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FIRE MANAGEMENT PLAN

1.0 INTRODUCTION

1.1 General

One of the primary objectives of the U.S. Fish and Wildlife Service (Service) in managing natural areas is the maintenance of ecosystems and their dynamic processes to ensure as nearly as possible a functional natural environment. As one of these processes, fire can constitute one of the greatest influences on an ecosystem.

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. This plan meets that requirement and provides fire management guidelines for Seedskadee and Cokeville Meadows National Wildlife Refuges.

Table 1: Management Units

Management Unit	Acres
Seedskadee National Wildlife Refuge	26,382
Cokeville Meadows National Wildlife Refuge	8,267

1.2 Description of Refuge

1.2.1 Seedskadee National Wildlife Refuge

1.2.1.1 Location

The Refuge headquarters is located 37 miles northwest of the city of Green River, Wyoming (Figure 1). The entire Refuge is within Sweetwater County in the heart of the Green River Basin of southwestern Wyoming (Figure 2).

1.2.1.2 Topography and Slope

Geographically, the Refuge is long and narrow, and bisected throughout its length by the Green River. The north boundary of the Refuge is seven miles below Fontenelle Dam. From here the Refuge extends 34 miles downstream and ranges in width from one to three miles. Total relief within the Refuge is 300 feet. The highest elevation is 6,490 feet near the north end of the Refuge at McCullen Bluff. The lowest elevation is 6,190 feet at the south end of the Refuge, below Big Island.

Figure 1: Vicinity Map

Figure 2: Seedskadee NWR

1.2.1.3 Soils

Soils of the area are generally poorly developed, susceptible to wind and water erosion, and have a relatively shallow profile as a result. Soils within the flood plain are dominated by alluvial deposits and range from deep silts to cobbles. Soils in the flood plain may change over short distances due to the influence of an ever changing river channel over (geologic) time.

1.2.1.4 Water

A major influence upon the flood plain is runoff supplied by the Green River and the Big Sandy River, a tributary to the Green River. Secondary drainage are numerous and may provide significant runoff, if only for brief periods. Two of significance include the Dry Creek that drains the Dry Creek Unit and adjacent federal lands, and Eighteen Mile Wash that drains a large area north of the Refuge and enters in the Pal Unit about the middle of the Refuge. In a typical year, snow melt occurs before the frost has gone out and runoff begins in the Dry Creek and Eighteen Mile Wash, which last one to two weeks. The Big Sandy River begins to carry significant runoff and increased flows may last for a month or more. The Green River is supplied primarily from snow melt in the Wind River Range and secondarily from drainage in the Wyoming Range. Runoff in the Green River below Fontenelle Dam is controlled by operations of the Dam. Significant increases through controlled releases from Fontenelle Dam begin in May and peak in July, after which flows are typically lowered. All of these drainage impact the Refuge by creating conditions favorable for the development of riparian and wetland habitats.

1.2.1.5 Climate

The Refuge is located on what is classified as a high desert plain. Winters are cold (to -40 Fahrenheit) summers are warm (to +100 Fahrenheit), and the annual precipitation averages less than seven inches (6.48"). Most precipitation comes in the form of snow or rains during April, May and June. Summer lightning storms are common, however they usually produce little significant rainfall.

1.2.1.6 Vegetation

About 4,338 acres of riparian area parallel the Green River through the Refuge, however, intensive management of this resource has only recently been considered. Patches of narrowleaf cottonwood with an understory of willows and berry producing shrubs are found along the river corridor. This habitat plays a key role in supporting numerous species of migratory and resident wildlife along the Green River corridor. Upland habitat management has historically centered on habitat protection through fencing and prescribed burning. Fires occurring under certain climatic conditions and season have adverse effects on this habitat.

Habitat on the Refuge can be separated into four broad types: **riverine**, **wetland** (marsh and wet meadow), **riparian** (shrub and forested), and **upland** (shrublands - sagebrush, greasewood and short statured mixed desert shrub).

Table 2: Habitat Types

HABITAT	ACRES
Riverine	1,394
Wetland	1,115
Riparian Forest	4,349
Upland Shrub	19,212

Source: Seedskaatee NWR Draft Comprehensive Conservation Plan and Environmental Assessment. 2002

G Riverine and Wetland

Approximately 2,500 acres of riverine and wetland (marsh and wet meadow) habitat exists on the Refuge. This includes deepwater and shallow marshes, wet meadows, and the river channel. Hardstem bulrush (*Scirpus acutus*), and cattail (*Typha latifolia*) are the dominant plant species in the tall-emergent marshes. Wet meadows are shallowly flooded areas often classified as seasonal or temporary wetlands. They are dominated by baltic rush (*Juncus balticus*), spikerush (*Eleocharis* spp.), bluejoint reedgrass (*Calamagrostis canadensis*), reed canarygrass (*Phalaris arundinacea*), Missouri iris (*Iris missouriensis*), and several species of domestic grasses. The river channel supports a large abundance of submerged aquatics such as pond weeds (*potamegeton* spp.) and coontail (*ceratophyllum* spp.) As the water levels recede, numerous species of hydrophytic vegetation such as baltic rush (*Juncus balticus*), sloughgrass (*Beckmania scyzachne*), and bluejoint reedgrass (*Calamagrostis canadensis*) begin vigorous growth along the banks below the high water mark. These sites are affected by the annual discharges and other impacts resulting from the Fontenelle Dam.

Currently, a serious threat to Refuge wet meadows and adjoining riparian areas is the invasion of non-native plants. Perennial pepperweed (*Lepidium latifolium*) is the most troublesome species. It has already established extensive stands in some wet meadow area. Saltcedar (*Tamarix ramosissima*), Russian knapweed (*Centaurea repens*), Canada thistle (*Cirsium arvense*) and musk thistle (*Carduus nutans*) have also been documented. Under certain favorable conditions, native vegetation is replaced with these invasive exotics. Disturbance of the ground surface by mechanical means appears to favor these species. Control has included biological releases for Canada and musk thistle and mechanical and chemical treatment for all species listed above. Other control methods considered to date include prescribed burning, farming and reseeding, and grazing. Prescribed burning has shown promise in other locations when used in combination with other control methods.

G Riparian

For the purposes of this plan, riparian habitat (shrub and forest) includes both the

bottomland and aquatic portions of the creeks and rivers on the Refuge. Approximately 4,350 acres of riparian forest and shrub habitat exist on the refuge. The dominant plant species in this habitat are narrowleaf cottonwood (*Populus angustifolia*) with an understory of shrubs or grasses. Areas of coyote willow (*Salix exigua*) and sandbar willow (*Salix exigua*) also exist in the riparian corridor. There are areas which are dominated by berry producing shrubs, such as Wood's rose (*Rosa woodsii*), silver buffaloberry (*Shepherdia argentea*), silverberry (*Eleagnus commutata*), skunkbush sumac (*Rhus trilobata*), golden current (*Ribes aureum*), gooseberry (*Ribes cereum*), and dogwood (*Cornus stolonifera*). On the Refuge this habitat exists primarily within the flood plain of the Green River. The Big Sandy River has some riparian shrub areas but no areas of cottonwood forest.

G Upland Shrub

Approximately 19,000 acres of semidesert upland shrub habitats exists on the Refuge. This habitat contains many intergrading shrub types. For convenience these have been mapped as three major shrub types: Sagebrush-dominant, greasewood dominant, and short-statured mixed desert shrub.

The dominant plant species in the sagebrush type include Wyoming big sagebrush (*Artemisia tridentata*), rabbitbrush (*Chrysothamnus nauseosus*), four winged saltbush (*Atriplex canescens*), shadscale (*Atriplex confertifolia*), and winterfat (*Eurotia lanata*). Grasses include western wheatgrass (*Agropyron smithii*), Indian ricegrass (*Oryzopsis hymenoides*), and prairie june grass (*Kohleria cristata*). Major forms include scarlet globe mallow (*Sphaeralcea coccinea*), beard tongue (*Penstemon* spp.) and pricklypear cactus (*Opuntia polyacantha*).

Dominant plant species in the greasewood dominant habitat include greasewood (*Sarcobatus vermiculatus*), saltgrass (*Distichlis spicata*), alkali sacaton (*Sporobolus airoides*) and in some places basin wild rye (*Elymus cinereus*). Dominant plant species in the short statured mixed shrub habitat type include horsebrush (*Tetradymia canadensis*), bud sage (*Artemisia spinescens*), Gardner's saltbush (*Atriplex gardnerii*), and bottlebrush squirreltail (*Sitanion hystrix*).

1.2.1.7 Wildlife

The Refuge's habitat diversity is reflected in its broad diversity of wildlife. The Refuge's wetland and riparian habitats are unique to the surrounding predominantly dry upland habitat. This oasis-like setting is a valuable habitat for numerous resident and migratory species. Species lists for birds, mammals, fish, amphibians, and fish are available included in Appendix A.

1.2.1.8 Endangered Species

Currently, *Spiranthes diluvialis* is the only federally listed threatened plant species likely to occur on the Refuge and no endangered plant species are listed. Several extensive plant surveys

have been completed and Refuge staff have spent many hours looking for this species and it has not been detected. If it were to occur, research indicates that fire stimulates flowering and seed production in most instances. Fire may damage the plant if burned when actively growing. This would occur when soil and fuel moisture were high, conditions which would likely not support a fire.

A number of other species listed as Species of Special Concern in the Wyoming Natural Diversity Database are listed as possibly occurring on the Refuge. These include dwarf milkweed (*Asclepias uncialis*), Rollin's cat's-eye (*Cryptantha rollinsii*), Wilcox eriastrum (*Eriastrum wilcoxii*), (*Opuntia polyacantha* var. *junipera*). Although no information could be found on these specific species, species in the same genus with a similar growth habit were found to be located in habitats which rarely if ever burned due to lack of fuels or were stimulated to flower and produce seed after a fire.

There are five terrestrial threatened or endangered species likely to occur on the Refuge or found within the species historic range. They include the bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falcon peregrinus*), whooping crane (*Grus americana*), gray wolf (*Canis lupus*), and black footed-ferret (*Mustela nigripes*).

Bald eagles are common in the winter on the river corridor with up to 40 recorded at one time. Nesting attempts have steadily increased and in 1997 two nests successfully fledged at least one eaglet each. Cottonwood trees are commonly used for nesting platforms and foraging perches. Protecting these mature cottonwoods from fire is essential to providing suitable bald eagle nesting and foraging habitat. Peregrine falcons are rare migrants through the Refuge. One to two sightings a year are reported in the fall and spring. Wild or prescribed fire would likely have no adverse effects on peregrine falcons. There have been several documented sightings of whooping cranes using the developed wetlands near headquarters. These birds were part of the Grays Lake NWR experimental flock. No sightings have occurred in the recent past. Wild or prescribed fire would likely have no adverse impacts on whooping cranes. Gray wolves were reintroduced to the Yellowstone ecosystem and several of these animals have been reported in the upper Green River area. A lone male wolf was illegally shot north of the Refuge near Daniel, about 70 miles away. Wild or prescribed fire would likely have no adverse impacts to the Gray wolf. Black footed ferrets have been reported historically on the Refuge. The last confirmed sighting was in the late 1970s by Wyoming Game and Fish personnel. It is believed that there are no black footed ferrets found on the Refuge. If present, however, wild or prescribed fire would not likely adversely effect the black footed ferret.

Downstream threatened or endangered (T&E) species or their habitat within the Green River/Colorado River drainages were considered, including the Colorado squawfish (*Ptychocheilus lucius*), Humpback chub (*Gila cypha*), Bonytail chub (*Gila elegans*), and Razorback sucker (*Xyrauchen texanus*). With the construction of Flaming Gorge Dam, all suitable habitat was eliminated. Wild or prescribed fire would likely have no adverse effect on these species.

Other species of concern include the following candidate species: long-legged bat, Preble's

shrew, wolverine, trumpeter swan, Harlequin duck, black tern, white-faced ibis, ferruginous hawk, northern goshawk, long-billed curlew, loggerhead shrike, western boreal toad, and roundtail chub. There is no critical habitat that has been designated for this area for these species.

1.2.1.9 Land Use

The Refuge is almost entirely surrounded by federal lands administered by the Bureau of Land Management (BLM). There are a few parcels of State land and a limited amount of private land that also border on the Refuge. Two BLM Districts adjoin the Refuge and have primary fire management responsibilities for these lands. Ranching and livestock grazing is the primary industry in the immediate vicinity.

1.2.1.10 Values and Improvements On and Adjacent to Station

Refuge buildings include a headquarters building consisting of a small visitors information center and offices, a maintenance shop, and two heavy equipment storage buildings. In addition to the Headquarters building there are three homes and one bunkhouse.

Two in holdings totaling 5 acres exist within the boundary of the Refuge. One of the two sites is occupied by a private party. Fuels surrounding this in holding are very light and it is unlikely that the fuels could carry a fire except in extreme fire danger situations. One neighboring ranch is located 1 mile north of the north boundary of the Refuge and another ranch is located approximately 3 miles south of the south boundary.

1.2.11 Cultural Resources

The Refuge is rich in historic and prehistoric resources. Native Americans used the Green River to travel through the arid landscape and in more recent times, hundreds of thousands of emigrants traveled west through present day Refuge. National Historic Trails include the Oregon Trail, California Trail, Mormon Trail, and Pony Express Trail. The Lombard Ferry site has been designated as a National Register of Historic Places site. In addition, nearly two dozen historic era buildings and dozens of prehistoric sites have been documented on the Refuge.

1.2.2 Cokeville Meadows National Wildlife Refuge

Seedskaadee NWR also administers Cokeville Meadows National Wildlife Refuge. The area, composed of irrigated meadows, was identified by the Service in the 1960's as critical waterfowl production habitat. Recently established, Cokeville Meadows NWR will be 26,657 acres in size when the lands within the boundary are fully acquired. As of November 1, 1998, only 5900 acres had been acquired. Due to the size and location of the blocks of land that have been acquired to date, the area is not being actively managed as a Refuge.

As more blocks of land are acquired and the Service becomes involved in active management of the Refuge, the Service will develop a Fire Management Plan to fully address the fire

management needs of the area. Until a plan is developed, the only option available to the Service is to fully suppress all fires occurring on Service lands.

The Refuge Operations Specialist at Seedskafee National Wildlife Refuge will meet with Cokeville Volunteer Fire Department officials to develop agreements to provide fire protection for Service lands. The agreement(s) will be incorporated into this plan.

1.3 Historical/Ecological Role of Fire

Documentation of historical fire frequencies in the Great Basin are generally lacking. It is believed that fire played a more significant role in the development of habitats prior to European settlement. Discussions with fire ecologists and habitat managers from federal and State agencies surrounding the Refuge reveal that their observations and research conclude that historical fire frequencies ranged from 15 to 75 years in sagebrush uplands. This would vary considerably depending on amount and type of fuels, elevation, aspect, etc. Little information exists on historical fire frequencies in riparian zones, however this may correlate to sagebrush uplands as fires carrying through the uplands would have the opportunity to ignite riparian zones. Whether these areas would ignite likely would be controlled by the moisture content of the fine fuels.

Fire has played a historical role in shaping the development and maintenance of habitats in southwest Wyoming. Without doubt, fire occasionally swept across the sagebrush-grass steppes during their development. Sagebrush is highly flammable when dry. During the dry summer months, an understory of cured grasses and forbs would readily carry a fire, even if the shrubs were scattered. Judging from the reports of early explorers, these fires were not frequent enough to alter the vegetation in favor of more fire-enduring grasses (Mueggler, 1976). It is reasonable to assume that fires originating in sagebrush-grass habitat could easily be driven by the wind into riparian areas and the river bottom, effecting other ecosystems as well.

As settlement increased, the number of fires was reduced and frequencies were lengthened to present day levels through a combination of intense livestock grazing which removes much of the fine fuel load, aggressive fire control efforts, installation of man made firebreaks such as roads, and the reduction in intentionally set fires which was widely reported as a practice used by many Native American tribes. The Wyoming Game and Fish Department believes that the reduction in fire frequency has in some areas contributed to the development of extensive areas of climax community shrub habitats. This has in turn negatively effected sage grouse, antelope, mule deer, elk, and numerous other species that require some areas of early to mid successional shrub/grass communities. This plays a critical role in survival for these species during severe winters and fawning and brood rearing periods. Much of the Refuge's habitat is considered crucial winter range for antelope and the basin supports the highest densities of sage grouse in the world.

Neighboring landowners have given reports to past refuge managers of intense fires that burned through the river bottoms. Fire scarring observed on exterior bark and evident on tree cores gives evidence of fires with enough intensity to scar mature cottonwoods dating back over 150

years.

1.4 Refuge Fire History

Fire reports have been filed at the refuge for each wildfire occurring on the refuge since 1970. Starting in 1982, fire reports have been entered in to a national fire data base known as SACS. Since that time, refuge personnel have responded to 12 wildfires, nine of which were on service lands. The majority of fires occurring on the refuge were ten acres or less. However, one fire of 136 acres and another of 40 acres were documented. Lightning was responsible for four fires that burned a total of 156 acres. Based on the information available from SACS, the refuge averages a fire every two years. That statistic can be misleading since the refuge only had two reported fires during the first ten years of the reporting period. Since 1993, the refuge has averaged one start a year. A listing of past wildfires and other related information is included in Appendix B.

2.0 POLICY COMPLIANCE - GOALS AND OBJECTIVES

2.1 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 Fire Management Plans must be consistent with firefighter and public safety, protection values, and 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 Fire Management Plans 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.

2.2 NEPA Compliance

This plan meets the requirements established by the National Environmental Protection Act (NEPA). Regulations published in the Federal Register (62FR2375) January 16, 1997, categorically excludes prescribed fire when conducted in accordance with local and State ordinances and laws. Wildfire suppression and prescribed fire operations are both categorically excluded, as outlined in 516 DM2 Appendix 1. The Service has determined that prescribed fire activities will only be carried out in accordance with a Fire Management Plan that tiers off a land management plan that has addressed the use of fire as a management tool and has been through the NEPA process. This plan tiers off the Seedskadee NWR Comprehensive Conservation Plan which has been through the NEPA process (Attachment 1).

2.3 Authorities Citations

Authority and guidance for implementing this plan are found in:

- G Protection Act of September 20, 1922, 42 Stat. 857;16 U.S.C. 594.
- G Economy Act of June 30, 1932, 47 Stat. 417; 31 U.S.C. 315.
- G Reciprocal Fire Protection Act of May 27, 1955, 69 Stat.66.67;42 U.S.C. 1856, 1856 a and b.
- G National Wildlife Refuge System Administrative Act of 1966, as amended, 16 U.S.C. 668 dd-668 ee.
- G Disaster Relief Act of May 22, 1974, 88Stat. 143; 42 U.S.C. 5121.

- G Federal Fire Prevention and Control Act of October 29, 1974, 88 Stat. 1535; 15 U.S.C. 2201.
- G 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.
- G Supplemental Appropriation Act of September 10, 1982, 96 Stat.837.
- G Wildfire Assistance Act of 1989, Pub. L. 100-428, as amended by Pub. L. 101-11, April,1989.
- G Department of Interior Departmental Manual, Part 620 DM-1, Wildland Fire Management (April 10, 1998).
- G U.S. Fish and Wildlife Service Manual, 621 FW1-3 (February 7, 2000)
- G U.S. Fish and Wildlife Service Fire Management Handbook (December 28, 2000)

2.4 Other Regulatory Guidelines

Fire Management activities within the Refuge will be implemented accordance with the following regulations and directions:

- G Departmental Manual Part 519 (519DM)
- G Code of Federal Regulations (36CFR 800)
- G The Archaeological Resources Protection Act of 1979
- G The Archaeology and Historical Preservation Act of 1974, as amended
- G National Historic Preservation Act of 1966
- G The Endangered Species Act of 1973, as amended
- G The Provisions of the Clean Air Act, as amended 1990

2.5 Enabling Legislation and Purpose of Refuge (Mission Statement)

While the emphasis of mitigation at Seedskaadee NWR from its creation was primarily on waterfowl habitat, in recent years there has become growing evidence that the habitat of additional migratory and native species along the Green River below Fontenelle have been impacted by construction and operation of the Fontenelle Dam. Management today is concerned about maintaining quality habitat for all migratory and native species which may frequent the Refuge, providing compatible and wildlife dependent public use opportunities, understanding

and protecting cultural resources, and providing interpretative and educational information on the Refuge's habitat, wildlife, and cultural resources. The purpose of this plan is to help achieve these objectives.

Seedskaadee National Wildlife Refuge was established on November 30th, 1965 under authority of Congressional Act (Colorado River Storage Act of April 11, 1956). The Refuge was set aside to partially mitigate for the loss of wetland habitat caused by the construction of Fontenelle and Flaming Gorge Dams.

More specifically, Seedskaadee NWR'S enabling legislation reads:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. & 715d (Migratory Bird Conservation Act)

"...Shall be administered by him (Secretary of the Interior) directly or in accordance with cooperative agreements ... and in accordance with such rules and regulations for the conservation, maintenance and management of wildlife, resources thereof, and its habitat thereon,..." 16 U.S.C. & 644 (Fish and Wildlife Coordination Act)

"... to acquire lands necessary for the construction, operation, and maintenance..." of "... (1) public recreational facilities on lands withdrawn or acquired..." for the Colorado River project in order to "... conserve the scenery, the natural, historic, and archaeological objects, and the wildlife on said lands, and to provide for public use and enjoyment of the same and of the water areas created by these projects... and (2) facilities to mitigate losses of and improve conditions for, the propagation of fish and wildlife." The Secretary may "... dispose of ..." the facilities "... to Federal ... agencies ... upon such terms and conditions as will best promote their development and operation in the public interest." 43 U.S.C. & 620g (Colorado River Storage Act).

2.6 Overview of Planning Documents

The Refuge just completed a Comprehensive Conservation Plan to guide the management of the Refuge into the next Century. The CCP addresses the broad land acquisition goals and redefines the Refuge's Objectives. The goals and objects identified below were taken from the Comprehensive Conservation Plan. The Fire Management Plan is a step-down plan from this plan and other habitat management planning documents.

2.7 Land Management Goals and Objectives

2.7.1 Vision Statement

The Vision Statement from the CCP indicates:

“Seedskaadee NW R will strive to preserve, restore, and enhance the ecological integrity of the Green River riparian corridor and associated uplands as habitat for migratory birds

and other indigenous wildlife for the benefit of present and future generations. (The Refuge) will manage for a variety of native plants and wildlife, with emphasis on migratory birds and threatened and endangered species. Natural habitats of the Green River will be preserved or restored. The Refuge will provide interpretation of the natural and human history of the area and provide for wildlife-dependent recreation that is compatible with Refuge purposes. To meet this Vision, the Service will seek partnerships with other agencies, interest groups, landowners, and local communities.”

2.7.2 Management Goals

The management focus for wildlife and habitat found in the CCP is summarized by the following Goals:

- G To restore, enhance, or protect threatened and endangered flora and fauna that currently occur or have historically occurred in the area of the Refuge.
- G Preserve, restore, and enhance the ecological diversity and abundance of migratory and resident wildlife with emphasis on native species.
- G Protect and restore riparian habitats along the Green River to provide for the annual life needs of migratory birds and native wildlife using the Green River Basin.
- G Manage wetlands to meet the breeding and migratory requirements of waterfowl, shorebirds, wading birds, and other wetland dependent species.
- G Preserve, restore, and enhance the ecological diversity of indigenous flora associated with the Great Basin upland desert shrub and grassland habitats to support native wildlife found in the Green River Basin.
- G The Refuge staff...will manage water quality and quantity in the Green River to maintain and/or restore the riparian and cottonwood forests and provide habitat for waterfowl, trumpeter swans, fish, and other native species dependent on river and forested habitat.
- G Restore and maintain indigenous flora diversity by controlling the invasion of exotic plant species on the Refuge.

2.7.3 Land Management Objectives

Land management objectives related to fire management include:

- G The Refuge will provide large mature cottonwood trees along the banks of the Green River to serve as nesting, roosting, and hunting perching sites for bald eagles. Maintain a minimum of 10 percent of the forest in mature or old-growth timber.
- G The Refuge staff will investigate managing part of the 3,120 acre Dry Creek Unit as open

shortgrass and sagebrush habitat to provide nesting and feeding sites for mountain plovers.

- G The Refuge staff will continue to manage wetland units to provide a minimum of 20 percent open shallow wetlands and open shortgrass habitat types.
- G Maintain or improve nesting, brood, and wintering sage grouse habitat.
- G Aggressively protect 1,200 acres of mature cottonwood forested areas from drought, wildfire, and wildlife damage.
- G In wetlands, management will attempt to maintain a water and cover ration of approximately 50:50.
- G Manage the Sagebrush and Dunkle units to optimize fall and spring migration habitat ...by managing for shallow open water...
- G Manage the Pal wetland unit as a primarily shallow wet meadow and willow shrub habitat for a diversity of wetland dependent birds.
- G Manage sagebrush dominated and Salt Desert Shrub habitats for no-net loss and to minimize fragmentation of these habitats.
- G Manage grasslands to maintain shrub cover at less than ten percent...
- G Eradicate or reduce by 90 percent over the next 10 years the frequency of (exotic plants).

3.0. REFUGE FIRE MANAGEMENT OBJECTIVES

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).

Fire Management Objectives include:

- G Firefighter and public safety is always the priority.
- G Protect life, property, and other resources from unplanned fire.
- G Use fire to maintain a water and cover ratio of approximately 50:50 on designated wetland areas.
- G Use fire to re-establish a balance between shrub cover and perennial grass and forb cover and create a mosaic of uneven-aged stands of vegetation.
- G Develop fire response procedures that result in minimal net-loss of tall sagebrush in draws.
- G Eradicate or reduce by 90 percent certain exotic species.
- G Develop and implement a process to ensure the collection, analysis, and application of fire management information needed to make management decisions.

4.0 FIRE MANAGEMENT STRATEGIES

4.1 General

It is the intention of the U.S. Fish and Wildlife Service to continue to manage all wildland fires occurring within the Complex using the appropriate management concept. Prescribed fire, either alone or in combination with mechanical, biological, or other means, will be utilized under controlled conditions and defined weather variables to achieve resource management goals and objectives, including the reduction of hazardous fuel loadings.

The basic fire management strategy for the Complex will be to use the appropriate management response concept to suppress all wildfires commensurate with values at risk. Strategies employing a range of suppression options may be considered by the Incident Commander. 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. In these cases indirect attack will be employed utilizing natural and human-made features as wildfire control points. Minimum impact suppression techniques (MIST) will be utilized, where appropriate.

The Fire Management Plan and Delegations of Authority, as appropriate, will provide guidance to the Incident Commander. The matrix contained in the following table is intended to provide an overview of available combinations of strategies and tactics based on certain situations. It is the responsibility of the Incident Commander to use the guidance provided in this Fire Management Plan and the Delegation of Authority, as appropriate, to select the strategy and tactics to be use based on current and future conditions.

Table 3: Appropriate Management Response

SITUATION	STRATEGY	TACTIC
1. Wildland fire on Refuge lands which does not threaten life, natural or cultural resources or property values.	Restrict the fire within defined boundaries established either prior to the fire as part of the WFSA process or during the fire.	1. Holding at natural and man-made barriers. 2. Burning out. 3. Mop-up as appropriate 4. Observe and patrol.
1. Wildland fire on Service property with low values to be protected. 2. Wildfire burning on to 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. Mop-up as appropriate 4. Patrol 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.

All fire management activities will be conducted in a manner consistent with applicable laws, policies, and regulations.

4.2 Limits

- G Smoke management will be carefully considered for all prescribed burns and will be addressed in all prescribed burn plans.
- G All fires occurring on the Refuge will be staffed or monitored until declared out.
- G Prescribed burning in areas where threatened, endangered, and candidate species exist will not be conducted if the prescribed fire will be detrimental to the species or any adverse impacts cannot be mitigated, Section 7 clearance will be secured, as appropriate.
- G Utilization of heavy equipment (dozers, discs, plows, and graders) during high intensity fires will be allowed only with the approval of the Project Leader or his/her designee.
- G The use of prescribed fire to achieve management objectives must be conducted in a cost

effective manner.

- G Engines will remain on roads and trails to the fullest extent possible.
- G Aerial Retardants and foams will not be used within 300 feet of any waterway as described in the Guidelines for Aerial Delivery of Retardant or Foam near Waterways.

4.3 Effects on Neighboring Lands

Due to the limited nature of the prescribed fire program and the low number of wildfires occurring on Service lands, the fire management program is not expected to have a great impact on neighboring lands. A full suppression program using the appropriate management response concept is meant to suppress fires in a safe manner that prevents escapes to neighboring lands where fuels are continuous. The impacts of smoke from wildland fires should be short-lived.

5.0 FIRE MANAGEMENT RESPONSIBILITIES

5.1 ___Refuge Staff Responsibilities

The Refuge is remote and has a small staff. All fire management duties on the Refuge are collateral duties. The Refuge is supported by a Zone Fire Management Officer who is available to provide guidance for the refuge's program and participate as time and circumstances allow.

All trained and qualified employees at the Refuge will participate to the level of their training and qualifications in fire management activities. The Project Leader is responsible for planning and the implementation of an effective and the safest possible fire management program at the Refuge. The Project Leader is also ultimately responsible for all decisions related to both wildfire and prescribed fire in the Refuge. The fire job responsibilities in the Fireline Handbook (PMS 410-1) and the ones described for the positions below are to be fulfilled.

5.1.1 Project Leader

- G Responsible for the overall management of the Refuge, including fire management.
- G Insures fire management policies observed.
- G Fosters effective cooperative relations within the Refuge, cooperating fire organizations, and adjoining land owners.
- G Within budgetary restraints, ensures sufficient collateral duty firefighters meeting Service standards are available for initial attack.
- G Approves individual prescribed fire plans.
- G Serves as collateral duty firefighter, as qualified.

5.1.2 Assistant Refuge Manager

- G During the absence of the Project Leader, delegated the responsibility for managing the fire management program.
- G Supervise the resource management activities on the Refuge including the selection of objectives and tools to be used in achieving objectives.
- G Responsible for planning and coordinating preparedness activities including:
 - # The Refuge fire training program.
 - # Physical fitness testing and Interagency Fire Qualification System data entry.
 - # Coordinating with cooperative agencies on a regional level. Drafting revisions for cooperative agreements, as necessary.

- # Ensuring the Step-up Plan is followed.
- # Prepares annual FireBase budget request and manages and tracks use of the Firebase account.
- G Responsible for coordinating prescribed fire activities including:
 - # Reviewing proposed annual prescribed fire program to meet resource management objectives.
 - # Writing prescribed burn plans.
 - # Preparing daily validation that prescribed fires are under prescription and meet all other Service policy requirements.
- G Maintains liaison with Regional Fire Management Coordinator and Cooperators.
- G Maintains fire records, reviews completed DI-1202's for accuracy and submits them to the Zone FMO, and annually reviews and updates as necessary the Fire Management Plan.
- G Serves as collateral duty firefighter, as qualified.
- G Serves as Prescribed Fire Burn Boss, as qualified.

5.1.3 Maintenance Worker

- G Maintains engine(s) in a state of readiness.
- G Serves as collateral duty firefighter, as qualified.

5.1.7 Seasonal and Collateral Duty Firefighters

- G Responsible for their assigned equipment, and physical conditioning.
- G Qualifies annually by completing the appropriate fitness test by April 15th, or within 2 weeks of EOD date.
- G Maintains assigned fire equipment in ready state and using all safety gear assigned.
- G Assists the Assistant Refuge Manager maintain accurate fire records.
- G Serves as collateral duty firefighter, as qualified.

5.1.8 Wildfire Incident Commander (as assigned)

- G The Incident Commander (IC) is responsible for the safe and efficient suppression of the assigned wildfire.

- G Fulfills the duties described for the IC in the Fireline Handbook.
- G Notifies the Project Leader or Dispatcher of all resource needs and situational updates, including the need for extended attack.
- G Ensures wildfire behavior is monitored and required data is collected and all firefighters are informed of forecast and expected fire weather and behavior. Informs fire suppression personnel of escape routes and safety zones. Posts lookouts.
- G Ensures personnel are qualified for the job they are performing.
- G Identifies and protects endangered and threatened species and sensitive areas according to the Fire Management Plan.
- G Utilizes minimum impact tactics to the fullest extent possible.
- G Ensures fire is staffed or monitored until declared out.
- G Ensures that the fire site is stabilized and notifies management if rehabilitation is required.
- G Submits completed DI-1202 (wildfire report), Crew Time Reports, a listing of any fire related expenditures or losses to the Assistant Refuge Manager, and completes taskbooks within 3 days of fire being declared out.

5.1.9 Prescribed Burn Boss (as assigned)

- G Writes or reviews prescribed burn prescriptions for assigned blocks.
- G Implements approved prescribed burn plans.
- G Assist with the administration, monitoring, and evaluation of prescribed burns.
- G Submits completed DI-1202 (wildfire report), Crew time reports, a listing of any fire related expenditures or losses to Assistant Refuge Manager, and completes taskbooks within 3 days of fire being declared out.

5.2 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.

Seedskafee NWR is almost entirely surrounded by federal lands owned and/or managed by the Bureau of Land Management. There are a few parcels of State land and a limited amount of private land that also border the Refuge. Two BLM Districts (Kemmerer and Rock Springs) adjoin the Refuge and have primary fire management responsibilities for these lands. The District Forester for the Wyoming State Forestry Division in Lyman, Wyoming, has fire management responsibilities for State Lands. In addition, Sweetwater County has fire management responsibilities for the entire County.

The Cokeville Volunteer Fire Department has the responsibility for suppressing wildfires in the Bear River District, which includes Cokeville Meadows NWR.

In 1996, Seedskafee NWR entered into a Wyoming Interagency Cooperative Fire Protection Agreement for Sweetwater County. An annual Wildland Fire Control Annual Operating Plan that facilitates the sharing of fire fighting resources for Sweetwater County between the BLM, Wyoming State Forestry Division, Forest Service, Fish and Wildlife Service, Sweetwater County, Sweetwater County Fire District 1, and the Eden-Farson Fire District is reviewed, revised if necessary, and signed by March of each year. Appendix C contains copies of all agreements and a list of cooperators is included in Appendix D.

In accordance with the agreement, cooperators agree to:

- G Provide assistance in suppression of wildfires as defined in the Wyoming Interagency Cooperative Fire Protection Agreement.
- G Assist, as needed, in the investigation of suspicious fires.

The role of the refuge is defined in the above agreements, and the refuge will participate to the limit allowed by staff availability, their level of qualifications, and circumstances allow.

6.0 FIRE SEASON

6.1 Refuge Fire Frequency

Based on data from the Shared Applications Computer System (SACS), the refuge averages a fire every two years. That statistic can be misleading since the refuge only had two reported fires during the first ten years of the reporting period. Since 1993, the refuge has averaged one start a year. It is anticipated that in periods of drought, the refuge could experience a greater number of fires.

6.2 ___ Refuge Fire Season

The fire season established the BLM for the Rock Springs Zone begins May 15 and ends October 15 each year. However, data from SACS indicates the refuge fire season runs from March 15 through October 21. Fires outside of the latter window are possible, but unlikely based on an analysis of fire occurrence and normal fuel conditions and fire behavior.

For Service planning purpose, the fire season established by SACS should be used.

7.0 EQUIPMENT AND STAFFING NEEDS

7.1 Normal Unit Strength

7.1.1 Equipment and Supplies

Engines are the primary initial attack resource on the Refuge because of the predominance of fine fuels and access roads. The light engine will be fully prepared year round and stored in the heated fire bay. The water tender will be filled when the possibility for hard freeze is past, usually in April. All other equipment will be stored at Refuge headquarters and may be kept in the equipment storage building during the winter months.

Lists of tools and other equipment can be found in Appendix E.

7.1.2 Personnel and Level of Qualifications

Position needs of the Fire Management program for preparedness and suppression needs at Seedskaadee NWR are found in Table 4. A listing of current employee qualifications is contained in Appendix F.

Table 4. Fire Management Staffing Needs

Position	Minimum Number Required	
	Wildfire	Prescribed Fire
Incident Commander Type 5 (ICT5)	1	
Prescribed Burn Boss (RXB3 or RXB2)		1
Engine Boss (ENGB)	1	1
Engine Operator (ENOP)	2	1
Fire Fighter Type 2 (FFT2)	3	3

Note: One person can be qualified for more than one position.

8.0 PREPAREDNESS

8.1 Current Staff Available to Meet Position Needs

An Employee Contact List is included in Appendix F.

8.2 Pre-season Readiness Activities

Table 5: Annual Refuge Fire Management Activities

ACTIVITY	1	2	3	4	5	6	7	8	9	10	11	12
Update Interagency Fire Agreements/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									
Prescribed Fire Plan Preparation			x									

Review and Update Fire Management Plan	x													
Prepare Pre-season Risk Analysis			x											

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

8.2.1 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 Project Leader 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.

The Regional Office will pay for all approved fire training if the following criteria are met:

- G Participant completes and submits to the Zone FMO a National Wildfire Coordinating Group Interagency Training Nomination form (NFES 2131), complete with supervisory approval and an estimated cost of training, travel and per diem prior to the commencement of training.
- G The training is approved by the Zone Fire Management Officer.
- G Upon completion of the training, a copy of the Certificate of Completion and a copy of the travel voucher are sent to the Budget Assistant for Refuges and Wildlife in the Regional Office.

8.2.2 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 G 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 G). 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.

8.2.3 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.

8.3 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 basis throughout the year. All are available on the Internet at <http://www.boi.noaa.gov/fwxweb/fwoutlook.htm>. The Refuge fire staff can also contact the **Rawlins Interagency Dispatch Center (1-800-295-9953)** 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 Rocky Mountain 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 Rocky Mountain 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 Rocky Mountain Area Coordination Group.

8.4 ___Step-Up Plan

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

8.5 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 reposition 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 Fire Management 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/fwxweb/fwoutlook.htm>.

9.0 WILDFIRE PROGRAM

9.1 Special Safety Concerns and Firefighter Safety

The safety of Service employees and cooperators involved in fire management activities is of primary concern. Only trained and qualified employees will be assigned to fire management duties. All fire management personnel will be issued appropriate personal protective equipment and will be trained in its proper use. No Service employee, contractor or cooperator will be purposely exposed to life threatening conditions or situations except when necessary to save the life of another person.

The primary threat to firefighter safety is from fast moving, wind-driven wildfires that can quickly over take and trap firefighters. Due to terrain, soil conditions, and the location of various wetlands and water courses, it may be difficult for an engine to out-run a fast moving fire. It is important that firefighter practice **LCES at all times!** Spot weather forecasts should be requested early-on during initial attack to gain insight into the possibility of shifting winds from thunderstorms, approaching fronts, and other weather related phenomena.

Smoke from wildfires is a recognized health concern for firefighters. Wildfire incident commanders and burn bosses 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.

The Goals and Objectives of the Refuge Safety Plan will be incorporated into all aspects of fire management. The Fire Management Plan will provide direction to accomplish safety objectives listed below during wildfire suppression actions and prescribed fire activities.

- G Provide safe working conditions for employees.
- G Provide safe environments for the visiting public.
- G Protect and insure safety of government equipment.
- G Define equipment available and:
 - # identify responsibilities.
 - # identify sources of resources.
 - # provide documentation.
 - # promote a healthy safety attitude.

9.2 Prevention Program

Although fire may have historically played a role in the development of habitats on the Refuge, human ignited fires and natural ignitions burning without a prescription are likely to result in unwanted damage to cultural and/or natural resources.

A review of fire records indicates that during the period of 1986-96 a total of 6 fires were human caused. They ranged from vehicle fires to illegal campfires. A formal fire prevention analysis has not been completed due to the insignificant number of human caused ignitions. If ignitions significantly increase or begin to occur in new areas, prevention strategies will be reviewed and modified, if necessary.

In order to prevent human-caused wildfire, an educational program will be utilized to reduce the threat of human caused fires. Actions taken to implement this include:

- G All staff members will be familiar with this plan. New employees and volunteers will be given an orientation session which includes discussion of fire prevention and detection.
- G Fire prevention will be discussed at safety meetings, prior to the fire season, and during periods of high fire danger. Periodic training of staff regarding fire prevention will be conducted.
- G During periods of high fire danger, warnings will be posted at visitor information stations.
- G Public contacts will be made via press releases and verbal contacts during periods of high fire danger.
- G A thorough investigation will be conducted of all fires suspected to have been illegally set. Upon completion of the investigation by a trained staff member, cooperator, and/or local law enforcement officer, appropriate action will be taken.

9.3 ___Detection

The Refuge relies on neighbors, visitors, cooperators, and staff to detect and report fires. In addition, the Step-up plan provides for increased patrols by Refuge personnel during periods of very high and extreme fire danger.

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.

9.4 Initial Reporting and Dispatching

All fires occurring within or adjacent to (within two miles) the Refuge should be reported to Seedskaatee NWR headquarters. The person receiving the report will be responsible for implementing the Fire Dispatch Plan (Appendix I) and assume duties of Fire Dispatcher until relieved or released.

For local fires, the **Fire Dispatcher** will stay on duty until:

- G All Refuge resources return;
- G Relieved by another dispatcher; or
- G Advised by IC that he/she can leave.

The Fire Dispatcher will not be required to stay on duty if the fire occurs outside the Refuge's radio coverage area, but the Dispatcher must notify the **Rawlins Interagency Dispatch Center (1-800-295-9953)** that a dispatcher is not on duty at the Refuge before leaving.

The **Fire Dispatcher** will be responsible for coordinating the filling and delivery of any resource orders made by the IC for all operational and logistical needs, including engines, aircraft, tools, supplies, and meals. The IC will place all resource orders through the Dispatcher, and specify what is needed, when it is needed, and where it is needed. 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 Rawlins Interagency Dispatch Center (1-800-295-9953).** The Zone FMO will generally be able to assist with ordering resources from outside the area.

Requests for assistance by cooperators on fires not threatening the Refuge must be made to the Project Leader or his/her designee. Only qualified and properly equipped resources meeting NWCG standards will be dispatched off of the Refuge.

Appendix J contains a listing of communication frequencies commonly used on Seedskaadee NWR.

9.5 Pre-attack Plans

Due to the limited number of fire responses and the size of the staff, the Refuge has not developed Pre-attack Plans. At some future date, the Refuge will develop plans in accordance with the guidance provided in the Fire Management Handbook, and include a copy of each plan in Appendix K.

9.6 Fire Suppression

9.6.1 Program Overview

Service policy requires the Refuge to utilize the ICS system and firefighters meeting NWCG and Service qualifications for wildfires 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. Once fire suppression personnel are assigned to the fire, they become the top priority.

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 Rawlins 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:

- G Providing a size-up of the fire to dispatch as soon as possible.
- G Using guidance found in the fire Management Plan or in the Delegation of Authority, determining the strategy and tactics to be used.
- G Determining the resources needed for the fire.
- G Briefing 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. Assigns lookout(s).
- G Advising Dispatch of additional resources required to suppress the fire.
- G 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 on 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.

9.6.2 Initial Attack Strategies and Tactics

The **appropriate suppression response concept** will be used to manage all wildfires reported on the Refuge. Suppression strategies and tactics will be unique to each incident depending on safety considerations, weather conditions, fuel conditions, cost of suppression, values at risk, availability of resources, and location of the fire in relation to strictures and cultural sites. Generally, the primary response will be aggressive direct attack action using engines. However, there may be occasions where direct attack on high intensity, rapidly spreading wildfire would jeopardize firefighter safety and not be appropriate. In cases such as this, indirect attack will be employed utilizing natural and human-made features such as roads, water courses, and breaks in fuel, as wildfire control points.

9.6.3 Minimum Impact Suppression Tactics

Minimum Impact Suppression Tactics (MIST) will be used whenever possible. Guidance can be found in the [Fire Management Handbook](#).

9.6.4 Limits to Suppression Activities

- G The use of dozer or plow lines will not be permitted on Service lands except to protect life or improvements such as buildings or bridges, and only with the approval of the Project Leader or his/her designee.
- G Hand line construction which causes soil disturbance is to be avoided.
- G Engines will remain on roads and trails to the fullest extent possible.
- G Old-growth and mature cottonwood that are damaged by fire will not be felled, unless dictated by safety consideration. If at all possible, a tree, if deemed hazardous, will be flagged and suppression forces evacuated from the area.
- G Retardant is not to be used within 300 feet of a stream or other water feature.

9.7 Escaped Fires/Extended Attack

The IC will notify the Dispatcher or Project Leader, who will in turn will notify the Zone FMO, whenever it appears a fire will escape initial attack efforts, escape Service lands, or when fire complexity will exceed the capabilities of command or operational forces. The Zone FMO will provide assistance, as available, with the implementation of the extended attack operations including:

- G Assisting the Project Leader complete the WFSA (Wildland Fire Situation Analysis) (Appendix L).
- G Assisting the Project Leader complete the Delegation of Authority (Appendix L), if needed.
- G Ordering of appropriate resources through the Dispatch Center.

9.8 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:

- G All trash will be removed.
- G Firelines will be refilled and waterbars added if needed.
- G Hazardous trees and snags cut and the stumps cut flush.
- G Disked firelines should be compacted as soon as possible to preserve the living root stock of natives grasses.
- G 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:

- G **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.

- G **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.

- G 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 Project Leader is responsible for supervising the preparation of 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.

10.0 PRESCRIBED FIRE PROGRAM

10.1 Program Overview

The Refuge will use 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 hazard fuel reduction prescribed burns within or near Refuge development zones, sensitive resources, and boundary area to reduce the risk from wildfire damage. To the greatest extent possible, hazard reduction prescribed fires will only be used when they compliment resource management objectives.

10.2 Resource Management

Management ignited prescribed burns will be used to accomplish the following resource objectives:

- G Use fire to maintain a water and cover ratio of approximately 50:50 on designated wetland areas.
- G Use fire to re-establish a balance between shrub cover and perennial grass and forb cover and create a mosaic of uneven-aged stands of vegetation.
- G Develop fire response procedures that result in minimal net-loss of tall sagebrush in draws.
- G Eradicate or reduce by 90 percent certain exotic species.

10.3 Hazardous Fuel Reduction

Prescribed fire, either alone or in combination with mechanical, chemical, and/or biological means will be used to accomplish the following hazard fuel reduction objectives:

- G Provide for firefighter and public safety.
- G Protect life, property, and other resources from the impacts of wildfire.
- G Protect cottonwood trees from fire by pre-treating fuels near the base of the trees.

10.4 Use of Fire to Achieve Resource Objectives

The CCP did not address a concept like Wildland Fire Use for Resource Benefit (WFURB). Therefore, WFURB will not be used as a management tool on Complex lands at this time. In the future, if it is decided that Refuge managers want to consider resource benefits when determining the appropriate management response, the Refuge will initiate action to complete an

Environmental Assessment that fully addresses this management action.

10.5 Burning Season

Prescribed burning can occur at any time during the year depending on resource and management objectives. Most burning will occur in the period from March through October.

10.6 Potential Impacts

An escaped prescribed fire could erode support for the prescribed burn program, especially if neighboring private lands or improvements were impacted. A limited number of structures and improvements such as fences could be destroyed. Grazing lands under permit on BLM lands could also be burned, impacting the grazing rotation schedule or eliminating expected forage. A prescribed burn conducted without consideration for smoke dispersal could impact air quality in the area.

10.7 Limits

- G The County Sheriff's Office, Rawlins Interagency Dispatch Center, and local fire departments will always be notified by the Burn Boss prior to ignition. Private landowners adjacent to the proposed burn will also be notified. The required notifications will be included in each burn plan.
- G Prescribed burns will not be conducted without a permit issued by the State of Wyoming Division of Air Quality. Permit requirements are included in Appendix P.
- G Prescribed fire activities may be limited during nesting season.
- G Drought can have an effect on fire severity and control. It is important to track one or more of the drought indicators. Prescribed burns should not be initiated if the Palmer Drought Index reading is - 4 or lower.
- G The use of heavy equipment and other ground disturbing devices will be approved on a project by project basis by the Project Leader or his/her designee.

10.8 Complexity

Prescribed fire complexity will be determined by the U.S. Fish and Wildlife Service Region 6 Complexity Analysis (Appendix M). The complexity of a prescribed fire is dependent upon fuels/vegetation, objectives, smoke management, values at risk, burn boundaries, size, and number of personnel involved. All prescribed fires currently being considered are of low complexity. The Complexity Rating will be reviewed as a matter of standard procedure by the Zone Fire Management Officer.

10.9 Planning

Each prescribed fire must have a complete and approved formal Prescribed Fire Plan before it can be funded and implemented. The Prescribed Fire Plan should be prepared and developed by an interdisciplinary team. Ideally, one member of the team should have completed the Prescribed Fire Planning and Implementation (PFPI) or Prescribed Burn Boss (RX-300) training course and be Burn Boss qualified. Guidance provided in Chapter 2 of the Fire Management Handbook will be followed when developing Prescribed Fire Plans and conducting prescribed fire activities.

In accordance with Regional and national guidelines, individual resource management prescribed burns and hazard fuel treatment projects must be identified in advance and entered into FireBase for funding in out-years. In order to meet that requirement, the Assistant Refuge Manager will coordinate with the Refuge staff to identify and develop a listing of projects that project the Refuge's fire program needs at least two years out. As the prescribed burn and hazard fuel reduction program evolves, the Refuge will develop a fuels management program that identifies units to be treated up to 5-years out. This will allow the Refuge better establish priorities and to complete projects requiring regularly scheduled treatment.

Currently, the Refuge does not have any predetermined treatment areas. The Project Leader is responsible for supervising the development of resource management objectives for individual management units. Refuge employees will monitor habitat and wildlife populations in these units. When it is determined that fire would be an appropriate management tool for a given block of land, a site-specific Prescribed Burn Plan designed to achieve the desired resource objectives will be prepared in accordance with the Region 6 format. Each Prescribed Burn Plan will be reviewed by the Zone FMO and approved by the Project Leader. Before the plan is implemented, the assigned Prescribed Burn Boss must certify that the prescription will meet the stated resource objectives. The plan can be amended by the Project Leader after it has been approved. A copy of the amended prescription and a justification must be signed by the Project Leader and attached to the plan.

The Refuge will implement its fire management program within the constraints of the Endangered Species Act of 1973, as amended, and Service policy, which requires that State threatened and endangered species and federal candidate species be incorporated into planning activities. The Refuge will take appropriate action to identify and protect from adverse effect any rare, threatened, or endangered species located within the Refuge. All Prescribed Burn Plans will also be in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. Each burn plan will be submitted for review by the Regional Fire Archeologist or his/her designee.

Contingency planning is an integral part of the prescribed fire planning process, and begins with the first visit to the burn unit. It is important to identify in advance, circumstances or conditions that may require the implementation of the contingency plan. Each prescribed burn plan will include a section that thoroughly addresses the actions to be taken in the event a prescribed burn must be suppressed or managed as a wildfire.

The contingency plan will identify:

- G The individual(s) who has the authority to activate the contingency plan.
- G Clearly defined conditions (trigger points) that indicate the contingency plan should be activated.
- G A listing of those to be notified or contacted.
- G Who assumes the duties of the Incident Commander and what are the roles of others.
- G The location of values at risk and other resources requiring protection.
- G The preferred strategies and tactics.
- G The location of containment lines or natural fuel breaks outside the burn unit.
- G The location of water refill points, staged equipment, etc.
- G Contingency forces (Type, number, location).

A prescribed burn will not be implemented unless all contingency forces are confirmed as being on-site or in standby status, as specified in the plan.

Through out the year, the Assistant Refuge Manager and Zone Fire Management Officer will conduct informal reviews of the Refuge's fire management activities. As part of the process, all prescribed fires will be reviewed to insure that adequate support is available to conduct planned burns and that habitat management objectives were achieved. Written notes will be attached to the burn plan and the notes will be used to plan the next year's fire management activities.

Multiple prescribed fires may be initiated at the same time within the Refuge. A qualified Prescribed Fire Manager will coordinate multiple burns. Depending on the complexity of the burns, the Prescribed Fire Manager need not be on scene but must be readily available by phone. The maximum number of simultaneous burns will depend upon the cumulative impacts of smoke on sensitive targets and the availability of the prescribed equipment and personnel.

The Refuge may also assist private landowners with prescribed burning to improve the value of their land as wildlife habitat. A Wildlife Extension Agreement with a written provision for the use of prescribed fire must be approved prior to implementing burns on private lands. Such assistance is subject to guidance provided within the Fire Management Handbook, private lands program policies, Region 6 Fire Management Guidelines, and funding and staffing restraints.

10.10 Preparation and Implementation

- G Preparation of prescribed burn units will be handled on a project specific basis with site preparation standards identified in the burn plan for that unit.

- G Preparation of fire breaks or other site work may begin at any time after a decision has been made to conduct a burn in a specific area. The Assistant Refuge Manager will assign qualified individuals to conduct the work. If adequate staffing is not available at the Refuge, needed personnel and equipment will be resource ordered.
- G Staff who are to work on the burn should be notified of the burn schedule at least a four weeks prior to the burn to ensure that they plan their work and leave accordingly.
- G The week prior to the burn, all engines, tools, supplies and other items should be checked to assure that things are ready and in working order. On the day prior to the burn date, the Burn Boss will inspect tools and equipment to be used so that unexpected shortages do not occur on the burn day and delay or prevent the planned burning activity.
- G The day prior to the burn, the Burn Boss will ensure all local, State and Smoke Management permits have been acquired.
- G Public contacts will be completed as designated in the burn plan.

10.11 Monitoring and Evaluation

The Region 6 Monitoring Guidelines will be used during prescribed fire activities to monitor the various values (Appendix N). Plant species composition, percent of cover, and changes in stand structure will be monitored to determine burn response and long-term (multiple treatment) vegetation responses. After each prescribed burn a permanent record will be made for filing which will include all pertinent information about the burn, including the objectives, weather, fire behavior, etc.

The process of defining the needs and providing direction for station monitoring and fire research programs is listed below along with a short discussion of actions taken.

Prescribed Fire Monitoring and Evaluation Processes:

- G Utilize all available sources of information to establish an accurate picture of natural historic fire regimes for the Refuge. Establish Refuge prescribed fire programs based on this knowledge to the extent practical.
- G Combine the available knowledge concerning fire effects and fire ecology, historic fire regime and historic plant and animal species composition to determine the additional monitoring and evaluation needs for the Refuge.
- G Develop management plans to outline the implementation of monitoring programs within the Refuge.
- G Develop proposals and request funding for the various (level of intensity) monitoring programs from available sources.

- G Conduct funded monitoring and research, basing future management decisions on program results. Utilize program results to prioritize fire treatments and schedules, alone or in combination with other treatments (e.g., grazing, mechanical, etc.).
- G Minimize negative impacts on threatened, endangered and sensitive species.

11.0 FIRE MANAGEMENT UNITS

11.1 General

Fire management units are areas that have similar fuel and terrain characteristics, common fire management strategies, and require similar effort to control wildfire or implement a prescribed fire program. The guidance provided in this section will pertain to both wildfire and prescribed fire.

The Seedskadee-Cokeville Meadows Refuge Complex has been broken into two Fire Management Units. Each Refuge is classified as a Fire Management Unit.

11.2 Fire Management Unit - Seedskadee Refuge

11.2.1 Overview

All of Seedskadee NWR will be considered as one Fire Management Unit (FMU) for suppression. Due to the modest nature of the prescribed burn program and the ability of Refuge managers to develop site specific burn plans, at this point in time, the Refuge will be considered as one FMU for the prescribed fire program, as well. At some future date when the Refuge is able to expand their prescribed fire program, additional Fire Management Units may be designated.

11.2.2 Fire Management Objectives

The Fire Management Unit encompasses the entire Refuge. Therefore, the previous discussion of Station Objectives fully addresses the unit objectives for the Fire Management Unit.

11.2.3 Unit Strategies

All wildfire fires will be attacked aggressively. All fires on the Refuge have the potential to escape into adjacent private land and cause damage to crops, pasture or improvements. For that reason all fires must immediately be sized up by the responding Refuge fire personnel and a decision made as to whether the responding initial attack team can contain and control the fire. If there is any doubt, then assistance should immediately be requested from local fire departments or interagency resources.

The Incident Commander will choose the appropriate suppression strategy and technique. As a guide: On low intensity fires (generally flame lengths less than 4 feet) the primary suppression strategy will be direct attack with hand crews and engines. If conditions occur that sustain higher intensity fires (those with flame lengths greater than 4 feet) then indirect strategies which utilize back fires or burning out from natural and human-made fire barriers may be utilized. Those barriers should be selected to safely suppress the fire, minimize resource degradation and damage and be cost effective.

Prescribed fire will be used alone or in combination with other methods to achieve resource management objectives and to reduce hazardous accumulations of fuels.

11.2.4 Unit Tactics

- G Fires will be attacked using engines when possible. Roads, wetlands, and other barriers will be used where possible as primary control lines, anchor points, escape routes and safety zones, as conditions allow.
- G Burnout operations will be conducted from roads or other barriers when it is safe and effective to do so.
- G Burnouts will also be used to strengthen primary control lines when it is safe and effective to do so.
- G Approved fire retardant chemicals may be deployed by either air or ground forces on upland areas.

11.2.5 Habitat Types

Habitat types are discussed in Section 1.2.1.6.

11.2.6 Fuels

Fire behavior is dependent on many factors. Some of the most important influences are relative humidity, air temperature, fuel type, fuel moisture, windspeed, slope, aspect, time of day, and season. On-site predictions of estimated fire behavior can be made with the above inputs through the use of nomograms and other fire behavior predictor models developed for this purpose. The various prediction systems provide outputs of rate of spread, fireline intensity, heat per unit area, and flame length.

General statements can be made for fires in certain fuel types.

- G **Fuel Model 1 - Grass** - describes areas dominated by short grass, such as saltgrass. Rate of spread of 78 chains/hour with flame lengths of 4 feet are possible under moderate conditions. This fuel model occurs on low river terraces.
- G **Fuel Model 3 - Grass** - describes areas dominated by grass or grasslike vegetation averaging 3 feet in height. This would include cured stands of cattail and patches of basin wild rye. Rate of spread of 104 chains/hour with flame lengths of 12 feet are possible under moderate conditions. This fuel model occurs around developed wetlands and some naturally occurring wetlands.
- G **Fuel Model 4 - Shrub** - describes areas in which fast spreading fires involve the foliage and live and dead fine woody material. Stands of mature shrubs, 6 feet or more tall, are

included. This fuel model occurs in scattered patches of mature stands of willow in the floodplain.

- G **Fuel Model 6 - Shrub** - describes areas where the shrub layer carries the fire at windspeeds greater than 8 mile/hour. Fire drops to the surface layer at lower windspeeds or openings in the stand. This fuel model occurs in extensive upland areas containing Wyoming big sagebrush, greasewood, and several other species of desert shrub. Little if any fine dead fuels may be present, and the shrub layer will only carry a fire under moderate to severe windspeeds.

Wildfire can be dangerous and unpredictable during any season of the year, however **the months of July, August, and September typically have the potential for the most severe fire behavior and the most likely period of occurrence.** During these months, cool season grasses and other plants have cured out, relative humidity is usually low, temperatures are the highest of the year, wind speeds are typically high in the afternoon, and ignition sources (lightening and visitors) are common.

11.2.7 Fuel Loading and Unusual Fire Behavior

Hardstem bulrush (*Scirpus acutus*), and cattail (*Typha latifolia*) are the dominant plant species in the tall-emergent marshes. Fuel loads are high. Fuel loads in the sagebrush type are light for one hour fuels and moderate for 10 hour fuels. Fuel loads are light in the Greasewood type for one hour fuels and moderate for 10 hour fuels. The short statured mixed shrub habitat type is characterized by large areas of bare ground, desert pavement and rocks. Fuel loads are very light.

At the present time the Refuge does not have a weather station, therefore the necessary data has not been collected to accurately determine a fire weather history. Until such time as the refuge purchases and installs a weather station and catalogues site specific data in WIMS, a BLM weather station at a representative site will be used to determine potential fire behavior and trends necessary to properly manage the fire suppression program.

11.2.8 Expected Fire Effects

A listing of selected species and expected fire effects information can be found in Appendix O.

11.2.9 Limits to Strategy and Tactics

- G The use of dozer or plow lines will not be permitted on Service lands except to protect life or improvements such as buildings or bridges, and only with the approval of the Project Leader or his/her acting.
- G Hand line construction which causes soil disturbance is to be avoided.
- G Retardant is not to be used within 300 feet of a stream or other water feature.

11.3 Fire Management Unit - Cokeville Meadows

11.2.1 Overview

All of Cokeville Meadows NWR will be considered as one Fire Management Unit (FMU) for suppression. Following the completion of key land management planning documents which address the role prescribed fire will have in achieving resource management objectives, this plan will be expanded to address prescribed fire.

11.2.2 Fire Management Objectives

Fire Management Objectives include:

- G Firefighter and public safety is always the priority.
- G Protect life, property, and other resources from unplanned fire.

11.2.3 Unit Strategies

All wildfire fires will be attacked aggressively. All fires on the Refuge have the potential to escape into adjacent private land and cause damage to crops, pasture or improvements. For that reason all fires must immediately sized up by the responding fire suppression personnel and a decision made as to whether the responding initial attack team can contain and control the fire. If there is any doubt, then assistance should immediately be requested from local fire departments or interagency resources.

The Incident Commander will choose the appropriate suppression strategy and technique. As a guide: On low intensity fires (generally flame lengths less than 4 feet) the primary suppression strategy will be direct attack with hand crews and engines. If conditions occur that sustain higher intensity fires (those with flame lengths greater than 4 feet) then indirect strategies which utilize back fires or burning out from natural and human-made fire barriers may be utilized. Those barriers should be selected to safely suppress the fire, minimize resource degradation and damage and be cost effective.

11.2.4 Unit Tactics

- G Fires will be attacked using engines when possible. Roads, wetlands, and other barriers will be used where possible as primary control lines, anchor points, escape routes and safety zones, as conditions allow.
- G Burnout operations will be conducted from roads or other barriers when it is safe and effective to do so.
- G Burnouts will also be used to strengthen primary control lines when it is safe and

effective to do so.

- G Approved fire retardant chemicals may be deployed by either air or ground forces on upland areas.

11.2.5 Habitat Types

The primary habitat types are upland shrub-grass mixed, irrigated meadows, and grasslands.

11.2.6 Fuels

Fire behavior is dependent on many factors. Some of the most important influences are relative humidity, air temperature, fuel type, fuel moisture, windspeed, slope, aspect, time of day, and season. On-site predictions of estimated fire behavior can be made with the above inputs through the use of nomograms and other fire behavior predictor models developed for this purpose. The various prediction systems provide outputs of rate of spread, fireline intensity, heat per unit area, and flame length.

General statements can be made for fires in certain fuel types.

- G **Fuel Model 1 - Grass** - describes areas dominated by short grass, such as saltgrass. Rate of spread of 78 chains/hour with flame lengths of 4 feet are possible under moderate conditions. This fuel model occurs on low river terraces.
- G **Fuel Model 3 - Grass** - describes areas dominated by grass or grasslike vegetation averaging 3 feet in height. This would include cured stands of cattail and patches of basin wild rye. Rate of spread of 104 chains/hour with flame lengths of 12 feet are possible under moderate conditions. This fuel model occurs around developed wetlands and some naturally occurring wetlands.
- G **Fuel Model 4 - Shrub** - describes areas in which fast spreading fires involve the foliage and live and dead fine woody material. Stands of mature shrubs, 6 feet or more tall, are included. This fuel model occurs in scattered patches of mature stands of willow in the floodplain.
- G **Fuel Model 6 - Shrub** - describes areas where the shrub layer carries the fire at windspeeds greater than 8 mile/hour. Fire drops to the surface layer at lower windspeeds or openings in the stand. This fuel model occurs in extensive upland areas containing Wyoming big sagebrush, greasewood, and several other species of desert shrub. Little if any fine dead fuels may be present, and the shrub layer will only carry a fire under moderate to severe windspeeds.

Wildfire can be dangerous and unpredictable during any season of the year, however **the months of July, August, and September typically have the potential for the most severe fire behavior and the most likely period of occurrence.** During these months, cool season grasses

and other plants have cured out, relative humidity is usually low, temperatures are the highest of the year, wind speeds are typically high in the afternoon, and ignition sources (lightening and visitors) are common.

11.2.7 Fuel Loading and Unusual Fire Behavior

Fuel loading studies have not been conducted. It is assumed that normal fuel loadings exist.

At the present time the Refuge does not have a weather station, therefore the necessary data has not been collected to accurately determine a fire weather history. Until such time as the refuge purchases and installs a weather station and catalogues site specific data in WIMS, a BLM weather station at a representative site will be used to determine potential fire behavior and trends necessary to properly manage the fire suppression program.

11.2.8 Expected Fire Effects

A listing of selected species and expected fire effects information can be found in Appendix O.

11.2.9 Limits to Strategy and Tactics

- G The use of dozer or plow lines will not be permitted on Service lands except to protect life or improvements such as buildings or bridges, and only with the approval of the Project Leader or his/her acting.
- G Hand line construction which causes soil disturbance is to be avoided.
- G Retardant is not to be used within 300 feet of a stream or other water feature.

12.0 ADDITIONAL OPERATIONAL ELEMENTS

12.1 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.

Under moderate to severe fire danger index ratings, flaming fronts are capable of moving at fast speeds in all fuel models. The fire crew will keep the fire scene clear of people except for Service firefighters and cooperating fire crews.

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.

Wildfires which might escape Service lands and spread to inhabited private property are also a concern. The IC is responsible for contacting the local law enforcement agency having jurisdiction so that they can warn and/or evacuate the public from potentially dangerous situations. Additionally, the Refuge will use prescribed fire and other management techniques to manage hazard fuels in high risk areas.

Firefighter and public safety always take precedence over property and resource protection during any fire management activity.

12.2 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. There are several different aspects to this task.

12.2.1 Wildfire Suppression

During wildfire suppression, the IC is in charge of dispersal of information to the press and or public. The IC may delegate this responsibility if needed.

12.2.2 Prescribed Fire

An informed public is a vital component of the prescribed fire program. During and immediately after, the Burn Boss will be responsible for this aspect of the program. This aspect of the operation may be delegated, as appropriate.

Areas that have been burned will present opportunities for the public to actually see the effects of fires, and offer staff members an opportunity to explain the purpose of the burns to the public. The following will be used to promote the prescribed fire program to the public:

- G Talks in local schools.
- G Attendance at local volunteer fire department meetings.
- G Including the prescribed fire message in Refuge interpretive publications.
- G Personal contacts with bystanders during prescribed burns.
- G Follow prescriptions in burn plans to prevent escapes.
- G Developing a quantitative fire effects monitoring program and sharing the results with the public.

12.3 Reports

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

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

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

12.4 Fire Critique and Review

12.4.1 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:

- G Significant injury, accident, or fatality.

- G Significant property or resource damage.
- G Significant safety concerns are raised.
- G An extended attack is necessary.

12.4.2 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:

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

12.5 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.

13.0 AIR QUALITY AND SMOKE MANAGEMENT GUIDELINES

The area is in compliance with the national air quality standards as established by the EPA. The management of smoke is incorporated into the planning of prescribed fires, and to the extent possible, in suppression of wildfires. Sensitive areas will be identified and precautions 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. The Wyoming Department of Environmental Quality (DEQ), Division of Air Quality, administers air quality program in Wyoming. The State requires that a permit be issued by the DEQ prior to burning. A permit application (Appendix P) must be completed and submitted by electronic mail to KRAIRI@MISSC.STATE.WY.US. A hard copy of a SASEM run must be mailed to the DEQ at 122 W. 25th Street Cheyenne, WY 82002 .

Smoke from wildland fires is a recognized health concern for wildland firefighters. Incident commanders and Prescribed Burn Bosses must plan to minimize exposure to heavy smoke by incorporating the recommendations outlined in the publication Health Hazards of Smoke (Sharky 1997).

14.0 CULTURAL RESOURCES

Fire Management activities at the Refuge will be implemented in accordance with the regulations and directions governing the protection of cultural resources as outline in Departmental Manual Part 519, Code of Federal Regulations (36 CFR 800), the Archeological Resources Protection Act of 1979, as amended, and the Archeological and Historic Preservation Act of 1974. All fire management activities will be in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

There have been past inventories that have recorded certain sites and identified others as significant. These sites have been identified and addressed in the CCP.

Currently wildfires are suppressed. However, historical 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 vegetative growth, increasing the chances of an uncontrolled wildfire that could potentially endanger the Refuge's cultural resources as well as surrounding private property. 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 indicated 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:

- G 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.
- G 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.
- G The Wyoming State Historic Preservation Officer (SHPO) will be contacted by the Regional Fire 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.

- G 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.
- G 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.
- G 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.
- G The use of mechanized equipment within the refuge must be approved by the Project Leader on a fire-by-fire basis, and the use 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.
- G The location of sites discovered as the result of fire management activities will be reported by the Project Leader and to the Regional Fire Archeologist.
- G Rehabilitation plans will address cultural resources and will be reviewed by the Regional Fire Archeologist.

15.0 RESEARCH NEEDS

The effects of fire on plant species and communities in the Great Basin has received considerable attention over the last 30 years. Research has primarily centered on desert shrub communities, with little attention paid to the effects of fire on wetland and riparian habitats. Research on the effects of fire within Refuge boundaries has been limited to observations by Refuge staff.

Fire research that is needed at Seedskaadee NWR includes:

- G An assessment of the effect of fire intensity, time, etc. on regeneration of certain berry producing shrubs, cottonwoods, and willows native to the area.
- G An assessment of age class and structure for upland shrub communities.

Fire behavior data will be collected on all fires occurring at the Refuge. Long-term monitoring will comply with accepted scientific methods and will be funded from sources other than Fire. These data, along with information gathered through research studies, will be used to improve the effectiveness of the fire management program. The Refuge will continue to encourage fire related research on Service lands where research operations will not conflict with resource management objectives.

Research will be conducted on an interagency basis whenever possible.

16.0 CONSULTATION AND COORDINATION

All fire management program activities will be implemented in cooperation and coordination with the State of Wyoming Department of Environmental Quality, and with member agencies of the Wyoming Interagency Cooperative Fire Protection Agreement for Sweetwater County. Other agencies and organizations will be consulted as needed.

Copies of this Fire Management Plan will be sent to the following parties for comment:

- G Bureau of Land Management, Rock Springs District
- G Bureau of Land Management, Kemmerer
- G Eden-Farson Fire District
- G State of Wyoming Department of Environmental Quality
- G US Fish & Wildlife Service
 - # Regional Office - Region 6
 - # Regional Fire Management Coordinator
 - # Fire Management Specialist
 - # Ecological Service - Cheyenne, Wyoming

- G The following were consulted in the development of this plan.
 - # Lou Ballard - Zone FMO Utah - Colorado
 - # Bob Rebarchik, Zone FMO Montana/Wyoming/Utah
 - # Carl Douhan - Contractor - Littleton, Colorado
 - # Dan Stroud - Habitat Biologist, Wyoming Game and Fish Department
 - # Kevin Spence - Aquatic Habitat Biologist, Wyoming Game and Fish Department
 - # Dave Tart - Biologist, Forest Service, Pinedale, Wyoming
 - # Rhoda Lewis - Regional Archeologist - Lakewood, Colorado

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ATTACHMENT 1

FINDING OF NO SIGNIFICANT IMPACT

CCP for Seedskaadee National Wildlife Refuge

APPENDIX A

Wildlife

APPENDIX B

Fire History

APPENDIX C

Agreements

APPENDIX D

Cooperators

FIRE COOPERATORS

Agency	Name/Title	Address	Phone Number
Rawlins Interagency Dispatch Center		1300 North 3 rd Street P.O. Box 670 Rawlins, WY 82301	1.800.295.9953
Bear River VFD	Mike Duran Chief		307.279.3229 (w)
Sweetwater County	Dennis Washam Sweetwater County Fire Marshall	1616 W. 2 nd Street Rock Springs, WY 82901	307.352.6770 (w) 307.382.6609 (h) 307.350.8200 (c)
Bureau of Land Mgt	Tony Tezak Station Foreman		307.352.0256 x 316 307.282.5005 (h) 307.350.8954 (c)
Wyoming State Division of Forestry	Dana Stone District Forester	P.O. Box 1497 Lyman, WY 82937	307.787.6148 (w) 307.787.6272 (h) 307.780.8276 (c) A weekend answering service is available when general fire conditions merit its use: 307.787.6148

APPENDIX E

Normal Unit Strength

NORMAL UNIT STRENGTH

Table 1: Normal Unit Strength - Equipment

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)	1997	100%	1	12k	1	12
Slip-on unit(s)			0		0	
Water Tender - 200 gallon			1		1	
Portable Pump(s) Standard float-a-pump			1 0		1 1	
Power Saw(s)						
Mower(s)						
Tractor(s)						
Grader(s)						
Plow Unit/Disk						
ATV(s)						
Other List						

Other Equipment Available for Fire Suppression or Prescribed Fire Operations Not Fire Funded
John Deere 850 Dozer
John Deere 550 Dozer
John Deere 4440 Tractor
John Deere 5200 Tractor
John Deere 670 Motor Grader
Case W24 Front End Loader

Use the table to list capital equipment used for preparedness and initial attack or for prescribed fire activities funded wholly or in part by fire.

Radios are listed on a separate inventory

Indicate 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 ENGINE INVENTORY

TYPE 6 Wildland Fire Engine Stocking List			
<i>Category</i>	<i>Item Description</i>	<i>NFES #</i>	<i>Quantity</i>
Fire Tools & Equipment	Combination Tool	1180	1
	Shovel	171	2
	Pulaski	146	2
	Backpack Pump	1149	2
	Fusees(case)	105	0.5
	Foam, Concentrate, Class A (5-gallon)	1145	1
	Chain Saw		1
	Chain Saw Tool Kit	342	1
	Portable Pump		*
	Drip Torch	241	1
Medical	First Aid Kit, 10-person	68	1
	Body Fluids Barrier Kit	640	1
General Supplies	Flashlight, General Service	69	1
	Chock Blocks		1
	Tow Chain or Cable	1856	1
	Jack, hydraulic (comply w/GVW)		1
	Lug Wrench		1
	Pliers, Fence		1
	Food (48 hour supply)	1842	1
	Rope/Cord (feet)	1041	1
	Sheeting, plastic, 10' X 20'	1287	1
	Tape, Duct	71	1
	Tape, Filament (roll)	222	2
	Water (Gallon/person)water cooler	943	1
	Bolt Cutters		1
	Toilet Paper (roll)	142	*
	Cooler or Ice Chest	557	*
	Hand Primer, Mark III	145	*
	Hose Clamp	46	1
	Gaskets (set)		1
	Pail, Collapsible	141	1
	Hose Reel Crank		*
Safety	Fire Extinguisher (5 lb.)	2143	1
	Flagging, lime green (roll)	258	*
	Flagging, yellow w/black stripes (roll)	267	*
	Gas Safety Can (5-gallon)	1291	*
	Reflector Set		*
Vehicle & Pump Support	General Tool Kit (5180-00-177-7033/GSA)		1
	Oil, Automotive, quart		2
	Oil, Penetrating, can		1
	Oil, Automatic transmission, quart		1
	Brake Fluid, pint		1
	Filter, Gas		1

TYPE 6 Wildland Fire Engine Stocking List			
Category	Item Description	NFES #	Quantity
	Fan Belts		1
	Spark Plugs		1
	Fuses (set)		1
	Tire Pressure Gauge		1
	Jumper Cables		1
	Tape, electrical, plastic	619	1
	Tape, Teflon		1
Radio	Portable		1
	Mobile		1
	Batteries (for portable radio)		2
Hose	Booster (feet/reel)100' rolls	1220	2
	Suction (length, 8' or 10')		2
	1" NPSH (feet)100' rolls	966	3
	1 ½" NH (feet)100' rolls	967	3
	¾" garden 50' rolls	1016	6
	1 ½" NH, engine protection (feet)		20
	1 ½" NH, refill (feet)		15
Nozzle	Forester, 1" NPSH	24	2
	Adjustable, 1" NPSH	138	2
	Adjustable, 1 ½" NH	137	3
	Adjustable, ¾" NH	136	2
	Foam, ¾" NH	627	1
	Foam, 1 ½" NH	628	1
	Mopup Wand	720	1
	Tip, Mopup Wand	735	2
	Tip, Forester nozzle, fog	903	*
	Tip, Forester nozzle, straight stream	638	*
Wye	1" NPSH, Two-Way, Gated	259	1
	1 ½" NH, Two-Way, Gated	231	2
	¾" NH w/Ball Valve, Gated	739	4
Adapter	1" NPSH-F to 1" NH-M	3	*
	1" NH-F to 1" NPSH-M	4	1
	1 ½" NPSH-F to 1 ½"NH-M	7	1
	1 ½" NH-F to 1 ½" NPSH-M	6	*
Increaser	¾" NH-F to 1" NPSH-M	2235	1
	1" NPSH-F to 1 ½" NH-M	416	1
Coupling	1" NPSH, Double Female	710	1
	1" NPSH, Double Male	916	1
	1 ½" NH, Double Female	857	2
	1 ½" NH, Double Male	856	1
Reducer/Adapter	1" NPSH-F to ¾" NH-M	733	3
	1 ½" NH-F to 1" NPSH-M	10	4
	2" NPSH-F to 1 ½" NH-M	417	*
	2 ½" NPSH -F to 1 ½" NH-M	2229	*
Reducer	1 ½" NH-F to 1" NH-M	9	1

TYPE 6 Wildland Fire Engine Stocking List			
Category	Item Description	NFES #	Quantity
	2.5" NH-F to 1 ½" NH-M	2230	1
Tee	1" NPSH-F x 1" NPSH-M x 1" NPSH-M w/cap	2240	2
	1 ½" NH-F x 1 ½" NH-M x 1" NPSH-M w/cap	731	2
	1 ½" NH-F x 1 ½" NH-M x 1" NPSH-M w/valve	230	2
Valve	1 ½" NH-F, Automatic Check and Bleeder	228	1
	¾" NH, Shut Off	738	5
	1", Shut Off	1201	1
	Foot, w/strainer		1
Ejector	1" NPSH x 1 ½" NH x 1 ½" NH, Jet Refill	7429	*
Wrench	Hydrant, adjustable, 8"	688	1
	Spanner, 5", 1" to 1 ½" hose size	234	1
	Spanner, 11", 1 ½" to 2 ½" hose size	235	2
	Pipe, 14"	934	1
	Pipe, 20"		1
Personal Gear (Extra Supply)	File, mill, bastard	60	*
	Goggles	1024	2
	Hard Hat	109	1
	Head Lamp	713	1
	Gloves		*
	First Aid Kit, Individual	67	1
	Fire Shirt		*
Engine	Fireline Handbook	65	1
	Belt Weather Kit	1050	1
	Binoculars		1
	Map Case w/Maps		1
	Inventory List, engine		1

*Items listed with no minimums but are carried by engines as an option

Table 3 Cache and Individual Items. Includes items that are issued to individuals. Balance of items will be stored in cache. These items are in addition to Engine supplies.

Category	Item Description	NFES #	Quantity for 5 person cache	Quantity for 10 person cache
Fire Tools and Equipment	Combination Tool	1180	3	6
	Shovel	'0171	3	6
	McLeod	'0296	3	6
	Pulaski	'0146	3	6
	Backpack Pump	1149	3	6
	Foam Concentrate, Class A (10 gallon/engine)	1145	20	40
	Drip Torch	'0241	6	12
Individual Equipment	Rations (12 meals/box)	1842	1	2
	Fire Shelter w/case and liner	'0169	6	12

Category	Item Description	NFES #	Quantity for 5 person cache	Quantity for 10 person cache
	Hard Hat	'0109	6	12
	Head Lamp	'0713	6	12
	Goggles	1024	6	12
	Packs, Personal Gear	1855	6	12
	Line Gear	1372	6	12
	Personal First Aid Kit	'0067	6	12
	Sleeping Bag	'0022	5	10
	Water Bottles	'0038	24	48
	Tent, Individual	'0077	5	10
	Nomex Shirt (3/person+20% per size)		18	36
	Nomex Pants (3/person+20% per size)		18	36
	Leather Gloves(2/person+20% per size)		12	24
	Ear Plugs(200/box)	1027	1	1

APPENDIX F

Listing of Current

Wildland Fire Suppression Personnel

CURRENT EMPLOYEE QUALIFICATIONS

As of August 2002

NAME	POSITION	QUALIFICATIONS
Carol Damberg	Refuge Manager	FFT2
Edward Rodriguez	Assistant Refuge Manager	FFT2, ENOP (T)
Sandee Vance	Administrative Assistant	None
Gene Smith	Maintenance Mechanic	FFT2
Christopher Alexander	Maintenance Worker	FFT2
Lamont Glass	Biologist	FFT2, ENOP (T)
Douglas Damberg	Refuge Operations Specialist	FFT2, FFT1, ICT5
John McCleary	Bio-Technician	FFT2

ENOP - Engine Operator

FALB - Faller, Class B

FFT2 - Firefighter Type 2

FFT1 - Firefighter Type 1

ICT5 - Incident Commander Type 5

RXI2 - Prescribed Fire Ignition Specialist Type 2

RXB3- Prescribed Fire Burn Boss Type 3

T - Trainee

APPENDIX G

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	25 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:

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

- G Fill packs the night before to check for leaks (use plumber's Teflon tape to stop leaks in threaded fitting).
- G Weigh bags before test. Check weight after the test if necessary. Note: Bags are used without trombone pumps.
- G 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:

- G An accurately measured flat course with good surface.
- G 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.
- G 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).
- G Candidates should be rested and well informed about the course and the need to maintain a fast pace.
- G Favorable environmental conditions. Avoid adverse conditions.
- G Complete the PAR Q physical activity readiness questionnaire and sign an informed consent form.

Safety

- G A locally developed safety/med evacuation plan must be prepared for the course.
- G 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.
- G 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.
- G Require candidates to read and sign the PAR Q health screening questionnaire and an informed consent form.
- G Check to see that candidates are wearing proper (above ankle) footwear.
- G Encourage candidates to stretch and warm up prior the test.
- G Do not test tired or injured individuals, or test during conditions that could compromise

health or safety.

- G Monitor candidates to identify those having difficulties and encourage them to terminate the test if necessary.
- G Encourage fluid intake and replacement and provide fluids in route when heat stress conditions (temperature /humidity) exist.
- G 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.
- G Encourage a cool down with an easy walk after the test. Monitor the recovery of candidates who appear exhausted or distressed.
- G 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:

- G Hike hills (w/pack) to build leg strength and endurance
- G Jog the flat course (w/o pack) to build aerobic fitness.
- G Hike/jog over distance for stamina.
- G Engage in cross-training (mountain biking, weight lifting).
- G 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 requirement 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:

G 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.

G The "Pack Test" development followed the Federal Uniform Guidelines for Employee Selection producers beginning with a Job Task Analysis for Wildland Firefighting.

G 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.

G 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 $\dot{V}O_2$), 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	DELAY BECOMING MUCH MORE ACTIVE:
	<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: _____

APPENDIX H

Step-up Plan STEP-UP PLAN

The Step-up plan will guide fire preparedness operations and use of emergency preparedness funding. The plan utilizes **RAWS data from Muddy Creek, Wyoming (ID# 481801)**, a remote weather station which is located in the vicinity of the Refuge and is known to have similar weather patterns.

The Burning Indices can be obtained from the Interagency Dispatch Center (1-800-295-9953) or on the internet at <http://www.fs.fed.us/re/fire/rwc/rwc> .

NFDRS Fuel Model T (7T1P2), Muddy Creek, WY RAWS

PREPAREDNESS ACTION	BURNING INDEX
----------------------------	----------------------

	0-7	8-16	17-33	34-59	60+
Maintain Radio Contact	X	X	X	X	X
Maintain Response Time of: (minutes)	60	60	45	20	20
Fire-ready engine at Refuge Headquarters	X	X	X	X	X
Carry PPE while on duty, wear nomex and boots			X	X	X
Water tender on standby			X	X	X
Tour of duty changed at Manager's discretion			X	X	X
Monitor BLM fire frequency				X	X
Detection patrol conditional				X	X
Refuge fire ban conditional				X	
Refuge fire ban mandatory					X

During the Memorial Day, Independence Day and Labor Day holidays move up to the next burning index break point because of the increased risk of human caused ignitions.

If burning index is 50 or greater and lightning is forecast, move up to next burning index

break-point because of increased risk of lightning ignitions.

APPENDIX I

Dispatch Plan

FIRE DISPATCH PLAN

SEEDSKADEE NATIONAL WILDLIFE REFUGE

Upon report of smoke or fire:

- I. Record as much information as possible from the caller below.**
- II. Maintain log of all radio and telephone communication (log form attached).**

Initial information from reporting party:

- A. Name:
- B. Callback number:
- C. Location of smoke or fire (be specific):
- D. Access to fire:
- E. Color of smoke:
- F. Size of fire:
- G. Type of vegetation:
- H. Fire behavior:
- I. Improvements threatened:
- J. Anyone at the fire scene:
- K. See anyone in area or vehicles leaving area:

III. Check map for ownership/protection status.

IV. If fire is on refuge or within 4 mile initial attack zone:

- A. After regular working hours use **Fire Personnel Directory** for contacting Refuge staff. Start with Refuge Manager and work down list till someone is contacted.
- B. During regular working hours:
 - 1. Notify Refuge Manager.
 - 2. Utilize clerk if available or use other refuge staff as dispatcher.
 - 3. Select and dispatch an Incident Commander (should be qualified IC or the highest qualified firefighter available).
 - 4. IC to follow procedures outlined in Section 9.6 of the FMP.
 - 5. Dispatch appropriate resources. Do not dispatch unqualified firefighters without approval of Refuge Manager.
 - 6. Notify BLM and Sweetwater County (see Appendix B for phone numbers). Advise them of Refuge response and resources sent from Refuge.
 - 7. If fire danger is high or extreme, request a spot weather forecast for the next 6 hours from National Weather Service - (307-772-2468). Procedures for obtaining a spot weather forecast are available on the web at <http://www.crh.noaa.gov/cys/firewx/OpsPlan/cysopla.htm#SPOTF>. The forecast should include any predicted changes in temperature, humidity, wind direction, wind speed, barometric pressure, precipitation, and lightning activity.
 - 8. Remain on duty and dispatch further assistance as requested by IC.
- C. If fire is on Refuge but involves a structure:
 - 1. Contact Sweetwater County (See Appendix B for phone numbers).

2. Structural firefighting is not the functional responsibility of FWS; however, refuge personnel may assist in structure protection on an emergency basis to save human life. Refuge personnel may assist in protecting wildlands around the structure when such actions can be accomplished safely. Water or retardant chemicals may be applied to a structure from the outside in an effort to safeguard it from an advancing wildfire.

V. If fire is not on refuge or threatening refuge:

A. If mutual aid request is from a Cooperating Agency:

1. Take resource order information:
 - Nature of incident.
 - Location and access to fire.
 - What type and quantity of resources are needed.
 - When they are to report.
 - Radio Frequency and IC/Officer in Charge call sign
2. Inform cooperator that you will check what is available and call back ASAP (must be within 1 hour).
3. Notify Refuge Manager and get approval for dispatch. Refuge staff limited to fires within 4 mile protection zone during Staffing Class V.
4. Dispatch resources requested and approved by Refuge Manager. Additional resources can be obtained from other refuges if needed and available (see regional dispatch plan in back of Fire Management Handbook).
5. Notify cooperator of what was dispatched and an estimated time of arrival.
6. Coordinate the filling of additional resource orders from the Cooperator.
7. Remain on duty until relieved by Task Force Leader.

B. If the Refuge is the first agency contacted and fire not on or threatening refuge:

1. Notify Sweetwater County (see Appendix B for phone number) and BLM

(1-800-295-9953).

2. Dispatch resources if approved by appropriate county dispatch and Refuge Manager.
3. Remain at scene until relieved by a representative of the agency who has fire protection responsibility for the fire.

C. Interagency dispatch request.

1. Take resource order information:
 - Nature of incident.
 - What type and quantity of resources are needed.
 - Reporting location.
 - Specific location of the incident.
 - Reporting time.
 - Travel instructions.
 - Resource order number and request number.
 - Agency responsible for incident.
2. Inform cooperator that you will check what is available and call back ASAP (must be within 1 hour).
3. Notify Refuge Manager and get approval for dispatch.
4. Dispatch resources requested and approved by Refuge Manager. Additional resources can be obtained from nearby refuges if needed and available (see also Region 6 Wildland Fire Mobilization Plan).
5. Notify cooperator of what was dispatched and an estimated time of arrival at reporting location.

FILLING RESOURCE ORDERS

1. Determine from the IC:
 - a. Exactly which type of resources are needed.
 - b. How many of each type of resources are needed.
 - c. When and where should the resources be delivered.
2. Contact Rawlins Interagency Dispatch Center (1-800-295-9953) to order resources.
3. When notified that an order has been filled and that resources have been dispatched:
 - a. Record info - source, order number, eta, etc.
 - b. Notify IC of ETA
 - c. Track resources to make sure they arrive. If they do not meet their ETA contact Rawlins Interagency Dispatch Center.
4. When resources have been released or demobilized:

All demobilization will be coordinated through Rawlins Interagency Dispatch Center.

**FIRE DIRECTORY
SEEDSKADEE NWR
FIRE PERSONNEL DIRECTORY**

September 2002

FIRE REPORTING OR ASSISTANCE REQUEST:

NAME	WORK PHONE	HOME PHONE
Carol Damberg Refuge Manager	(307)875-2187 ext 12	307-875-6218
Ed Rodriguez Assistant Refuge Manager	(307)875-2187 ext 11 (307)870-8469 - cell phone	307-875-8660
Sandee Vance	(307)875-2187 ext 10	307-875-5889
Christopher Alexander	(307)875-2187 ext 15	208-847-2813 (cell phone)
Doug Damberg	(307)875-2187 ext 19	307-875-6218
Lamont Glass	(307)875-2187 ext 13	307-871-2452 (cell phone)
John McCleary	(307)875-2187 ext 22	307-875-6392
Gene Smith	(307)875-2187 ext 15	307-870-6721

ADJACENT LANDOWNERS

Name	Address	Phone Number
Jim Helmick		(307) 875-9552
Bill Thoman		(307)877-9336
John Crosson		(307)273-9661 or (307) 875-7839

APPENDIX J

Communication Frequencies

COMMUNICATION FREQUENCIES

VHF RADIO

OWNER	REFUGE MODE	TRANSMIT	RECEIVE
Refuge Repeater	1	171.750	172.450
Refuge	2	172.450	172.450
BLM Scene of Action	7	168.400	168.400
Rock Springs BLM Repeat		169.250	168.575
Rock Springs BLM Repeat		169.025	168.575
Rock Springs BLM Direct	8	168.575	168.575
Wyoming Mutual Aid	4	154.875	154.875

APPENDIX K

Pre-attack Plans

APPENDIX L

Wildland Fire Situation Analysis and Delegation of Authority

WILDLAND FIRE SITUATION ANALYSIS

Incident Name:

Jurisdiction:

Date and Time Completed:

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

Section I, WFSA Information Page

- A. Jurisdiction(s): Assign the agency or agencies that have or could have fire protection responsibility, e.g., USFWS, BLM, etc.
- B. Geographic Area: Assign the recognized "Geographic Coordination Area" the fire is located in, e.g., Northwest, Northern Rockies, etc.
- C. Unit(s): Designate the local administrative unit(s), e.g., Hart Mountain Refuge Area, Flathead Indian Reservation, etc.
- D. WFSA #: Identify the number assigned to the most recent WFSA for this fire.
- E. Fire Name: Self-explanatory.
- F. Incident #: Identify the incident number assigned to the fire.
- G. Accounting Code: Insert the local unit's accounting code.
- H. Date/Time Prepared: Self-explanatory.
- I. Attachments: Check here to designate items used to complete the WFSA. "Other could include data or models used in the development of the WFSA. Briefly describe the "other" items used.

I. Wildland Fire Situation Analysis

To be completed by the Agency Administrator(s)

A. Jurisdiction(s)

B. Geographic Area

C. Unit(s)

D. WFSA #

E. Fire Name

F. Incident #

G. Accounting Code:

H. Date/Time Prepared _____ @ _____

I. Attachments

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

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

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

Section II. Objectives and Constraints

- A. Objectives: Specify objectives that must be considered in the development of alternatives. Safety objectives for firefighter, aviation, and public must receive the highest priority. Suppression objectives must relate to resource management objectives in the unit resource management plan.

Economic objectives could include closure of all or portions of an area, thus impacting the public, or impacts to transportation, communication, and resource values.

Environmental objectives could include management objectives for airshed, water quality, wildlife, etc.

Social objectives could include any local attitudes toward fire or smoke that might affect decisions on the fire.

Other objectives might include legal or administrative constraints which would have to be considered in the analysis of the fire situation, such as the need to keep the fire off other agency lands, etc.

- B. Constraints: List constraints on wildland fire action. These could include constraints to designated wilderness, wilderness study areas, environmentally or culturally sensitive areas, irreparable damage to resources or smoke management/air quality concerns. Economic constraints, such as public and agency cost, could be considered here.

II.

Objectives and Constraints

To be Completed by the Agency Administrator(s)

A. Objectives (Must be specific and measurable)

1. *Safety*

- Public

- Firefighter

2. *Economic*

3. *Environmental*

4. *Social*

5. *Other*

B. Constraints

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

Section III. Alternatives

- A. Wildland Fire Management Strategy: Briefly describe the general wildland fire strategies for each alternative. Alternatives must meet resource management plan objectives.
- B. Narrative: Briefly describe each alternative with geographic names, locations, etc., that would be used when implementing a wildland fire strategy. For example: "Contain within the Starvation Meadows' watershed by the first burning period."
- C. Resources Needed: Resources described must be reasonable to accomplish the tasks described in Section III.B. It is critical to also look at the reality of the availability of these needed resources.
- D. Final Fire Size: Estimated final fire size for each alternative at time of containment.
- E. Estimated Contain/Control Date: Estimates of each alternative shall be made based on predicted weather, fire behavior, resource availability, and the effects of suppression efforts.
- F. Cost: Estimate all incident costs for each alternative. Consider mop-up, rehabilitation, and other costs as necessary.
- G. Risk Assessment - Probability of Success/Consequences of Failure: Describe probability as a percentage and list associated consequences for success and failure. Develop this information from models, practical experience, or other acceptable means. Consequences described will include fire size, days to contain, days to control, costs, and other information such as park closures and effect on critical habitat. Include fire behavior and long-term fire weather forecasts to derive this information.
- H. Complexity: Assign the complexity rating calculated in "Fire Complexity Analysis" for each alternative, e.g., Type II, Type I.
- I. A map for each alternative should be prepared. The map will be based on the "Probability of Success/Consequences of Failure" and include other relative information.

III. Alternatives (To be completed by FMO / IC)			
	A	B	C
A. Wildland Fire Strategy			
B. Narrative			
C. Resources needed			
Handcrews	_____ _____	_____	_____
Engines	_____ _____	_____ _____	_____ _____
Dozers	_____	_____	_____
Airtankers	_____ _____	_____ _____	_____ _____
Helicopters	_____ _____	_____ _____	_____ _____

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

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

Section IV. Evaluation of Alternatives

A. Evaluation Process: Conduct an analysis for each element of each objective and each alternative. Objectives shall match those identified in Section II.A. Use the best estimates available and quantify whenever possible. Provide ratings for each alternative and corresponding objective element. Fire effects may be negative, cause no change, or may be positive. Examples are: 1) a system which employs a "-" for negative effect, a "0" for no change, and a "+" for positive effect; 2) a system which uses a numeric factor for importance of the consideration (soils, watershed, political, etc.) and assigns values (such as -1 to +1, - 100 to +100, etc.) to each consideration, then arrives at a weighted average. If you have the ability to estimate dollar amounts for natural resource and cultural values, this data is preferred. Use those methods which are most useful to managers and most appropriate for the situation and agency. To be able to evaluate positive fire

effects, the area must be included in the resource management plan and consistent with prescriptions and objectives of the fire management plan.

Sum of Economic Values: Calculate for each element the net effect of the rating system used for each alternative. This could include the balance of: pluses (+) and minuses (-), numerical rating (-3 and +3), or natural and cultural resource values in dollar amounts. (Again, resource benefits may be used as part of the analysis process when the wildland fire is within a prescription consistent with approved Fire Management Plans and in support of the unit's Resource Management Plan.)

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

<p><i>Economic</i></p> <p>Forage</p> <p>Improvements</p> <p>Recreation</p> <p>Timber</p> <p>Water</p> <p>Wilderness</p> <p>Wildlife</p> <p>Other (specify)</p>			
<i>Sum of Economic Values</i>			
<p><i>Environmental</i></p> <p>Air</p> <p>Visual</p> <p>Fuels</p> <p>T & E Species</p> <p>Other (specify)</p>			
<i>Sum of Environmental Values</i>			

Social Employment Public Concern Cultural Other (Specify)			
<i>Sum of Social Values</i>			
Other			

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

Section V. Analysis Summary

- A. Compliance with Objectives: Prepare narratives that summarize each alternative's effectiveness in meeting each objective. Alternatives that do not comply with objectives are not acceptable. Narrative could be based on effectiveness and efficiency. For example: "most effective and least efficient," "least effective and most efficient," or "effective and efficient." Or answers could be based on a two-tiered rating system such as "complies with objective" and "fully complies with or exceeds objective." Use a system that best fits the manager's needs.

- B. Pertinent Data: Data for this Section has already been presented, and is duplicated here to help the Agency Administrator(s) confirm their selection of an alternative. Final Fire Size is displayed in Section III.D. Complexity is calculated in the attachments and displayed in Section III.H. Costs are displayed on page 4. Probability of Success/Consequences of Failure is calculated in the attachments and displayed in Section III.G.

- C. External and Internal Influences: Assign information and data occurring at the time the WFSA is signed. Identify the Preparedness Index (1 through 5) for the National and Geographic levels. If available, indicate the Incident Priority assigned by the MAC Group. Designate the Resource Availability status. This information is available at the Geographic Coordination Center, and is needed to select a viable alternative. Designate "yes," indicating an up-to-date weather forecast has been provided to, and used by, the Agency Administrator(s) to evaluate each alternative. Assign information to the "Other" category as needed by the Agency Administrator(s).

Section IV. Decision

Identify the alternative selected. Must have clear and concise rationale for the decision, and a signature with date and time. Agency Administrator(s) is mandatory.

V. Analysis Summary			
To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander			
Alternatives	A	B	C
A. Compliance with Objectives Safety Economic Environmental Social Other			
B. Pertinent Data Final Fire Size Complexity Suppression Cost Resource Values Probability of Success Consequences of Failure			

C. External / Internal Influences

National & Geographic
Preparedness Level _____

Incident Priority _____

Resource Availability _____

Weather Forecast
(long-range) _____

Fire Behavior Projections _____

VI.

Decision

The Selected Alternative is: _____

Rationale:

Agency Administrator's Signature

Date/Time

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

Section VII. Daily Review

The date, time, and signature of reviewing officials are reported in each column for each day of the incident. The status of Preparedness Level, Incident Priority, Resource Availability, Weather Forecast, and WFSA validity is completed for each day reviewed. Ratings for the Preparedness Level, Incident Priority, Resource Availability, Fire Behavior, and Weather Forecast are addressed in Section V.C. Assign a "yes" under "WFSA Valid" to continue use of this WFSA. A "no" indicates this WFSA is no longer valid and another WFSA must be prepared or the original revised.

Section VIII. Final Review

This Section is completed by the Agency Administrator(s). A signature, date, and time are provided once all conditions of the WFSA are met.

VIII. Daily Review								
To be completed by the Agency Administrator(s) or Designate								
Selected to be reviewed daily to determine if still valid until containment or control								
			P	I	R	W	F	W
			R	N	E	E	I	S
			E	C	S	A	R	
			P	I	O	T	E	B
			A	D	U	H	E	V
			R	E	R	E	R	H
			E	N	C	F	O	L
			D	T	E	O	R	R
			N	P	A	F	A	D
			E	R	V	O	R	V
			S	I	A	R	I	
			S	O	V	R	E	O
			L	R	A	C	R	
			E	I	I	A	S	P
			V	P	L	T	R	
			E	R	A	F	O	P
			L	I	B	O	R	
				T	I	R	E	J
				Y	L	E	C	
					I	C	T	I
					T	O	N	
						S	S	
Date	Time	By						

A GUIDE FOR ASSESSING FIRE COMPLEXITY

The following questions are presented as a guide to assist the Agency Administrator(s) and staff in analyzing the complexity or predicted complexity of a wildland fire situation. Because of the time required to assemble or move an Incident Management Team to wildland fire, this checklist should be completed when a wildland fire escapes initial attack and be kept as a part of the fire records. This document is prepared concurrently with the preparation of (and attached to) a new or revised Wildland Fire Situation Analysis. It must be emphasized this analysis should, where possible, be based on predictions to allow adequate time for assembling and transporting the ordered resources.

Use of the Guide:

1. Analyze each element and check the response "yes" or "no."
2. If positive responses exceed, or are equal to, negative responses within any primary factor (A through G), the primary factor should be considered as a positive response.
3. If any three of the primary factors (A through G) are positive responses, this indicates the fire situation is, or is predicted to be, Type I.
4. Factor H should be considered after all the above steps. If more than two of these items are answered "yes," and three or more of the other primary factors are positive responses, a Type I team should be considered. If the composites of H are negative, and there are fewer than three positive responses in the primary factors (A-G), a Type II team should be considered. If the answers to all questions in H are negative, it may be advisable to allow the existing overhead to continue action on the fire.

GLOSSARY OF TERMS

Potential for blow-up conditions - Any combination of fuels, weather, and topography excessively endangering personnel.

Rate or endangered species - Threat to habitat of such species or, in the case of flora, threat to the species itself.

Smoke management - Any situation which creates a significant public response, such as smoke in a metropolitan area or visual pollution in high-use scenic areas.

Extended exposure to unusually hazardous line conditions - Extended burnout or backfire situations, rock slide, cliffs, extremely steep terrain, abnormal fuel situation such as frost killed foliage, etc.

Disputed fire management responsibility - Any wildland fire where responsibility for management is not agreed upon due to lack of agreements or different interpretations, etc.

Disputed fire policy - Differing fire policies between suppression agencies when the fire involves multiple ownership is an example.

Pre-existing controversies - These may or may not be fire management related. Any controversy drawing public attention to an area may present unusual problems to the fire overhead and local management.

Have overhead overextended themselves mentally or physically - This is a critical item that requires judgment by the responsible agency. It is difficult to write guidelines for this judgment because of the wide differences between individuals. If, however, the Agency Administrator feels the existing overhead cannot continue to function efficiently and take safe and aggressive action due to mental or physical reasons, assistance is mandatory.

FIRE COMPLEXITY ANALYSIS

	FIRE BEHAVIOR: Observed or Predicted	Yes/No	
1.	Burning Index (from on-site measurement of weather conditions). Predicted to be above the 90% level using the major fuel model in which the fire is burning.	___	___
2.	Potential exists for "blowup" conditions (fuel moisture, winds, etc.)	___	___
3.	Crowning, profuse or long-range spotting.	___	___
4.	Weather forecast indicating no significant relief or worsening conditions.	___	___
	Total	___	___
B.	RESOURCES COMMITTED		
1.	200 or more personnel assigned.	___	___
2.	Three or more divisions.	___	___
3.	Wide variety of special support personnel.	___	___
4.	Substantial air operation which is not properly staffed.	___	___
5.	Majority of initial attack resources committed.	___	___
	Total	___	___
C.	RESOURCES THREATENED		
1.	Urban interface.	___	___
2.	Developments and facilities.	___	___
3.	Restricted, threatened or endangered species habitat.	___	___
4.	Cultural sites.	___	___
5.	Unique natural resources, special designation zones or wilderness.	___	___
6.	Other special resources.	___	___
	Total	___	___
D.	SAFETY		
1.	Unusually hazardous fire line conditions.	___	___
2.	Serious accidents or facilities.	___	___
3.	Threat to safety of visitors from fire and related operations.	___	___
4.	Restricted and/or closures in effect or being considered.	___	___
5.	No night operations in place for safety reasons.	___	___

		Total	___	___
E.	OWNERSHIP			Yes/No
	1. Fire burning or threatening more than one jurisdiction.		___	___
	2. Potential for claims (damages).		___	___
	3. Conflicting management objectives.		___	___
	4. Disputes over fire management responsibility.		___	___
	5. Potential for unified command.		___	___
		Total	___	___
F.	EXTERNAL INFLUENCES			
	1. Controversial wildland fire management policy.		___	___
	2. Pre-existing controversies/relationships.		___	___
	3. Sensitive media relationships.		___	___
	4. Smoke management problems.		___	___
	5. Sensitive political interests.		___	___
	6. Other external influences.		___	___
		Total	___	___
G.	CHANGE IN STRATEGY			
	1. Change in strategy to control from confine or contain.		___	___
	2. Large amount of unburned fuel within planned perimeter.		___	___
	3. WFSA invalid or requires updating.		___	___
		Total	___	___
H.	EXISTING OVERHEAD			
	1. Worked two operational periods without achieving initial objectives.		___	___
	2. Existing management organization ineffective.		___	___
	3. IMT overextended themselves mentally and/or physically.		___	___
	4. Incident action plans, briefings, etc., missing or poorly prepared.		___	___
		Total	___	___

Signature _____

Date _____ **Time** _____

DELEGATION OF AUTHORITY

Seedskafee National Wildlife Refuge
Green River, Wyoming

As of (Time) and (date) , I have delegated authority to manage the (Fire/Incident Name and Fire Number) , Seedskafee National Wildlife Refuge, to Incident Commander (Name) and his incident management team.

As Incident Commander, you are accountable to me for the overall management of this incident including it's control and return to local forces. I expect you to adhere to relevant and applicable laws, policies, and professional standards. While the suppression of the fire is your primary task, you are expected to do so in a manner that provided for the safety and well being of involved personnel. Consideration for the needs of local residents and communities is essential for successful management of the incident.

I am assigning (Name) As the line officer representative to act as liaison and provide any help you need. (S)He is authorized to speak for me in the event a decision is needed.

My specific considerations for management of this fire are:

1. Ensure the safety of firefighters, visitors, and public.
2. Protect private and refuge property to the extent possible
3. Minimize damage to environmental resources
4. Key resource considerations are: protecting rare, threatened, and endangered species: preserving as much wildlife habitat as possible; avoiding wildlife entrapment situations; protecting cultural resources; and limiting degradation of the Complex's aesthetic values.
5. Restrictions for suppression actions are no earthmoving equipment (dozers, discs, plows, graders) without approval of the Project Leader.
6. Manage the fire cost-effectively for the values at risk.
7. Provide training opportunities for Service personnel when ever possible in order to strengthen our organizational capabilities.

Signed: _____ Date:

Project Leader

APPENDIX M

Prescribed Fire Complexity

Prescribed Fire Complexity Worksheet

Using the attached criteria, rate each element on a scale of 0 to 9, then multiply by the weighting factor (shown in parentheses in first column) to determine the weighted subvalues. Add the subvalues to determine the total weighted value which is used to determine the complexity of the prescribed burn.

PRESCRIBED FIRES

COMPLEXITY ELEMENT/ (WEIGHTING FACTOR)	RATING VALUE	WEIGHT SUBVALUE	LOW BURN COMPLEXITY	HIGH BURN COMPLEXITY
1. Potential for escape (10)			Very low probability.	High probability.
2. Values at risk (10)			Very little risk to people, property, resources.	Great risk to people, property, resources.
3. Fuels/fire behavior (6)			Mostly uniform and predictable.	Great variability & unpredictability. Prescription includes very low fuel moisture conditions.
4. Fire duration (7)			Fire generally of short duration & require little management.	Fires of long duration & require continuous management.
5. Smoke/air quality (7)			Smoke impacts are low or insignificant.	Smoke sensitive areas frequently affected.
6. Ignition methods (3)			Simple & rarely hazardous.	Highly technical or frequently hazardous.
7. Management team size (3)			Burn requires a few generalized positions.	Burn requires large team of separate, specialized positions.
8. Treatment objectives (5)			Objectives simple & easy to achieve. Prescriptions are broad & encompass safe burning conditions.	Objectives are difficult to achieve. Prescriptions are restrictive or burning conditions are risky.
Total Weighted Value:				

Low Complexity: 50 - 115 Total Weighted Value Points - Management Level: RXB3
 Normal Structure: 116 - 280 Total Weighted Value Points - Management Level: RXB2
 Complex Structure: 281 - 450 Total Weighted Value Points - Management Level: RXB1

Prepared by (RXBB/FMO) _____ Date _____

PRESCRIBED FIRE COMPLEXITY ELEMENT RATING CRITERIA

Complexity elements are used to define the relative complexity of a prescribed fire project. For the 8 complexity elements listed, users assign a complexity score of 0, 1, 3, 5, 7 or 9, based upon the rating criteria described for each numeric score. Even numbers or numbers greater than 9 are not permitted. If a specific prescribed burn does not precisely match the stated criteria in every respect, a station will have to use its best judgment determine which rating is most appropriate. Each prescribed burn does not have to meet all listed rating criteria for a particular numeric score to qualify for that rating. Each higher rating category includes all the rating criteria listed for the previous categories.

These rating criteria will be used for all management ignited prescribed fires (prescribed burns), regardless of size. The complexity score will be included on the Fire Report (DI-1202) in the "Remarks" section. Post-fire complexity ratings are used to compile a summary complexity score for the normal prescribed fire year, which is used in the FIREPRO budget analysis for funding and staffing needs.

COMPLEXITY ELEMENTS

1. POTENTIAL FOR ESCAPE:

Score Criteria

- | | |
|-----|--|
| [0] | No potential for prescribed fire escape. Burn unit surrounded by non-burnable fuel or water. |
| [1] | Little potential of spot fires outside burn unit. If occurring, only one to two totaling no more than 0.25 acre. Spots can be controlled utilizing on-site holding forces. |
| [3] | Potential for multiple spot fires (more than two) outside the burn unit totaling less than 1 acre, but still controllable utilizing on-site holding resources. One or two dangerous fuel concentrations exist near the burn unit perimeter, and are expected to result in limited torching and spotting potential. |
| [5] | Potential for multiple spot fires outside the burn unit totaling more than 1 acre, requiring greater than average holding capability along certain sections of burn perimeter. Additional holding resources may be needed to control if escape occurs. Fuel outside burn unit is continuous, with limited fuel breaks. Engines and heavy equipment are primary suppression tools. |
| [7] | An escaped fire will exceed the capability of the holding resources on site. Additional resources will need to be requested for suppression. Escaped fire will cause implementation of contingency plan, and prescribed burn will be declared a wildfire. Fuel outside burn unit may be continuous and heavy with no fuel breaks making suppression efforts difficult. Engines and heavy equipment are primary suppression tools. Probability of Ignition greater than 70 percent. |
| [9] | Good potential for multiple fire escapes. An escaped fire will exceed the capability of the holding resources on site and additional resources will need to be requested. Escaped fires will cause implementation of contingency plan and prescribed burn will be declared a wildfire. Fuel outside the burn unit is extensive and heavy, making suppression actions difficult. Prescription calls for fireline intensity and fuel moisture in the primary fuel model that are known to cause serious spotting potential. Probability of Ignition greater than 85 percent. Wind speeds at the upper end of prescription. |

2. VALUES AT RISK

Score Criteria

- [0] No risk to people, property, cultural and natural resources, either inside the designated burn unit or in the event of fire escape.
- [1] Burn is in an area infrequently visited by people and contains no historic structures, buildings, sensitive biological communities, T&E species, or habitats that could be damaged by prescribed fire. The area adjacent to the burn may contain a few locally significant natural or cultural resources, or structures that could be damaged by fire escapes.
- [3] Burn is in an area occasionally visited by people, and may be adjacent to a primary field unit road. The burn unit contains structures, cultural resources, sensitive biological communities, or T&E habitat that must be protected from fire.
- [5] Burn is in an area that receives moderate use. Public safety is a major concern addressed in the burn unit plan, but still requires a minor commitment of project resources. The unit may contain several significant structures; there may be one or two primary natural or cultural resources (as identified in the station fire management plan) inside or immediately adjacent to the burn unit which must be protected from fire. - OR - the area adjacent to the burn unit contains one or two cultural or natural resources, or structures valued between \$50,000 and \$250,000 that could be threatened by fire escapes.
- [7] Burn is in an area that receives moderate use, and protecting public safety requires a modest commitment of project resources. The burn unit may contain several significant structures, and contain or be immediately adjacent to several sensitive biological communities or habitats (as identified in station fire management plan) that must be protected from fire. - OR - the area adjacent to the burn unit contains three or more cultural or natural resources or developed sites with structures valued between \$250,000 and \$500,000 that could be threatened by fire escapes.
- [9] The burn unit is in an area of concentrated public use, and protecting public safety requires a major commitment of project resources. The unit may contain several major structures (such as residences, historic buildings) and there may be critical natural or cultural resources (such as threatened or endangered species, or major archeological artifacts) inside the burn unit that must be protected from fire. - OR - the area adjacent to the burn unit contains critical natural or cultural resources or developed sites with structures valued at more than \$500,000.

3. FUELS/FIRE BEHAVIOR

Score Criteria

- [1] Fuels are uniform, and fire behavior is easily predicted using the standard fire behavior models and prediction systems (BEHAVE PROGRAM). Terrain is mostly flat, or the slope is uniform.
- [3] Fuels within the primary model vary somewhat in loadings and arrangement, but are still well represented by one of the standard fire behavior fuel models. There may be small areas of secondary fuel types present, mostly away from the burn unit perimeter. The terrain contains low relief, and slope and aspect cause minor variations in fire behavior. The fire behavior variations present no difficulties in carrying out the burn, and the predominant fire behavior still can be predicted easily under most prescription conditions.
- [5] Considerable variation exists within the primary fuel complex. Prescriptions may be based on two fuel models, or may require a customized model in addition to or in place of a standard model. A few areas of unusual fuel concentrations or atypical fuels not well represented by the prescription-based models may exist on or near the burn unit perimeter. The terrain contains significant relief,

but the variations present only minor control problems, and no problems in meeting burn unit objectives. Fire behavior can still be predicted using standard fire behavior prediction systems.

- [7] Major variations in the fuel complex require **two or more** fuel models, and may require several customized models. High fuel concentrations and atypical fuels not well represented by the prescription-based models may be common on or near the burn unit perimeter. The terrain encompasses two or three major vegetative communities through a broad elevational gradient. Variations in slope and aspect have major effects on fuels, fire weather and fuel moisture. The resulting variations in fire behavior may present moderate fire control problems and minor problems in meeting the overall burn unit objectives. Fire behavior cannot be predicted well using standard fire behavior prediction systems without application of adjustment factors.
- [9] The burn unit contains highly variable fuels throughout, making it difficult to utilize standard or customized fuel models. The terrain encompasses more than three major vegetative communities through an elevation gradient so broad that more than one climate zone may be present. Wide variations in slope, aspect and elevation have major effects on fuels, fire weather and fuel moisture. The resulting variations in fire behavior may present major fire control problems and moderate problems in meeting overall burn unit objectives. Fire behavior cannot be predicted well without the aid of local experts (Fire Behavior Analysis).

4. FIRE DURATION

Score Criteria

- [1] Entire burn unit will be burned in one burning period. Some minor residual burning may continue inside the unit, but requires no continued resource commitment. Primarily 1-hour fuels.
- [3] Complete burnout of burn unit requires 1 to 3 days. Some minor residual burning may continue inside the unit, but requires no continued resource commitment. Primarily 10-hour fuels.
- [5] Complete burnout of burn unit requires 2 to 3 days. Significant residual burning inside the burn perimeter may continue for up to 3 days, requiring small holding crew. Primarily 100-hour fuels.
- [7] Complete burnout of burn unit requires 3 days to 1 week. Significant residual burning inside the burn perimeter may continue up to another week, requiring a holding crew on site during the burning period. Primarily 1,000-hour fuels.
- [9] Complete burnout of burn unit requires more than 1 week. Significant residual burning may continue for up to another 3 weeks along most of the burn unit perimeter, requiring a complete holding crew on site.

5. AIR QUALITY

Score Criteria

- [1] Burn is remote from developments or visitor use areas or is of such small size that smoke impacts are insignificant. No critical targets are present. Critical targets are areas that are unusually sensitive to smoke impacts. These include areas such as airports, highways, air quality non-attainment areas, and hospitals in which health and safety are quickly and severely impacted by even minimal amounts of smoke, targets that already have an air pollution or visibility problem, and any targets where the impact of smoke will be compounded by the presence of emissions from other sources. Burning is outside the non-attainment areas, and RACM/BACM eliminates any impacts to these areas.
- [3] One or more minor developments or visitor use areas may experience noticeably impaired

visibility and increased particulate concentrations, but not in excess of secondary Federal standards. The impairment is expected to last no more than 3 days. No critical targets are present. There are no impacts to non-attainment areas.

- [5] Several communities or visitor use areas may experience significantly impaired visibility (as defined in State, county, or field station visibility standard) or particulate concentrations exceeding secondary Federal standards. The impairment is expected to last no more than 1 week. Not more than one health-related complaint is likely to be received from health or medical authorities. No critical targets are present. Smoke trajectory is important, but broad.
- [7] One town (more than 20,000 people) or one major visitor use area may experience significantly impaired visibility (as defined in a State, county or field station visibility standard) or particulate concentrations exceeding secondary Federal standards. The impairment is expected to last not more than 1 week. One to three critical targets are present. Smoke trajectory is critical. Mixing height and transport wind speed may be important.
- [9] Several towns (each of 20,000 people or more) or several major visitor areas may experience significantly impaired visibility (as defined in State, county or field station visibility standard) or particulate concentrations exceeding secondary Federal standards. The impairment is expected to last more than 1 week. Any impact likely to result in a violation of a primary Federal air quality standard would also qualify. Smoke trajectory, mixing height, and transport wind speed are critical.

6. IGNITION METHODS

Score Criteria

- [1] Burn is ignited using drip torches, fusees, or other simple ground methods. Ignition requires not more than two personnel. Ignition patterns are simple, with no chance for confusion or hazardous situations to develop.
- [3] Burn is ignited using simple ground methods or Terra Torch device (or equivalent). Ignition requires three to four personnel who may work in small teams igniting separate areas simultaneously. Ignition patterns may be complex enough to require detailed planning, but there is only minor chance of confusion. Ignition team is not expected to become involved in hazardous situations.
- [5] Burn is ignited using a combination of ground methods, or both ground and aerial methods. Ignition requires four to six personnel working in teams to ignite separate areas simultaneously. Burn and ignition complexity requires separate position for ignition specialist. Ignition patterns require detailed planning, coordination between teams, and considerable attention to avoid confusion. Ignition teams may be exposed to hazardous situations for short periods.
- [7] Ignition methods are tailored to accomplish different results in different sections of the burn. Burn unit may be composed of several fuel types requiring different ignition techniques and patterns. Ignition team(s) is composed of six to eight personnel, who may ignite separate areas simultaneously. Several ignition specialists may be required for different segments of the burn. Ignition methods require detailed planning and coordination often including an ignition specialist in aerial command post. Ignition teams are frequently exposed to hazardous situations due to fuels, fire line intensity, and complex terrain. Ignition methods or patterns are subject to revision by burn boss to achieve desired results or due to changing conditions.
- [9] Burn requires a combination of complex aerial and ground techniques, often including helitorch, in complex, hazardous terrain and fuels. Ignition team is composed of more than eight personnel. Ignition methods require detailed planning by experts with extensive experience in specialized techniques. Ignition methods are subject to frequent revision by burn and ignition bosses due to changing or uncertain conditions. Detailed coordination is imperative to avoid placing team members in unacceptably dangerous situations.

7. MANAGEMENT TEAM SIZE

Score Criteria

- [1] Burn team consists of two to three personnel, with the burn boss holding several overhead positions.
- [3] Burn team consists of four to six personnel, including separate positions for Burn Boss and Holding Specialist.
- [5] Burn team consists of seven to nine personnel, including separate positions for Burn Boss, Ignition Specialist, and Holding Specialist.
- [7] Burn team consists of 10-12 personnel, including Burn Boss, Ignition and Holding Specialist, Aircraft Manager (aerial ignitions), and a Fire Weather Observer.
- [9] Burn team consists of more than 12 personnel, including Burn Boss Type I, Holding Boss, Ignition Specialist, Aircraft Manager, Weather Observer, and several ignition and holding foremen.

8. TREATMENT OBJECTIVES

Score Criteria

- [1] Objectives are limited to fuel reduction or maintenance burning and are easily achieved (e.g., removing cured grasses from grasslands or field maintenance). Prescriptions are broad and encompass safe burning conditions.
- [3] Objectives are limited to dead and downed fuel reduction, or simple habitat restoration projects involving minor changes to vegetation. May involve two or three different fuel models. Objectives are easy to achieve using relatively low-intensity surface fires and simple burning patterns. Range of acceptable results for the burn objectives are broad.
- [5] Objectives include dead and downed fuel, and live fuel reduction burns or change to structure of vegetative/habitat communities. Also include habitat conversion projects requiring changes in the composition of two or more vegetation types. Objectives and results are broad and could be moderately difficult to achieve, and may often require moderate intensity fires involving living fuels. Burning patterns are moderately complex. Flame lengths or scorch heights are critical to meet burn objectives.
- [7] Objectives include living and dead fuels. Include habitat restoration projects requiring changes in the structure and composition of two or more vegetative habitats. Narrow burn parameters (prescription) fire behavior, smoke dispersal, operational constraints, and other burn criteria present a limited opportunity of project success with a single burn. The chance of success is heavily dependent on careful planning and precise timing.
- [9] Objectives include living and dead fuels. Fuel reduction, ecological considerations, and political or operational constraints may be conflicting, requiring careful prioritization of objectives and expert planning. The prescription may require a combination of different fire intensities that makes it difficult to achieve objectives. The prescription criteria and window of opportunity are narrow. Burn objectives are specific, and range of results narrow. Project includes a major change in structure and composition of burn area. The prescription requires burning under risky

conditions that could lead to fire escape.

APPENDIX N

Monitoring

MONITORING GUIDELINES

RECOMMENDED FIRE MONITORING STANDARDS

REGION 6

The following are the recommended standards to be used when planning, implementing, and evaluating prescribed burns. These should be viewed as minimum values to be monitored and the information contained in this check list incorporated into a monitoring record sheet.

Planning and Preparation

Environmental Conditions Prior to the Burn

Photo Points Established

Fuel

Model(s)

Loading (By Size Class)

% Cover (Type/Model)

Continuity

Crown ratio

Depth of Fuel Bed

Other

Air Temperature (Maximum - Minimum to develop trends)

Relative Humidity (Maximum - Minimum to develop trends)

Wind Speed and Direction (Eye-level/20 Foot)

Fuel Moisture

Dead Fuel Moisture (Use of Fuel Sticks and/or Drying Ovens highly recommended)

Live Fuel Moisture (Fuel Models 2,4,5,7,10)

Soil Moisture (Dry, Moist, Wet)

Drought Indicator (Track One or More)

Execution

Environmental Conditions During the Burn

Date/Time

Air Temperature	(Every 30 minutes)
Relative Humidity	(Every 30 minutes)
Wind Speed and Direction	(Eye Level) (Every 30 minutes)
Cloud Cover	

Fuel Moisture (Indicate How Determined: Calculated, Actual)

Dead Fuel Moisture (Using above values, calculate every 30 minutes utilizing Tables and Worksheets, Nomograms, BEHAVE, etc.)

Live Fuel Moisture (Fuel Models 2,4,5,7,10 - Collect immediately prior to the burn and evaluate later)

Fire Behavior

Flame length	(Head, Flank, Backing)
Rate of Spread	(Forward, Flank, Backing)
Resistance to Control	
Spotting Distance	

Smoke/Air Quality

Mixing/Dispersion	(Good, Fair, Poor)
Trajectory of Column	(Surface/Upper Level)
Duration	(Active Burning/Smoldering)
Problems	

Note: It is recommended that photos be taken to document smoke dispersal.

Post Burn

First Order Fire Effects

Photo Point

Percent of Area Burned

Percent of Fuels Consumed (By Fuel Loading Size Class, when possible)

Percent of Thatch/Duff Consumed

Scorch Height

Mortality

Note: The information in the first two categories will be used to determine the amount of particulate matter produced, and may/will be used by State Air Quality Regulators.

APPENDIX O

Listing of Fire Effects for Selected Species

APPENDIX P

WYOMING SMOKE PERMIT

Wyoming Department of Environmental Quality (DEQ) request for open burning permit application submission information.

- G The name, address, and telephone number of the person submitting the application;
- G The type of business or activity involved;
- G A description of the proposed equipment and operating practices, the type, quantity, and composition of wastes to be burned, and the expected composition and amount of air contaminants to be released into the atmosphere;
- G The schedule of burning operations;
- G The exact location where open burning will be used to dispose of such waste;
- G Reasons why no method other than open burning can be used for disposal;
- G Evidence that the proposed open burning has been approved by any fire department which may have jurisdiction. Upon approval of the application by the Division of Air Quality, the person may proceed with the operation without being in violation of Subsection (b)(i).

A permit application is available on line at
<http://www.crh.noaa.gov/cys/firewx/OpsPlan/cysopla.htm#SPOTF>