
Open Water	800 acres	N/A

Sandy soils
Sandy 8-12" typically has sandy soils and receives 8-12 inches of precipitation annually. In climax stage, the site is dominated by basin big sagebrush (*Artemsia tridentata*), arrowleaf balsamroot (*Balsamorhiza sagittata*), Indian ricegrass (*Oryzopsis hymenoides*) and needle and thread grass (*Stipa comata*).

Approximately 1200 acres of this ecotype was seeded to crested wheatgrass (*Agropyron cristatum*) and in the 1960's and it is now the dominant species in those areas. Prescribed burning in this habitat tends to reduce the density of sagebrush and stimulates the production of grasses and forbs. However, undesirable species such as rabbitbrush (*Chrysothamnus spp.*), knapweed (*Centaurea repens*), thistle (*Cirsium/Cardus spp.*), and crested wheatgrass (*Agropyron cristatum)* may out-compete native vegetation and become the predominant species.

Wet Meadow
Wet Meadows are usually dominated by Baltic rush (*Juncus balticus*) and various sedges (*Carex spp.*). The water table is usually within 1-2 feet of the surface during the growing season which keeps the site green even during mid-summer. Fire results in the removal of dead material and loss of cover but the nutrient release promotes rapid re-growth following the burn or during the next growing season. Due to soil moisture and sub-irrigation these areas usually remain in sedges and rushes.

Saline Wet Meadow
Saline Wet Meadows are usually dominated by saltgrass (*Distichlis stricta*). Fire results are similar to wet meadows with the area remaining in saltgrass.

Marsh
Marshes are dominated by hardstem bulrush (*Scirpus acutus*) and broadleaf cattail (*Typha latifolia*). These sites are usually flooded during the growing season. The result of fire is controlled by the follow-up management. If the area is not flooded immediately after the fire then the nutrient release will stimulate rapid and dense regrowth.

Open Water
Open water areas are generally deeper than marshes (average 3-5 ft.) and many hold water year-round. Submergent vegetation is dominant, but emergents may be present along the edges. The response of emergents to fire the same as for marshes.
Crops
In the past, upwards of 1,000 acres were used to produce crops. Currently about 120 acres remain under production with small grain and alfalfa. The rest has either been seeded to dense nesting cover (DNC) or has reverted back to natural vegetation or introduced cool season grasses (quack grass and smooth

brome). A fire in these fields would destroy established vegetation used by nesting waterfowl and if conditions were right destroy the grain crop planted for migrant bird use. These effects would last only a season until new growth emerged in the spring. There is the possibility that noxious weeds such as wild oats (*Avena fatua),* wild mustard (*Brassica spp*.) and thistle (*Cirsium* sp.) would outcompete native vegetation.

Riparian
Another habitat found on the refuge includes the riparian willows (*Salix spp*.) and cottonwood (*Populus spp.*) shelter belts. These comprise less than 2% of the refuge but are heavily utilized by big and small game, passerines and raptors during the winter months. The cottonwoods are used extensively for roosting by migrating and wintering bald eagles. The willows along Camas Creek provide feeding and nesting areas in the summer and thermal cover for big game and wintering birds. Fire in these areas can range from minimal effect to total destruction of the tree community. When a fire occurs during wet or normal conditions, usually the surrounding ground litter is burned or the bark is singed. But during dry or windy conditions the entire shelterbelt could be consumed by fire.

Soils
Detailed soils information has been published by the USDA Soil Conservation Service. The variation of soils at Camas NWR has little influence on fire management. Vegetation differs with the different soil types but height, density and vigor are generally the result of moisture availability rather than soil type.

The entire refuge is underlain by the Snake River aquifer. Lakebed sediments to the south cause what is known as a perched water table. For practical considerations, this perched water table makes the Mud Lake/Camas Creek watershed a closed basin for surface water. Drought conditions can occur if snow accumulations in the mountains are below average for one or more years. This in turn affects soil moisture content on the refuge.

The surface geology of the refuge is mostly wind-blown sands with limited areas of clay deposited as lake sediments. A few outcrops of lava appear along the western boundary. Recent deposits of silt are found in the marshes and lakes. Some shallow peat deposits are also found in these areas.

A fire can alter many of the properties that are characteristic of soil. Some of these properties such as chemical composition, pH, and nutrient/mineral content are each affected differently by fire and most are beyond our scope to measure.

Many studies have been conducted on the effects of fire on soil properties and fire. Wright and Bailey (1982) in their classic text Fire Ecology - United States & Southern Canada, go into great detail describing some of these effects. They summerize various studies on mineral and nutrient composition by stating...

> "Despite the rapid decomposition of organic material and nutrient losses that occur during a fire, large quantities of nitrogen, phosphorus, potassium, calcium, magnesium, sodium and to some extent sulfur, are readily soluble. Before the fire many of these elements in living and dead material on cold or dry sites were unavailable for plant growth."

Other important properties of soil such as moisture content and biological/organic makeup are also of concern to the refuge manager. Wright & Bailey (1982) discuss these aspects and state that they are directly influenced by fire intensity, fuel moisture, amount of green material/litter, topography, and seasonal weather conditions. On Camas NWR because of our reduced fuel loads and the low amounts of residual vegetation our fires tend to be "cool". Cool fires rarely penetrate deep enough to cause substantial long-term loss of soil moisture or organics. These fires will decrease the abundance of soil

microbes, micro-organisms, and insects but the new population will reach equilibrium anywhere from 1-5 years.

Wind erosion is another factor to be considered in a Fire Management Plan. Vegetation is the most vital element determining rate of soil blowing (Stoddard, Smith & Box 1975). On Camas NWR the areas most susceptible to wind erosion after a fire would be the upland areas which comprise mostly Fuel Model 1. The surface soils on Camas contain adequate organic matter, moisture and physical properties which facilitate the mechanical binding of soil particles. This is especially true in spring when soil moisture levels are highest and when most prescribed fires would be initiated. There are several areas totaling nearly 50 acres which are best described as "sandhills". These areas would need to be protected or monitored in the event of a fire to prevent any long-term damage. It may be necessary to insure adequate cover in these areas by re-establishing vegetation through seeding or planting.

Peat basins in the wetlands may be one of the few areas on the refuge that would be substantially altered by fire. Objectives for those units containing peat deposits may conclude that fires would be advantageous in these units in order to deepen the marsh and set back succession. On the other hand, an uncontrolled peat fire could turn a productive shallow-water unit into a deep water pond which may contribute little in value for waterfowl nesting and feeding purposes. An uncontrolled peat fire could also burn into dikes and roadbeds if they contain substantial amounts of peat soils. Peat fires once started are difficult to extinguish. Flooding or abundant precipitation or the passage of time are the only practical methods. Peat deposits are not substantial on the refuge but should be mapped sometime in the future. Most of these areas can only be burned during drought years due to soil moisture content.

Climate

The area climate is typical of the inter-mountain region, being relatively dry with mild summers and cold winters. Temperatures exceeding 90 degrees F. are usually encountered only a few days each summer, while winter lows in the -30 degrees F. range are not uncommon. Precipitation averages less than 9 inches annually with about 25% coming during the months of May and June.

Hydrology

Camas NWR lies entirely in Jefferson County whose economy is dependent on ranching and farming. Most of the crops are irrigated by means of pumping ground water, potentially affecting the refuge by lowering the water table.

Camas Creek, which bisects the refuge, is one of the principal sources of water for the refuge. Because its flow is dependent on the mountain snowpack, water amounts available to the refuge vary year to year. To supplement this creek flow nine wells have been drilled on the refuge to supply additional water. These wells are our only source of water during the summer and fall.

Structures and Facilities

Since the establishment of the refuge, numerous physical improvements have been constructed for management purposes. These include 35 miles of roadway, 70 miles of fences, 10 bridges, numerous dikes, water control structures and various signs. Administrative facilities have also been built over the years. Buildings on the refuge which are maintained include:

Headquarters

- Office/Storage Building
- Shop/Storage Building
- Oil house

Quarters #1

Brown Place (1/4 mile east of HQ)
4-Bay Machine shed
1 steel granaries
Wooden pole barn

Sub-Headquarters (1 mile SE of HQ)
Quarters #2
Garage

The only other building on the refuge is an old log barn or "cabin" (Brindley cabin) which is not used, and is located about 1 3/4 miles south of HQ. It is minimally maintained to prevent further deterioration. The Idaho State Historical Office has placed no significant value to the structure. However, it is a picturesque structure and serves as a landmark for directing refuge visitors.

Other improvements on the refuge include nine irrigation pumps. Each of these sites has an above-ground 30-50 hp turbine water pump, electrical control panel and power pole. One of these pumps is used for irrigating refuge farm fields and is connected to a wheel-line sprinkler pipe. In addition to the well sites, there are about 4.5 miles of utility poles adjacent to or along deeded ROW's on the refuge.

The final area of improvement on the refuge is the equipment storage yard. This area is adjacent to HQ and is used for storage of items such as fencing material and scrap metal. It is also used as a parking area for refuge farm implements and heavy equipment. The yard contains 3 above-ground fuel storage tanks containing diesel fuel and gasoline.

The current replacement value for all maintained refuge buildings, bridges, pump sites is estimated at $3,920,000 based on the 1992 Real property inventory.

GRAYS LAKE NWR

Grays Lake NWR is 27 miles north of Soda Springs in southeast Idaho. It lies in a high mountain valley at 6,400 feet. Grays Lake is actually a large, shallow marsh with dense vegetation and little open water. Most of the marsh vegetation is bulrush and cattail. Adjacent lands are primarily wet meadows and grasslands.

Grays Lake NWR is the largest hardstem bulrush marsh in North America. This marsh attracts large numbers of ducks, sandhill cranes, Canada geese and trumpeter swans. By agreement with local land owners and the Bureau of Indian Affairs, water levels cannot be manipulated . Surrounding the marsh are large wet meadows. These meadows are used by feeding geese and cranes and their broods. The fields are managed with grazing, haying and prescribed burning to provide short foraging habitat. These practices are currently being investigated by researchers. Some small grain crops are grown to provide supplemental feed for geese and cranes and to keep them on the refuge, rather than in private croplands. Integrated pest management is practiced to prevent noxious weeds from degrading native habitats.

Cultural Resources

See Appendix 9 for a copy of the cultural resources review contained in the Grays Lake NWR Master Plan. The Lander Cut-off of the Oregon Trail passed along the south boundary of the Refuge. Artifacts may be present in this area.

Fish and Wildlife
Management efforts focus on measures to benefit sandhill cranes, and waterfowl. The refuge hosts the largest nesting population of greater sandhill cranes in the world; during the staging period in late September and early October, as many as 3,000 have been found in the valley at one time. Other common nesting species include the mallard, cinnamon teal, canvasback, lesser scaup, redhead, and Canada goose. In a typical breeding season, the refuge may produce up to to 5,000 ducks and 2,000 geese. Franklin's gulls also nest in large colonies and may reach nearly 40,000 in some years. These colonies also attract large numbers of nesting white-faced ibis. Moose, elk, and mule deer use the refuge and are common throughout the area.

Grays Lake Refuge was the site of the discontinued whooping crane cross-fostering experiment. This experiment used sandhill crane foster parents to hatch and raise whooping cranes. The sandhill cranes were successful in raising the whooping crane chicks and teaching them the migration route to the New Mexican wintering sites. However, the whooping cranes imprinted on the sandhills and never paired successfully with each other. This experiment has been discontinued and it is no longer possible to see whooping cranes on the refuge.

Vegetation
The 1982 Master Plan lists a resource inventory of the refuge which describes 9 major vegetation types. Several minor sites are also recognized but are not considered significant in fire management decisions.

Table 3: Vegetation at Grays Lake

Description	**Size**	**Dominant Fuel Type**
Emergent	19,290 acres	Hardstem bulrush/cattail
Semi-Wet Meadow	4,490 acres	Bluegrass/Baltic rush
Grasslands and Grainfields	2,745 acres	Mid- and short-grasses
Wet Meadow	2,545 acres	Baltic rush/sedges
Shallow Water Open	1470 acres	N/A
Sagebrush/Grassland	830 acres	Sage and short grasses
Aspen/Conifer Forest	790 acres	Aspen/fir/mid- and short grasses
Mountain Brush	415 acres	Chokecherry/-serviceberry/snowberry/-grasses
Riparian	225 acres	Willow/mid-grass

Emergent
Areas that are underwater nearly year-round (most years) with plants growing from the soil through the water surface and above. Principal plants include: hardstem bulrush, broad-leaved cattail, Baltic rush, sedges and burweed. Highly flammable on dry years and during late summer/early fall on average precipitation years.

Semi-Wet Meadow
Areas with the water table near the surface much of the year and often underwater in the spring, especially in high runoff years. Vegetation is complex with variations in soil and moisture content, but is mostly grasses and sedges. Sagebrush and rabbitbrush are found on the fringes. Are is used as hayland. Generally combustible only late in the season.

Grasslands and Grainfields
Areas that are often used as pasture/range and hayland, are well drained, and consist mostly of grasses, (over 60%) with some brush and shrubs. Next to the meadow types, grasslands carry some of the highest fuel loadings on the refuge, but are more prone to drying and present a greater fire hazard that the more mesic habitats.

Areas that are cultivated and planted with grain - usually barley or wheat. These areas are considered among the most productive of all cover types. In late summer or fall the flammability of these sites rise as crops cure.

Wet Meadows
Wet Meadows are usually dominated by Baltic rush (Juncus balticus) and various sedges (Carex spp.). The water table is usually within 1-2 feet of the surface during the growing season which keeps the site green even during mid-summer. Fire results in the removal of dead material and loss of cover but the nutrient release promotes rapid re-growth following the burn or during the next growing season. Due to soil moisture and sub-irrigation these areas usually remain in sedges and rushes.

Open Water
Open water areas are generally deeper than marshes (average 3-5 ft.) and many hold water year-round. Submergent vegetation is dominant, but emergents may be present along the edges. The response of emergents to fire is identical as for marshes.

Sagebrush/Grassland
Areas on dry soils with mostly sagebrush, rabbitbrush, and grasses. Usually occurs at lower elevation than mountain brush. One of the earliest sites to cure and one of the most prone to fire.

Aspen/Conifer
Areas with either aspen or coniferous trees (fir, pine, spruce) as dominant species. Usually found on north and east facing slopes. Generally a mesic site

Mountain Brush
Area with bitterbrush, serviceberry, snowberry, choke and/or other shrub species as dominant. Occurs on all aspects at lower elevations, but usually on south and west facing slopes at higher elevations. Potential high fuel loading, but moderate moisture regime that keeps fire hazard relatively low until the later half of the burn season.

Riparian
Areas adjacent to and near permanent and intermittent streams, with willows the most common species. High moisture content generally keeps combustibility low throughout all but the driest years.

Soils
The surface geology of the refuge is mostly loess deposits with limited areas of clay deposited as lake sediments. A few basaltic outcrops appear around the basin and on Bear Island. Recent deposits of silt are found in the marshes and lakes with extensive and deep peat beds also found in these areas.

Other important properties of soil such as moisture content and biological/organic makeup are also of concern to the refuge manager. Wright & Bailey (1982) discuss these aspects and state that they are directly influenced by fire intensity, fuel moisture, amount of green material/litter, topography, and seasonal weather conditions. On Grays Lake NWR with our heavy fuel loads and high amounts of residual vegetation, our fires tend to be "hot". Hot fires often penetrate deep enough to cause substantial long-term loss of soil moisture or organics. These fires will decrease the abundance of soil microbes, micro-organisms, and insects but the new population will reach equilibrium anywhere from 1-5 years (Wright & Bailey 1982). The counterbalance is that, while the natural fires tend to be intense, they are also infrequent.

Vegetation is the most vital element determining rate of soil blowing (Stoddard, Smith & Box 1975). On Grays Lake NWR wind erosion after a fire would be insignificant. The surface soils on the refuge contain adequate organic matter, moisture and physical properties which facilitate the mechanical binding of soil particles. This is especially true in spring when soil moisture levels are highest, although most prescribed fires would be initiated in the fall.

Hydrology
Water sources for the Grays Lake Basin are primarily from snow-melt and numerous springs. The major creeks flowing into Grays Lake are Gravel Creek, Eagle Creek, and Willow Creek. Surface water leaves the basin through the Grays Lake Outlet and Clark's Cut.

Grays Lake Outlet is the natural drainage of the valley but has been dammed near the north refuge boundary. Flow is controlled by the BIA. The Grays Lake Outlet flows into the Snake River near Idaho Falls.

Clark's Cut is a man-made channel dug in the early 1920's to drain water from Grays Lake into Meadow Creek, which empties into the Blackfoot Reservoir and Blackfoot River before reaching the Snake River. Clark's Cut has a water control structure at the marsh and is the major exit for Grays Lake water. The water drawdown schedule agreed to by the BIA, riparian landowners, and the refuge requires drainage of all but 0.5 ft of water by June 25 each year. The water is used by the Fort Hall Irrigation Project which owns the water rights.

Structures and Facilities
Some physical improvements have been constructed for management purposes. These include 3.5 miles of roadway, 20 miles of fences, underground power lines, numerous water control structures, canals, irrigation ditches and various signs. Administrative facilities have also been built, including:

Office/Visitor Center
Shop/Storage Bldg.
Manager's Residence
Bunkhouse
Hazardous Materials Storage Building

The only other building on the refuge is an old, homestead-era, wood frame house (Kackley or Sam Sibbett house) which is not used, and is located about 2 miles south of HQ. The Idaho State Historical Office has, so far, placed no significant value to the structure. However, it is a picturesque structure and serves as a landmark for local residents.

The final area of improvement on the refuge is the equipment storage yard. This area is adjacent to HQ and is used for storage of items such as fencing material and scrap metal. It is also used as a parking area for refuge farm implements and heavy equipment.

MINIDOKA NWR
Minidoka Refuge is an overlay on a Bureau of Reclamation reservoir, Lake Walcott. Lying 12 miles northeast of Rupert in the Snake River Valley in south-central Idaho, the refuge extends upstream about 25 miles from the Minidoka Dam along both shores of the Snake River and includes all of Lake Walcott. Over half the refuge is open water, with small patches of marsh.

The refuge is an important stopover area in the Pacific Flyway. Concentrations of up to 100,000 ducks and geese have been documented during spring and fall migrations, and close to 500 tundra swans can be seen as they migrate through in the spring. The refuge also serves as a molting area for waterfowl in summer. Of the 28 species of waterfowl that use the refuge, those most commonly seen are the Canada goose, mallard, pintail, redhead, gadwall, and wigeon. Colony-nesting birds on the refuge include the Clark's and western grebe, double-crested cormorant, great blue heron, California gull, snowy egret, cattle egret, black-crowned night-heron, and American white pelican. Bald eagles are regularly observed on the refuge in fall and spring, and peregrine falcons are occasionally seen as they migrate through in fall.

Most of the upland areas are shallow soils underlain by fairly recent basalt lava flows, with an occasional sand dune scattered throughout. This mix of rock, sand, and shallow soil supports a diversity of small mammals, reptiles and invertebrates.

The divergence point of the Oregon and California Trails was about a mile south of the refuge boundary and an alternate route of the Oregon Trail crossed the northern part of the refuge.

The diversity of habitats contributes to the diversity of species occurring on the Refuge. The open water areas contain large areas of shallow beds of submergent vegetation. The reservoir is habitat for the Utah valvata, an endangered snail. The upland habitats support a variety of shrub-steppe and grassland bird and mammal species. The basalt lava flows provide habitat for some of the more diverse reptile faunas in Idaho. The Idaho dunes tiger beetle, a species of special concern, is found on refuge sand dunes.

Management of wetland areas focuses on providing undisturbed habitat for wildlife. Undisturbed areas are essential for colonial nesting birds, especially American white pelicans, and for molting waterfowl. Undisturbed habitat of this quality and quantity do not occur anywhere else in southeast Idaho. The shallower areas and areas near colonial bird nesting islands are closed to boat traffic. Water levels in the main reservoir are controlled by the Bureau of Reclamation. Levels are raised early in the spring and held stable till late fall so there is no danger of nest flooding. Wildland fire control and prevention are important practices; wildland fires reduce sagebrush and juniper and favor exotic native grasses, such as cheat grass. Cheatgrass can out-compete native plant species and increase fire frequencies, further degrading the habitat. Native grasses, forbs, and shrubs may be reseeded after wildland fires. Integrated pest management is practiced to reduce noxious weeds.

Lake Walcott State Park, within the boundary of Minidoka Refuge, is managed by the Idaho Department of Parks and Recreation. Camping, picnicking, and a boat ramp can be found in the State Park.

The reservoir usually freezes sometime in December. There are several unimproved roads on both sides of the reservoir (these are suitable for high clearance and 4-wheel-drive only) that are open to the public. These are used by fisherman primarily. There are no areas closed to foot traffic on the refuge; the entire refuge is open to fisherman and birders.

There are two maintained gravel roads on the south side of the refuge that are locked (except during hunting season) to prevent easy access to sensitive wildlife areas. These roads however are still open to foot traffic and are used by birders during spring and summer. Over 200 species of birds have been seen on the refuge; waterbirds and birds common to sagebrush steppe are most common.

Fish and Wildlife

A wide variety of species occurs on the refuge. Over 230 species of birds have been recorded on the refuge. Several avian species (sage grouse, sharp-tailed grouse, sage thrasher, Brewer’s sparrow) are dependent on sagebrush habitats. Most aquatic avian species will be relatively unaffected by fire.

Common large mammals include mule deer, pronghorn antelope, and coyote, with lesser numbers of bobcat, elk, mountain lion, and an occasional moose. Small mammals and bats have not been adequately surveyed on the refuge. Many mammalian species, especially the large ungulates, are dependent on sagebrush habitats. There are several species of amphibians, but they are relatively unaffected by fire. Prediction maps suggest high reptilian diversity on the refuge. All reptiles are upland dependent and could be harmed by extensive fires, especially those which result in increase of cheat grass and loss of native vegetation. Lizards have been fairly well sampled , with at least 5 species known to occur. Four species of snakes are known to occur, but 5-6 more species could be present. Better sampling for nocturnal snake species is needed to determine their presence on the refuge. There is a rare insect, the Idaho Dunes Tiger beetle, that occurs on the refuge. It is found in small colonies in sand dunes on the refuge. Its range is across the Snake River Plain from Bruneau Dunes to St. Anthony Dunes. It is not listed, nor petitioned. There is an endangered snail in Lake Walcott, the Utah valvata. Run off from heavy rain or snow pack the year following large burns could possibly affect water quality, and in turn might affect the snail.

Vegetation
Vegetation types on the refuge are predominately Wyoming big sagebrush-grass and shortgrass complexes. The overstory is comprised primarily of sagebrush and rabbit brush and the understory is cheatgrass and crested wheatgrass. Sparse juniper appears in the overstory in some areas. Native grasses commonly found in the refuge include western wheatgrass, Indian ricegrass, and needlegrass.

Table 4: Vegetation at Minidoka NWR

Habitat Type	**Acres**	**Fuel Model**
Non-burnable: includes open water, roads, and parking lots.	11,280	N/A
Short-grass	5,460	1
Grass and Understory dominated	3,451	2
Tall grass	440	3

Soils
Soils are shallow and vary from sandy loam to coarse gravel and are sensitive to wind erosion.

Climate
Mid-summer temperatures are usually in the 90^{o}s F. range and frequently reach 100^{o}F., while winter extremes can drop below -10^{o}F. Rainfall is typically light during the summer months with low humidity. Overall precipitation averages about 10 inches per year, with winter peaks and highly variable spring peaks. Dry lightning storms are not uncommon during July and August.

Structures and Facilities
The Refuge has five structures within the boundaries (Residence, boat house, Granary, oil storage facility, service and storage area, and the refuge office). There are five privately owned structures within 100 feet of tall grass fuels. These strucutres are located near the Raft River section of the refuge.

OXFORD SLOUGH WPA

Oxford Slough Waterfowl Production Area (OSWPA) is 1,878 acres in size and was purchased by the FWS in 1985. This is the only WPA in Region 1 and is located 10 miles north of Preston, ID at the small town of Oxford. Approximately half of the acreage is bulrush marsh, with some open and seasonally wet meadow. The remaining acreage consists of drier upland grass and brush types, some of these being alkali in nature, and farm ground. Water from Oxford Slough eventually flows into the Bear River to the south. OSWPA is administered from Bear Lake NWR, 50 miles to the east. Some of the upland areas areas have alkaline soils, covered with native grasses and shrubs; these areas are not grazed or managed. Several native grass hayfields, and irrigated alfalfa fields are hayed to provide short grass feeding areas for geese and cranes. Some dry land cropland has been seeded to dense nesting cover and some is still cooperatively farmed. Part of the marsh is still in private ownership, so no water management is done. The marsh is allowed to fluctuate naturally; in drought years it dries out.

Cultural Resources

Little is known of the cultural resource aspects of the Oxford Slough area. This area has been settled and used intensely for agriculture since its settlement in the late 1800s. The Shoshone Indians frequented the valley around Preston, Idaho and probably hunted and camped in and around the Oxford Slough wetlands**.** No archeology sites are known at this time. Any possible Indian encampment sites in the area have probably been greatly disturbed by intensive livestock use over the years prior to the establishment of OSWPA in 1985.

Fish and Wildlife

The 710 acres of deeper wetlands on OSWPA are home to many species of aquatic wildlife. Notably there is a central colony of 800 white-faced ibis along with snowy egrets, black-crowned night herons, and Franklin's gulls. Ducks and geese use the marsh on migration and with good water, the wetlands produce good numbers of dabbling and diving ducks. Tern and grebe species also are abundant throughout the main marsh area. The grasslands are home to variety of passserine bird species, most notably the bobolink. Long-billed curlews are frequently seen in the alkali grassland and flats. Greater sandhill cranes pairs nest along the marsh edges and stage on the WPA during early fall. Columbian sharp-tailed grouse, Hungarian partridge and ring-necked pheasants also use the dense grasslands for cover and foraging.

Vegetation

The main vegetative feature is the 710 acres of deeper type bulrush emergent marsh of Oxford Slough. There are some 830 acres of native grasslands, much of this being of the drier more alkali types (salt grass, alkali sacaton) with scattered patches of sagebrush and greasewood. . There are 170 acres of native wet meadows (*Juncus spp*., *Carex spp*. and a variety of meadow grasses) that are seasonally wet, much of this is hayed under permit each year. Portions of the grasslands are hayed each year. There are 180 acres of developed cropland for growing grain and alfalfa under a cooperative farm permit.

Soils

There are three basic soil types as listed below:

(1) Oxford clay on the north end where the cultivated land is located.

(2) The central marsh area is underlaid with organic mucks and probably some peat, underneath lie Logan silty clay loam. The west side meadows have deeper silty loams and clay loams, with the east side drier grasslands made of more alkali soils, hard pan.

(3) Heavy Trenton clay loam. The northeast corner of the WPA does have deposits of gravel and rock alluvium along the north hill side.

Climate
OSWPA is situated at elevation 4,750 ft. MSL. Temperatures range from 100 degrees F. in the summer to -25 degrees F. during winter. Precipitation averages 14 inches per year.

Hydrology
OSWPA receives its water from run-off and irrigation excess flows coming down the sloughs and ditches from the north from Swan Lake and other small irrigation reservoirs. Creeks along the west side from Oxford Mountain also deliver water via a ditch system and pipeline. The west side meadows are usually flood irrigated during the spring gradually drying in July for hay season. The main slough fills in the spring and, depending on the water year, can drop quickly in late summer. Much of the slough can dry up depending on the year. This can cause severe problems for young aquatic birds unable to fly. During late October excess irrigation flows begin refilling the marsh again. This provides fall/winter water until freeze-up for migrating waterfowl.

Structures and Facilities
OSWPA has a six mile boundary fence around its perimeter. Some of this fence is in fairly good condition, other sections are poor. There are no refuge buildings at the WPA. There is one new entrance sign. The small town of Oxford lies long a portion of the west boundary of OSWPA. The Union Pacific railroad has an elevated grade/track running north to south along the east side of the unit.

WILDLAND FIRE MANAGEMENT SITUATION

HISTORIC ROLE OF FIRE

Wildland fires on the Refuge's are infrequent. For example, on Grays Lake NWR fewer than five fires occurred in the last 25-years. A prescribed burning program was initiated on the Complex in 1997 with prescribed fires ignited at Bear Lake and Grays Lake NWR's.

Although the frequency of prescribed fire has waned in recent history, there apparently was an ancient burning tradition at Grays Lake. Native Americans used the area as a summer hunting ground and are rumored to have burned the basin to improve hunting opportunities.

Bear Lake NWR is located at elevation 5,925 ft. MSL and is typical of high elevation valleys in the Rockies, with long cold winters (-40 degrees F. at times) with significant amounts of snow, and slow thawing period through normally cool and blustery springs. From mid June on the summers can be warm, but are short, with few frost free days. Temperatures rarely get above 90 degrees F. Summer thunderstorms can be common. The falls can be warm to wet and cold as the valley moves into the long winter period in November. Precipitation averages 13 inches (50% in the form of rain, 50% in snow). There are less then 90 frost free days, with killing frost occurring usually after August 20, but light frosts can occur anytime during the summer. With the above climate the fire environment in the Bear Lake Valley is one of infrequent wildland fires due to the high elevation, cool temperatures, high relative humidity, and abundance of water and wetlands. Fires are caused by human activity and by spring and summer thunderstorms. Most of these are small and quickly burn themselves out in the wetland vegetation. Surrounding foothill grassland/sage and forest fires off-refuge can be significant at times (August-September) especially during drought years, requiring considerable resources to get under control. The valley floor is a fairly benign fire environment with flat topography and fuel types of primary Type III bulrush emergents and short grass wet meadows (hayed) Type I. There are small areas of grassland shrub fuel types as well. This description for Bear lake NWR also is applicable to Grays Lake NWR.

Camas and Minidoka NWRs are located at lower elevations along the Snake River Plain and generally have similar precipitation patterns, however, temperatures are hotter and winds more consistent leading to earlier fire seasons and higher frequency of fire.

We assume that the historic role of fire on Oxford Slough WPA is very similar to the Bear Lake area except that the elevation of the Preston/Oxford area is some 1,300 feet lower, with drier conditions during the summer months. Settlers in the area and current day farmers/ranchers periodically burn some of the emergent sloughs and ditches during the spring to improve water movement to their lands. Summer lightning strikes and human caused fires such as Union Pacific train caused fires along the track right-of-way on the east side of OSWPA occurs infrequently, but can result in significant grassland fires (100-1,000 acres in size) in and around OSWPA

Pre-settlement fire history

Camas NWR is dominated by sagebrush-grass communities. Information concerning fire history in sagebrush-grass communities prior to the influence of man is very limited. Houston (1973) reported that the average fire frequency in sagebrush-grass communities in northern Yellowstone National Park was 32 to70 years. Wright et al. (unpub. man.) indicated that the fire frequency was probably about 50 years. Shinn (1971) reported that the arid grass shrub plains of the northern Great Basin reflects feature characteristics of a landscape having close association with fire. Shinn (1977) found twenty-four references to native cultural burning in historical journals. According to Steward (1956, 1963) the impact

of artificial burning surpasses that of naturally-occurring fires. Early European settlers viewed the cultural burning practices of native Americans with contempt. A policy of total fire prevention evolved based on the premise that all fires were unnatural and therefore harmful. Fire exclusion was incorporated in federal land management policies around the turn of the century (Shinn, 1977; Agee, 1974; Kilgore, 1976; Komarck, 1962).

Wright and Bailey (1982) thought that fire return intervals in the Wyoming big sage vegetation type was around 100 years. They do not provide estimates of fire size, but based on the return interval one would conclude that fires burned only during extreme conditions. In this case fires would probably be fairly large. Based on the fairly low productivity of these sites, fires were probably patchy.

Houston (1973 - as cited in Wright & Bailey 1982) stated that fire return intervals in the mountain big sage brush (as found at Grays Lake, Bear Lake and Oxford Slough) in Yellowstone National Park was 20 to 25 years. Since these refuges are lower in elevation than the Park, the fire return interval was probably a little shorter, somewhere between 2- 25 years.

Not much is known about fire history at Bear Lake NWR, except that ranchers settling in the valley during the late 1860s used spring burns through marsh and grassland vegetation to improve forage for their livestock. Stories of fall fires set by ranchers created problems by igniting peat areas in the wetlands and burning meadows and stacked hay.

Undoubtably lightning or Indian caused fires swept through portions of this Complex at different times depending on the situation.

Post-settlement Fire History

The fire season for the State of Idaho runs from May 15 to October 20. However, the season may vary according to local conditions and fire is possible as early as late February. Generally, spring moisture reduces the fire potential early in the season and fall rains followed by snowfall in November end the fire season.

The fire history of Bear Lake NWR and Grays Lake NWR for the past 30 years is one of infrequent wildland fires. Most of these were human caused through carelessness or lightning caused. Spring thunderstorms sometimes will ignite small marsh fires within the refuge in the dead emergents prior to June green regrowth. These fires are small in size (<200 acres) and quickly burn themselves out against water channels or green vegetation. They number from none in wet years to 3-4 in drier years, particularly springs with more thunder cell activity. Wildland fires in mid- to late-summer can get large quickly, and rapidly move off the refuge onto BLM, state, and/or private rangelands along the eastern edge of Bear Lake NWR. These are infrequent, but during drought years there have been 2-3 of these types of fires along the East County Road. This terrain is steep rocky and brushy. With a wind, the fire moves quickly off- refuge on to BLM or state lands, sweeping to the top of Merkley Ridge. Many of these fires appear to have been deliberately set along the county road, others were accidental, and some were started by lightning. There have been have had around 6-8 of these east side fires in the last 15 years or so. Most were well under 2,000 acres in size overall, and refuge lands burned was < 200 acres. Camas refuge was established in 1937 and fire suppression has been part of the management program since then. The area around the refuge contains numerous ranches and various outbuildings. The potential for costly property damage is possible during periods of extreme fire danger.

Records at Camas NWR since 1962 indicate 13 wildland fires occurred, burning 673 acres. Four fires were caused by lighting, 4 were man-caused and 5 were caused by downed power lines or electrical shorts in irrigation pumps . The largest was 312 acres; the smallest involved one cottonwood tree.

From historical records we can conclude the incidence of wildland fires at Camas NWR is low. The majority of fires are man-caused. However, there remains the potential for extreme fire situations both on the refuge and along the north and western boundary of the refuge. These adjoining lands are administered by the BLM and contain dense stands of sagebrush and grass. These areas are highly combustible during late summer and drought years due to low fuel moisture content. The adjoining lands along the east and south boundary are mostly irrigated cropland. This area also contains numerous roads and other natural firebreaks.

Table 5: Wildland Fires on Camas NWR 1983-2001

Date	**Fire Name**	**Acres**	**Cause**	**Estimate**
04/23/87	Sandhole	312	Adjacent land-owner burning	$1,000
09/06/90	Qtrs. #2	5	Down power-line	$832
06/05/92	Well #7	1	Electrical short in pump	$1,000
08/28/92	Powerline	30	Down power-line	$4,400
07/28/96	Rat Farm	115	Lightning strike	$2,000
08/01	Unk.	120	Downed Power Line	$5,000

Elevation and aspect differences on the refuge contribute little to fire behavior. With a relatively flat terrain, fire behavior on the refuge is affected mostly by vegetative density and wind influences. Most fires tend to burn slow to moderate unless gusty or strong winds are present. The exception would be fires in dense bulrush or cattail which could generate enough heat to produce their own localized wind conditions.

Very little is known, but settlers to this area may have burned wetland/emergents meadows at times to improve livestock forage and to clear irrigation ditches and canals. As mentioned above periodic lightning strikes and sparks from the Union pacific tracks can cause infrequent grassland and shrub fires in and around OSWPA.

Post-Settlement Fire History Minidoka NWR.

July and August are the months with most wildland fires on the refuge. Fires in August were more frequent and larger than those during any other month. There are records of 25 wildland fires in refuge

records dating back to 1966. In the past 10 years there have been 15 wildfires on the refuge. Six started off the refuge, and eight started on the refuge. The origin of 1 fire was not determined, but it probably started off the refuge. Thirteen were caused by lightning, 1 by a vehicle and 1 by an electrical short in a transformer on a power pole. Total acreage involved in these fires was 30,049 acres, 5,122 of which were on the refuge. Other acreage was primarily BLM, with minor amounts of private and BOR lands burned. Five lightning fires started in July, with an average of 388 refuge and 230 acres of other lands burned. Seven lightning fires started in August with and average of 435 refuge and 2,154 other acres burned. One lightning fire started in September and burned 120 refuge acres and 10,701 acres of other lands. The human-caused and electrical-caused fires were smaller. The average start date for these 13 lightning fires is 4 August

Table 6: Wildland Fires on Minidoka NWR 1991-2000.

Year	Fire name	month	day	refuge aces	total acres	cause	start on/ off refuge
2000	Refuge	July	26	1242	1839	lightning	on
2000	North Walcott	July	26	39	47	lightning	on
2000	1SGifford	Aug	9	1	3	lightning	off?
2000	MNWR	Aug	23	1102	1102	lightning	on
1999	Lake Walcott1	May	8	2	5	vehicle	off
1999	Walcott2S	Aug	3	22	257	lightning	off
1999	Smith Springs	Aug	20	109	119	lightning	on
1998	Walcott3	July	23	430	874	lightning	off
1996	Lake Walcott	Aug	1	660	12986	lightning	off
1996	North & South Wapi	Sept	10	120	10821	lightning	off
1995	Walcott	Aug	29	1143	3643	lightning	on
1995	Coldwater	Aug	29	10	10	lightning	on
1995	Unit 6	Sept	11	12	13	electrical	off
1994	Lake Point	July	27	80	80	lightning	on
1991	Smith Springs	July	13	150	250	lightning	on

Prescribed Fire History

The typical valley fire season is considered to be May 15 through October. In recent years (1990-2001) the refuge has had a fairly active, but small prescribed burning program. Prior to 1990 little planned burning was done. Prescribed burning is done during early March while the marsh water levels are lower and the dead bulrush more exposed. During this time marsh burning is relatively easy with snow and ice on meadows and channels, these acting as the control points. Some 6-8 percent of marsh acreage of selected bulrush and cattail areas are burned each spring in 3-4 burns.. After the burn, the marsh water levels are raised, flooding over the burned emergent stems and creating numerous new ponds and channels for migratory bird production and use.

Between 1988-1990 several small controlled burns were initiated in bulrush strands by the Complex Biologist. These burns were conducted in order to gather data from fire effects on invertebrate populations and on water chemistry. A total of 9 burns was conducted and none was larger than ¼ acre.

There has been no prescribed burning at OSWPA by the FWS since its purchase in 1985. However, OSWPA management may include small prescribed burns in the future.

Prescribed burning at Bear Lake NWR has been a management tool used off and on since 1990. Approximately 12 prescribed burns have been completed during this time. Most within the last three years. Approximately 6-8 percent of the refuge's emergent habitat is burned each year in early March. The March burn effort usually involves 3-4 planned burns, with a total burn acreage of 800-1,500 acres depending on the year. Burn areas are carefully selected with the objective to burn expansive dense bulrush areas of the marsh in a patchwork type burn of un-burned emergent stands intermixed with burned areas that are immediately flooded with 1-2 feet of water. This creates an excellent interspersion of open water and nesting bulrush for waterfowl and other marsh wildlife to use. This condition lasts through two growing seasons. The marsh burns are rotated to new areas of the marsh needing treatment each year.

RESPONSIBILITIES

Agency Administrator/ Project Leader (PL)

- $ Is responsible for implementation of all Fire Management activities within the Complex and will ensure compliance with Department, Service and refuge policies.
- $ Selects the appropriate management responses to wildland fire.
- $ Coordinates Complex programs to ensure personnel and equipment are made available and utilized for fire management activities including fire suppression, prescribed burning and fire effects monitoring.
- $ Ensures that the fire management program has access to Refuge and resources when needed.
- $ Ensures that Refuge Managers and complex Staff consider the fire management program during Refuge related planning and implementation.

Refuge Manager (RM)

- $ Identifies prescribed burn units and biological objectives to Fire Management Officer (FMO), notifies FMO of prescribed fire project constraints, and ensures that Refuge resources are available to accomplish prescribed fire and fire suppression objectives.
- $ Acts as the primary Refuge Resource Management Specialist during fire management planning and operations.
- $ Decides when to request overhead or additional firefighting personnel and equipment.
- $ Drafts wildland fire Rehabilitation Plans for Project Leader, and is responsible for posting and enforcing fire restriction regulations.
- $ Coordinates through Project Leader to provide biological input for the fire program to the FMO.
- $ Coordinates prescribed fire and suppression actions.

Biologist

- $ Coordinates through Refuge Managers and Deputy Project Leader to provide biological input for the fire program with the FMO.
- $ Assists in design and implementation of fire effects monitoring, to the FMO.
- $ Participates, as requested, in prescribed burning and wildland fire suppression.

Fire Management Officer (FMO)

- $ Responsible for all fire related planning and implementation.

- $ Integrates biological Refuge objectives into all fire management planning and implementation.
- $ Solicits program input from the RM.
- $ Supervises prescribed fire planning.
- $ Is responsible for implementation of this Plan. This responsibility includes coordination and supervision of all prevention, pre-suppression, detection, wildland fire, prescribed fire, suppression, monitoring, and post-fire activities involving Refuge lands.
- $ Is responsible for preparation of fire reports following the suppression of wildland fires and for operations undertaken while conducting prescribed fires.
- $ Prepares an annual report detailing fire occurrences and prescribed fire activities undertaken in each calendar year. This report will serve as a post-year's fire management activities review, as well as provide documentation for development of a comprehensive fire history record for the complex.
- $ Submits budget requests and monitors FIREBASE funds.
- $ Nominates personnel to receive fire-related training, as appropriate.
- $ Responsible for Interagency coordination.

Supervisory Range Technician (SRT)

- $ Is responsible for planning, coordinating, and directing preparedness activities including fire training, physical fitness testing and Interagency Fire Qualification System (IFQS) data entry, fire cache and equipment inventory accountability, maintenance, and operation, cooperation with cooperative agencies.
- $ Insures step-up plan is followed.
- $ Ensures fire management policies are observed.
- $ When available, may serve as prescribed fire burn boss, propose prescribed fire projects.
- $ Assists the FMO and the Biologist with fire effects monitoring.
- $ Helps prepare a Refuge fire prevention plan, and coordinates fire prevention with other employees.
- $ Assists in updates of this Plan, maintains fire records, reviews fire reports (DI-1202) for accuracy, and enters fire reports into FMIS.
- $ Maintains engines in state of readiness.

Fire Management/Suppression Personnel

- $ Consist of all Complex Refuge personnel, whether permanent or seasonal, who meet the minimum standard set by the National Wildfire Coordinating Group (NWCG) for firefighters.
- $ Are fully equipped with proper personal protective equipment, have taken and passed the minimum classroom training, and meet physical fitness standards required.
- $ Undertake fire management duties as assigned by the qualified IC on each suppression action or by the Prescribed Fire Burn Boss on each prescribed fire project.
- $ Are responsible for their personal protective equipment and physical conditioning, qualifying annually with the work capacity test before April 15.

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 3) 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 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 consist of experienced, fully- qualified firefighters, including those on their first fire. 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
Bear Lake, Camas and Grays Lake NWR's fall within the East Idaho Interagency Fire Center (EIIFC) dispatch zone. The EIIFC will have initial attack responsibility for these three refuges. All fires are reported to EIIFC and the center dispatches all suppression forces. The Complex fire crew is stationed at Grays Lake NWR.
Minidoka NWR falls within the Southern Idaho Interagency Fire Center (SIIFC) dispatch zone. The (SIIFC) will have initial attack responsibility for Minidoka NWR. All fires are reported to SIIFC and the center dispatches all suppression forces. Minidoka NWR annually furnishes to the SIIFC a list of resource constraints to be used in fire suppression on the refuge, a list of Service contacts, and an air hazard map. The refuge manager will designate a resource advisor when possible; if not Cooperators will follow the list of resource constraints.

Cooperative agreements with various federal, state and local agencies (Appendix 6) generally provide that resources of each agency are available to assist in initial attack efforts. These agreements detail payment among cooperators, list of response areas, communications frequencies, and have been reviewed by a contract specialist and/or solicitor.

The Complex 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

The Complex annually provides the SIIFC and EIIFC with updated guidelines in the event that Refuge staff is not present at the scene to serve as resource manager. Ground disturbance should be minimized, but disk and dozer lines are approved only on areas with previous archaeological clearance. There are no special restrictions on fire retardant, other than standard protection of waterways. Disturbances from these factors is deemed less of a risk than allowing more Wyoming big sagebrush habitat to burn.

There is a grove of cottonwood and willow tress at Water Unit 1 that supports a great blue heron nest colony; these tree should receive extra protection. Refuge buildings, Lake Walcott State Park facilities and Minidoka Dam facilities are on the north shore of Lake Walcott near the dam and will require extra protection. Some buildings at the dam are on the national register of historic sites. Private buildings near the refuge occur at Raft River, near Gifford Springs boat ramp, and at Call's ranch.

Sensitive riparian areas at Minidoka NWR can be found at Water Unit 1 and below the dam on the south side of the river. Since more than half of refuge uplands have been burned in the last 10 years any remaining sagebrush habitat should be considered a critical protection area.

Sensitive resources on the main unit of Bear Lake NWR include:

- $ The northeast Mud Lake colonial nesting areas used by white-faced ibis, Franklin's gulls, other herons and egrets. Although not critical, should this area burn, it is a sensitive area to loss of residual emergent cover. If this area of the marsh should burn, colonial nesters would be forced to move to other adjacent emergent habitat in the marsh. This would probably impact production for that year and maybe into the next. No prescribed burning is done in this area. Most of this area is secure from wildland fire, except by direct hit by lightning, the colonial nesting area is surrounded by open water areas. Should a strike occur there is very little the refuge can do about it.
- $ The 40 ft. X 60 ft. metal field storage building and equipment storage yard is critical to the refuge mission in terms of facility, equipment and material support. The graveled compound does provided a control buffer for wildland fire and small prescribed burns.
- $ Refuge public use facilities are limited but are of high value to the refuge visiting public, these include: the new public restrooms, cedar kiosk and new entrance sign. All these are located on sparsely vegetated dikes, graveled areas and rocked pads. The refuge annually clears vegetative growth around these structures and this will adequately protect them short of an extreme wind and wildland fire event.

The Thomas Fork Unit (TFU) has no sensitive areas that are critical to its mission. However, areas of concern include:

- $ The new 6.5 mile wood boundary fence is susceptible to loss from fire. The refuge has no plans except for some haying done annually along the fence to reduce vegetative height. If a wildland fire occurs, some of this fence may burn will be replaced.
- $ The 2.8 miles riparian corridor through the western portion of the TFU is another concern but is not considered critical. Wildland fire moving through the stream bank areas along Thomas Fork Creek will damage existing vegetation, but stimulate willow and grassland growth over the long term. The refuge has no plans to develop control lines along this area. The TFU haying program already provides short grass meadow habitat along the riparian areas at this time and this will be adequate.

Oxford Slough WPA has no facilities and has few sensitive areas, they include:

- $ OSWPA new entrance sign. This structure sets in dense grass lands and is susceptible to fire.
- $ The white-faced ibis colony in center of Oxford Slough is a sensitive area. Due to lack of open water around, it is susceptible to burning off in the spring prior to new growth and during the dry fall period. A burn off of the nesting area would be a temporary set back for the colonial nesters and it is not realistic for the refuge to provide control areas to protect this colony.
- $ The small hamlet of Oxford, Idaho, lies along a portion of OSWPA along its west boundary. Oxford is a town of 44 people and is made up of scattered residences and meadow lots. The private lots next to the refuge are irrigated meadows that are mowed, farmed or grazed and maintained in a short vegetative condition for the most part. The refuge plans to maintain its current haying and cooperative farming program at OSWPA in the areas adjacent to these private lots near to town to maintain a wider fire control buffer of the shorter fuel types.

Camas NWR

Sensitive areas of the Refuge are the riparian habitat along Camas Creek associated with headquarters (old growth cottonwood and black willow trees); sagebrush habitats located on the north and west side of the refuge; the peregrine hack tower; headquarters buildings; refuge residences; and the irrigation pumps.

Gray's lake national wildlife refuge

a. Refuge lands lie adjacent to private lands, and there are private residences, numerous wooden fenceposts and some outbuilding.
b. Herman, eagle and gravel creeks contain limited riparian vegetation (primarily willows) that would be damaged by fire. Burning in these areas should be planned to protect these areas in accordance with refuge objectives to restore woody riparian vegetation on these drainages.
c. A large mixed nesting colony of white-faced ibis and franklin's gulls exists in the south-central portion of gray's lake marsh. Burning in the immediate area of the colony should be avoided so as not to disrupt the nesting habitat.

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 11) 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

o. Minimum impact fire suppression tactics will be used to the fullest extent possible.
p. 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.
q. Foam use will be minimized in areas known to harbor surface artifacts.
r. Mechanized equipment should not be used in areas of known cultural significance.
s. The location of any sites discovered as the result of fire management activities will be reported to the Regional Archaeologist.
t. Rehabilitation plans will address cultural resources impacts and will be submitted to the Regional Archaeologist using the RCRC.

Prescribed Fires

u. 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).
v. 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.
w. 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.
x. Mechanized equipment should not be used in areas of know cultural significance.
y. 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 the Complex. 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. Normal suppression operations dictate reporting fires to BLM for initial attack. Only refuge personnel that meet current NWCG wildland firefighter certifications will attempt to suppress wildland fires that are small and easily managed by a small crew. Only three permanent staff are currently certified. Once the fire crew is fully staffed and a viable pumper unit is established, this crew will be dispatched to all refuge fires for initial attach and support to the larger BLM response teams.

Records show that fire season is typically from May 15 to October 20.

FIRE MANAGEMENT STRATEGIES

All unplanned wildland fires will be suppressed in a safe, aggressive, and cost-effective manner to produce fast, efficient action with minimum damage to resources using appropriate management strategies.

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 refuge headquarters, neighboring residences and ranches, and adjacent private croplands, will receive priority consideration in fire control planning efforts. In all cases, the primary concerns of fire suppression personnel shall be the safety, and if needed, all individuals not involved in the suppression effort may be evacuated.

Physical limitations such as moist-soil conditions which precludes equipment use, lack of adequate fire/fuel breaks especially along refuge boundaries, and limited manpower and resources are challenges at these refuges. Other constraints which have been identified include:

1. Lack of a cultural resource inventory: Native-American tribes were known to inhabit the area in vicintiy of Complex units. It is highly possible that all units were used as migration corridor and as hunting and gathering sites. Artifacts are occasionally found, but they have never been located in abundance on the refuges. A map of cultural resource sites would assist fire managers in choosing strategies that would least impact Refuge resources.

2. The staffing at each refuge (Oxford Slough WPA is not staffed) consists of a permanent manager, and 1 or more permanent and temporary personnel, which may consist of the following, a biologist, maintenance workers, and technicians. During a fire emergency, the Complex will usually rely on interagency crew dispatched from the Eastern Idaho Interagency Fire Center or Southern Idaho Interagency Fire Centers.

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.

Suppression crews may travel off-road if access by road is not possible. Suppression crews are authorized to cut fences for access if there are no gates nearby or the gates are locked. Crews must repair fence cuts upon demobilization or inform the refuge manager of the location of unrepaired fences if they are not able to repair.

Vehicle access to normally closed areas of the refuge will be made using existing fire roads when possible. When off-road travel is determined to be necessary, vehicle access will be allowed with approval of the Refuge Manager or Delegate.

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 approval from the Refuge Manager except when life and/or property are at risk.

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

There is currently no cooperative fire agreement with Bear Lake County because of fitness and training concerns relative to fighting fire on Service lands. An MOU for fire protection between the Service, BLM, and the Forest Service covers all the Refuges in the Complex (Appendix 6).

Critical protection areas such as the refuge field shop and storage compound site, equipment parked in the field, protection of power lines that cross the refuge, and public use facilities will receive priority consideration.

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, equipment inventory, personnel qualifications, and training. The preparedness objective is to have a well trained and equipped fire management organization to manage all fire situations within the Complex; this may be accomplished by facilitating interagency cooperation. Preparedness efforts are to be accomplished prior to the start of the normal fire season.

Historical weather analysis

Typical weather indices collected at each unit are listed in Appendix 5. This data comes from Annual Narratives and is presented as a typical pattern of precipitation experienced at each unit.

Fire Prevention

An active fire prevention program will be conducted in conjunction with other agencies to protect human life and property, natural resources, 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. Trained employees need to relate to the public the beneficial effects of prescribed fires.

It is essential that employees be well informed about fire prevention and the objectives of the refuge's fire management program. Further, employees must be kept informed about changes in existing conditions throughout the fire season.

During periods of extreme or prolonged fire danger emergency restrictions regarding refuge operations, or area closures may become necessary. Such restrictions, when imposed, will usually be consistent with those implemented by cooperators. The FMO will recommend when such restrictions may be necessary. Closures will be authorized by the Project leader in consultation with Refuge Managers and the Fire Management Officer.

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). The Complex 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 the interagency fire community in pump and engine operation, power saws, firefighter safety, fire weather and fire behavior, helicopter safety and prescribed fire objectives and activities. Supplemental 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 FMO will coordinate fire training needs with those of other nearby refuges, cooperating agencies, and the Regional Office.

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

Fire suppression is an arduous duty. On prescribed fires, personnel may be required to shift from implementation/monitoring activities to suppression. 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 45 minutes or less.

Supplies and Equipment

The following equipment is available at Camas NWR:

Fire Equipment

- 1- 200 gal. Trailer-mounted engine
- 1- 200 gal. Tractor-mounted sprayer
- 1-75 gal. Slip-on engine
- 1- 50 gal. Pickup-mounted sprayer
- 1- Road Grader
- 1- Farm Tractor (with disc/plow)
- 1- Portable pump (hose/accessories)
- 4- Mobile Radios
- 3- Portable Radios

1- Chainsaw
Misc. Fire hand tools

Minidoka NWR has an 80 gallon slip-on unit, a few hand tools, and two fire hydrant hose stations to protect the headquarters buildings. The hydrants are currently in disrepair, but should be functional by summer=s end of 2001. There are only two permanent staff at Minidoka NWR and they are not fire qualified.

Bear Lake NWR has an older type 200 gallon slip-on Western Fire Equipment pumper mounted on a 2X4 1 ton crew cab truck for use as a wildland fire and prescribed burn support vehicle. This vehicle is old but functional at this time, but should be replaced as soon as possible. This unit is full of water and stored at the refuge field site for refuge and SIRC Fire Crew use. This is considered our basic equipment need for this station and Oxford Slough WPA, and will be used to augment the SIRC engine should it be needed. The refuge also has an assortment of portable fire water pumps, hose, chain saws, and fire fighting tools.

Caches are located at all units with the primary cache at Grays Lake NWR since the fire crew is stationed at this unit. A Type 6 engine is stationed at Grays Lake NWR. An older 200 gallon slip on unit is mounted on the refuge swamp cat.

Additional equipment and supplies are available through cooperators and the interagency cache system. Requests for additional personnel and equipment are made through the servicing Dispatch center for the area

DETECTION

The Refuge Manager will report any fire to the Eastern Idaho Interagency Fire Center (Bear Lake, Grays Lake, Camas, Oxford Slough) or South Idaho Interagency Fire Center (Minidoka). Following notification, a call will be made to the Project Leader/Deputy Project Leader and/or the FMO to report the fire situation. The Refuge Manager or reporting employee will complete the information on the Fire Report Form (Appendix 16).

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 may require an investigation and report by law enforcement personnel. For serious human-caused fires, including those involving loss of life, a qualified arson investigator will be requested.

COMMUNICATIONS

The Complex in general does not have a reliable radio system that connects Complex Office with each unit. Units besides Minidoka do have mobile radio communications that enable unit staff to talk to one another.

All Refuges within the Complex operate on a direct radio frequency (i.e., no repeater). The frequency for use by Refuge staff is 169.550 (Bear Lake, Camas, Grays Lake, Oxford Slough) and 170.050 (Minidoka). Cell phones are utilized to maintain contact with Refuge Headquarters (Appendix 4).

Radio communication with interagency cooperators is maintained using BLM and Forest Service frequencies (Appendix 4). An agreement is in place for SIIFC for sharing these frequencies (Appendix 6); the agreement with EIIFC still needs to be formulated.

A wildland fire on the refuge will be immediately called into the complex office to notify the Project Leader and FMO,. EIIFC will be notified of fires on Camas, Grays Lake, Bear Lake and Oxford Slough. SIIFC will be notified for fires on Minidoka. This should be done in consultation with the complex FMO who coordinates refuge fire suppression operations.

PRE-ATTACK PLAN

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

1. The Incident Commander (IC) will locate, size-up, and coordinate suppression actions. The IC will complete the pre-attack planning checklist.
2. Provide for public safety.
3. Considering the current and predicted fire conditions, the Incident Commander will assess the need for additional suppression resources and estimate the final size of the fire. The potential for spread outside of the refuge should be predicted, as well as the total suppression force required to initiate effective containment action at the beginning of each burning period.
4. The Incident Commander will assess the need for law enforcement personnel for traffic control, investigations, evacuations, etc. and make the request to the FMO.
5. Document decisions and complete the fire report (DI-1202).
6. Should a wildland fire move into an extended attack, a Wildland Fire Situation Analysis will be prepared and a Delegation of Authority will be invoked. Once a Delegation of Authority has been authorized the Incident Commander will make the final decisions pertaining to the fire. A copy of Delegation of Authority is in Appendix 3.

Fire Management Units

Fire Management Units (FMUs) are areas on a refuge which have common wildland fire management objectives and strategies, are manageable units from a wildland fire standpoint, and can be based on natural or manmade fuel breaks. In the Southeast Idaho Complex, each refuge will be a separate 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 the appropriate suppression response. Prescribed fires will be used to reduce hazardous fuels and to meet resource management objectives.

Bear Lake NWR

If a fire were to burn off an area of the marsh during a dry period, the peat layers of the marsh could burn for a long period of time or until the water table rises.

Fuel Models 1 and 3 are those represented on Bear Lake NWR (about 20 percent and 80 percent, respectively).

Table 6: Fuel Model Composition Bear Lake NWR

Fuel Model 1 Drier Grasslands and Hayed Wet Meadow	15%
Fuel Model 3 Emergent Vegetation and Un-hayed Wet Meadow	65%
Fuel Model 5 Grassland and Shrub	3%

Open Water	17%

The refuge terrain is flat with the exception of the refuge lands that extend 0.25 mile up the steep slopes of Merkley ridge along the East County road. Wildland fire in the refuge's heavy bulrush stands with a strong wind can become very large fires that quickly move across the marsh. The marshes numerous open water areas and two large canals can significantly create fire control points that limit fire movement.

The Merkley Ridge area along the southeast side of the refuge has burned several times in the past at various locations along the county road. Many of these are the result of lightning, fires being set or a careless smoker. These fires can rapidly move upslope onto BLM and/or state lands.

The wet meadow and grassland areas of the refuge vary between Type 1 and 3 fuels on flat terrain. Many of these wet meadows are hayed and/or grazed to short grass stubble by August. The drier un-hayed grasslands along the northwest part of the refuge have heavy fuels, which have the potential for significant wildland fire activity. Roads and private grazed lands adjacent to these areas may limit fire movement on or off-refuge.

A large percentage of the habitat at Bear Lake NWR consists of heavy emergent (primarily bulrush) residual cover in the large marsh. This type 3 fuel model burns easily during the early spring (prior to green up) and fall periods (after frosts kill the stems). The main marsh area of the refuge is some 14,000 acres in size with 3,000 acres of this being open water. The bordering wet meadows areas around the edge of the marsh total around 2,500 acres in size and would be classed as Type 1 fuel in a hayed condition and Type 3 fuel in a un-hayed condition. The wet meadows consist of Juncus spp., Carex spp., and a variety of water tolerant grasses. The refuge also has some drier habitats of grasslands (1,300 acres, Type 1 fuel) and shrub/grassland mixes (300 acres, Type 5 fuel). The drier grass species include: saltgrass, alkali sacaton, several species of wheatgrass, and basin wildrye. Some of this shrub (sagebrush, greasewood) and grassland habitat is located on the steep slopes of Merkley Ridge on the east side of the refuge.

Camas NWR

The fire risk at Camas NWR is considered moderate to high due to its location amid ranches, private dwellings and the numerous refuge facilities.

Most of the refuge marshes contain stands of cattail and bulrush (Model 3). About 25% of the refuge is comprised of this fuel model. The remainder of the refuge has wetlands with a lower vegetal aspect or upland range. All of these areas fall into fuel model 1 with the exception of areas containing sagebrush which is a fuel model 6.

Table 7: Fuel Model Composition for Camas NWR

FUEL MODEL COMPOSITION CAMAS NWR	
Fuel Model 1	40%
Fuel Model 3	25%
Fuel Model 6	25%
Open Water	10%

In the past, upwards of 1,000 acres were used to produce crops. Currently about 120 acres remain under production with small grain and alfalfa. The rest has either been seeded to dense nesting cover (DNC) or has reverted back to natural vegetation or introduced cool season grasses (quack grass and smooth brome). A fire in these fields would destroy established vegetation used by nesting waterfowl and if conditions were right destroy the grain crop planted for migrant bird use. These effects would last only a season until new growth emerged in the spring. There is the possibility that noxious weeds such as wild oats (*Avena fatua*), wild mustard (*Brassica* spp.) and thistle would out-compete native vegetation.

Another habitat found on the refuge includes the riparian willows (Salix spp.) and cottonwood (Populus spp.) shelter belts. These comprise less than 2% of the refuge but are heavily utilized by big and small game, passerines and raptors during the winter months. The cottonwoods are used extensively for roosting by migrating and wintering bald eagles. The willows along Camas Creek provide feeding and nesting areas in the summer and thermal cover for big game and wintering birds. Fire in these areas can range from minimal effect to total destruction of the tree community. When a fire occurs during wet or normal conditions, usually the surrounding ground litter is burned or the bark is singed. But during dry or windy conditions the entire shelterbelt could be consumed by fire.

Grays Lake NWR
Most of the refuge (65%) comprises a typical Fuel Model 3. (Fuel Model descriptions are taken from Anderson, 1982)

Fuel Model 3 is found on about 65% of the refuge. It is also characterized as herbaceous but the vegetative cover is tall (averaging 3 feet) and dense. At any given time approximately 50% of the cover is dead or cured. Bulrush and cattails are good examples of this fuel. Fires in this fuel can be very intense and spread rapidly. If a wind is present the spread may burn through fuels standing in water. Fires in this fuel model also leave little in the way of burning or smoking residues. If no woody vegetation is present, the fire may be completely out in less than an hour after its run.
Fuel Model 1 is characterized as fine, herbaceous vegetation in a cured or dry state. Very little shrubby vegetation or timber is present and fuel depth is usually under 1.0 feet. Fires in these models are usually surface fires that move rapidly and leave little in the way of burning/smoking residue.

Fuel Model 6 is the final type found on the refuge. It is a predominantly woody shrub habitat averaging a fuel bed depth of 2.5 feet. It may have an overstory of timber or woody vegetation in selected areas. On Grays Lake NWR this is characterized as an aspen/conifer ecotype with an occasional or willow community. These willows are usually adjacent to water. Approximately 5% of the refuge is comprised of this fuel type. Fires in this fuel generally burn in the understory but with dry and windy conditions the fire will easily burn into the overstory. These fires can continue to smolder and smoke for hours or days after a fire has burned through. Fires within the shelter belts can be hard to extinguish and may take a protracted initial attack.

The fuel types and fuel load is such that most smoke rapidly disperses in a few hours. Prescribed burn prescriptions will take into account both plume trajectory and smoke dispersion times.

Minidoka NWR
Fire in the uplands areas of Minidoka NWR would likely lead to increases of non-native grass species (cheatgrass and crested wheatgrass). Sagebrush is recolonizing previously disturbed areas (planted with crested wheatgrass) and fire at this time would kill the sagebrush and promote growth of crested wheatgrass and cheatgrass. North of the Snake River, the vegetation is native grasses and sagebrush, but previous fires in similar areas have resulted in a stand of cheatgrass.

Fuel Models 3 and 6 and open water (about 10 percent, 40 percent and 50 percent, respectively) mentioned above are the predominant fuel types on Minidoka NWR.

Oxford Slough WPA

Oxford Slough WPA's (1,890 acres) main marsh area is some 710 acres size and is primarily bulrush emergents, with some cattail (a Type 3 fuel model). The WPA has expansive drier type grasslands with some wetlands along its east and southwest regions that are more alkali in nature (saltgrass, alkali sacaton, small alkali playas and some taller type grasses), within this 830 acre area are also scattered patches of greasewood and sagebrush patches. These grasslands would be primarily Fuel Type 1 grading into Type 3-5 in some areas of brush and grass. The north end of OSWPA is dominated by hilly cropland area, 80 acres of DNC planting and irrigated crops along the northwest area of the WPA. Croplands total 180 acres. The west side vegetation consists of wet meadow grasslands, some brush, areas of reed canary grass, Juncus spp. And other water tolerant grasses. Much of this area is hayed each year providing a mix of short and taller cover types.

Table 8: Fuel Model Composition for Oxford Slough WPA

Fuel Model 1 alkali grasslands	44%
Fuel Model 1 hayed wet meadow	9%
Fuel Model 3 wetland emergents	38%
Cropland	9%

The WPA marsh does not have significant amounts of open water control areas and should lightning strike the main marsh area in late summer most of the slough would burn off. The Union Pacific railroad has a track that runs from north-south along the east boundary of the WPA and train activity has caused wildland fires in the past that have moved onto the WPA and burned several hundred acres of grasslands on the east side. These types of fires are infrequent. The wet meadow areas along the west side are hayed annually under a cooperative farming agreement. The small town of Oxford lies is adjacent to the WPA and is considered to be a critical control area to prevent any wildland fire movement close to Oxford's scattered residences and meadow lots. Most of this area is hayed to short stubble in July which would reduce flame lengths and rate of spread.

SUPPRESSION TACTICS

Wildland fires will be suppressed in a safe and cost-effective manner to produce fast, efficient action with minimum damage to resources. Suppression involves a range of possible actions from initial attack to full suppression. All wildland fires will be suppressed.

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

There will be only one Incident Commander responsible through the FMO to the Refuge Manager. The Incident Commander will designate all overhead positions on fires requiring extended attack.

Below are listed the priorities for protection during a fire emergency:

Firefighter and public safety
Buildings/facilities on refuge
Buildings/facilities off refuge
Power lines along right-of-ways
Peregrine hack tower
Pump sites and wells

For non-priority sites, which will include most of the refuge marsh and upland habitat, suppression strategy will be dependent on time of the year and fuel moisture loads.

Specific tactics developed for suppresion operations on the Complex are:

Utilize existing roads, wetlands and other features as primary control lines, anchor points, escape routes and safety zones.
Use burnouts to stabilize and reinforce control lines.
If heavy equipment is used, attempt to construct control lines on or adjacent to existing roads.
Heavy equipment is only necessary if fire threatens structures or adjacent private property.

The use of aerial retardant will be prohibited on refuge wetlands except in the most extreme emergencies (i.e. a needed drop to protect personnel or private property)**.** Retardants contain ammonia and should not be used over refuge wetland habitats.

Private Inholdings and Structures:

Located inside Camas NWR is a 40 acre private inholding which contains two houses, corrals, barns, and storage buildings. The inholding has a paved county road on one side, the structures are separated from refuge lands by green irrigated alfalfa fields. This is the only inholding in the SE Idaho NWR Complex which contains structures.

Service owned structures on the refuges will be inventoried and assessed for surrounding hazardous fuels by the refuge fire crew. If needed annual maintenance will be done to prevent hazardous fuel build-up around the structures.

Priorities for protection at Minidoka are listed below:

1. Public visitors in Lake Walcott State Park
2. Buildings and facilities at Refuge Headquarters, Lake Walcott State Park, and Minidoka Dam.
3. Power lines along rights-of-way.
4. Riparian and intact sagebrush habitat.

Specific tactics for fire suppression at Minidoka NWR.

1. Use existing roads, the reservoir and other natural features for control lines, anchor points, safety zones and escape routes.
2. Use burnouts to stabilize and reinforce control lines.
3. Heavy equipment is allowed if there has been an archaeological clearance or if necessary to protect life and buildings.
4. Retardant is allowed with standard restrictions on use near water.

Suppression Conditions

The Complex annually provides the SIIFC and EIIFC with updated guidelines in the event that Refuge staff is not present at the scene to serve as resource manager. Ground disturbance should be minimized, but disk and dozer lines are approved only on areas with previous archaeological clearance. There are no

special restrictions on fire retardant, other than standard protection of waterways. In cases of threat to life and/or private property, the Incident Commander has the authority to utilize whatever means necessary.

Wildland Fire Situation Analysis
For fires that cannot be contained in one burning period, a WFSA must be prepared (Appendix 12). 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 Complex Project Leader.

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

Public safety will require coordination between all refuge staff and the IC. Notices should be posted to warn visitors, trails may be closed, traffic control will be necessary where smoke crosses roads, etc. Where wildland fires cross roads, the burned area adjacent to the road should be mopped up. 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.

Retardant will only be used on upland sites to contain marsh fires from spreading to adjacent private land.

REHABILITATION AND RESTORATION
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. Completely restore camping areas and improved helispots.

7. 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 rehabilitation 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 Emergency Rehabilitation (BAER) fund.
Rehabilitation plans for each fire will be reviewed by the Project Leader, Refuge Manager, and FMO. A final plan will be submitted to Region for establishing an account. Rehabilitation should be initiated prior to complete demobilization or early the following season.

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

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

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

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

SIIFC/ EIIFC will be requested to investigate any fire of suspicious origin. For fires which burn on Refuge lands, SIIFC/ EIIFC will provide a copy of the investigation report to the Complex. However, if the fire is lightning caused no investigation report will be issued. The Service will make the decision whether to prosecute or try to recover damages for human caused fires.

PRESCRIBED FIRE ACTIVITIES

PRESCRIBED BURN PROGRAM OBJECTIVES

Prescribed fire can be a useful tool for restoring and maintaining natural conditions and processes at the Complex. Prescribed fire, in conjunction with grazing, will play an important role as an effective and economical tool in managing refuge habitat. Fire, rather than grazing, may be able to be used more selectively to achieve management goals.

Other examples of managing for certain ecotypes would be using fire in marshes to create open water areas in dense stands of cattail and bulrush. Some areas of dense emergents are necessary for diving duck nesting but interspersion with open areas is needed to allow for movement, feeding, resting and courtship. In areas of dense nesting cover (DNC) after several growing seasons, a thick layer of litter develops which affects plant vigor and density. Prescribed burning can be used to restore a more natural balance to the stand.

Since the refuge objectives are to provide optimum nesting and feeding habitat, burns will be conducted during pre- or post-migration (approximately September 15 - April 1). This is the dormant season for vegetation and the burn schedule will be set depending on the specific objective desired. This also coincides with the lowest fire danger period, an approach that must be used due to the excessive fuel loading and the proximity of private land and residences. Specific management needs for each refuge and the Complex as a whole will be determined annually. Specific burn objectives, fire frequency rotation, firing methodology, and prescriptions will vary from year to year. Burn plans will be updated to reflect any variations (Appendix 13). The Project Leader must approve prescribed fire plans.

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. Measures to ensure the successful implementation of the prescribed fire program are to:

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

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.

PRESCRIBED FIRE MANAGEMENT STRATEGIES

Prescribed fire will be used to reduce hazard fuel accumulation, restore fire to fire-dependent ecological communities, improve wildlife habitat, and to maintain cultural/ historic scenes where appropriate. All

prescribed fire activity will comply with applicable Federal, state, and local air quality laws and regulations.

All prescribed fire projects will have a burn plan approved by the Project Leader. Each burn plan will be prepared using a systematic decision-making process, and contain measurable objectives, predetermined prescriptions, and using an approved environmental compliance document. A categorical exclusion has been prepared for this FMP. 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.

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 prescribed burn window for the Complex is generally early-Spring (March-April) and late-fall (September-November). Refuge Managers, in conjunction with the FMO, will develop an annual plan for prescribed fire activities. The FMO is responsible for submitting the RCRC (Appendix 11) to the Regional Archaeologist as soon as the burn area is identified.

Prescribed Fire activities will be reviewed annually. Necessary updates or changes to the Fire Management Plan will be accomplished prior to the next fire season. Any additions, deletions, or changes will be reviewed by the Refuge Maanger 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, biologist, and/or Refuge Manager to discuss objectives, special concerns, and gather all necessary information to write the burn plan. After completing the reconnaissance, a qualified 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 13. Each burn plan will be reviewed by the Refuge Manager, Biologist, FMO, 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 undertaken by qualified personnel. The Prescribed Burn Boss will fill all required positions to conduct the burn with qualified personnel. All personnel listed in the burn plan must be available for the duration of the burn or the burn will not be initiated.

Weather and fuel moisture conditions must be monitored closely in planned burn units to determine when the prescription criteria are met. A belt weather kit may also be utilized to augment monitoring.

When all prescription criteria are within the acceptable range, the Prescribed Burn Boss will select an ignition time based on current and predicted weather forecasts. A thorough briefing will be given by the Prescribed Burn Boss and specific assignments and placement of personnel will be discussed. An updated spot weather forecast will be obtained on the day of ignition and all prescription elements will be rechecked to determine if 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 preburn 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 will be completed and additional personnel and resources ordered as determined by the Incident Commander. If the fire continues to burn out of control, additional resources will be called from the local cooperating agencies via the servicing dispatch. A management overhead team may be requested to assume command of the fire.

MONITORING AND EVALUATION

Monitoring of prescribed fires is intended to provide information for quantifying and predicting fire behavior and its ecological effects on refuge resources while building a historical record. Monitoring measures the parameters common to all fires: fuels, topography, weather and fire behavior. In addition, ecological changes such as species composition and structural changes will be monitored after a fire. This information will be very useful in fine-tuning the prescribed burn program.

During prescribed 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. 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.

The strategy for documenting fire effects will entail a working collaboration between the Refuge Biologist and the Refuge Manager. Between them they will produce a data monitoring form which will be used to evaluate the effectiveness of the prescribed burns from the stated objective.

Prescribed Burn Critique

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

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 Complex's fire records for future use and reference.

The Prescribed Burn Boss will prepare a final report on the prescribed burn. Information may 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

The control of air pollution in the United States is addressed in the Clean Air Act (CAA). The act stipulates that each state has a primary responsibility to protect air quality. To insure compliance each state is required to develop a State Implementation Plan (SIP). This plan outlines strategies to prevent or reduce air pollution and particulate release. In Idaho, enforcement rests mainly with the state government in the Department of Environmental Quality.

The Smoke Management Plan for Idaho is still in revision but they currently set two standards; one to protect public health and the other to protect the public welfare. Areas that exceed the standard are designated as Non-Attainment Areas (NAA). The nearest NAA area to the Complex units is the Power/Bannock County (Pocatello Area). The other standard is designed to protect air quality in areas which already meet the standard and to protect air quality related values in Class I areas. Class I areas are national or international parks, monuments, preserves or wilderness which are at least 5,000 acres in size. Visibility is of utmost concern in these Class 1 areas as is air quality both of which can easily be affected by smoke. The two Class 1 areas nearest the Complex are Craters of the Moon National Monument located in Butte County and Yellowstone National Park located in Teton County, Wyoming.

Smoke from prescribed or wildland fires can contribute significantly to air pollution. Smoke management will be emphasized when any type of control burn is contemplated. It will be incorporated into any prescribed burn plan.

The SE Idaho NWR Complex is a member of the Montana/Idaho Airshed Group. The group members include all of the federal agencies, state land management agencies, and private forest products companies . The intent of the Airshed Group is to limit negative impacts from controlled burns through scientific monitoring of weather conditions and formal coordination of burns. Prior to the burn season the Fire Management Officer submits a list of planned burn projects to the South Idaho Airshed coordinator describing the type of burns, number of acres in each unit, and unit location and elevation. The Airshed group then compiles a list of all proposed burn projects and gives an identification number to each one. The day before the planned burn the burn boss will contact the area Airshed representative to report the planned burn unit for the next day. The program coordinator and a meteorologist provide timely restriction messages for airsheds with planned burning. The Missoula Monitoring Unit issues daily decisions which can restrict burning when atmospheric conditions are not conducive to good smoke dispersion. Restrictions may be directed by airshed, elevation or by special impact zones around populated areas. The burn boss will access the daily decision notice from the monitoring unit via the internet. Prescribed burn projects will not be conducted if the Missoula Monitoring Unit posts a burning restriction for the refuge airshed.

Local smoke sensitive areas around the units include the farms and ranches which border these areas and small towns located nearby. The area of greatest concern is Interstate Highway I-15 which abuts Camas and Minidoka NWR's and State Highways that abut Bear Lake and Grays Lake NWR's. These areas will receive special consideration for smoke management during prescribed burns. In case of wildland fire, any smoke over the interstate or state highways which would affect traffic would trigger notification of the Idaho Highway Patrol and local law enforcement agencies

FIRE RESEARCH

The Grays Lake NWR Grassland Management Study was completed in 2000 and includes research on the value of prescribed fire as a management tool on intermontaine grassland habitat. Data evaluation is ongoing and final reports are anticipated by January 2002. Preliminary reports are included as reference material (Appendix 8). This will be updated as final reports are submitted. This research will help formulate a management strategy for Grays Lake NWR grasslands.

Also included is a copy of a report on marsh fire history at Grays Lake NWR prepared by the Desert Research Institute.

Bear Lake NWR staff have developed a monitoring protocol to assess wildlife response to habitat conditions, to include areas treated with prescribed fire.

PUBLIC SAFETY

The Complex is dedicated to ensuring the safety of each visitor and to all residents and property adjacent to the refuge's boundary. Residents adjacent to the refuge will be notified in advance of any prescribed burn.

During prescribed burns at least one burn team member will have basic first aid training. A first aid kit will be on-site for prescribed burns as well as wildland fires. The local police, fire, cooperative agencies, 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.

The main public safety concern is smoke dispersal. Roads near the refuges could be impacted by smoke from refuge fires. Visibility could be degraded to a degree which would make travel by vehicle hazardous. These areas will be taken into account when writing controlled burn prescriptions.

PUBLIC INFORMATION AND EDUCATION

The public will be kept informed of prescribed fire activities via news releases. The role of wildland fire and prescribed fire may be incorporated into presentations that are given to various user groups and visiting public.

In addition all the refuges in the S.E. Idaho Complex belong to SIIFC/ EIIFC which provide fire information to the public. This co-op is an arrangement of various state and local agencies which have all signed a Memorandum of Understanding (MOU) in regards to the sharing of personnel and equipment during fire emergencies.

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.

Prior to prescribed burning, information will be made available to visitors, local residents, and/or the press about what is scheduled to happen and why. This information may 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 FMO will retain a copy for the refuge files.

ANNUAL FIRE SUMMARY REPORT

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

Roddy Baumann, Prescribed Fire Specialist, Pacific Region, USFWS, Portland
Rod Blacker, FMO, Malheur NWR
Steve Bouffard, Refuge Manager, Minidoka NWR
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Amanda McAdams, Fire Planner, Pacific Region, USFWS, Portland
Carl Mitchell, Wildlife Biologist, Grays Lake NWR
Tom Romanello, Assistant Fire Management Officer, Sheldon-Hart NWR
Richard Sjostrom, Refuge Manager, Bear Lake NWR
Don Voros, Refuge Supervisor, USFWS, Portland

Agency Administrator. The appropriate level manager having organizational responsibility for management of an administrative unit. May include Director, State Director, District Manager or Field Manager (BLM); Director, Regional Director, Complex Manager or Project Leader (FWS); Director,

Regional Director, Park Superintendent, or Unit Manager (NPS), or Director, Office of Trust Responsibility, Area Director, or Superintendent (BIA).

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

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

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

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

Bureau. Bureaus, offices or services of the Department.

Class of Fire (as to size of wildland fires):
Class A - 3 acre or less.
Class B - more than 3 but less than 10 acres.
Class C - 10 acres to 100 acres.
Class D - 100 to 300 acres.
Class E - 300 to 1,000 acres.
Class F - 1,000 to 5,000 acres.
Class G - 5,000 acres or more.

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

Energy Release Component (ERC) A number related to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. It is generated by the National Fire Danger Rating System, a computer model of fire weather and its effect on fuels. The ERC incorporates thousand hour dead fuel 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.

Fire Management Officer (GS-9/11)
Lance Roberts

Lead Range Technician (GS-5/6)
Vacant

Range Technician (GS-4)
vacant

Range Technician (GS-3)
Brett Moore

Refuge Manager (GS-12), Grays Lake NWR
Mike Fisher

Refuge Manager (GS-12), Bear Lake NWR
Dick Sjostrom

Refuge Manager (GS-12), Minidoka NWR
Steve Bouffard

Refuge Manager (GS-12), Camas NWR
Gerry Deutscher

Request for Cultural Resource Compliance

U.S. Fish and Wildlife Service, Region 1

Appendix Determination	**Date rec'd by CRT:**
_____	_____

Project Name:					**Program:** (Partners, Refuges, JITW, WSECP, etc.)	
State: CA, ID, HI, NV, OR, WA		**EcoRegion:** CBE, IPE,KCE, NCE			**FWS Unit:** **Org Code:**	
Project Location:	**County**	**Township**	**Range**	**Section**	**FWS Contact:** Name, Tel#, Address	
USGS Quad:					**Date of Request:**	
Total project acres/linear ft/m:		**APE Acres / linear ft/m (if different)**			**Proposed Project Start Date:**	

MAPS Attached	**Check below**		
Copy of portion of USGS Quad with project area marked clearly **(required)**			Project (sketch) map showing Area of Potential Effect with locations of specific ground altering activities **(required)**
Photocopy of aerial photo showing location **(if available)**			Any other project plans, photographs, or drawings that may help CRT in making determination **(if available)**

Directions to Project: (if not obvious)	
Description of Undertaking:	Describe proposed project and means to facilitate (e.g., provide funds to revegetate 1 mile of riparian habitat, restore 250 acres of seasonal wetlands, and construct a 5-acre permanent pond). How is the project designed (e.g., install 2 miles of fence and create approximately 25' of 3' high check dam)?

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