

WILDLAND FIRE MANAGEMENT PLAN

FOR

Fish Springs National Wildlife Refuge

Dugway, Utah

March 25, 2002

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I. INTRODUCTION

Fish Springs National Wildlife Refuge (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 that are compatible with the primary objectives.

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.

II. POLICY COMPLIANCE - GOALS AND OBJECTIVES

A. Compliance With Service Policy

U.S. Fish and Wildlife Service policy requires that an approved Fire Management Plan must be in place for all 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 land 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.

B. NEPA Compliance

Regulations published in the Federal Register (62 FR 2375) January 16, 1997, categorically excludes prescribed fire when used for habitat improvement purposes and conducted in accordance with local and State ordinances and laws. Wildfire suppression actions are categorically excluded, as outlines in 516 DM 2 Appendix 1. This plan updates a previous Fire Management Plan. An Environmental Assessment for Fire Management, including the use of prescribed fire to achieve management objectives, was completed and a Finding of No Significant Impact was signed by the Acting Regional Director (Appendix A).

C. Authorities Citation

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).

D. Enabling Legislation and Purpose of Refuge (Mission Statement)

Fish Springs National Wildlife Refuge was established by Public Land Order No. 1942, August 12, 1959. Located at the southern end of the Great Salt Lake Desert, the Refuge was established to provide waterfowl resting, feeding, and nesting habitat in the Pacific Flyway (Figure 1). Values at risk include an isolated wetland with associate plant, bird and other wildlife, improvements and other structures, and cultural resources dating back to 5000 Before Present (BP).

E. Overview of Planning Documents

A 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. This Fire Management Plan (FMP) which updates the May 19, 1983 Fish Springs FMP, has been 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). It is anticipated that the objectives listed in these documents will also be reflected in the Comprehensive Management Plan when it is developed.

The FMP has been developed to provide direction and continuity and to establish operational procedures to guide all wildland fire management activities to ensure that fire is properly used as a means of habitat management to achieve the Refuge's goals and objectives. This plan will be evaluated and updated in future years as required by changes in policy, management actions, and priorities. A 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 Fire Management Plan will take 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.

F. Land Management Goals and 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.

Land Management goals as indicated in the Station Purposes, Mission, Goals, and Objectives for Fish Springs NWR and the Refuge Marsh Management Plan:

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.

III. FIRE MANAGEMENT OBJECTIVES

A. Introduction

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 and protect public and private property and cultural and natural resource values. Service policy and the Wildland Fire Policy and Program Review direct an agency administrator to use the appropriate management strategy 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 Fire Management Plan, the Refuge staff may use wildland fire in accordance with local and State ordinances and laws to achieve resource management objectives (habitat improvement).

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

1. Wildland fire is an important component of the Refuge's resource management 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 will minimize natural and cultural resources damage.
5. Rapid rates of spread and fire suppression response time could contribute to suppression problems and increase the likelihood of an escape onto adjacent lands.

B. Refuge Fire Management Goals

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

C. Refuge Fire Management Objectives

1. Increase the aquatic insect diversity and abundance by burning the various units on a 5-year cycle.
2. Retard invasion of undesirable species and exotic species, open up overgrown areas, and reduce vegetative litter by burning unit on a 5-year cycle.
3. 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. Remove dead vegetation, cycle nutrients, and increase vigor of desirable plant species.

5. Increase habitat diversity by creating a mosaic of habitats and increasing habitat interspersion and edge. Controlled burning will be used to create nesting edge for ducks.

IV. FIRE MANAGEMENT STRATEGIES

A. General

The Refuge will manage all wildfires in keeping with Service policy and management ignited prescribed fire will be utilized under controlled conditions and defined weather variables as outlined in a prescribed fire burn plan to achieve resource management objectives.

Service Policy mandates that wildland fire be managed using the appropriate management response concept. Using the Appropriate Management Response concept, the Refuge will suppress all wildfires consistent with values at risk. Strategies employing a range of suppression options depending on the situation will be used. Resource management benefits will not be a consideration when selecting the appropriate management response. Suppression actions will be based on firefighter and public safety, public and private property and cultural and natural resources, and cost of suppression in relationship to the values at risk.

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. Minimum impact suppression tactics (MIST) will be used, where appropriate.

The appropriate action may include high intensity direct attack, lower intensity indirect direct, 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. The matrix in Table 1 is intended to illustrate some of the options available to the Incident Commander as he or she sizes up a wildland fire and determines the appropriate response. The Fire Management Plan will provide guidance, but the Incident Commander must make the decision based on current conditions and resources

available.

Table 1: 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 entering another unit to be burned.	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
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 or indirect 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.

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 Memorandums 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. Rationale

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.

D. Limits

1. Smoke management must be considered for any prescribed burn and will be addressed in all prescribed burn plans.
1. 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 or his/her designee.

2. 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 significant weather changes are predicted.
 - ◆ No air stagnation alert.
 - ◆ Fire is restricted to one area.
4. 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.
5. Prescribed burning in areas where threatened, endangered and candidate species exist will not be conducted if the prescribed fire is determined to the species or if any adverse impacts cannot be mitigates. Section 7 clearance will be secured, as appropriate.
6. Prescribed fires must be scheduled around nesting and migratory patterns of various species and will be addressed in Prescribed Fire Burn Plans
7. Prescribed burns will not be conducted during periods of high fire danger when county 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.

E. Impacts of Fire Management Activities

Escaped prescribed fires and wildfire would impact the adjacent BLM grazing allotment, which is also a Wilderness Study Area. However, the use of prescribed fire is well accepted by Dugway Proving Ground and the BLM, the latter often assists with prescribed fires on the Refuge.

The Lincoln Highway is visible on the 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. All burn plans will be sent to the Regional Archeologist or his/her designees for review prior to approval.

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.

The 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.

The effects 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 20 air-miles to the west. Prescribed fires have had the chance to burn into the semidesert upland on the western side 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.

F. Fire Management Considerations

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 (Appendix B). 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.

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.

V. DESCRIPTION OF THE AREA

A. General Description

Fish Springs NWR is one of the most isolated Refuges in the Lower 48 States. The nearest neighbors reside in Callao, UT, a collection of ranches 25 miles by road west of the Refuge. The nearest communities with services are Dugway Proving Ground, Utah, 51 miles to the northeast, and Delta, Utah, 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 (Figure 1).

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 2,000 acres of mud and alkali flat and 6,000 acres of semidesert upland.

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

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 out-croppings 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.

Figure 1: Map of Fish Spring NWR

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 (48" annually) 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. Winds are generally light to moderate.

D. Vegetation

Anderson wolfberry, horsebrush, shadescale, 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 tree specie native to the Fish Springs area is a few scattered juniper 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. 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 (Appendix D). One fish species and both amphibian species were introduced. The least chub, a Candidate Species, has been successfully reintroduced into Walter's Spring with additional releases planned in the coming years.

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.

A complete list of mammal species can be found in Appendix E.

G. Birds

Since establishment, over 275 species of birds have been documented at Fish Springs, 61 of which are known to nest on the Refuge (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. A listing is on file at Refuge Headquarters. 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. 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 what is now the Refuge picnic area. The exact location of this station will be determined following 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.

Several segments of the historic Lincoln Highway are visible in the Refuge uplands.

K. Improvements

The primary improvements on the Refuge are the buildings in the headquarters/shop area, with an estimated replacement cost of \$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 (20 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.

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.

N. Air Quality

Due to the remoteness of the Refuge, air quality is extremely good. The airshed includes the WSA that must be managed in accordance with the Clean Air Act, as amended.

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 9,700 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.

Figure 2: Map showing BLM Wilderness Study Area

P. Refuge Fire Environment and History

➤ **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, January - April 1960).

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).

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.

➤ **Fire Frequency**

Based on a review of the fire history, a wildland fire frequency of 1 fire every 10 years has been established.

➤ **Fire Season**

Although the season can vary, the wildfire fire season is commonly July through September. In years of low precipitation, the fire season can run from March to Mid-November.

VI. FIRE MANAGEMENT UNITS (FMU)

A. Introduction

Fire management units (FMUs) are areas with similar fuels and other characteristics, require similar efforts in fire suppression or prescribed fire, and that have common fire management strategies. The Refuge will be considered one Fire Management Unit for both wildland and prescribed fire.

B. Fuel Types

NFFL Fuel Model 1 Short Grass. The Refuge marsh consists of a mosaic of grass fuel models. Nearly 6,500 acres of Fuel Models 1 and 3 exist on the Refuge with Fuel Model 1 predominant (4,300 acres). Fuel Model 1 consists of saltgrass and spikerushes. Areas of peat moss, which falls into this group, exist downstream from the springs and immediately north of House Spring in west Mallard Unit (2,200 acres).

NFFL Fuel Model 3 Tall Grass. Tall grasses and rushes are predominate in this fuel model. Predominant plants are wirerush, bulrushes, Phragmites, and cattail.

NFFL 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 6,000 acres of desert shrub. This fuel model is declining in many parts of Utah.

C. Fire Behavior

Data and descriptions for the following fuel models was 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).

1. NFFL 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 mid-flame 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.

2. 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 mid-flame 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.

3. 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 coarse 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 mid-flame windspeed of 10 mph. Short range spotting is common. Resistance to control is very high to extreme.

D. Fuel Status and Special Concerns

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 result in very high to extreme burning conditions where direct attack is not considered feasible.

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.

E. Fire Effects

The following is an overview of the expected fire effects. Specific effects taken from FMIS Fire Effects for selected species can be found in Appendix H.

1. Vegetation

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

2. Wildlife

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. 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 post-drought 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.

3. Air Quality

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

4. 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.

F. Fire Management Objectives

The fire management objectives are outlined in Section III. Fire Management Objectives

G. Strategies and Tactics

Suppression strategies and tactics are discussed in Section IV. Fire Management Strategies. Limits and special concerns are also discussed in that section.

VII. FIRE MANAGEMENT RESPONSIBILITIES

A. Introduction

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) .

B. Refuge Staff

1. The **Refuge Manager** 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. In keeping with budget and staffing limitations, ensures sufficient collateral duty firefighters meeting Service standards are available for initial attack and prescribed burns. Approves minor 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.
2. 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:
 - a. To provide initial attack fire suppression capability and ensure all wildland wildfire receive the appropriate level of initial attack response.
 - b. Conduct prescribed fire activities in support of refuge habitat management programs.
 - c. Establish appropriate fire related agreements/contracts and ensure they are reviewed and updated on an annual basis.
 - d. Monitor results of wildland and prescribed fires to assure they are meeting established objectives.
 - e. Update fire management and associated plans (dispatch, training,

- etc.) on an annual basis.
- f. Continue to develop "red-carded" firefighters for prescribed and wildland fire, trained and equipped to accomplish the fire management program.
 - g. Assure fire equipment is in a ready state.
 - h. Annually administer the fitness test and ensure only those who have passed may participate in wildland fire management activities.
 - i. Ensure that employees are physically able to safely accomplish their assigned work.
 - j. Provide and enforce the use of personal protective equipment.
3. The **Refuge Mechanic** will be responsible for the proper maintenance and repair of firefighting equipment and vehicles to be used. He/she will also be responsible for maintaining the fire breaks as delineated by the ROS
 4. 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.
 5. **The Refuge 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 Refuge's fire management team are found in Appendix K.

C. Cooperator Involvement

Along with other land management agencies, the Service has adopted the National Interagency Incident Management System (NIIMS) Wildland and Prescribed Fire Qualification Subsystem Guide, PMS 310-1 to identify minimum qualification 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.

A Memorandum of Understanding is developed with the Bureau of Land Management, Richfield and Salt Lake Districts for wildfire suppression (Appendix L).

VIII. EQUIPMENT AND STAFFING NEEDS

A. Normal Unit Strength

A listing of equipment and supplies can be found in Appendix M.

B. Required Staffing

The Refuge staff is very limited making it difficult to fully staff the fire management program. If possible, based on staffing and budget limitations the positions listed in the following table should be developed and maintained.

Table 2: Minimum Staffing Requirements

Position	Suppression	Prescribed Fire
Incident Commander Type 5 (ICT5)	1	
Engine Operator	1	1
Firefighter (FFT2)	2	2
Prescribed Burn Boss (RXB3)		1

Note: A person may be qualified for more than one position, however a minimum of four fire qualified staff would be required to meet the recommended minimum staffing requirements.

IX. PREPAREDNESS

A. Current Staff Available to Meet Position Needs

A listing of current staff available to meet position needs and an Employee Contact List can be found in Appendix J.

B. Pre-season Readiness Activities

Table 3: Annual Refuge Fire Management Activities

ACTIVITY	1	2	3	4	5	6	7	8	9	10	11	12
Update Interagency Fire Agreements and AOP's	x											
Winterize Fire Management Equipment											x	
Inventory Fire Engine and Cache		x										
Complete Training Analysis										x		
Annual Refresher Training			x									
Annual Fitness Testing			x									
Pre-Season Engine Preparation			x									
Weigh Engines to verify GVW Compliance			x									
Issue PPE			x									
Prescribed Fire Plan Preparation		x										
Review and Update Fire Management Plan											x	
Prepare Pre-season Risk Analysis			x									
Weather Station Maintenance and Calibration										x		

Activities should be completed prior to the end of the month that is indicated.

C. Annual Refresher Training

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 performance. 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.

All personnel involved in Fire Management activities are required to annually complete fire management refresher training in order to be qualified for fire management activities in that calendar year. Refresher training will concentrate on local conditions and factors, the Standard Fire Orders, LCES, 18 Situations, and Common Dominators. NWCG and other courses are available that meet the firefighter safety requirement; but, efforts will be made to vary the training and use all or portions of other NWCG courses to cover the required topics. Fire shelter use and deployment under adverse conditions, if possible, must be included as part of the annual refresher.

D. Physical Fitness

All personnel involved in fire management activities will meet the fitness standards established by the Service and Region. At this point in time, firefighters participating in wildfire suppression must achieve and maintain an Arduous rating. Firefighters participating in Prescribed Burns must achieve and maintain a Moderate rating. Information found in Appendix N provides specific instructions to administer the tests, a health screening questionnaire to aid in assessing personal health and fitness of employees prior to taking the test, an informed consent form, and safety considerations. A trained and qualified American Red Cross First Responder (or equivalent) who can recognize symptoms of physical distress and perform the appropriate first aid procedures must be on site during the test.

Wildland fire fitness tests shall not be administered to anyone who has obvious physical conditions or known heart problems that would place them at risk. All individuals are required to complete a pre-test physical activity readiness questionnaire prior to taking a physical fitness test. They must read and sign the Par-Q health screening questionnaire, an informed consent form (Appendix N). If an employee cannot answer NO to all the questions in the PAR-Q health screening questionnaire, or is over 40 years of age, unaccustomed to vigorous exercise, and testing to achieve a Moderate or Light rating, the test administrator will recommend a physical examination. As noted below, all individuals over 40 years of age must receive an annual physical prior to physical testing.

E. Physical Examinations

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.

F. Impacts of Regional and National Preparedness Levels on Station Activities

As indicated previously, periods of drought can greatly impact fire behavior and resistance to suppression. For that reason the Rangeland Fire Danger Index, Palmer Drought Index, and the Keetch-Byram Drought Index will be monitored at a minimum on a weekly bases 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 (See following section).

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 that would normally be able to assist with Refuge fire management activities. It may be necessary to go out of Region to get the resources needed to staff the Refuge engine during periods of extreme drought or high fire danger.

The Refuge is in the Eastern Great Basin Area. During National and Regional Preparedness Levels IV and V, it is necessary to receive approval from the Regional Fire Management Officer and the concurrence of the Eastern Great Basin Area Coordination Group to conduct prescribed burns during PL IV and the National Coordination Group during PL V. Prescribed fire activities will not be conducted when the National Preparedness is at Levels IV or V without approval of the Eastern Great Basin Area Coordination Group.

G. Step-Up Plan

All preparedness activities will be in accordance with the Refuge's Step-up Plan (Appendix O).

H. Severity and Emergency Presuppression Funding

Severity funding is different from Emergency Presuppression funding. Emergency Presuppression funds are used to fund activities during short-term weather events and increased human activity that increases the fire danger beyond what is normal. Severity funding is requested to prepare for abnormally extreme fire potential caused by an unusual climate or weather event such as extended drought. Severity funds and emergency presuppression funds may be used to rent or preposition additional initial attack equipment, augment existing fire suppression personnel, and meet other requirements of the Step-up Plan.

Emergency Presuppression and Severity funds will be requested in accordance with the guidance provided in the Service's Fire Management Planning Handbook. As a general guide, Severity funding will be requested if a severe drought is indicated by a Palmer Drought Index reading of -4.0 or less or a Keetch-Byram Drought Index of 600 or greater and a long-range forecast calling for below average precipitation and/or above average temperatures. Drought Indices can be located at: <http://www.boi.noaa.gov/fwweb/fwoutlook.htm>.

X. WILDFIRE PROGRAM

A. Firefighter Safety

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. In addition, the following actions will be taken during wildfire suppression operations:

1. Public traffic will be prevented from accessing the area and warning signs placed on county roads.
2. 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 appraised of weather conditions and potential fire behavior.
3. Firefighters will be briefed on expected weather, fire behavior, communications, escape routes and safety zones. Fire lookouts will be posted.
4. All refuge personnel performing fire management jobs will meet appropriate training, experience, and qualification requirements for incident assignments in accordance with Service and Departmental policy as outlined in the Fire Management Handbook and 310-1.
5. All fire suppression and prescribed burn personnel will be equipped with approved personal protective equipment (PPE).
6. Crews will maintain communications between themselves, cooperators, and with dispatch.

Smoke from wildfires 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 by incorporating the recommendations outlined in the publication Health Hazards of Smoke (Sharkey 1997), which is available from PMS or the Missoula Technology and Development Center

B. 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.

C. 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.

D. Initial Reporting and Dispatching

The Fire Dispatcher will be responsible for coordinating the filling and ensuring delivery of any resources requested by an Incident Commanders (IC). An IC will place all resource orders through the dispatcher, specifying what is needed, and when and where it is to be delivered. The Dispatcher will promptly determine if the resource orders can be filled or procured locally and notify the IC. If a Resource Order can not be filled locally, the Dispatcher will place the order with the Richfield Interagency Dispatch Center. The FMO will generally be able to assist in ordering resources from outside the local area.

E. Suppression

Service policy requires the Refuge to utilize the ICS system and firefighters meeting NWCG and Service qualifications when suppressing wild fires occurring on Refuge property. All suppression efforts will be directed towards safeguarding life and property while protecting the Refuge's resources and other values at risk from harm.

All fires occurring on the Refuge and staffed with Service employees will be supervised by a qualified incident commander (IC). If a qualified IC is not available, one will be ordered through the Zone FMO or the Richfield Interagency Dispatch Center. Until the IC arrives, the highest qualified firefighter will assume the duties of the IC until relieved by a qualified IC or the fire is suppressed. The IC will be responsible for:

1. Providing a size-up of the fire to dispatch as soon as possible.
2. Using guidance found in the fire Management Plan or in the Delegation of Authority, determine the strategy and tactics to be used.
3. Determine the resources needed for the fire
4. Brief assigned resources on the strategy and tactics to be used, expected fire behavior, historic weather and fire behavior patterns, impacts of drought, live fuel moisture, escape routes and safety zones, and radio frequencies to be used.
5. Advising dispatch of resource needs on the fire.
6. Managing all aspects of the incident until relieved or the fire is suppressed

The IC will receive general suppression strategy from the Fire Management Plan, but appropriate tactics used to suppress the fire will be up to the IC to implement. Minimum impact suppression tactics should be used whenever possible.

Upon arriving at the scene, all resources, including mutual aid resources, will report to the IC (either in person or by radio) prior to deploying to the fire. Mutual aid forces will be first priority for release from the fire. Procedures outlined in the dispatch section and elsewhere in this plan will be used to acquire Service and Interagency fire personnel and resources.

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.

1. 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 after arriving at the scene and sizing up the fire.
2. The primary 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.

3. 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.
4. When backup forces are needed for extinguishment of a fire, the Bureau of Land Management will respond to a call from the Refuge.
5. Direct attack will generally be the most effective control strategy, except during periods of drought and extremely high wind when rates of spread are to high and indirect attack is necessary. It may be necessary to use indirect attack to ensure low impact suppression tactics are employed to prevent irreversible suppression damage.

If a wildfire cannot be controlled with initial attack forces the unit will utilize a decision making process, a Wildland Fire Situation Analysis (WFSA) that evaluates alternative management strategies against selected environmental, social, political, and economic criteria will be completed (Appendix P). The WFSA should be developed jointly with the BLM because a fire of this magnitude would escape the Refuge boundaries and burn lands which are the responsibility of the Bureau of Land Management.

Due to the size of the Refuge, the limited amount of burnable vegetation, and the number of employees, Pre-attack Plans have not been developed.

A. Mop up Standards and Emergency Stabilization and Rehabilitation

The IC will be responsible for mop-up and mitigating suppression impacts incurred on Refuge fires. The mop-up standards established in the Fireline Handbook will be followed. Refuge fires will be patrolled or monitored until declared out.

Prior to releasing all firefighters from a wildland fire the following actions will be taken:

1. All trash will be removed
2. Firelines will be refilled and waterbars added if needed.
3. Hazardous trees and snags cut and the stumps cut flush.
4. Disked or plowed firelines should be compacted as soon as possible to preserve the living root stock of natives grasses.
5. Overturned sod resulting from plowing must be rolled back with a grader or by hand and compacted to preserve native grass root stock.

Other emergency stabilization and emergency rehabilitation measures may be taken in accordance with Chapter 5 of the Fire Management Handbook. Briefly:

1. **Emergency stabilization** is the use of appropriate emergency stabilization techniques in order to protect public safety and stabilize and prevent further degradation of cultural and natural resources in the perimeter of the burned area and downstream impact areas from erosion and invasion of undesirable species. The Incident Commander may initiate Emergency Stabilization actions before the fire is demobilized, as delegated by the Agency Administrator, but emergency stabilization activities may be completed after the fire is declared out.
2. **Rehabilitation** is the use of appropriate rehabilitation techniques to improve natural resources as stipulated in approved refuge management plans and the repair or replacement of minor facilities damaged by the fire. Total "rehabilitation" of a burned area is not within the scope of the Emergency Rehabilitation funding. Emergency Rehabilitation funding can be used to begin the rehabilitation process if other funding is committed to continue the rehabilitation throughout the life of the project (beyond the initial 3 years of Emergency Rehabilitation funding). Major facilities are repaired or replaced through supplemental appropriations of other funding.
3. Because of the emergency nature of the fire event, the emergency stabilization section of the **Emergency Stabilization and Rehabilitation Plan** (ESR Plan) must be developed expeditiously and is frequently developed by a local unit or designated burned area ESR team. The rehabilitation section of the ESR Plan is not considered an emergency, and is developed as other refuge land use plans. The refuge manager is responsible for preparing all ESR Plans. In order to be funded, ESR Plans must meet resource management objectives and be approved by the Project Leader and the Regional Director.

XI. PRESCRIBED FIRE PROGRAM

A. Program Overview

The Refuge uses prescribed fire as a tool in two management areas - resource management and hazardous fuel reduction. Resource management prescribed burning is used to restore, create, and/or maintain a diversity of plant communities in order to restore and perpetuate native plant and wildlife species. The Refuge may use hazardous fuel reduction prescribed burns within or near Refuge development zones, sensitive resources, and boundary areas to reduce the risk from wildfire damage. To the greatest extent possible, hazardous reduction prescribed fires will only be used when they complement resource management objectives.

Wildland Fire Use for Resource Benefit will not be a management strategy at the Refuge.

B. Primary Objectives of the Prescribed Fire Program

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.

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.

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 4)

Table 4: Fire Management Units and Burn Rotation

Burn Unit	Year Scheduled
Mallard and Gadwall	2003
Avocet and Spring Unit <small>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.</small>	2004
Curlew and Ibis	2005
Pintail and Shoveler	2006
Egret and Harrison	2007

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:

1. What is the purpose or expected results?
2. Will fire produce those results or are there other methods to be considered?
3. What are the undesirable impacts of burning?
4. Do benefits of manipulation outweigh undesirable impacts?
5. Can the treatment area be burned considering site location, personnel and equipment available?
6. 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. Treatment Specifications

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

Figure 3: Burn Units

E. 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.

F. 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.

G. Potential Impacts

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

As stated previously, 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. Containing prescribed burns generally has not been a problem due to the Refuge's extensive system of roads and dikes.

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 and/or Dept Of Defence) will be contacted as will the Richfield Interagency Fire Dispatch Center.

H. Responsibilities and Planning

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.

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.

I. Contingency Planning Guidelines

Contingency planning will be addressed in each prescribed burn plan. The Refuge Manager will determine to what extent the burn crew will attempt to extinguish a fire that has crossed a fire break. During the pre-burn briefing the burn boss will discuss the actions that will be taken in the event that the fire burns outside the boundaries of the prescribed burn unit. If the decision is to allow it to burn into an adjacent burn unit, 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 also serve as the Incident Commander for the suppression operations and define the type of attack that will be used to suppress fire. The Refuge Manager will pre-identify secondary holding lines to be used in the prescribed burn plan.

If the fire is moving towards the boundary of the refuge and the Burn Boss/Incident Commander has determined that the on-site 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. A Richfield Dispatch may already be monitoring the radio frequency.
- The Burn boss or designated Refuge personnel will contact the owner of the land that will be affected 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 until the local law enforcement agency having jurisdiction arrives to direct traffic.

J. 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.

XII. ADDITIONAL OPERATIONAL ELEMENTS

A. Public Safety

Firefighter and public safety will always take precedence over public and private property and cultural and natural resource protection during any fire management activity. Firefighter safety was covered previously. This section will deal with public safety.

Fire fronts in grass fuel models move rapidly and are dangerous. However, visitation to the Refuge is limited; therefore, entrapment by public users is not considered to be a big threat. The Refuge staff will attempt to keep the fire scene clear of people except for Service firefighters and cooperating agency personnel.

Smoke from a Refuge fire could impair visibility on roads and become a hazard. During wildfires, the local law enforcement agency having jurisdiction is responsible for managing traffic hazards from smoke. Smoke from prescribed fires is addressed in the prescribed burn plan and its management and mitigation are the responsibility of the burn boss. Actions to reduce the hazards associated with smoke include: use of road guards and pilot car, signing, altering ignition techniques and sequence, halting ignition, suppressing the fire, and use of local law enforcement as traffic control.

B. Public Information and Education

Informing the public is an important aspect of fire suppression, fire prevention, prescribed fire, and the Service mission. Information and education are critical to gaining public support for the Refuge's fire management programs. Due to the isolated nature of the Refuge, this program will be conducted informally.

C. Reports

Following the suppression of a wildfire or the completion of a prescribed burn, the IC and Burn Boss will:

1. Complete a DI-1202 Fire Report within 3 days of the fire being declared out.
2. Include a list of all expenses and/or items lost or expended on the incident and list personnel assignments on the
3. Complete a Crew Time Reports for all personnel assigned to the wildfire or prescribed fire.

4. Submit the documents to the Zone FMO within 3 days of the fire being declared out.

The Refuge Manager will send all data to the Zone FMO to be entered into the FMIS database within 10 days after the fire is declared out.

D. Fire Critique and Review

1. Wildfire Review

Wildfires will be critiqued by the IC and the results documented in the DI-1202. The Regional Fire Management Coordinator and/or Zone FMO will conduct formal critiques in the event of:

- a. Significant injury, accident, or fatality.
- b. Significant property or resource damage.
- c. Significant safety concerns are raised
- d. An extended attack is necessary.

2. Prescribed Burn Review

Prescribed fires will be critiqued by the burn boss and documented in the prescribed burn plan. The Regional Fire Management Coordinator and/or Zone FMO will conduct formal critiques in the event of:

- a. Significant injury, accident, or fatality.
- b. An escaped prescribed fire occurs
- c. Significant safety concerns are raised.
- d. Smoke management problems occur.

E. Annual Fire Management Plan Review

The Fire Management Plan will be reviewed annually to ensure the fire program advances and evolves with the Service's and the Refuge's mission. The plan will also be reviewed following completion of the CCP process and new habitat management plans.

XIII. AIR QUALITY AND SMOKE MANAGEMENT GUIDELINES

The management of smoke is incorporated into the planning of prescribed fires, and to the extent possible, in suppression of wildfires. Sensitive areas are identified and precautions are taken to safeguard visitors and local residents. Smoke dispersal is a consideration in determining whether or not a prescribed burn is within prescription. Generally the fine grass fuels and small burn size generate low volumes of smoke for short duration (4-5 hours).

The Refuge's fire management activities which result in the discharge of pollutants (smoke, carbon monoxide, particulate, and other pollutants from fires) are subject to and must comply with all applicable Federal, State, and local air pollution control requirements as specified by Section 118 of the Clean Air Act, as amended 1990. No permits are required by the State of Utah, but state air quality regulations must be adhered (Appendix Q). The State of Utah maintains a Memorandum of Agreement with the Forest Service and Bureau of Land Management for prescribed burn emissions 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.

XIV. FIRE RESEARCH/MONITORING

The effects of fire on the Refuge's plants and animals, need 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 each 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

XV. 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 outlined in Department Manual Part 519, Code of Federal Regulations (36 CFR 800), the Archeological Resources Protection Act of 1979, as amended, and

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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 3000 B.C. Pottery found in the area is dated to Puebloid 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.

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.

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APPENDIX A

Station Purposes, Mission and Goals Statement

Refuge Marsh Management Plan

1984 Fire Management Plan and FONSI

Appendix B

Endangered Species and Fire Policy Clarification Memo (1995)

Appendix C

List of Common Plants on the Refuge

Appendix D

List of Reptiles

Appendix E

List of Mammals

Appendix F

List of Birds

Appendix G

Fire History

Appendix H

Fire Effects - Vegetation

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

Appendix I

Fire Effects - Wildlife

Additional Wildlife species information
can be found at <http://www.fs.ged.us/database/feis/animals/>

Appendix J

Individual Fire Management Qualifications

Table 1: 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			

Appendix K

Fire Management Team

Call-out List

Appendix L

Interagency Agreements

MOU between FWS and BLM

AOP - Richfield Area

Appendix M

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	18K
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 fire and separate table for 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.)

Table 2: Supplies and PPE**Date: March 1, 1999**

Item	Quantity	
	Need	Have
Hose, lightweight, lined 1.5" x 100'	9	
Hose, lightweight, lined 1" x 100'	9	
1" NH gated wye	2	
1.5" NH gated wye	2	
1.5" nozzle	2	
1" Forester nozzle	4	
Hydrant wrench, spanner	2	
Hose clamp	2	
flapper	6	5
Pulaski w/sheath	3	5
Shovel w/sheath	6	5
McCleods	2	5
Combi tool	6	0
Drip Torch	2	5
Fusees	1 Case	1 Case
Safety Can: 3 Gallon	2	
Foam	15 gallons	
Backpack Pump	6	5
Canteen, large	2	
Belt Weather Kit	2	2
Hard Hat	12	7
Goggles	12	7
Headlamps	12	
Fire Shelter w/Liner	12	5
Line Pack w/harness	12	5
Water Bottle	48	10
Ear Plugs	12 pks	1 package of 10

Leather Gloves, Assorted sizes	24 pr	12 pr
Sleeping Bags	10	
Personal Gear Pak (Red Bag)	12	
Personal First Aid Kit	12	
Nomex Shirts Small Medium Large X-Large	Enter Desired Number should have 18 pr (Men & Women)	12 various sizes
Nomex Pants - Men's 28x30 32x30 32x34 34x30 34x32 34x34 36x30 36x32 36x34 38x34 40x34		12 various sizes
Nomex Pants - Women's Size 10 Size 12 Size 14 Size 16		

Appendix N

Fitness

Job-Related Work Capacity-Tests for Wildland Firefighters

Background: Studies of wildland firefighting clearly show the link between fitness and work performance. Fit workers can do more work with less fatigue, and still have a reserve to meet unforeseen emergencies. They perform better in a hot environment, and recover faster from adverse firefighting conditions like long shifts and reduced rest. In short, fitness is the most important factor in work capacity.

Since 1975 Federal Agencies have used a 5-minute step test and an alternative 1.5 mile run test to screen candidates for wildland firefighting. In 1994 the Missoula Technology & Development Center (MTDC) began a review of work capacity testing alternatives. MTDC conducted a comprehensive job task analysis and extensive laboratory and field studies of candidate tests. The result is a family of job-related field tests.

Work Category	Test	Distance	Pack	Time
Arduous	Pack Test	3 Miles	45 lbs	45 min
Moderate	Field Test	2 Miles	35 lbs	30 min
Light	Walk Test	1 Mile	none	16 min

Pack Test The test consists of a 3 mile hike with a 45 pound pack (fire-suppression water bag) over level terrain. A time of 45 minutes, the passing score for the test, approximates a step test score of 45 (ml/kg.min), the established standard for wildland firefighters. The test is a valid, job-related test of the capacity for arduous work, defined as: "Duties involve field work requiring physical performance calling for above average endurance and superior conditioning. These duties may include an occasional demand for extraordinarily strenuous activities in emergencies under adverse environmental conditions and over extended periods of time. Requirements include running, walking, climbing, jumping, twisting, bending, and lifting more than 50 pounds; the pace of work typically is set by the emergency condition." The energy cost of the test is similar to that demanded on the job. The Pack Test is correlated to measures of aerobic and muscular fitness, as well as performance in field tasks such as working with hand tools, or carrying loads over rough terrain. The duration of the test insures the capacity to perform prolonged arduous work under adverse conditions, with a reserve to meet emergencies.

Field Test: A 2 mile hike with a 25 pound pack in 30 minutes, approximates a step test (max V02) score of 40. A job-related test of work capacity designed for those with moderately strenuous duties: "Duties involve field work requiring complete control of all physical faculties and may include considerable walking over irregular ground, standing for long periods of time, lifting 25 to 50 pounds, climbing, bending, stooping, squatting, twisting, and reaching. Occasional demands may be required for moderately strenuous

activities in emergencies over long periods of time. Individuals usually set their own work pace.

Walk Test This one mile walk test approximates a step test score of 35 is a test to determine the ability to carry out light duties: "Duties mainly involve office type work with occasional field activity characterized by light physical exertion requiring basic good health- Activities may include climbing stairs, standing, operating a vehicle, and long hours of work, as well as some bending, stooping, or light lifting. Individuals almost always can govern the extent and pace of their physical activity."

Instructions

The Pack Test is a 3 mile hike with a 45 lb. pack over level terrain. Field studies show that performance on the pack test is significantly related to performance of firefighting tasks, including line construction with hand tools. Studies conducted at the University of Montana Human Performance Laboratory indicate that the energy cost of the test is similar to the cost of firefighting tasks. A score of 45 minutes on the Pack test approximates a Step Test Score of 45 (ml/kg-min). Because of its length, the Pack Test is an excellent indicator of sustained work capacity. Scores on a flat course are highly related to performance on a hilly course. And performance on the Pack Test is significantly related to vascular fitness, including measures of upper and lower body strength. The Pack Test is: job-related, safe, inexpensive, and easy to administer. It is a valid, reliable, and objective measure of work capacity that does not adversely impact workers on the basis of gender, ethnicity, age, height, or weight. **(These instructions apply to the Field and Walk Tests).**

The Course

Course must be essentially level and have a firm, relatively smooth walking surface. Course length (3 miles) must be accurate: double-check measurements. Use a measuring wheel or a calibrated bicycle computer. Vehicle odometers are not sufficiently accurate.

Loop or out-and-back courses are preferable. Avoid one-way courses where unfavorable conditions (wind, grade) are not offset. A moderate grade (2-3%) is acceptable if the course starts and finishes at the same place. Have lap counters available for multi-loop courses. Use course monitors when needed.

Candidates must be informed of the course layout (use a map or sketch of the course). Use distance markers (e.g., at 1 or 1.5 miles) to aid candidates. Use hazard and traffic makers as needed.

Equipment

Packs: The 5 gallon backpack pump water bag (NSN8465-01-321-1678, cost \$35.23) used in test development is recommended: The number required will depend on the number of candidates to be tested simultaneously. If other packs are used the test administrator must insure the correct weight (45 lbs).

Pack liners: (NSN8465-01-321-1679, cost \$6.51): Have at least one extra liner for each pack.

Canteens:(NSN8465-00-102-6381, cost \$0.43): Use up to 2 in pack pocket to obtain proper weight (45 +/- 2 lbs).

Safety Vests/Route Markers: As needed.

Distance Markers: Use mile and mid-point markers so candidates can maintain proper pace.

Stop watches: Utilize 2 watches to provide back-up timing.

Vehicle: Bicycle or other vehicle to monitor candidates on the course.

Radios: As needed for monitoring and safety.

Scale: An accurate hanging style spring scale is recommended for weighing packs.

Forms: **PAR-Q** health screening questionnaire and an informed consent form (attached).

Data collection form (should include: site, date, conditions, test administrator, and column for name, gender, age, height, weight, Pack Test and other scores - step test, 1.5 mile run, etc.).

Test Administration

One person can administer the test when:

- The administrator is a trained First Responder (American Red Cross) or equivalent.
- The timer can monitor the course.
- The safety/med evacuation plan can be executed.
- Five or fewer people are being tested at one time.
- Candidate safety and compliance with test requirements can be assured.

For larger groups or when course monitoring is difficult, a 2 to 3 person team should be used.

Testing Tips

- Fill packs the night before to check for leaks (use plumber's Teflon tape to stop leaks in threaded fitting).
- Weigh bags before test. Check weight after the test if necessary. Note: Bags are used without trombone pumps.
- Group or staggered starts can be used. Many candidates will benefit from the support provided by a group start.

Environment: Administer the test in moderate environmental conditions; do not test new recruits when the temperature is high or when the temperature and humidity combine to create high heat stress conditions (see heat stress chart); if necessary, test early in the day to avoid high temperature /humidity combinations; avoid high winds that may affect performance.

Hydration: If the weather is hot, encourage candidates to drink fluids prior to the test, and provide fluid replacement mid way in the course. Candidates may carry a water bottle.

Altitude: Use this chart to adjust for tests administered at elevations above 4,000 ft.

Table 1: Altitude Corrections for Work Capacity Tests*

Altitude	Pack Test	Field Test	Walk Test
8-9,000 ft	90 sec	60 sec	30 sec
7-8,000 ft	75	50	25
6-7,000	60	40	20
5-6,000	45	30	15
4-5,000	30	10	10

* Add correction to required test time (e.g., Pack Test at 6-7,000 ft, add 60 seconds to test standard (45 min) for altitude adjusted standard of 46 n-dn

The altitude adjustment assumes that the candidate has had an opportunity to acclimate to the altitude of the test site. If a candidate doesn't meet the required standard, even with the adjustment, he or she should be encouraged to train at the altitude and retake the test.

Instructions for Candidates

In advance of test: Distribute confidential PAR Q physical activity readiness questionnaire so candidates can decide if they should seek medical advice before taking the test. Have candidates read and sign an informed consent form.

Clothing: Candidates may select the clothing worn during the test. "T" Shirts and shorts are acceptable. Footwear that provides ankle height support, such as hiking boots or ankle height sport shoes, is required for the Pack and Field tests, and recommended for the walk test.

Safety: Brief candidates on the test, the course, safety considerations, and accommodations. Tell candidates to terminate the test if they experience major physical problems or discomfort, or feel the need to terminate for any reason.

Pace: Demonstrate to candidates how they should hike (power walk) the course as fast as possible without jogging. The heel of one foot must make contact before the opposite toe leaves the ground. jogging or running will invalidate the test and require a retest.

Accommodations: Candidates may use gloves or other padding to make the pack more comfortable. A candidate-provided walking staff may be used during the test.

Hydration: If weather is hot, tell candidates to drink plenty of fluids prior to the test. Candidates may elect to carry a water bottle, but the extra weight will not be counted as part of the pack weight.

Essentials of Good Testing:

- An accurately measured flat course with good surface.
- Proper weight packs. Use the specified water bags and verify pack weight with a calibrated scale. If alternative packs are used encourage candidates to adjust them properly.
- Duplicate and accurate timing. Give candidates split times along the course (e.g., at one mile or the mid point - 1.5 mile for Pack Test).
- Candidates should be rested and well informed about the course and the need to maintain a fast pace.
- Favorable environmental conditions. Avoid adverse conditions.
- Complete the PAR Q physical activity readiness questionnaire and sign an informed consent form.

Safety

- A locally developed safety/med evacuation plan must be prepared for the course.
- A trained and qualified American Red Cross First Responder (or equivalent) who knows the symptoms of physical distress and appropriate first aid procedures must be on site during the test.
- Avoid use of roads and intersections where traffic is a problem or concern. When using roads, use traffic control devices and traffic controllers in hi-visibility vests as needed.
- Require candidates to read and sign the PAR Q health screening questionnaire and an informed consent form.
- Check to see that candidates are wearing proper (above ankle) footwear.
- Encourage candidates to stretch and warm up prior the test.
- Do not test tired or injured individuals, or test during conditions that could compromise health or safety.
- Monitor candidates to identify those having difficulties and encourage them to terminate the test if necessary.

- Encourage fluid intake and replacement and provide fluids in route when heat stress conditions (temperature /humidity) exist.
- At the mid-point, terminate those who are substantially behind the required pace (22.5 minutes for 1.5 miles and/or are having difficulty maintaining the pace. Candidates cannot jog or run to make up time.
- Encourage a cool down with an easy walk after the test. Monitor the recovery of candidates who appear exhausted or distressed.
- Recommend several weeks of training before retaking the test.

Training for the Pack Test

Begin at least 4 to 6 weeks before you report for duty. Train by hiking or power walking, using the ankle height footwear you will use in the test.

Hike a 3 mile flat course without a pack. When you can cover the course in less than 45 minutes; Add a pack with about 25 pounds to your training hikes;

Increase the pack weight until you can hike 3 miles in 45 minutes with a 45 pound pack. Also:

- Hike hills (w/pack) to build leg strength and endurance
- Jog the flat course (w/o pack) to build aerobic fitness.
- Hike/jog over distance for stamina.
- Engage in cross-training (mountain biking, weight lifting).
- Finally, do job-specific tasks and training to become work hardened for the coming season. Wear work boots on extended hikes. Work with hand tools to prepare trunk and upper body muscles for prolonged work. Work hardening insures that the hands, feet, muscles, tendons and ligaments used on the job are tough and ready to go.

Informed Consent Work Capacity Tests 2/97

Pack Test is intended for those involved in arduous duties (defined as requiring a max V02 of 45, lifting more than 50 pounds and occasional demand for extraordinarily strenuous activities). The 3 mile test with a 45 pound pack in 45 minutes is strenuous, but no more so than the duties of wildland firefighting.

Field Test is intended for those with moderately strenuous duties (requires a max V02 of 40, lifting 25 to 50 pounds, and occasional demand for moderately strenuous activity). The 2 mile test with a 25 pound pack in 30 minutes is fairly strenuous, but no more so than field duties.

Walk Test intended for those whose duties involves light work with occasional field activity (required max V02 of 35). The -1 mile walk in 16 minutes is moderately strenuous, but no more so than the duties assigned.

Risks: There is a slight risk of injury (blisters, sore legs, sprained ankle) for those who have not practiced the test. If you have been inactive and have not practiced or trained for the test, you should engage in several weeks of specific training before you take the test. Be certain to warm up and stretch before taking the test, and to cool down after the test. The risk of more serious consequences (e.g., respiratory or heart problems) is diminished by completing the PAR Q physical activity readiness questionnaire.

If you cannot answer NO to all the questions in the PAR Q health screening questionnaire, or if you are over 40 years of age and unaccustomed to vigorous exercise, you should contact your physician, by phone or in person, before you take the test. Your physician may want to see PAR Q and information about the test or job demands.

1. I have read the information on this form and understand the purpose, instructions, and risks of the job-related work capacity test.
2. I have read, understood, and truthfully answered the PAR Q physical activity readiness questionnaire.
3. I believe I have the ability to complete the test and carry out the assigned duties of the position (e.g., wildland firefighter).
4. I assume responsibility and release the US Government from liability for injuries sustained in testing that result from any physical or mental disorders.* Reference EEOC #915.002 (5/19/94)

Test (circle) Pack Field Walk

Signature _____ Date _____

Print Name _____ Witness _____

QUESTIONS AND ANSWERS "PACK TEST"

1. Why are we changing from the Step Test and 1 1/2 mile run?

ANSWER: The Step Test has been used since 1975 by Federal land management agencies. New Laws (Americans With Disabilities Act), field experience and research on long-term work capacity caused us to reevaluate the current tests. In 1990 the Service-Wide Civil Rights Action Group requested the Forest Service Fire and Aviation Management staff to evaluate the Step Test. They believed that it discriminated against people who should be able to participate in fire activities. The Missoula Technology and Development Center (NMC) was assigned the work of assessing the technical and legal aspects of the Step Test and 1 1/2 mile run. The appropriateness of the physical fitness standard for fire suppression positions was evaluated by the National Wildfire Coordination Group (NWCG). The conclusions were:

The Step Test and 1 1/2 mile run do not meet Federal requirements of testing employee fitness (Federal Uniform Standards for Employee Selection Procedures).

The Step Test and 1 1/2 mile run are not performance related and are therefore not appropriate tests.

Many of the fire position physical fitness standards were not required in order for incumbents to perform the duties of the positions. The fitness requirements were eliminated for many positions and were revised for others in the 1993 revision of the Wildland Fire Qualification Subsystem used by NWCG. (See Summary of ICS Physical Fitness Requirements attached to this document.)

The post-exercise heart rate count used in the step test is difficult to perform accurately thus giving incorrect fitness assessments for some employees.

2. What is the objective of fitness testing/ the "Pack Test"?

ANSWER: Fitness testing was introduced to the process of selecting wildland fire personnel to help reduce the number of heart attacks and other physical fitness related illnesses and injuries experienced by firefighters. Specifically, fitness testing is to determine if a person has the minimum levels of aerobic and muscular fitness to perform the tasks associated with their assigned fire suppression positions safely and effectively.

3. Did line management participate in the decision to utilize the "Pack Test"?

ANSWER: The direction for Fire and Aviation Management to review the Step Test in response to the Service-wide Civil Rights Group came from Dale Robertson, Chief of the Forest Service at that time. The action plan for the review was accepted by the Chief. A 5100 memorandum dated May 29, 1996 signed by John Chambers acting for the Director

of Fire and Aviation Management went to all Regional Foresters and Area Director requesting review and comments. The letter explained that the "Pack Test" was proposed to replace the existing tests and giving the history and rationale leading to the "Pack Test".

4. Why was the "Pack Test" chosen?

ANSWER: The enclosed materials contain the details but the general reasons are:

- The existing tests were not appropriate in terms of what they were established to evaluate or with respect to legal requirements and the "Pack Test" was developed to meet those criteria.
- The "Pack Test" development followed the Federal Uniform Guidelines for Employee Selection producers beginning with a Job Task Analysis for Wildland Firefighting.
- The "Pack Test has "energy costs" similar to tasks performed on the fireline. It is significantly correlated to laboratory measures of aerobic and muscular fitness and to performance on field tasks.
- Statistical analyses of the data from field tests run on 333 firefighters show no "adverse impact" for gender, ethnicity, age, height or weight based on the Equal Employment Opportunity Commission (EEOC) standard.

5. Are all state and contractor personnel required to take the "Pack-Test"?

ANSWER: The Forest Service requires all contractors' personnel to meet the fitness standard used by the Forest Service. After January 1, 1998, contractors personnel employed by the Forest Service will have to pass the "Pack Test" if required by the position filled. All agencies have the flexibility to establish the appropriate physical fitness test(s) for their personnel under the ICS 310-1, Wildland Fire Qualification Subsystem Guide.

NWCG members (includes the states) accept each others' personnel based on the certification used by the respective members.

6. Was there a control group for the "Pack"? What was its makeup? What statistical information is available?

ANSWER: Yes, the attached information prepared by Dr. Sharkey describes the design of the project and details the steps involved.

7. Is the "Pack Test" gender neutral?

ANSWER: Yes, Dr. Sharkey's information describes the testing, the analyses of the data obtained and the conclusions relative to "adverse impact" defined by EEOC.

8. Is the "Pack Test" equally effective in testing the fitness of a 200-pound firefighter and a 120-pound firefighter (45 pound pack requirement for Arduous)?

ANSWER: Yes, Dr. Sharkey's information shows no "adverse impact" based on firefighter weight.

9. Were fire medical records reviewed to ensure that the "Pack Test" is the correct test to prevent injuries/illnesses resulting from inadequate fitness levels?

ANSWER: The goal of work task related testing is to subject employees to testing that represents tasks they would routinely perform on the job. The task analysis identified those kinds of tasks. The development of the two alternative tests that were analyzed was based on the tasks identified. The "Pack Test" is not and was not intended to replace an intensive physical examination which could evaluate the myriad of physical and medical parameters and conditions to "ensure" accident/illness prevention. It is a screening that can be done by the agencies at a reasonable cost which will identify employees who do not have the muscular and aerobic fitness required to safely and effectively perform the tasks required of them fighting fire.

10. Was a medic physician advisor consulted during the development of the "Pack Test"?

ANSWER: Yes, Dr. Sharkey's educational and experience background is enclosed. Fitness, human performance and testing have long medical related histories. Dr. Sharkey, as a professional Human Performance/Exercise Physiologist has incorporated the pertinent background and technology in the development of the "Pack Test". The "Pack Test" has been formally presented to the Occupational Physiology and medicine section of the American College of Sports Medicine in 1994-95 and 96.

11. How/why was the 45 pounds determined to be the weight for the Pack Test?

ANSWER: Early in the project to evaluate the Step Test and 1 1/2 mile run, fire program managers in the federal agencies were polled to determine the critical tasks required of firefighters. Responses showed a high need for firefighters to be able to carry heavy packs such as hose bags, pumps and 5-gallon waterbags. The 5 gallon waterbag was chosen because it fit the identified task and it is commonly available.

12. Were Demographics of the fire organization (red carded employees) reviewed in the development of the "Pack Test"?

ANSWER: The Wildland Fire fighter Job Task Analysis included input from all Federal agencies from all geographic areas of the United States. The field testing done to evaluate the Pack Test included statistically valid numbers representing gender, ethnicity, age, height and weight.

13. Has the test protocol been reviewed by medical doctors? With what results?

ANSWER: All phases of test development have been reported at the Occupational Medicine and Physiology Research section of the American College of Sports- Medicine for peer review and feedback- We have consulted with researchers at the U.S. Army Environmental Medicine Laboratory in Natick, and with physicians and physiologists in Canada, Australia and New Zealand. The "Pack Test" has received favorable comments and has caused some to reevaluate their approaches.

14. Define and explain the energy expenditure formula of the Pack Test.

ANSWER: The pack weight and required pace (4 MPH) were determined in laboratory studies to approximate the average energy cost of fireline duties, 22.5 ml of oxygen per kilogram of body weight. The previous fitness standard (45 ml) was based on that energy cost. Correlation analysis of treadmill oxygen intake (max V02), step test and the 1 1/2 mile run score of 45 ml/kg/minute. That indicates that the "Pack Test" does not "raise the barn. it does show that an individual has the capacity to sustain the energy cost of firefighting duties - at least for 45 minutes.

15. Administering the "Pack Test" to 1200 to 1300 firefighters is a huge investment in time. Additionally there is a concise period of time (window) in which they can be done. Are there recommendations on how this can best be accomplished?

ANSWER: Using the "Pack Test" does require an investment of time and energy but the benefits of screening employees who do not have the aerobic or muscular fitness to safely perform firefighting duties out weigh the drawbacks. our commitment is to perform our work safely and the screening is a small price to pay. Firefighters have been outspoken about the inadequacy of the current fitness testing (TriData Phase I report of the Wildland Firefighter Safety Awareness Study) and the need to have more realistic testing. Anecdotal reports have repeatedly charged that emergency hire firefighters often are not fit enough to walk the fireline to their work assignment or to work effectively through the operational period. Anecdotal reports from medical units have reported that many firefighters they saw were not physically fit enough to perform the work required. A screening that deals with those three areas of concern would be very beneficial to prospective firefighters and the agency.

Fire Program managers will have to work out testing schedules. Compared to the Step Test the "Pack Test" takes longer per test it but lends itself to testing several/many employees at a time. The requirement for physical fitness testing to be done prior to issuing a fire qualification (red card) has not changed so there is no impact on date of completion. A significant benefit to the "Pack Test" is that employees can practice the test and know that they are capable of passing the test prior to coming in for official testing. This should reduce the need for and impact of repeat testing.

- 16 Is the use of a treadmill acceptable for retesting?

ANSWER: The "Pack Test" was designed and validated on a flat track. No work has

been done to validate the tests on a treadmill (it would require at least a 1% grade to adjust for lack of wind resistance, terrain variation etc. Holding the rail for balance would invalidate the test given on the treadmill and it is likely most would need to hold the rail. There is no reason to increase the cost of testing while increasing the risk of inaccurate results.

17. Is it possible to use other packs (not the bladder bag)?

ANSWER: Yes, the test requires that the pack meet the weight specified for the respective test. Good testing will require that pack weights are verified prior to and immediately following testing.

18. The test is to be conducted in temperatures below 80 degrees. In some geographic locations the temperature exceeds 80 degrees during June when employees would need to be tested. What options are available?

ANSWER: The latest publication draft by Dr. Sharkey does not contain the temperature reference. It does include a heat stress and a recommendation about testing during high heat stress conditions.

19. Are there recommendations on how to manage the logistics of administering the "Pack Test"?

ANSWER: Dr. Sharkey makes recommendations on how to conduct the tests in the interest of test validity and safety. We expect to get additional suggestions after the tests have been used for training and practice.

20. There were several questions pertaining to the liability clause and the PAR-Q form. Dr. Sharkey has suggested the use of the forms to encourage and aid employees to assess their personal health and fitness states prior to taking the test. The Forest Service will determine if and how forms such as those 2 are to be used and will include the instructions in the implementation instructions.

21. What is the reason for omitting blood pressure reading immediately prior to taking the "Pack Test"?

ANSWER: Use of blood pressure (or similar types of information like heart rate used in the Step Test) violates the EEOC's interpretation of the Americans with Disabilities Act (ADA). Blood pressure was not a parameter in the test or previous testing and has no direct correlation with the ability of employees to safely and effectively perform the tasks of their positions.

22. Were fire medical records reviewed; was a fire medic advisor consulted?

ANSWER: In 1994-95, interviews were conducted with crew members, safety officers

and crew "bosses. KMC and the SHWT continually review medical records, injury reports and other information related to employee injuries and illnesses. we requested advice from physicians, physiologist, field workers and others during the development and field evaluation of the test. The NWCG SHWT was also consulted and asked for comments during the development process.

23. Were demographics of the fire organization reviewed?

ANSWER: Yes, all studies included female subjects and in the field study, we attempted to "mirror" the composition of the work force in terms Of gender, ethnicity, age, height and weight of firefighters. This consideration is mandated by the Federal Uniform Guidelines for Employee Selection procedures.

24. Has the "Pack Test" protocol been reviewed by medical doctors?

ANSWER: Yes, see response above: American College of Sports Medicine, U.S. Army, etc. None has questioned the test. U.S. Army has conducted studies in which they trained female recruits to hike at 4.4 mph with 75 pounds.

25. Liability; what does the EEOC have to do with it?

ANSWER: The language for the suggested waiver comes from an EEOC publication that discusses the ADA. The ADA precludes asking questions re: a candidate's health or disability in a pre-employment test. The EEOC suggests this waiver subject to managements, approval.

26. Why use the PAR Q form?

ANSWER: It is a validated questionnaire that has been shown to substantially reduce risk in exercise tests and training. Developers require that it be used as is. We do not intend to see the responses on the PAR Q, only to confirm that the candidate read and understood what it says. The form considers the major risks - other questions were discarded during the development of the form.

27. Can the Pack Test be used to meet the fitness requirements for Law Enforcement?

ANSWER: Yes, the Law Enforcement Coordinators for western regions of the FWS agreed to also use the Pack Test as a means to test fitness for LE personnel. Those passing the Pack Test will receive a Level 5 Fitness Rating.

28. Let's say that I start out with a 45 pound pack to do the pack test. I pass the 2 mile mark in under 30 minutes, but it takes me over 45 minutes to finish the 3 mile course. Can I receive a Moderate rating?

ANSWER: Yes. This would more than demonstrate your ability to perform at a Moderate

level.

PAR-Q and YOU

(A Questionnaire for People Aged 15 to 69)

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: Check YES or NO.

YES	NO	
___	___	1. Has your doctor ever said that you have a heart condition <u>and</u> that you should only do physical activity recommended by a doctor?
___	___	2. Do you feel pain in your chest when you do physical activity?
___	___	3. In the past month, have you had chest pain when you were not doing physical activity?
___	___	4. Do you lose your balance because of dizziness or do you ever lose consciousness?
___	___	5. Do you have a bone or joint problem that could be made worse by changes in your physical activity?
___	___	6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
___	___	7. Do you know of <u>any other reason</u> why you should not do physical activity?

IF YOU ANSWERED YES TO ONE OR MORE QUESTIONS

Talk with your doctor by phone or in person **BEFORE** you start becoming much more physically active or **BEFORE** you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.

You may be able to do any activity you want - as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.

Find out which community programs are safe and helpful for you.

IF YOU ANSWERED NO TO ALL QUESTIONS	<p>DELAY BECOMING MUCH MORE ACTIVE:</p> <p>If you are not feeling well because of a temporary illness such as a cold or fever - wait until you feel better; or</p> <p>If you are or may be pregnant - talk to your doctor before you start becoming more active.</p>
<p>If you answered NO honestly to <u>all</u> PAR-Q questions, you can be reasonably sure that you can:</p> <p>Start becoming more physically active - begin slowly and build up gradually. This is the safest and surest way to go.</p> <p>Take part in a fitness appraisal - it is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively.</p>	<p>PLEASE NOTE: If your health changes so that you then answer YES to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.</p>

Informed Use of the PAR-Q The Canadian Society for Exercise Physiology, Health Canada and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.

You are encouraged to copy the PAR-Q but only if you use the entire form

Note: If the PAR-Q is being given to a person before he or she participates in a physical activity program or a fitness appraisal, this section may be used for legal or administrative purposes.

I have read, understood and completed this questionnaire. Any questions I had were answered to my full satisfaction.

Name: _____

Signature: _____ Date: _____

Signature of Parent or Guardian: _____
(For participants under the age of Majority)

Witness: _____ Date: _____

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Appendix O

Step-up Plan

RESERVED

Appendix P

Wildland Fire Situation Analysis

Appendix Q

Utah Smoke Management Plan

RW FIRE
MAIL STOP 60130

Memorandum

To: Project Leader, Fish Springs National Wildlife Refuge

From: Regional Fire Management Specialist, Mountain-Prairie Region

Subject: Fire Management Plan

Attached is the approved copy of the Fire Management Plan for Fish Springs National Wildlife Refuge and a floppy disk containing an electronic file of the approved Fire Management Plan. The only thing remaining at this time to bring the plan up-to-date is to include a copy of the current Fire Agreement (Appendix K). Please send a copy for our files to my attention.

Over time conditions will change at the Refuge. The plan should be reviewed annually to insure it is current. If large scale changes need to be made, the plan should be rewritten and submitted for review and approval in accordance with existing policy.

If you have any questions or comments, please contact me at 303-236-8145, extension 618.

Attachment

bcc:RO, Rwf, RW file,
RW:CDouhan