

Wildland Fire Management Plan

Dugway, Utah

Approved by: _____ Date: _____
Regional Director, Region 6

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I. INTRODUCTION

Fish Springs National Wildlife Refuge was established to provide waterfowl resting, feeding, and nesting habitat in the Pacific Flyway. Secondary objectives are to provide habitat for other migratory birds and resident wildlife and provide wildlife oriented recreational activities which are compatible with the primary objectives.

This Fire Management Plan (FMP) which updates the May 19, 1983 Fish Springs FMP, is written to help achieve resource management goals and objectives as defined in the Station Purposes, Mission, Goals, and Objectives for Fish Springs NWR and the Refuge Marsh Management Plan (Appendix A). These objectives will also be reflected in the Comprehensive Management Plan when it is developed.

The FMP is developed to provide direction and continuity and to establish operational procedures to guide all Wildland fire program activities to insure that fire is properly used as a means of habitat management to achieve the station's goals and objectives. This plan will be evaluated and updated in future years as required by changes in policy, management actions, and priorities.

U.S. Fish and Wildlife Service policy requires that an approved Fire Management Plan must be in place for all of service lands with burnable vegetation. Service FMP's must be consistent with firefighter and public safety, protection values, land, natural and cultural resource management plans and must address public health issues, Fire Management Plans must also address all potential wildland fire occurrences and may include the full range of appropriate management responses. The responsible agency administrator must coordinate, review and approve FMP's to ensure consistency with approved and management plans.

Service policy allows for a wildland fire management program that offers a full range of activities and functions necessary for planning, preparedness, emergency suppression operations, emergency rehabilitation and prescribed fire operations, including non-activity fuels management to reduce risks to public safety and to restore and sustain ecosystem health.

This plan meets National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) compliance. An environmental assessment (EA) for Fire Management was completed in 1983 and is on file. A new EA will not be completed for prescribed fire due to new regulations published in the Federal Register (62 FR 2375) January 16, 1997. The new regulation categorically excludes prescribed fire when used for habitat improvement purposes and conducted in accordance with local and State ordinances and laws. Wildfire suppression actions and prescribed fire are both categorically excluded, as outlines in 516 DM 2 Appendix 1.

The U.S. Fish and Wildlife Service (Service) policy requires that all refuges with burnable vegetation develop a Fire Management Plan that details wildfire suppression policies, the use of prescribed fire for attaining resource management objectives, and fire program operational

procedures. This plan meets those requirements and provides fire management guidelines for Fish Springs NWR.

The Fire Management Plan is one of several step down management plans developed from land and resource management goals and objectives identifying the specific actions to be taken to achieve Refuge objectives.

Authorities for implementing this plan are found in:

1. Protection Act of September 20, 1922 (42 Stat. 857; 16 USC 594). Authorizes the Secretary of the Interior to protect from fire, lands under the jurisdiction of the Department directly or in cooperation with other Federal agencies, states, or owners of timber.
2. Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66, 67; 42 u.s.c. 1856,1856a and b). Authorizes reciprocal fire protection agreements with any fire organization for mutual aid with or without reimbursement and allows for emergency or major disaster by direction of the President.
3. National Wildlife Refuge System Administration Act of 1966 (80 Stat. 927; 16 USC 1601) 668dd-668ee). Defines the National Wildlife Refuge System as including wildlife refuges, areas for the protection and conservation of fish and wildlife which are threatened with extinction, wildlife ranges, game ranges, wildlife management areas and waterfowl production areas.
4. Federal Fire Prevention and Control Act of October 29, 1974 (88 Stat. 1535; 15 USC 2201). Provides for reimbursement to state or local fire services for costs of firefighting on federal property.
5. Departmental of The Interior Manual, Part 620 DM-1, Wildland Fire Management (April 10, 2000).
6. U.S. Fish and Wildlife Service Refuge Manual, 621 FW1-3, Fire Management (February 7, 2000).
7. U.S. Fish and Wildlife Service Wildland Fire Management Handbook (December 2, 2000).
8. Economy Act of June 30, 1932. Authorizes contracts for services with other Federal agencies.
9. Disaster Relief Act of May 22, 1974 (88 Stat. 143;42 U.S.C. 5121). Authorizes Federal agencies to assist state and local governments during emergency or major

disaster by direction of the President.

10. Wildfire Suppression Assistance Act of 1989 (Pub. L. 100-428, as amended by Pub. L. 101-11, April, 1989).
11. Federal Grants and Cooperative Act of 1977 (Pub. L. 95-244, as amended by Pub. L. 97-258, September 13, 1982, 96 Stat. 1003 31 U.S.C. 6301-6308).

II. COMPLIANCE WITH FISH AND WILDLIFE SERVICE POLICY

Fish Springs National Wildlife Refuge (figure #1) was established by Public Land Order No. 1942, August 12, 1959 at the southern end of the Great Salt Lake Desert. Fish Springs National Wildlife Refuge was established to provide waterfowl resting, feeding, and nesting habitat in the Pacific Flyway. Secondary objectives are to provide habitat for other migratory birds and resident wildlife and provide wildlife oriented recreational activities which are compatible with the primary objectives.

Values at risk include an isolated wetland with associate plant, bird and other wildlife, improvements and other structures, and cultural resources dating back to 3000 B.C.

The Comprehensive Conservation Plan has not been completed for the Refuge. Currently the Refuge is managed through a Refuge Marsh Management Plan (Appendix A). A policy clarification document entitled Endangered Species and Fire Policy Clarification Memorandum, 1995 (Appendix B), provides additional guidance. The Fire Management Plan is a step down plan from the Refuge Marsh Management Plan.

The Comprehensive Conservation Plan is scheduled to be completed by 2000. This plan takes into account management practices that will be incorporated into the Comprehensive Conservation Plan. This plan will be reviewed at the completion of the CCP planning process to ensure compatibility.

A. Management Objectives

The management objectives for Fish Springs NWR are to protect, restore, preserve, and manage a critical wetland and upland area within the physiographic region known as the Bonneville Basins of the Interior Basins Eco-Region for the benefit of endangered, threatened, and sensitive species and to provide superior habitat for migrating, nesting, and wintering migratory birds and indigenous wildlife oriented recreational opportunities and environmental education.

Specific Goals include the following:

1. To preserve, restore and enhance essential habitat for flora and

fauna that are classified as endangered, threatened, or sensitive species.

2. Protect and preserve cultural resources.
3. Maintain, protect, and where possible, increase quality nesting, migrational, and wintering habitat necessary to sustain migratory birds.
4. Maintain, protect and where possible, enhance quality habitat necessary to sustain optimum populations of resident flora and fauna.
5. Increase and enhance wildlife, environmental, and cultural resources viewing and educational opportunities for the visiting public, where compatible.

B. Use of Fire Management Plan to achieve Objectives

1. Monitoring indicates that aquatic insect diversity and abundance are generally favored by the 6 year drawdown/burn management rotation currently being implemented
2. Fire will be used to retard invasion of undesirable species and open up overgrown areas, and reduce vegetative litter.
3. Fire will be an important grassland management tool. It will be used to remove accumulations of mulch and dead plant material in order to expose the soil surfaces to sunlight and increase early spring soil temperature needed for plant growth.
4. Periodic marsh burning will be used to remove dead vegetation, cycle nutrients, and increase vigor of desirable plant species.
5. Fire's affects will be used in the modification of habitat. Fire will be used to increase local habitat diversity by creating a mosaic of habitats and increasing habitat interspersation and edge. Controlled burning will be used to create nesting edge for ducks.
6. Fire will be used to control exotic species, as appropriate.

A. The Endangered Species and Fire Policy Clarification memorandum issued by Acting Director John G. Rogers (September 21, 1995) indicates that fire may be

used to manage for Species of Special Concern. As indicated earlier, the primary mission of the Refuge is to manage for such species. The use of proper fire management techniques will help to achieve the Refuge's resource management objectives. The CCP, when completed, will provide additional direction.

III. DESCRIPTION OF THE AREA AND FIRE EFFECTS

A. General Description

Fish Springs NWR is one of the most isolated Refuges in the lower 48. The nearest neighbors reside in Callao, UT, a collection of ranches 18 miles west of the Refuge. The nearest communities with services are Dugway Proving Ground, UT, 51 miles to the northeast and Delta, UT, 78 miles to the southeast. The Refuge consists of 17,952 acres of fee title land surrounded on the east, west and south by Bureau of Land Management (BLM) holdings and on the north by the US Army's Dugway Proving Ground.

The Refuge is located in western Utah within the Interior Basins Ecosystem. Springs flowing from the eastern base of the Fish Springs Range feed a 10,000 acre saline marsh that forms the bulk of the Refuge. The remaining portion is comprised of 2000 acres of mud and alkali flat and 6000 acres of semidesert upland.

The Central Overland Stage, Pony Express, transcontinental telegraph, and Lincoln Highway left their marks within the present Refuge boundary.

Figure 1. Map of Fish Spring NWR

B. Topography and Soils

Fish Springs NWR is in a valley at the eastern front of the Fish Springs Range. The Great Salt Lake Desert is to the north, the small Thomas and Dugway Ranges to the east, and the House Range to the south closes the basin. Ancient Lake Bonneville once covered the area except for the peaks of the ranges. The elevation of the Refuge varies from 4285 to 4700 feet with a small portion of the Fish Springs Range accounting for elevations above 4350 feet. The Fish Springs Range is characterized by rocky outcroppings and lava peaks with some areas devoid of vegetation.

The semidesert uplands leading from the Range to the marsh are flat to gently rolling and contain alluvial soils with a high gravel content. Plant spacing is very wide in the uplands. Mud and alkali flats surround the eastern, northern, and southern limits of the marsh areas. The marsh soils are generally sandy-clay, less alkaline and occur on top of a hardpan layer. Peat deposits occur in the drainage areas downstream from the major springs.

Risk of wildfire or prescribed fires escaping the Refuge is low due to lack of vegetation on adjacent lands and physical barriers created by the extensive dike system on the Refuge. Access for fire suppression equipment is generally not a problem due to the dikes and access roads on the Refuge. A gravel county road runs along the south and west boundaries of the Refuge, providing additional access for suppression equipment and an additional barrier to escaped fires.

C. Climate

The average annual precipitation total is eight inches. Spring and fall months normally produce the greatest amounts. Wide temperature fluctuations typical of desert environments occur daily and seasonally. Temperatures can range from 109 F in summer to -19 F in winter. High moisture losses during the summer occur through evaporation and transpiration as a result of low humidity and high ambient temperatures. Dry thunderstorms are common during the summer. Winter temperatures can remain well below freezing for several days at a time with snowfall averaging 15 inches per year. The frost free season generally runs from late-April through mid-October. Windspeeds are generally light to moderate.

D. Vegetation

Anderson wolfberry, horsebrush, shadscale, Mormon tea, Indian ricegrass and cheat grass are representative of upland vegetation. The

subirrigated marsh meadows are interspersed with saltgrass, alkali sacaton, spike rushes, and wirerush. The very moist and permanent water areas contain Olney's, hardstem, and alkali bulrushes, cattail, and phragmites. Submerged plant species include widgeon grass, spiny naiad, coontail, sago pondweed, and muskgrass. Several isolated patches of willow exist near the springs.

The only trees native to the Fish Springs area are a few scattered junipers in the higher portions of the uplands. A turn of the century planting consisting of Fremont cottonwoods and silverleaf poplars exists at the Refuge picnic area. This planting is of biological and cultural significance and will be protected (see Section G.). A thin shelter belt of Russian olive and Siberian elm surrounds the Headquarters and residential area which will also be protected. Unlike other areas of the Great Basin, Russian olive does not readily spread into the marsh at Fish Springs (likely due to unfavorable soils).

The primary noxious weeds in the area are salt cedar, tall whitetop, and squarrose knapweed. Mature stands of salt cedar exist along the north and south boundaries with the core area containing scattered young plants. The Refuge staff controls salt cedar by chemically treating individual plants.

Tall whitetop is a recent invader which is confined to three fairly discrete stands. This plant is a real problem in other parts of the state and it is hoped that annual chemical treatments by the Refuge staff will eradicate the plant. The isolation of the Refuge from other seed sources makes reinfestation in the near future unlikely.

Squarrose knapweed is also a recent invader. This plant first became established along the county road skirting the south and west boundaries of the Refuge. Cooperative efforts between the county and the Refuge to contain knapweed have had limited success. It can now be found in the western uplands of the Refuge, as well as throughout the Fish Springs Range.

A list of common plants can be found in Appendix C.

E. Reptiles, Fish, and Amphibians

Twelve reptile, four fish, and two amphibian species can be found at Fish Springs NWR (listed in Appendix D). One fish and both amphibian species have been introduced. The least chub, a Candidate Species, has been successfully reintroduced into Walter's Spring with additional releases planned in the coming years (see Section III G).

F. Mammals

Forty-eight species of mammals have been recorded on the Refuge. The majority of these species are small rodents (19) and bats (11). Coyotes, jackrabbits, and introduced muskrats are commonly seen residents. A small mule deer population uses the Refuge, primarily in late summer and fall. Pronghorn are seen occasionally along the Refuge's western boundary.

Generally, the direct impacts of fire on wildlife include disturbance or occasional mortality of individuals or groups of individuals, particularly slow moving and/or sedentary species. Larger species (deer, coyotes, jackrabbits) will generally move away from fire. Suitable cover is readily available to these species in the adjacent marsh unit(s) during a prescribed burn. This adjacent habitat also provides a source for recolonization of slow moving species adversely affected by the burn. A complete list of mammal species can be found in Appendix E.

G. Birds

Since establishment, over 266 species of birds have been seen at Fish Springs, 61 of which are known to nest on the Refuge (see Appendix F). The Refuge provides the only significant wetland habitat for a 50-mile radius. Consequently, the Refuge attracts thousands of wetland-dependant species during migration. Over 40 species spend the winter at the Refuge.

H. Insects

Aquatic insect populations were monitored in 1983, 1984, and yearly since 1990. Non-aquatic insects have not been inventoried or monitored.

I. Threatened, Endangered, and Candidate Species

Bald eagles are generally found on the Refuge from late October through late March. Currently, the trees at the picnic area provide the only suitable roosting site for the eagles, although a recent pole planting near Thomas Spring may provide an additional site in the future. These trees will be protected.

Peregrine falcons have been seen in both spring and fall in recent years. They once nested in the Fish Springs Range and it is hoped they will nest here in the future.

It is believed that Fish Springs once harbored the least chub, currently a proposed endangered fish found only in the springs in the Bonneville Basin. The fish has been successfully reintroduced into Deadman and Walter's Springs with further stocking planned. These populations are considered experimental.

J. Cultural Resources

The Refuge has two sites that are listed on the National Register of Historic Places. Both sites are caves located in the northwest portion of the Refuge in the Fish Springs Range.

A Pony Express Station once existed near the Refuge picnic area. The exact location of this station will be determined via a surface artifact search being conducted by the University of Utah. All artifacts discovered in the search will be curated in the Refuge Office and/or the Utah Museum of Natural History. Current plans are to develop an interpretive display at the site in 1999. This site will be protected in prescribed burn plans and during wildfire suppression, to the fullest extent possible.

Several segments of the historic Lincoln Highway are visible in the Refuge uplands. The Refuge uplands do not carry fire well and any wildfire would require extreme windspeeds resulting in incomplete burning. The Lincoln Highway would likely remain visible following a wildfire. There are no current plans for prescribed burning in the uplands and the adverse impacts of burning on cultural resources will be evaluated prior to implementing any future plans.

Fire suppression and prescribed fire actions are taken primarily from established roads and dikes, although swatters and direct attack with engines are also used. Occasionally, short firebreaks are scraped with heavy equipment to protect sensitive areas. Cultural resources are considered prior to disturbing an area. (Appendix B, Endangered Species and Fire Policy Clarification Memorandum, 1995)

K. Improvements

The primary improvements on the Refuge are the buildings in the headquarters/shop area (replacement cost: \$1.7 million). These buildings are protected on all sides by gravel roads and parking lots. Developments outside the headquarters area include storage and public use structures, fences, and flumes (total replacement value: \$150,000). Most of these developments are not well protected from wildfire and require protective measures during prescribed burning.

Since Fish Springs is surrounded by BLM and US Army land, off-refuge improvements are few. Wildfire and escaped prescribed fires are restricted by salt flats on the north, south and east, leaving the west as the primary off-refuge concern. The nearest residences are in Callao (15 air miles to the west). Power is supplied to the Refuge by wooden power poles which cross the Fish Springs Range and enter the headquarters area from the west. Escaped prescribed fires and wildfire would impact the adjacent BLM grazing allotment, which is also a Wilderness Study Area (figure #2). Use of prescribed fire is well accepted by Dugway Proving Ground and the BLM, the latter of which often assists with prescribed fires on the Refuge.

The BLM has proposed new guidelines for wildfire suppression (potentially including prescribed natural fire) on BLM lands. Although in the planning stages, the guidelines currently encourage active suppression in the semidesert shrub community exhibited in the adjacent BLM lands (Jeff Scott, BLM - Salt Lake District). The Refuge will closely communicate with BLM personnel regarding suppression on BLM lands.

L. Affects of Fire Management Activity

As stated above the refuge is bordered on all sides by federal land. Fuels on the North, East and South edges of the refuge are scarce. These locations are predominantly mud and alkali flats. On the west side of the refuge the vegetation type is semidesert upland. Various refuge roads bisect the refuge allowing for control of burns. Gravel county roads run parallel and adjacent to the refuge boundary on the South and West sides, on the east after crossing 2-4 miles of mud flat and sparse desert shrubs.

The affects of prescribed fire on values outside the refuge boundary are few. The possibility of fire reaching the surrounding public lands as a result of intentionally ignited fuels is unlikely. The nearest off refuge development is in the town of Callao located 15 miles to the west. Prescribed fires have had the chance to burn into the semidesert upland on the western sided of the burn units without success. These fires are slow moving, requiring preheating from adjacent fuels to ignite and continue to burn. Prescribed fires are conducted with the approval of the Utah Department of Air Quality the day of the burn. This insures that the clearing index is reached to allow for adequate smoke dispersal before it reaches surrounding communities.

Escaped fires moving towards the west boundary into the semidesert

upland vegetation will be controlled by burning off the county roads to consume fuels in front of the fire or to work up the flanks of the fire extinguishing the brush until the head is reached and the progress of the fire is stopped. If the fire reaches the adjacent land, the land owner (BLM, Dept Of Army) will be contacted as will the Richfield Interagency Fire Dispatch Center.

M. Wilderness

While there is no designated wilderness area on the Refuge, the portion of the Fish Springs Range south of the power line is a BLM Wilderness Study Area (Figure 2). Under that designation, the area is managed under the same guidelines as officially designated wilderness. The BLM policy for suppression actions in this area is the “minimum tool” needed to control the fire.

Figure 2 Map showing BLM Wilderness Study Area

N. Air Quality and Smoke Management

Air quality and smoke management are incorporated into the planning of prescribed fires, and to the extent possible, in wildfire suppression. No burning permits are required by the State of Utah. Due to the remote location of the Refuge, air quality and smoke management hazards are limited. Air quality issues related to the Wilderness Study Area south of the Refuge will be addressed in Prescribed Burn Plans. A visibility hazard caused by smoke from prescribed or wildland fires could develop along the infrequently traveled county road skirting the south and west boundaries of the Refuge. Mitigation measures will be addressed in prescribed burn plans and the incident commander will take appropriate action should a wildfire occur adjacent to this road.

Smoke from wildfire and prescribed fires is a recognized health concern for firefighters. Prescribed burn bosses and wildfire incident commanders must plan to minimize exposure to heavy smoke to 1 hour or less, at which time the employee should be rotated to a smoke free area (USDA Forest Service, Missoula Technology and Development Center).

O. Water Resources

The wetland habitat on the Refuge consists of nine diked marsh units and the springs and flumes feeding these units. The marsh units encompass approximately 9700 acres with the springs and their associated drainages covering 300 acres (mostly in Spring Unit). The wetlands on the Refuge provide critical habitat for a myriad of migratory birds and resident wildlife in a harsh desert environment. In addition, the springs provide habitat for indigenous fish. In accordance with the Refuge Marsh Management Plan, one or two marsh units are drawn down and burned each year. Spring Unit has been divided into two burn units which are included in the burn rotation. Post fire erosion and wind born ash deposition impacting water resources is not a concern for the type and scale of burns conducted on the Refuge. Burn sizes are generally small and grass fuels do not produce heavy volumes of ash compared to forest fuels.

P. Refuge Fire Environment and History

1. Fuel Types

Fuel Model 1/3 - grass. The Refuge marsh consists of a mosaic of these two fuel models. Fuel model 1 consists of saltgrass and spikerushes. Fuel model 3 consists of wirerush, bulrushes, Phragmites, and cattail. Areas of peat moss exist downstream from the springs and immediately north of House Spring in west

Mallard Unit. Nearly 6500 acres of fuel models 1 and 3 exist on the Refuge with fuel model 1 predominant (4300 acres).

Fuel Model 2 - grass w/ open shrub. This fuel model is found on the desert shrub uplands between the Fish Springs Range and the marsh. Typical plants include: Anderson's lycium, horsebrushes, shadscale, and Mormon tea with an understory of cheatgrass and Indian ricegrass. The Refuge has approximately 6000 acres of desert shrub. This fuel model is declining in many parts of Utah (see Section O-3, Fire Occurrence/History).

2. Fire Behavior

Data and descriptions for the following fuel models obtained from Aids To Determining Fuel Models For Estimating Fire Behavior (Anderson 1982), and "Behave: Fire Behavior Prediction and Fuel Modeling System" (Version 4.1).

Fuel Model 1 - shortgrass. Fire spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. Fuel loads average 0.74 tons/acre with a fuel bed depth of one foot.

Fire behavior in this fuel model is directly related to fine fuel moisture and windspeed. Rates of spread can reach 446 chains/hour and flame lengths of 10' with a fine dead fuel moisture of 3% and midflame windspeed of 10 mph. Spot fires are generally not produced because fuels are consumed rapidly.

Fire fronts tend to become irregular as topography, fuel loads, wind, or natural barriers speed up or slow movements. Depending on windspeed, resistance to control is low to moderate.

Fuel Model 2 - grass w/ open shrub. Fire spread is primarily through the fine herbaceous fuels, either curing or dead. These are surface fires where the herbaceous material, in addition to litter and dead-down stemwood from the open shrub overstory contribute to fire intensity. Such stands may include clumps of fuels that generate higher intensities and that may produce fire brands. Total fuel load (<3") averages 4.0 tons/acre with 2.0 tons dead (<0.25"). The fuel bed depth is 1.0 feet.

Rates of spread can reach 176 chains/hour and flame lengths of

14' with a fine dead fuel moisture of 3% and midflame windspeed of 10 mph. Spotting may occur at ranges up to 0.5 miles. Resistance to control varies from moderate to extreme. Historically, the desert shrub community on and around the Refuge has not carried fire due to wide plant spacing and lack of fine fuels (see Section O-3, Fire Occurrence/History).

Fuel Model 3 - tallgrass. Fire in this model is the most intense of grass fuel models and displays high rates of spread under the influence of wind. Wind may drive fire into the upper heights of the grass and across standing water. Fuel loads consist of fine and course dead fuels average 3.0 tons/acre with a fuel bed depth of 2.5 feet.

Rates of spread can reach 387 chains/hour and flame lengths of 25' with a fine dead fuel moisture of 3% and midflame windspeed of 10 mph. Short range spotting (500') is common. Resistance to control is very high to extreme.

3. Fire Occurrence/History

Fire records prior to establishment of the Refuge are not readily available. Due to topography and the sparse vegetation surrounding the Refuge, fire in the area was probably a localized phenomenon. With the abundant fuel in the form of dead, dry marsh vegetation, frequent lightning storms, and the use of the area by nomadic tribes all of the ingredients necessary for fires were present. It is **assumed that fire was a relatively common occurrence in the area and was a determinant in the existing vegetation.** It is known that post-settlement landowners periodically burned the marsh to improve its grazing potential. Wildfire were "apparently not a problem" for these prior landowners (Fish Springs Narrative Report, Jan.-Apr. 1960).

Since Refuge establishment in 1959, a total of 54 fires have been reported on the Refuge (50 prescribed burns and 4 wildfire - all human caused). Prescribed burns have varied from one acre to 1630 acres. A summary of the Refuge fire history can be found in Appendix G. Based on a review of the fire history, a **wildland fire frequency** of 1 fire every 10 years has been established.

The **wildfire fire season** is commonly July through September. The season can vary. For example, in years of low precipitation, the fire season can run from March to Mid-november. Prescribed fires must be scheduled around nesting and migratory patterns of

various species and will be addressed in Prescribed Fire Burn Plans

Containing prescribed burns generally has not been a problem due to the Refuge's extensive system of roads and dikes. Historically, peat moss has allowed some prescribed burns to smolder within the burn perimeter for extensive periods. Most peat moss within the marsh units has been burnt out. However, some areas around and downstream from the springs still contain peat. The area immediately north of House Spring in west Mallard Unit contains peat (likely deposited in an attempt to farm the area). A fire break was constructed to prevent fire from entering this area during a prescribed burn of Mallard Unit in 1998.

Occasional lightning caused wildfires have occurred in the mountain ranges surrounding the Refuge. Such fires have generally been natural outs and only a few acres in size due to low fine dead fuel loading and high plant spacing. Large wildfires occur nearly every year from the Skull Valley near Dugway to Simpson Springs, 30+ miles east of the Refuge. Both of these areas exhibit higher fine dead fuel loading and human use than the Refuge and surrounding lands. The desert shrub community affected by these fires has been replaced by cheatgrass and other annual weeds creating a chronic fire hazard, as well as a loss of habitat. Wildfire in what remains of the desert shrub community are given a high priority rating for suppression by the BLM (Jeff Scott, BLM-Salt Lake District).

Q. The role of fire on Fish Springs Refuge

1. Fire Effects

The use of fire will help reach wildlife and land use objectives identified in Section II.

a. Vegetation and Fuels (FMIS Fire Effects, Appendix H)

Grasslands are burned primarily to manipulate vegetation and enhance biological productivity and diversity of specific organisms.

Fire will be an important wetland management tool, especially in areas where marsh vegetation has become rank and is of little value to many marsh birds. Most fires

cause little damage to common reed because the rhizomes are sufficiently protected by soil. Rhizomes can be damaged, however, by deep-burning fires which can occur when the soil is dry and the humidity of the litter and stembase is low. The effects of severe burning depend on the degree of damage inflicted upon the rhizomes. Following some severe fires, shoot emergence the following spring can be delayed for 1 to 2 months. The most damaging fires occur during drought years when entire peat layers can be consumed. This destroys the rhizomes and eliminates common reed from the area.

In many wildlife refuges, marsh vegetation is controlled by regulating water levels of the marsh. Although saltgrass rhizomes survive burning, they will be killed if saltgrass sites are flooded following burning.

Cattail marshes are difficult to burn 2 years in a row because accumulated debris is needed for fuel. The thick bases of cattail species are often the last part of the plant to dry out and are difficult to burn.

Hardstem bulrush is top-killed or killed by most fires. It sprouts from rhizomes following fire and probably sprouts from the root crown as well. It establishes from buried seed or seed dispersed onto burned sites.

b. Wildlife (FMIS Fire Effects, Appendix I)

A major effect fire can have on wildlife is the destruction of nesting habitat. However, one of the primary reasons to use fire as a tool is to remove excessive litter that is of little use to nesting birds. Although fire can be detrimental to ground nesting birds, prescribed burns can be timed to avoid overlap with nesting seasons. Some species are known to successfully renest following disturbance.

Studies by Nichols and Menke reported that fires near nesting cliffs could disturb Peregrine young or nesting pairs. No other direct fire effects on Peregrine falcon have been noted. Bald eagles have continued nesting during wildfire and returned to the nest the following year. Sandhill crane nests can be destroyed by fire but a June and August prescribed fire in a big sagebrush stand near Jackson, Wyoming, led to an increase in Sandhill crane numbers on

burned sites. Similar results occurred following several postdrought fires in the Okefenokee Swamp from July through June of the following year.

June prescribed fires, and summer wildfire in sagebrush-bunchgrass communities have been shown to have no apparent effect on Great Basin pocket mice population levels. It was concluded that fire was not destructive to small mammals that are capable of retreat to underground burrows.

c. Air Quality

Particulate in smoke can impair visibility. Volume and nature of smoke produced depends upon burn size, general moisture conditions, and type of vegetation. The higher moisture content of vegetation, the more smoke. Smoke effect can be mitigated by burning with wind and unstable atmospheric conditions to loft smoke and dissipate most ground level smoke.

The management of smoke is incorporated into the planning of prescribed fires. The majority of fuels are fine and create little smoke as these fuels are consumed rapidly. Air quality in the Refuge area is usually very good. The presence of smoke must be expected from any type of burn, but smoke will not be an air quality problem. Visibility along roads located adjacent to the boundary of the Refuge may be temporarily affected by smoke.

No permits are required by the State of Utah, but state air quality regulations must be adhered (Appendix N). The State of Utah maintains a Memorandum of Agreement with the Forest Service and Bureau of Land Management for prescribed burn emission but has not included the Fish and Wildlife Service. Neighboring land managers are in the process of revising and updating regulations and plan to include all land management agencies, including the Refuge.

d. Soils

Given adequate soil moisture, fire generally increases vegetative growth and plant reproduction. Plants are often greener, larger, and more vigorous. This results in improved

nesting cover for waterfowl, and some migratory and resident bird species. Exposed ground and residual ash creates a darkened soil surface. Burned surfaces warm more quickly in spring, increasing soil heating and often increase rates of microbial activity, seed germination, sprouting, and overall plant growth.

Increased soil heating could increase evaporation and transpiration, which could be detrimental to plants during warm, dry months. Generally, dark ash is broken down and the soil is shaded by new growth by mid-summer.

Fire can create conditions (temporarily) where erosion is elevated by increased soil exposure. Sod usually is sufficient to hold soil in place until vegetation regrowth occurs. Fish Springs for the most part is very flat and the Refuge expects to see little erosion following prescribed fires or wildfire.

Fire also can cause temporary reduction of soil microflora and micro fauna, especially in wet soils. Additionally, there is a loss of residue to build organic matter.

IV. REFUGE FIRE MANAGEMENT OBJECTIVES

Operating Statements, operational plans, Executive Orders, and laws pertaining to the Refuge include objectives which pertain to fire management. These objectives have been incorporated into this plan.

The mission of the Refuge is to protect, restore, preserve, and manage a critical wetland and upland area within the physiographic region known as the Bonneville Basin of the Interior Basins Ecoregion for the benefit of endangered, threatened, and sensitive species and to provide superior habitat for migrating, nesting, and wintering migratory birds and indigenous wildlife; to protect and preserve cultural resources; and to increase public opportunities for wildlife oriented recreational opportunities and environmental education.

Specific management objectives are found in Fish Springs NWR, Station Purposes, Mission, Goals, and Objectives (Section II A).

Service objectives state that the Service will take an active role in suppressing and preventing Refuge wildfire. Fire will be used as a management tool when it has been proven to be the most cost effective or the only way to achieve Refuge objectives.

A. General

The following considerations influenced the development of the Refuge's fire management goals and objectives.

1. Fire is a part of Fish Springs National Wildlife Refuge program.
2. Uncontrolled wildfire has the potential for negative impacts on and off the Refuge.
3. Positive or negative effects of prescribed fire on vegetation, and wildlife depend on burning conditions and species involved.
4. Use of "minimum tool" concept to minimize natural and cultural resources damage.
5. Rapid rates of spread and fire suppression response time could pose suppression problems and increase the likelihood of escape onto adjacent lands.

B. Refuge Management Goals

The goal of wildland fire management is to plan and make decisions that help accomplish the mission of the National Wildlife Refuge System. That mission is to administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. Fire management objectives (standards) are used in the planning process to guide management to determine what fire management responses and activities are necessary to achieve land management goals and objectives.

The primary goal is to provide for firefighter and public safety, property and natural resource values. Service policy, the Wildland Fire Policy and Program Review direct an agency administrator to use the appropriate management response concept when selecting specific actions to implement protection and fire use objectives. The resulting Appropriate Management Response are specific actions taken in response to a wildland fire to implement protection and fire use objectives. With an approved FMP, the Refuge staff may use wildland fire in accordance with local and state ordinances and laws to achieve resource management objectives (habitat improvement) outlined below.

1. Protect life and property and resources from wildfire.

2. Utilize prescribed fire as a tool to accomplish Refuge habitat management objectives.

It is the intention of the fire management program to support the management objectives and operational goals of the Refuge by protecting resources and habitats from the undesirable effects of uncontrolled wildfire. The fire management program will also include the use of prescribed fire to restore and enhance refuge habitats, promote natural diversity and manipulate wetlands to promote primary operational goals of increasing the production of waterfowl.

C. Refuge Fire Management Objectives

Fire management objectives (standards) are used in the planning process to guide in determining what fire management responses and activities are necessary to achieve land management objectives.

1. Safely suppress all wildfires using strategies and tactics appropriate to safety considerations, values at risk, and in accordance with Service policy.
2. Minimize the cost and impact of suppression activities.
3. Prevent human-caused wildfires.
4. Restore and perpetuate native wildlife species, by maintaining a diversity of plant communities through use of fire.
5. To invigorate desirable marsh, grass, forb, and shrub species and improve nutrition of vegetation to be used by wildlife.
6. Use fire to achieve identified management goals.
7. Restore and rehabilitate resources lost or damaged by fire or suppression activities.
8. Educate the public regarding the role of prescribed fire within the Refuge.
9. Manage all wildland fire using the Incident Command System.

V. FIRE MANAGEMENT STRATEGIES

A. General

Fish and Wildlife Service Policy mandates that wildland fire be managed using the appropriate management response concept (Table 2). Fish Springs will utilize an appropriate management response to manage all wildland fires and will incorporate minimum impact suppression tactics whenever appropriate.

Using the Appropriate Management Response concept, suppress all wildfires consistent with values at risk. Strategies employing a range of suppression options depending on the situation will be used. Minimum impact suppression tactics (MIST) will be used, where appropriate. The appropriate action will include high intensity direct efforts, lower intensity indirect efforts, or surveillance to ensure confinement within a designated area. The level of response will be consistent with land use objectives, and will be executed to minimize suppression cost and resource damage. The primary suppression strategy employed will be direct attack. However, there may be occasions when direct attack on high intensity, rapidly spreading wildland fire would jeopardize firefighter safety and not be appropriate, also all-out direct suppression actions may be too costly and often ineffective until the fire reaches ridge tops or other barriers. In these cases indirect strategy will be employed utilizing natural and human-made features as wildfire control points.

Table 2: Appropriate Management Response

SITUATION	STRATEGY	TACTIC
1. Wildland fires on Refuge lands which do not threaten life, natural or cultural resources or property values.	Restrict the fire within defined boundaries established either prior to the fire or during the fire.	1. Holding at natural and man-made barriers. 2. Burning out. 3. Observe and patrol
1. Wildland fire on Service property with low values to be protected. 2. Wildfire burning onto Service lands. 3. Escaped prescribed fire	Take suppression action, as needed, which can reasonably be expected to check the spread of the fire under prevailing conditions.	1. Direct and indirect line construction. 2. Use of natural and man-made barriers. 3. Burning out. 4. Patrol and mop-up of the fire perimeter

entering another unit to be burned.		
1. Wildland fire that threaten life, property or sensitive resources. 2. Wildland fire on Service property with high values to be protected. 3. Observed and/or forecasted extreme fire behavior.	Aggressively suppress the fire using direct or indirect attack methods, holding the fire to the fewest acres burned as possible.	1. Direct line construction. 2. Engine and water use. 3. Aerial retardant. 4. Burn out and back fire. 5. Mop-up all or part of the fire area.

A Wildland Fire Situation Analysis (WFSA) will be prepared to govern suppression actions for all fires when it is determined that initial attack efforts will be unsuccessful.

Management ignited prescribed fire will be utilized under controlled conditions and defined weather variables as outlined in a prescribed fire burn plan.

B. Fire Management Strategies

1. Suppress all wildfires in a safe and cost effective manner consistent with resources and values at risk. Use of minimum impact strategies will be used when possible.
2. Conduct all fire management programs in a manner consistent with applicable laws, policies, and regulations.
3. Utilize prescribed fire as a tool for hazard fuel reduction and for meeting resource management objectives. As much as possible, hazard fuel reduction prescribed fires will be used only when they complement resource management objectives.
4. Initiate cost effective fire monitoring which will tell managers if objectives are being met. Monitoring information will be used to refine burn prescriptions to better achieve objectives.
5. Maintain Memorandum of Understanding (MOU) with local fire suppression agencies for the purpose of cooperating in the suppression of fires on lands within and adjacent to the boundaries of Fish Springs.

C. Constraints on the refuge fire management strategies

1. Smoke management must be considered for any prescribed burn and will be addressed in all prescribed burn plans (Appendix N).
2. All wildland fires occurring on the Refuge will have suppression resources on them until mopped-up and declared safe to demobilize.
3. Other than to save human live, the use of heavy equipment, such as dozers, in and around critical areas must have approval of the Refuge Manager.
4. During the early and late season when fire danger is low or when a lightning strike starts a fire on one of the islands a surveillance strategy may be all that is required to ensure confinement within a designated area. The constraints for this strategy (Confinement) are as follow:
 - ◆ Normally applied to spring and fall fires (before 5/1 and after 10/1).
 - ◆ Burning Index 0-15 (3-day average).
 - ◆ Wind speed 0-10 mph.
 - ◆ No weather changes predicted.
 - ◆ No air stagnation alert.
 - ◆ Fire is restricted to one area.
5. Aerial Retardants and foams will not be used within 300 feet of any waterways as described in the Guidelines for Aerial Delivery of Retardant or foam near Waterways.
6. Prescribed burning in areas where threatened, endangered and candidate species exist will not be conducted if the prescribed fire os determined to the species or if any adverse impacts cannot be mitigates. Section 7 clearance will be secured, as appropriate.
7. Prescribed burns will not be conducted during periods of high fire danger when country or state-wide burning bans are in effect.
8. Generally, no more than one prescribed burn will be active at one time although multiple burns may be conducted consecutively in one day. Only in circumstances where additional burns are closely situated and can be safely managed by the Refuge staff and local back-up forces are available, will multiple fires be conducted simultaneously.

D. Rationale behind fire management strategies

1. Grass and brush areas could, if ignited, spread beyond the Refuge staff's ability to control the fire. Consequently, MOUs must be maintained with local fire districts and cooperators so that assistance can be sought in the event the refuge staff cannot contain the wildfire.
2. It may be necessary to reduce fuel loading in some areas for fire safety reasons to reduce the risk from wildfire damage. In areas where this is deemed necessary it must compliment resource management objectives.
3. Due to the isolated nature of the refuge, other options for achieving resource objectives are difficult and costly to implement.

VI. FIRE MANAGEMENT UNITS (FMUs)

According to U.S. Fish and Wildlife Service policy, all wildfire will be managed using the appropriate management response concept. Fish Springs will be considered one Fire Management Unit (FMU) for both wildland and prescribed fire.

Wildfire occurring on the Refuge will be initial attack by qualified employees utilizing FWS fire suppression equipment. Additionally, a Memorandum of Understanding is developed with the Bureau of Land Management, Richfield (Appendix J) and Salt Lake Districts for wildfire suppression.

If a wildfire cannot be controlled with initial attack forces the unit will utilize a decision making process, a Wildland Fire Situation Analysis (WFSA) (Appendix K), that evaluates alternative management strategies against selected environmental, social, political, and economic criteria. This is not anticipated to occur within the Refuge as a fire of this magnitude would escape its boundaries and become the responsibility of the Bureau of Land Management.

- A. Fire management units (FMUs)** are areas within the refuge that have common fire management strategies. These are areas that have similar characteristics and require similar efforts in fire protection or prescribed fire. Direct attack will generally be the most effective control strategy, except during periods of drought and extremely high wind when rates of spread are too high and indirect attack is necessary.

B. FMU strategies

FMU #1. Fish Springs National Wildlife Refuge

The full range of fire suppression strategies will be used in this unit. They will vary depending on burning conditions, location of the wildfire, time of year, safety, cost, wind, smoke problems, political concerns, and current and predicted weather.

- a. The number of people dispatched to the fire will depend on the time of year and burning conditions at time of ignition. At a minimum two people should be dispatched and the Incident Commander will determine additional needs.
- b. Main method of controlling unwanted wildfire will be direct attack. The use of existing barriers will be used to control fires where direct attack is not feasible.
- c. Control strategies will involve the use of a variety hand tools including backpack sprayers, shovels, rakes, etc., the Refuge's Type 6, 250 gallon fire engine, and other available equipment, as appropriate.
- d. When backup forces are needed for extinguishment of a fire, the Bureau of Land Management will respond to a call from the Refuge. Also, when requested by the Refuge and deemed practical by the District Manager, the BLM will provide technical assistance and support to the Refuge during prescribed burning operations.
- e. When a wildfire is reported on the Refuge, each employee at the fire scene should take the following immediate action:
 - (1) Warn or evacuate people who may be in danger.
 - (2) Suppress the fire, if possible or call for necessary backup.
 - (3) Try to prevent fire from spreading until help arrives.
- f. It may be necessary to use indirect attack to ensure low impact suppression tactics are employed to prevent irreversible suppression damage .

C. Safety considerations

Firefighter and public safety is the first priority. Persons engaged in fire suppression are exposed to a high risk environment. Fish and Wildlife

Service must reduce risk to protect human life and enhance performance. Major improvements can be accomplished by insuring employee job knowledge and personal fitness. Land Management Agencies have developed training and physical standards which must be met before engaging in prescribed burning and fire suppression. Controlled certification is an essential ingredient which identifies that standards were met. This directly effects employee safety, work performance, and agency liability.

- a. Public traffic will be prevented from accessing the area.
- b. Weather will be watched carefully, especially in unstable conditions when fire behavior can be very high. Suppression and prescribed fire crew members must be kept apprised of weather conditions and potential fire behavior.
- c. Firefighters will be briefed on expected weather, fire behavior, communications, escape routes and safety zones. Fire lookouts will be posted.
- d. All refuge personnel performing fire management jobs will meet appropriate training, experience, and qualification requirements for incident assignments according to FWS policy and NWCG 310-1 and DOI Incident Qualification and Certification System.
- e. All fire suppression and prescribed burn personnel will be equipped with approved personal protective equipment (PPE).
- f. Crews will maintain communications between themselves, cooperators, and with dispatch.
- h. All Fish and Wildlife Service personnel assigned to fireline duties will complete annual refresher training.
- i. In keeping with Service policy, a physical examination is required for all new permanent employees and all seasonal employees assigned to arduous duty as fire fighters prior to reporting for duty. A physical examination may be requested for a permanent employee by the supervisor if there is a question about the ability of an employee to safely complete one of the work capacity tests. All permanent employees over 40 years of age who take the Pack or Field Work Capacity Test to qualify for a wildland or prescribed fire position are required to have an annual physical examination before taking the test.

D. Impacts of drought and Regional and National Preparedness Levels

As indicated previously, periods of drought can greatly impact fire behavior and resistance to suppression. For that reason the Palmer Drought Index and the Keech-Byram Drought Index will be monitored at a minimum on a weekly basis throughout the year. All are available on the Internet at <http://ndc@fws.gov>. The Refuge fire staff can also contact the Richfield Interagency Dispatch Center (435/896-8404) during periods of high fire danger to track indices and anticipate possible fire activity. Preparedness actions have been identified in the Step-Up Plan to respond to unusual conditions associated with drought and other factors.

Large scale fire suppression activities occurring in various parts of the country can have an impact on local fire management activities. For example, resources may be limited to implement prescribed fire activities because the closest available resources may be assigned to fire suppression duties or refuge personnel may be involved as well. Regional drought conditions may also tie-up local resources needed to staff Refuge engines during periods of extreme drought or high fire danger.

The refuge is in the Great Basin Area. During National and Regional Planning Levels IV and V, it is necessary to receive approval from the Eastern Great Basin Area Coordination Group to conduct prescribed burns.

VII. FIRE MANAGEMENT RESPONSIBILITIES

The safety of firefighters and the public is the first priority. Persons engaged in fire suppression activities are exposed to a high element of risk. The Refuge Manager and fireline supervisors must make every effort to reduce the exposure to risk and enhance performances. One way is through formal and on-the-job training and improved physical fitness. The Service has adopted the training and fitness standards established in 310-1, and all firefighters must meet these and other standards established by the Service to participate in fire management activities

Wildland fire assignments are made on the basis of individual qualifications and position requirements (Appendix J) .

- A. The **Refuge Manager** of the Fish Springs NWR is the primary line officer responsible for all aspects of the fire management program. He is responsible for overall safety and occupational health program and ensures all refuge operations are conducted in a safe manner, in

accordance with Service policies, regulations, and guidelines. Ensures sufficient collateral duty firefighters meeting Service standards are available for initial attack and prescribed burns. Approves changes to the fire management plan, reviews and approves prescribed burn plans, makes fire assignments, and if qualified, participates in fire management activities to the level of his certification.

- B. Fish Springs does not have a dedicated Fire Management Staff. Fire Management responsibilities have been delegated to the **Refuge Operations Specialist**. Primary wildland fire management responsibilities are:
1. to provide initial attack fire suppression capability and ensure all wildland wildfire receive the appropriate level of initial attack response.
 2. conduct prescribed fire activities in support of refuge habitat management programs.
 3. establish appropriate fire related agreements/contracts and ensure they are reviewed and updated on an annual basis.
 4. monitor results of wildland and prescribed fires to assure they are meeting established objectives.
 5. update fire management and associated plans (dispatch, training, etc.) on an annual basis.
 6. continue to develop "red-carded" firefighters for prescribed and wildland fire, trained and equipped to accomplish the fire management program.
 7. assure fire equipment is in a ready state.
 8. annually administer the fitness test and ensure only those who have passed may participate in wildland fire management activities.
 9. ensure that employees are physically able to safely accomplish their assigned work.
 10. provide and enforce the use of personal protective equipment.
- C. The **Refuge Mechanic** will be responsible for the proper maintenance

and repair of firefighting equipment and vehicles to be used.

- D. The **Clerk** will see that records of names, addresses and telephone numbers of additional fire suppression resources are kept up to date and readily available. The position will also act as dispatcher during prescribed fire and suppression activities.

- E. **The Station Fire Management Team**

All **Refuge staff** must assist with the overall implementation of the fire management program to the limits of their qualifications or abilities. This team is composed of all qualified firefighters and other refuge staff members. Fire management team members are responsible for maintaining their equipment and physical condition, following instructions, and making appropriate decisions based on their knowledge and training.

A listing of the station's fire management team are found in Appendix L.

VIII. WILDLAND FIRE PROGRAM

- A. **Fire Prevention**

Objectives of the wildfire prevention program are to reduce the threat of unwanted human caused fires through visitor and employee education and awareness.

Smoking, open fires and Refuge access may be restricted by the manager during periods of extreme fire danger. Notices will be posted at appropriate entrances, roads and through local radio and news releases. The Manager will coordinate with other

State and
Federal Land
Management
Agencies in
periods of
extreme fire
danger.

B. Fire Season

The wildfire season in dry year may run from March through mid-November. A more typical fire season extends from mid-June through mid-September.

C. Fire Behavior

Wildfire behavior is variable depending on the burning conditions as reflected by the Burning Index (BI). Burning index of 80 or greater in Fish Springs fuel types can experience very high to extreme burning conditions where direct attack is normally not feasible.

D. Preparedness

The Fish and Wildlife Service has minimum training requirements for all fire positions. The Service is a member of the National Wildfire Coordinating Group (NWCG) and accepts its standards for interagency operations. There is required refresher training for all personnel that are involved with wildland fire activities. These requirements are found in the Service Fire Management Handbook under Training, Qualifications and Certification. Only employees meeting current fitness, training, and experience requirements will be dispatched to fires or utilized on prescribed burns. Employees not meeting these requirements may assist in support capacities, but are not permitted on the fire line.

Annual fire readiness requires personal protective equipment for each employee assigned fire fighting duties. This equipment will be issued yearly prior to the first fire. Also, all fire fighting equipment, such as the fire engine, must be ready prior to the first burn each year.

MOUs must be maintained annually with Local Fire Districts and other cooperators.

E. Pre-attack Plan

Pre-attack consists of having fire fighting equipment and personnel fire ready prior to the beginning of each fire season. Assure MOUs with local fire districts and cooperators are current.

F. Suppression

Service policy requires the Refuge to utilize the Incident Command System with firefighters meeting Service qualification requirements for fires occurring on Service property and mutual aid fires. Mutual aid resources will report to the Incident Commander (IC) and receive their duty assignment, and will be the first priority for release. If individuals arrive at a fire to assist but are not members of a fire department or qualified for any type of fire suppression they are not to be used as firefighters. If additional firefighters are needed, appropriate procedures will be followed to acquire them. This requires a fire order through the Richfield Interagency Fire Center in Richfield, UT.

Along with other land management agencies, the Service has adopted the National Interagency Incident Management System (NIIMS) Wildland and Prescribed Fire Qualifications Subsystem Guide, PMS 310-1 to identify minimum qualifications standards for interagency wildland and prescribed fire operations. PMS 310-1 recognizes the ability of cooperating agencies at the local level to jointly define certification and qualification standards for wildland fire suppression. Under that authority, local wildland fire suppression forces will meet the standards established for their agency or department. All personnel participating in prescribed fire management activities must meet Service fitness and training standards.

G. Fire Rehabilitation

Damage caused by the suppression effort should be rehabilitated as soon as practical utilizing emergency fire funds. No plan is required for rehabilitation of damaged caused by the suppression effort. The rehabilitation of damages to the natural resources caused by wildfire will be considered in a fire rehabilitation plan.

To gain approval for emergency rehabilitation funds to prevent resource damage arising from the fire, a plan must be written by the refuge staff and submitted to the Regional Fire Management Coordinator for review within 90 days of the unplanned ignition being declared out. Guidance for developing Rehabilitation Plans is found in the Fire Management Handbook.

H. Records and Reports

A fire report (DI-1202), will be filled out by the refuge and submitted to the Zone FMO in Missoula, Mt, for input into the Fire Management Information System (FMIS) within 10 days of the fire being declared out. The narrative portion of the DI-1202 will address the specifics of the fire, actions taken and outcomes from those actions. A formal review will be conducted on all serious injuries and losses of significant resources.

I. Detection

The Refuge will rely on staff and visitors along with other government agencies to detect and report wildfire.

There may be occasions when unqualified personnel discover a wildland fire. When this occurs the employee should report the fire and request assistance before taking action to suppress or slow the spread of the fire.

If the fire poses an imminent threat to human life, the employee may take appropriate action to protect that life before requesting assistance. The unqualified personnel will be relieved from direct on-line suppression duty or reassigned to non-fireline duty when qualified initial attack forces arrive.

IX. PRESCRIBED FIRE MANAGEMENT

The approved Prescribed Fire Plan constitutes the authority to burn, pending approval of all required documents. No one has the authority to burn without an approved plan or in a manner not in compliance with the approved plan. Prescribed burning plan conditions established in the plan are firm limits. Actions taken in compliance with the approved Prescribed Fire Plan will be fully supported, but personnel will be held accountable for actions taken which are not in compliance with the approved plan. Prescribed burns will not be conducted if the proposed burn is out of prescription. Also, after a prescribed burn is ignited and later becomes out of prescription, it will be extinguished.

The appropriate authorities will be notified by the Burn Boss prior to any prescribed burning. The required notifications will be included in each burn plan.

A. Primary Objectives of the Prescribed Fire Program

1. Improvement of waterfowl habitat.
2. Maintain suitable resting, feeding, and nesting for migratory birds.

3. Removal of dead vegetation that hinders new growth.
4. Release nutrients to enrich the soil.
5. Promote the establishment of desirable forbs in monotypic stands of saltgrass to enhance both food and cover conditions.
6. Increase microbial activity by increasing soil temperatures.
7. Reduce the possibility of catastrophic wildfire by reducing accumulations of fuels that may lead to hazardous conditions.

B. Purpose

Prescribed fire will be used for removal of accumulated dead vegetation and thinning vegetation which has formed rank stands rarely used by migratory birds. Burning of this nature enhances nesting cover for migratory birds and provides green browse for Canada geese. The use of fire is the most efficient means of accomplishing the desired objectives.

C. Selection of Treatment Areas

Areas to be burned have been selected based on habitat improvement needs as identified in the management planning documents. (Table 1)

Table 1 Fire Management Units and Burn Rotation

Burn Unit	Year Scheduled
Pintail and Shoveler	2001
Egret and Harrison	2002
Mallard and Gadwall	2003
Avocet and Spring Unit One spring unit will be burnt the same year as Avocet Unit. The Spring Units will be rotated so that they are only burnt once for every two time the Avocet Unit is burned.	2004
Curlew and Ibis	2005

Each area has been examined closely to determine its present condition, identify the desired condition, and determine if fire is the best means available to achieve the desired results. Various research data on burning is available to determine fire effects on individual plant species and general habitats, and will be reviewed. Each situation must be periodically reexamined on its own merits with the following criteria being used:

- What is the purpose or expected results?
- Will fire produce those results or are there other methods to be considered?
- What are the undesirable impacts of burning?
- Do benefits of manipulation outweigh undesirable impacts?
- Can the treatment area be burned considering site location, personnel and equipment available?
- Can the burn be done in a safe, cost effective, and timely manner?

The prescribed burn plan will contain all details regarding each individual burn unit. Existing Burn Units are identified in Figure 3 .

D. Evaluation of Treatment Areas

The best way to monitor a prescribed burn is to document conditions before, during and after the fire. Two of the common monitoring methods include vegetative transect(s) and photo points. Weather and fire behavior monitoring and gathering other pertinent data should also take place on the day of the fire. Monitoring is as important as the burn itself if resource management objectives are to be achieved. The compiling of

data will give a total picture of the burn to improve prescriptions and enhance results.

E. Treatment Specifications

The specific treatment for each burn will be formulated in the prescribed burn plan.

F. Safety

Safety of service personnel is of the utmost priority when conducting prescribed burns. Safety is promoted through proper training, providing a safe work environment, and supplying all necessary safety equipment and personal protective equipment (PPE) as outlined in the Fish and Wildlife Fire Management Handbook. Firefighter safety will be emphasized in each burn plan.

Figure 3 Burn Units

G. Responsibilities and Planning

Spring will be the period when most routine burning is conducted. The Refuge Manager is responsible for identifying units or areas in need of treatment, and for developing resource and treatment objectives for those units/areas based on refuge resource management goals and objectives. The Burn Boss is responsible for determining if prescribed fire can be utilized to meet the treatment objectives and will approve the burn plan. Prescribed fire is just one of a combination of tools (fire, manipulation, etc.) which will be considered.

Should prescribed fire be selected as the preferred treatment alone or in some combination with other treatments, the Refuge Manager will develop a burn prescription and plan which will accomplish the desired objectives. All planned ignitions will be accomplished using qualified personnel. This will include annual refresher training as stated in the Service Fire Management Handbook.

H. Complexity

Prescribed fires on the Refuge may vary from low to moderate complexity as determined by the Region 6 Complexity Analysis. Most prescribed fires, if not all, on the Refuge will be of low complexity.

I. Potential Impacts

Escaped prescribed burn going off refuge onto adjacent property could have potential negative impact. To mitigate escapes, weather variables and control lines will be monitored and included in the burn plan. Also, a backup plan, which addresses how to control the escaped fire, must be developed as part of the prescribed burn plan.

Due to lack of surrounding inhabitation and sparse vegetation outside the refuge there is no danger of fire to dwellings, business, etc. The refuge headquarters complex is well-removed from burning sites and is surrounded by sparse vegetation and roads which provide adequate fire breaks

J. Contingency Planning Guidelines

During the pre-burn briefing the burn boss will discuss actions that will be taken in the event that the fire burns outside of its prescribed borders. The refuge manager will determine to what extent the burn crew will attempt to extinguish the fire that has crossed a fire break. If the decision

is to let burn, efforts will be concentrated on containing the fire within the smallest area as possible. The network of roads and canals throughout the marsh units will be utilized to contain the fire. If the fire is to be extinguished the burn boss will define the type of attack that will be used to put out the fire and the manager will determine the best location to utilize the roads and canals to be most effective in carrying out the determined attack type.

If the fire is moving towards the boundary of the refuge and the burn boss has determined that the onsite crew will not be able to contain the fire within the boundary of the refuge the following steps will be taken.

- Richfield Interagency Fire Dispatch will be contacted and informed of the situation. Richfield dispatch will already be monitoring the burn radio frequency for assistance per pre-burn communication contact list.
- burn boss/refuge personnel will contact the owner of the land that will be effected by the fire and inform them of the situation and what is being done to contain the burn.
- refuge personnel will be used to alert refuge visitors. County roads that might be effected by smoke or fire suppression actions will have refuge personnel in locations to assist in travel through these areas.

K. Reporting and Documentation

Individual prescribed burn plans will be the primary document used to record prescribed fire information. Burn plans document personnel, costs, fire behavior, weather, and burn critique information. Prescribed burns will also be documented on DI-1202's and submitted to the Regional Office within 10 days after completion of the project.

X. **AIR QUALITY/SMOKE MANAGEMENT GUIDELINES.**

Visibility and clean air are valued by society. The protection of these resources must be given full consideration in fire management planning and operations. Additionally, smoke can impact health and safety of employees and visitors and must be considered during planning and approval processes. The impacts of smoke will be mitigated to the fullest possible extent. Smoke produced by prescribed fire activities should be well dissipated prior to its reaching any areas of habitation. The refuge is responsible for acquiring approval from Utah Air

Quality Division (Appendix N).

In general, air quality of the area is good. The management of smoke will be incorporated into the planning of prescribed fires. Prescribed burning must comply with state air pollution regulations and regulations pertaining to Class I air sheds.

XI. FIRE RESEARCH/MONITORING

The effects of fire on the Refuge's plants and animals, needs to be better understood. Through research and monitoring and careful application of fire, data collected can provide managers with a better understanding of the natural ecological effects of fire, and the information needed to refine prescriptions to meet resource objectives.

The refuge will institute a limited monitoring program which includes establishing one or more monitoring sites in a representative burn unit. The method(s) to be used will be selected by the Refuge Manager, and may include photo points and/or vegetative transects. Weather conditions on the day of the burn and observed fire behavior will be recorded. Post burn conditions will be documented within two weeks following the burn and compared to the data collected prior to the burn. Data will be evaluated to determine if the first order burn objectives were met and if the desired fire behavior was achieved. Data collected will also be used to validate prescriptions or to modify prescriptions or other variables to better achieve established objectives.

Fire behavior data will be collected on all fires occurring on Fish Springs. This data, along with any information gathered through research studies, will be used to improve the effectiveness of the fire management program

XII. PUBLIC SAFETY

Firefighter and public safety will always take precedence over property and resource protection during any fire management activity. For public safety, the fire scene will remain clear of unauthorized people. The responsibility for managing public safety lies with the Incident Commander(IC) or Burn Boss for wildland fire. Public safety considerations will be included as part of burn plans.

XIII. PUBLIC INFORMATION AND EDUCATION

Informing the public is an important part of the fire management program and the Fish and Wildlife Service mission. Information and education are critical to gaining public support for the Refuge's fire management programs. There are several different aspects to this task.

A. Wildland Fire Suppression

During wildfire the IC is responsible for providing fire information to the public. Also, the public must be kept apprised of burning conditions and the potential of wildfire occurrence. This will be done on a local basis when necessary.

B. Prescribed Fire

Prescribed fire public information will be dealt with as part of the prescribed fire plan. Informing the public is a vital component of the prescribed fire program. Areas that have been burned will present opportunities for the public to actually see the effects of fires, and offer staff members an opportunity to explain the purpose of the burns to visitors.

XIV. ARCHEOLOGICAL/CULTURAL/HISTORIC RESOURCES

Fire management activities at the refuge will be implemented in accordance with the regulations and directions governing the protection of cultural resources as outline in Department Manual Part 519, Code of Federal Regulations (36 CFR 800), the Archeological Resources Protection Act of 1979, as amended, and the Archeological and Historic Preservation Act of 1974. The National Historic Preservation Act of 1966, as amended, Section 106 clearance will be followed for any fire management activity that may affect historic structures or archeological resources.

As an oasis in the middle of the desert, Fish Springs has served as a stopping area for nomadic tribes for centuries. Studies during the early days of the refuge place early occupancy of the area at approximately 3,000 B.C. Pottery found in the area is dated to Pueblويد cultures during the period 900 to 1200 A.D. Estimates of occupation dates are inexact and are derived from comparison of implements found in the area to other areas which have received more study. Four caves, all showing archeological potential, are found near the north end of the Fish Springs Mountain range. Two of the caves, Fish Springs Cave and Barn Owl Cave, are on refuge lands. Most of the activity around the marsh is attributed to chipping artifacts and hunting, which assumes that the marsh supported a substantial wildlife population during the prehistoric period.

Currently wildfires are suppressed. However, historic evidence demonstrates that natural and artificial fires were regular events in the mixed grass prairie. In

recent years, fire suppression has resulted in a steady buildup of grassland and riparian fuel loads, colonization of disturbed soils by invading plant species, and natural vegetation growth, increasing the chances of an uncontrolled wildfire that could potentially endanger the Refuge's cultural resources as well as surrounding lands. Although over 20 years of fire ecology research allows ecologists to predict impacts on biotic communities, the possible impacts of prescribed burning (and wildfires) on Archeological resources are not well known. Research conducted in North Dakota indicate that fire-related impacts to buried artifacts are negligible, but effects on surface-exposed artifacts will be significant, depending on artifact type and size (Seabloom et al 1991).

Impacts to archeological 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 wildfire holding actions (Anderson 1983).

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

- Files and records of cultural resources should be consulted by the staff when planning prescribed burns, developing pre-attack plans, and performing other preparedness actions. The potential for adverse impacts to cultural resources will be evaluated prior to prescribed burning and in the selection of fire suppression strategies during wildfires.
- The Regional Archeologist will be contacted during the development phase of the burn plan writing process when cultural resources are suspected or known to exist in the project area.
- The Utah State Historic Preservation Officer (SHPO) will be contacted by the Regional Archeologist when it is known a planned management action may impact archeological or cultural resources. The SHPO has 30-days to respond. The Refuge will follow any programmatic archeological/cultural resources management plan that may be implemented in the future.
- Low impact wildfire suppression tactics (cold-trailing, use of foam/wet-water/water, use of natural and manmade barriers, change in vegetation, mowing etc.) will be used to the fullest extent possible. Line construction for prescribed fire activities will follow the same principle. Maps indicating the known location of significant cultural resources will be consulted prior to laying out burn units, and whenever possible, before constructing fireline to halt the spread of a wildfire.

- Prescriptions for management ignited prescribed fires will take into account the presence of known cultural sites. Cooler fires with short residence time will be used in areas containing known cultural sites, whenever possible.
- Known surface sites will be marked, protected and excluded from the burn, if possible. Foam will not be used in areas known to harbor surface artifacts.
- The use of mechanized equipment within the refuge must be approved by the Refuge Manager on a fire by fire basis, and the use of these resources will be considered in the approval process for any planned management actions. When the use of heavy equipment is authorized, its use will be monitored.
- The location of sites discovered as the result of fire management activities will be reported by the ROS to the Regional Archeologist.
- Rehabilitation plans will address cultural resources and will be reviewed by the Regional Archeologist.

XV. ANNUAL FIRE PLAN REVIEW

The fire management plan will be updated as major policy decisions and land acquisitions are made. At a minimum, this plan will be reviewed once a year by the Refuge Manager or his designee. Amendments to the fire management plan which change the direction or scope of the fire management program must be sent to the Regional Office for review and approval. Minor changes to the appendices, such as personnel changes, can be made at the refuge and attached to the plan during this yearly review process without involvement of the Regional Office.

A. Wildfire

All wildland fires will be critique by the Incident Commander. The Zone Fire Management Officer and/or the Regional Fire Management Coordinator will conduct formal reviews in the event of the following:

1. Significant injury, accident, or death
2. Significant property or resource damage
3. Significant safety concerns are raised.
4. Extended attack of more than one day

B. Prescribed Fire

Prescribed fires will be critiqued by the Burn Boss and documented in the Individual Fire Report (1202). The Zone Fire Management Officer and/or the Regional Fire Management Coordinator will conduct formal reviews in the event of the following:

1. Significant injury, accident, or death
2. An escaped prescribed fire occurs
3. Significant safety concerns are raised
4. Smoke management problems occur

XVI. CONSULTATION AND COORDINATION

The Fire Management Plan will be made available to those that have expressed an interest or may be utilized for assistance under an MOU.

Station Purposes, Mission, Goals and Copy of Refuge Marsh Management Plan

Endangered Species and Fire Policy Clarification Memo (1995)

List of Common Plants on the Refuge

List of Reptiles

List of Mammals

List of Birds

Fire History

Fire Effects - Vegetation

Additional Vegetative species information
can be found at **<http://www.fs.ged.us/database/feis/plants/>**

Fire Effects - Wildlife

Additional Wildlife species information
can be found at [**http://www.fs.ged.us/database/feis/animals/**](http://www.fs.ged.us/database/feis/animals/)

MOU Between Fish Springs and Richfield District BLM

Wildland Fire Situation Analysis

INDIVIDUAL FIRE MANAGEMENT QUALIFICATIONS

Position	Qualifications	Fitness Level	Name
Refuge Manager	FFT2	Arduous	Jay Banta
Refuge Ops Spec	FFT2	Arduous	Jim Graham
Maint. Worker	ENOP	Light	Bret Layland
Maint. Helper	FFT2	Arduous	Rodney Wright
Clerk			

NORMAL UNIT STRENGTH

Presently, the Refuge does not have an authorized Normal Unit Strength (NUS) of equipment and supplies required to maintain the fire management program. The following is the recommended minimum

Item	Year Purchased	Percent of Fire Funding	Have	GVW	Need	GVW
Engine Module(s) heavy (500-1000 gal) medium (200-400 gal) light (50-150 gal)					1	15K
Slip-on unit(s)	1998	100	1		1	
Water Tender(s)						
Portable Pump(s) Standard	1994	100	1		1	
Power Saw(s)	1998	100	1		1	
Mower(s)						
Tractor(s)						
Grader(s)						
Plow Unit/Disk						
ATV(s)						
Other List Radios Pickup Truck	1997	100	0 1		2 1	

Other Equipment Available for Fire Suppression or Prescribed Fire Operations Not Fire Funded	
2 Bulldozers	1 Grader
Trailer Mounted Water Tank	
Gas Powered Water Pump	

Use the table to list capital equipment used for prescribed and separate attack of prescribed fire activities funded wholly or in part by the year purchased, if known, and the percent of fire funding (e.g.: The station purchased a tractor. Fire paid 25% and the station secured other funding for the remainder.)

Appendix M (Continued)

CACHE INVENTORY

March 1, 1999

-5 ea.	Flappers
-5 ea.	McCleods
-5 ea.	Backpack pumps (fedco)
-5 ea.	Drip torches
-5 ea.	Pulaskies
-5 ea.	Shovels
-12 ea.	Fire pants (various sizes)
-12 ea.	Fire shirts (Various sizes)
-12 pairs	Leather gloves
-7 ea.	Goggles
-10 ea.	Ear plugs
-7 ea.	Hard hats and liners
-7 ea.	Fire shelter & case(2 practice, 5 regular)
-10 ea.	Canteen 1 quart w/cover
-5 ea	Hand held radios
-2 ea.	Belt weather kit
-5 ea.	Day Pack (Yellow pack)
-1ea.	Starter pistol
-70ea.	Primers
-24ea.	Flares
-1case	Fusees (10 min.)
-1ea.	Float pump, 1 1/2" discharge
-15ft.	Suction hose w/foot valve.

Each firefighter is required to have the following personal safety equipment supplied from the cache:

Goggle	Fire Shirt
Leather Gloves	Fire Shelter
Ear plugs	8' High Leather Boots(employ.)
Fire Pant	