

**FIRE MANAGEMENT PLAN**

**FOR**

**Waubay National Wildlife Refuge**

**Waubay, South Dakota**

**January 15, 1999**

Recommended by:

\_\_\_\_\_  
Project Leader,  
Waubay National Wildlife Refuge

Date

Reviewed by:

\_\_\_\_\_  
Prescribed Fire Specialist,  
Mountain-Prairie Region

Date

Concurred by:

\_\_\_\_\_  
Regional Fire Management Coordinator,  
Mountain-Prairie Region

Date

Concurred by:

\_\_\_\_\_  
Refuge Supervisor  
South Dakota/Wyoming/Montana

Date

Approved by:

\_\_\_\_\_  
Regional Director,  
Mountain-Prairie Region

Date

## Table of Contents

I.	INTRODUCTION	1
II.	COMPLIANCE WITH FWS POLICY	4
III.	DESCRIPTION OF REFUGE	5
IV.	REFUGE FIRE MANAGEMENT OBJECTIVES	16
V.	FIRE MANAGEMENT STRATEGIES	19
VI.	FIRE MANAGEMENT UNITS	24
VII.	FIRE MANAGEMENT RESPONSIBILITIES	31
VIII.	WILDLAND FIRE PROGRAM	35
IX.	PRESCRIBED FIRE MANAGEMENT	45
X.	AIR QUALITY/SMOKE MANAGEMENT	48
XI.	FIRE RESEARCH AND MONITORING	49
XII.	PUBLIC SAFETY	49
XIII.	PUBLIC INFORMATION AND EDUCATION	49
XIV.	ARCHEOLOGICAL/CULTURAL/HISTORIC RESOURCES	50
XV.	ANNUAL FIRE PLAN REVIEW PROCESS	50
XVI.	CONSULTATION AND COORDINATION	51

### List of Figures

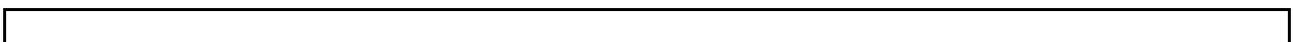
Figure 1.	Map of Day County	7
Figure 2.	Map of Day County showing Waubay National Wildlife Refuge location	8
Figure 3.	Map showing Fire Management Unit (FMU #1)	25
Figure 4.	Map showing Fire Management Unit (FMU #2)	28
Figure 5.	Map showing Fire Management Unit (FMU #3)	30
Figure 6.	Map showing Structures, Power Lines, and Roads	41
Figure 7.	Map showing Cultural Resource Sites	42

## List of Tables

Table 1. Habitat Types - Waubay National Wildlife Refuge	2
Table 2. Units - Waubay National Wildlife Refuge Complex	6
Table 3. Appropriate Management Response	20
Table 4. Fire Management Units	24
Table 5. Optimum Fire Staffing	32
Table 6. Normal Unit Strength - Equipment	33
Table 7. Normal Unit Strength - Supplies	34
Table 8. Annual Refuge Fire Management Activities	38

## APPENDICES

- A. Prescribed Burn Environmental Assessment (EA)
- B. Upland Management EA & Section 7 Consultation
- C. Stations Purposes, Mission, Goals, and Objectives.
- D. Fire Behavior Charts.
- E. MOU Between Waubay NWR and Waubay Fire Department
- F. Refuge Prescribe Burn Units
- G. Fire Cause Summary 1977-1997
- H. Employee Fire Management Qualifications
- I. Real Property Inventory of Buildings
- J. Waubay Wetland Management District By County
- K. Fitness Standards
- L. Monitoring Protocols





## I. INTRODUCTION

Fish and Wildlife Service policy states that Fire Management Plans will be developed for all FWS areas with burnable vegetation. These plans will: use information about fire regimes, current conditions, and land management objectives as a basis to develop fire management goals and objectives; address all potential wildland fire occurrences and include a full range of fire management actions; use new knowledge and monitor results to review fire management goals, and action; and be linked closely to land and resource management plans.

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

This plan will help achieve the objectives and directions described in the parent document, Upland Management Plan. The Upland Management Plan defines major land management issues, describes past and current activities and establishes actions that will be taken in the future. The FMP presents, in more detail, the actions that will integrate fire management with Waubay National Wildlife Refuge land management goals. This plan will be evaluated and updated in future years as required by changes in policy, management actions, and priorities.

In the early 1900's, prior to being established as a Wildlife Refuge, this area was part of a hunting club. Then, following the Dust Bowl years in 1935, Waubay Refuge was established to enhance the duck population that had been decimated by a lack of water during this era. Waubay is a Sioux Indian word meaning "nesting place for birds". Waubay National Wildlife Refuge was purchased to further the purposes of the Migratory Bird Conservation Act. It is owned by the Service in fee title and managed to provide high-quality wetlands and nesting cover primarily for waterfowl and other migratory birds. Many other wildlife species also benefit from the management including white-tailed deer and ring-necked pheasant. In 1958 additional lands were purchased under the Migratory Bird Hunting and Conservation Stamp Act as the Wetland Management District (WMD). These areas will be managed as the Waubay National Wildlife Refuge and Waubay Wetland Management District by staff headquartered at Waubay NWR as a single administrative field station, Waubay NWR/WMD Complex, of the U.S. Fish and Wildlife Service.

The Refuge consists of 4,650 acres. Habitat types are approximately 47 percent grassland, 35 percent wetland, 14 percent woodland/brush and 2.8 percent cropland. Woodlands are nearly surrounded by large glacial lakes, and are thought to have developed while protected from prairie wildfire that commonly

occurred on surrounding open prairie.

**Table 1: Habitat Types - Waubay National Wildlife Refuge**

Habitat Type	Acres
Grassland	2,232
Wetland	1,628
Woodland/Brush	651
Cropland	139

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

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

This plan meets the requirements of this Service mandate and provides fire management guidelines for Waubay NWR.

C. Authorities for implementing this plan are found in:



1. **Protection Act of September 20, 1922 (42 Stat. 857; 16 USC 594).** Authorizes the Secretary of the Interior to protect from fire, lands under the jurisdiction of the Department directly or in cooperation with other Federal agencies, states, or owners of timber.
2. **Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66, 67; 42 u.s.c. 1856,1856a and b).** Authorizes reciprocal fire protection agreements with any fire organization for mutual aid with or without reimbursement and allows for emergency or major disaster by direction of the President.
3. **National Wildlife Refuge System Administration Act of 1966 (80 Stat. 927; 16 USC 1601) 668dd-668ee).** Defines the National Wildlife Refuge System as including wildlife refuges, areas for the protection and conservation of fish and wildlife which are threatened with extinction, wildlife ranges, game ranges, wildlife management areas and waterfowl production areas.
4. **Federal Fire Prevention and Control Act of October 29, 1974 (88 Stat. 1535; 15 USC 2201).** Provides for reimbursement to state or local fire services for costs of firefighting on federal property.
5. **Departmental Manual, Part 620 DM 1 (April 10, 1998).** Defines Department of Interior Fire Management Policies.
6. **U.S. Fish and Wildlife Service Manual, 621 FW 1-3, Fire Management (February 7, 2000).** Defines Fish and Wildlife policies based on Departmental Manual 620 DM 1.
7. **U.S. Fish and Wildlife Service Fire Management Handbook (December 28, 2000).** Provides general planning and operational guidance for fire management programs in the Fish and Wildlife Service.
8. **Economy Act of June 30, 1932.** Authorizes contracts for services with other Federal agencies.
9. **Disaster Relief Act of May 22, 1974 (88 Stat. 143;42 U.S.C. 5121).** Authorizes Federal agencies to assist state and local governments during emergency or major disaster by direction of the President.

## II. COMPLIANCE WITH FISH AND WILDLIFE SERVICE POLICY

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Department of Interior policy requires that all refuges with burnable vegetation develop a fire management plan that details wildfire suppression policies, the use of prescribed fire for attaining resource management objectives, and fire program operational procedures. This Fire Management Plan is an extension of the refuge Upland Management Plan. This plan describes in detail fire management programs, activities and methods that will be undertaken by the U.S. Fish and Wildlife Service in meeting the wildfire suppression objectives and fire management strategies which utilize prescribed fire to attain the habitat environmental effects of the proposed fire management program in relation to refuge resources, the local environment as well as impacts to the public, adjacent landowners and surrounding communities.

- A. Waubay NWR currently has no Comprehensive Management Plan but is in the process of completing this plan by 2002. The refuge is operating under the Upland Management Plan that was developed in 1994 (**Appendix B, Upland Management EA & Section 7 Consultation**).
- B. Upland management of Waubay NWR and WMD is found not to have significant environmental effects as determined by the Environmental Assessment and Finding of No Significant Impact signed by the Refuge Supervisor 9/8/94.
- C. Finding of No Significant Impact signed by U.S. Fish and Wildlife Services Regional Director, Region 6, on 9/14/94 is based upon the analysis in the Waubay NWR Upland Management Environmental Assessment (EA). The Regional Director finds that manipulation of upland habitat for wildlife on Waubay National Wildlife Refuge and Wetland Management District, to accomplish unit goals and objectives, will not have a significant impact on the human environment. No Environmental Impact Statement is necessary.

The Regional Directors findings are based on 40 CFR 1508.27 as follows:

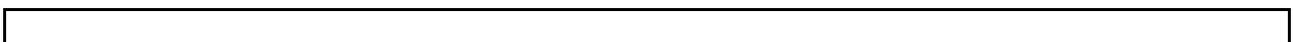
1. The use of the habitat management tools discussed in the EA would not cause detrimental impacts on public health or safety.
2. The use of these habitat management tools would not detrimentally impact the cultural resources, farmland, wetlands, or ecologically critical areas found within the six-county wetland district.
3. The habitat management tools analyzed within the EA have been used at Waubay Refuge and WMD for at least the past 13 years. There has been no controversy from the ongoing use of these tools. The increased use of these tools would not be any more

controversial than what has occurred in the past.

4. The use of these habitat management tools causes no possible effects on the human environment that are highly uncertain or involve unique or unknown risk.
5. The use of these habitat management tools will not establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration.
6. The use of the habitat management tools is not related to other actions resulting in cumulatively significant impacts.
7. The use of the habitat management tools would not adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or cause loss or destruction of significant scientific, cultural, or historical resources.
8. The use of the habitat management tools would not adversely affect endangered and threatened species or their habitats found within the wetland district.
9. The use of these habitat management tools does not threaten a violation of Federal, State, or local requirements imposed for the protection of the environment.

### **III. DESCRIPTION OF REFUGE**

Waubay NWR/WMD Complex is located wholly within the Prairie Pothole Region of the upper Great Plains. It is also part of the Prairie Pothole Joint Venture area, a geographic region of importance to the North American Waterfowl Management Plan. The Service has management and administrative responsibility on essentially five different landholding. These holdings are listed in Table 2.



**Table 2: Units - Waubay National Wildlife Refuge Complex**

Management Area	Acres
Waubay National Wildlife Refuge	4,650
Waterfowl Production Areas	39,984
Wetland Easements	104,992
Grassland Easements	129864
FmHA Conservation Easements	3,004

The Waubay National Wildlife Refuge is located in eastern Day County in the northeast corner of South Dakota (**Fig. 1 & 2**). The refuge covers 4650 acres adjacent to the northeast corner of a fairly large body of water known as Waubay Lake. Within the refuge are several smaller lakes and numerous sloughs. Since establishment of the Refuge many of these smaller lakes and sloughs have become part of Waubay Lake. The eastern quarter of the refuge is located within the Sisseton Indian Reservation. Additionally, nearly 40,000 acres of prime waterfowl habitat in a six county area have been purchased and are specifically managed for waterfowl production.

The refuge is situated in the northern portion of the physiographic province known as the Coteau des Prairies. A large oval shaped portion of this landform occupies the eastern one-fifth of the state. Flanking the Coteau des Prairies are the Minnesota River Valley to the east and the James River Valley.

The Coteau des Prairies has been described as a highland area of numerous hills and swales (Flint, 1955). This rolling terrain was formed by the oscillations of glaciers during the late Wisconsin period. Glacial features such as kames, moraines, meltwater channels, glacial lakes, and outwash plains constitute the topography.

A. General Description

1. Landscape

Northeastern South Dakota once was dominated by native prairie vegetation. Tall grasses and associated plant allies thrive in wetter climates or on heavier soils that retain moisture better. Drier climates or coarser soils tend to favor short prairie grasses and their associated flora. In general, tall grass prairie was the norm in the Minnesota River-Red River Lowland. Soils in the Dakota Lake Plain and James River Lowland were vegetated with mixed-tall

Figure 1: Map



Figure 2: Map



grass transition prairie. Mixed grass prairie extended over most of the Prairies des Coteau. Today, the Coteau des Prairies is still dominated by native prairie rangeland due to its general unsuitability for cropping. The other physiographic regions have lost more than 90% of their native grasslands to the plow.

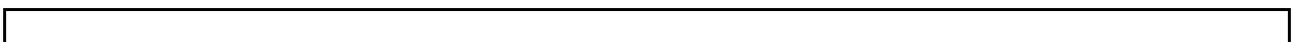
Even though drainage and other wetland-decimating factors have taken their toll, prairie wetlands are still a prominent feature of the Wetland Management District's landscape. The National Wetland Inventory has identified 348,482 wetland acres. These include ponds ranging from 0.1 acre wetlands with temporary water regimes to large glacial lakes to major rivers and smaller tributaries. Land use in the WMD is a mix of small grain farming, row crops, and livestock operations. Livestock operations are predominately beef cow/calf herds, but there are some dairy cattle farms. Native prairie and tame grasslands are used for grazing and haying by livestock operations. In general cattle operations dominate the Coteau des Prairies, cropping systems command other physiographic regions.

## 2. Climate

The climate is typically continental, characterized by cold winters and hot summers. Winter and summer temperatures can vary from extremes of minus 43 degrees Fahrenheit to 104 degrees Fahrenheit. More normal temperatures range from -26 to 95 degrees. Average annual precipitation is about 20 inches and is normally heaviest in late spring and early summer. Intense thunderstorms are normal occurrences in summer. Frequent spells of dry years often alternate with years that are wetter than normal. Wetland levels can fluctuate widely with these precipitation changes. The average seasonal snowfall is 30-35 inches. Combined snow and high winds often produce blizzard conditions. Prevailing winds are from the northwest. Wind speeds average 13 miles per hour but can often be much higher, especially in the spring. The growing season varies from 109 to 112 days.

## 3. Wildlife

The following synopsis describes various species potentially occurring on Service lands. This is not intended to represent or describe all species.



a. Invertebrates

Wetlands associated with Service lands normally carry high invertebrate populations. Nesting waterfowl, waterfowl broods, marsh and water birds, and shorebirds are highly dependent on these protein food sources for healthy, vigorous growth. Invertebrates associated with NWR/WMD Complex wetlands include worms, crustaceans, snails, and insects.

The Dakota Skipper butterfly (Hesperia dacotae) is a candidate for federal listing and is found within Waubay Complex.

b. Fish

There are over 100 species of freshwater fish that inhabit South Dakota and sixty-eight of these species have the potential to occur in lakes and wetlands on Service lands. The fishery associated with Service lands is classified as a warm-water fishery with low numbers of game fish and high numbers of minnows, carp, and suckers. Due to the shallow nature of lakes and wetlands, there is a high probability of fish winterkill.

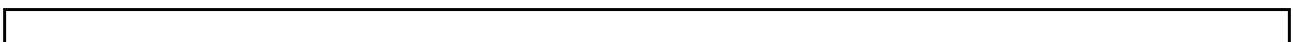
No federally listed fish species have been observed.

c. Reptiles and Amphibians

Thirty-three species of reptiles occur in South Dakota. Twenty of these species potentially occur within the NWR/WMD Complex. Broad reptile groups include turtles, skinks, and snakes.

The only State threatened species is the Northern redbelly snake (Storeria occipitomaculata). The usual habitat for this snake is moist woodlands. Waubay NWR and several locations in the WMD are known to host this snake.

There are 17 species of amphibians that could potentially occur on Service lands, consisting of salamanders, toads, and frogs. No federally listed reptiles or amphibians have been observed.



d. Endangered Birds

Since South Dakota is in the Northern Great Plains, grassland birds are the predominant bird life in the State. Approximately 244 birds species are recorded as regularly occurring within the NWR/WMD Complex. Another 12 species are accidental or extirpated.

Bald eagle can be seen around larger lakes during spring and fall migrations. Occasionally they are seen in winter. To date no nesting activity is known to occur on Service lands.

The whooping crane only rarely passes through the NWR/WMD Complex during its migration, the last sighting was in Clark County in the fall of 1985.

The peregrine falcon is also uncommon with the last reported sighting in 1985.

The Eskimo curlew is nearly extinct and may pass through on their migration and can potentially occur in wet meadows within the Complex.

The interior least tern is an uncommon migrant in the area.

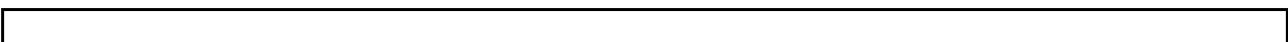
The piping plover is a federally threatened species that is known to occur in Waubay NWR/WMB Complex. The last documented nesting was in 1985.

e. Shore and Wading Birds

The diversity of wetlands associated with uplands on Service lands attracts a great variety of shorebirds and wading birds. Many shorebirds use the mudflats and shallows along the wetland edges or the shallows as wetland levels recede during their migrations in the spring and fall.

f. Raptors

Red-tailed hawks, Swainson's hawks, Northern harriers and



Great horned owls are the most common raptors in this area.  
They all nest within the NWR/WMD Complex.



g. Waterfowl

Waubay Complex lies within the Prairie Pothole Region of North America. This area is of prime importance for producing many of the nation's ducks. In addition, as part of the Central Flyway, other waterfowl species use the area as important stopover sites on migrational routes.

h. Upland Game Species

The ring-necked pheasant, gray partridge, and sharp-tailed grouse are common upland species that nest within the Complex.

i. Passerine and Other Bird Species

Approximately 137 other bird species nest and/or migrate through Waubay NWR/WMD Complex.

j. Mammals

There are an estimated 53 mammal species found within the six-county Complex. They range in size from the tiny shrews to the large ungulates, such the common white-tailed deer or rarely seen wandering moose or elk. No state or federal endangered or threatened mammals are known to occur in Waubay NWR/WMD Complex.

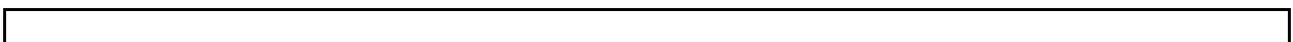
4. Human environment

a. Buildings

The headquarters complex includes a visitor center/office, maintenance shop, residence, bunkhouse, and several equipment storage sheds. The value of these structures is approximately 2 million dollars, replacement cost. No other structures exist on federally owned land. Improvements to private lands adjacent to the Refuge and associated lands consist of farmsteads, fences, utilities, equipment, and other agricultural support structures. Other private values are related to crops and pasture lands.

b. Socio-political climate

Waubay WMD is dominated by agricultural interests, chiefly



family farms raising crops and livestock. Many businesses cater to this base-line clientele. However, the city of Watertown is a regional manufacturing center. Uses of U.S. Fish and Wildlife Service lands include grazing, haying, hunting, bird-watching, and other recreation. Millions of dollars have been paid to landowners interested in preserving wetlands or grasslands. In general, U.S. Fish and Wildlife Service programs and activities are supported by the WMD population. Management of Service lands for wildlife habitat, including the use of prescribed fire, is supported by most people. Some interests oppose the use of fire since those lands could have been used to graze cattle or due to potential danger to buildings, private grasslands, or people.

B. The role of fire on Waubay National Wildlife Refuge

1. Historical role of fire

Prairie fires were a regular occurrence prior to white settlement. Joseph Nicollet, the regions earliest explorer, mentions a day in 1863 where the sky was obscured by a prairie fire for a day's travel . Early white settlers contended with frequent prairie fires (Olson 1918). Olson said fires were especially numerous early spring and fall when droughts had withered the grass. No buildings were safe unless protected by fire breaks.

Waubay NWR/WMD has a wetter climate than much of the prairie pothole region. Annual precipitation is about 20-inches. The rather wet climate, coupled with the fragmentation of grasslands by roads, croplands, wetlands, and other fire breaks does not lend itself to frequent catastrophic wildfires. Most private pastures have very low fuel loads and do not carry a fire well. These factors make wildfires a rather rare occurrence, and the wildfires that do occur are easily controlled or burn themselves out at the nearest firebreak. Waubay NWR had a wildfire of 2000 acres in 1993, but this was the most dramatic fire in the 60-year history of the station.

However, conditions often lend themselves to prescribed burns during dry periods. This station began a prescribed burning program to rejuvenate grasslands in the mid-1980's and the program has continued sporadically to the present. Annual prescribed burn acreage totals have ranged from 2000 to a few acres every year. Some years have had no prescribed burning conducted due to wet weather or other time demands. Resource

needs demand that these acreage totals be increased.

## 2. Fire Effects

### a. Vegetation and Fuels

Grasslands are burned primarily to manipulate vegetation and enhance biological productivity and diversity of specific organisms. Where native prairie is not a major component of a management unit, nearly all prescribed fires are used to reduce vegetative litter, to control noxious weeds, or to improve height and density of planted cover. Where native prairie is a major part of a management unit, the primary reasons for burning are to restore, improve, or enhance prairie habitat for wildlife. Occasionally, fire is used for very specific reasons such as reduction of Kentucky bluegrass or other undesirable, exotic cool season grasses, control of undesirable shrubs or trees, or to increase species richness. Burning makes some nutrients more soluble and therefore more readily available for growing plants. Nitrogen availability on burned sites also can increase due to elevated microbial activity following fires.

Area fuels are dominated by grasses. The WMD is situated within mixed grass prairie, which means there is a mix of tall and short grasses depending on soils, aspect, moisture, and other environmental factors. Short grass prairie is typically fuel model 1, but often times has fuel model 3 mixed in. Dense nesting cover and tall grass prairie can be characterized as fuel model 3. There are some oak savanna habitat, especially on Waubay NWR, that is fuel model 8.

### b. Wildlife

Fires affects wildlife primarily by modification of habitat. Fire removes vegetation and litter and therefore favors early successional species over later successional ones. Burns also increase local habitat diversity by creating a mosaic of habitats and increasing habitat interspersion and edge. Some direct wildlife mortality can result from fire. Most often this occurs in sedentary species, such as some reptiles, or immobile life stages, as in the egg or pupal stage of many insects. Although fire can be detrimental to ground nesting birds, prescribed burns can be times to avoid overlap with nesting seasons. Some species are known to successfully

renew following disturbance (Sowls 1955).

c. Air Quality

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

No permits are required during normal fire weather by the State of South Dakota.

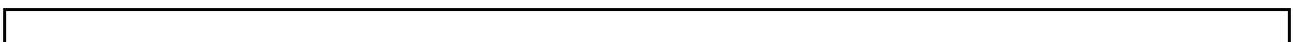
d. Soils

Given adequate soil moisture, fire generally increases vegetative growth and plant reproduction. Plants are often greener, larger, and more vigorous. This results in improved nesting cover for waterfowl, and some migratory and resident bird species. Exposed ground and residual ash creates a darkened soil surface. Burned surfaces warm more quickly in spring, increasing soil heating and often increase rates of microbial activity, seed germination, sprouting, and overall plant growth.

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

Fire can create conditions (temporarily) where erosion is elevated by increased soil exposure. Sod usually is sufficient to hold soil in place until vegetation regrowth occurs.

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



#### IV. REFUGE FIRE MANAGEMENT GOALS AND 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, property, and natural resource values. Service policy and the Wildland Fire Policy and Program Review direct an agency administrator to use the appropriate management response concept when selecting specific actions to implement protection and fire use objectives. The resulting Appropriate Management Response are specific actions taken in response to a wildland fire to implement protection and fire use objectives. With an approved Fire Management Plan, the Refuge staff may use wildland fire in accordance with local and State ordinances and laws to achieve resource management objectives (habitat improvement).

The Refuge Management Plans for Waubay NWR establishes a number of management objectives and operational goals which directly relate to the refuge fire management program. Waubay goals and objectives are to protect, restore and maintain wetland and upland habitats to provide for the life requirements of waterfowl and other migratory birds; to protect endangered and threatened species and their habitats; to optimize the diversity of naturally occurring plants and animals; to provide opportunities for public recreation and appreciation of our natural heritage. A complete list of Refuge goals and objectives can be found in **Appendix C**.

##### A. General

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

1. Fire is an essential natural part of Waubay NWR/WMD Complex native biotic communities.
2. Uncontrolled wildfire has the potential for negative impacts on and off the Refuge.
3. Positive or negative effects of prescribed fire on vegetation, and wildlife depend on burning conditions and species involved.
4. Use of "minimum tool" concept to minimize environmental and

cultural damage.

5. Rapid rates of spread and fire suppression response time can pose significant suppression problems and increase the likelihood of escape onto adjacent lands.

B. Management Objectives:

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

1. Provide habitat for any endangered species that may be found on the areas in the future
2. Optimize waterfowl production on each Waterfowl Production Area (WMD).
3. Provide and maintain quality upland and wetland habitat capable of supporting migratory bird populations throughout their life cycles.
4. Optimize the abundance and diversity of naturally occurring wildlife and plant species.
5. Provide quality wildlife/wildlands oriented recreation.

Service fire management policy is based on the Departmental Manual (620 DM 1) and the Federal Wildland Fire Policy and Program Review. Wildfires will be suppressed using appropriate management response strategies. Management actions taken on wildland fires must consider firefighter and public safety, be cost effective, consider benefits and values to be protected, and be consistent with natural and cultural resource objectives. The Service will employ prescribed fire whenever it is an appropriate tool for managing Service resources and to protect against unwanted wildland fire.

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

A. Fire management goals for Waubay NWR/WMD Complex:

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1. Protect life, property, and other resources from unwanted fire.
2. Use prescribed fire as a tool to accomplish habitat management objectives.

B. Fire management objectives for Waubay NWR/WMD Complex are:

1. Firefighter and public safety is the priority objective of the program. All Fire Management activities will reflect this commitment.
  2. Protect life, public and private property and cultural and natural resources from unwanted fire.
  3. Safely suppress all wildland fires using strategies and tactics appropriate to safety considerations, values to be protected, and in accordance with Service policy.
  4. Prevent the inappropriate application of fire where it may degrade cool-season grasslands and promote weed infestation.
  5. Minimize the cost and impact of suppression activities.
  6. Use prescribed fire to the fullest extent possible within or near Refuge development zones, wildfire sensitive resources, and boundary areas to reduce the risk from wildfire damage.
  7. Use prescribed fire to restore and perpetuate native wildlife species, by maintaining a diversity of plant communities.
  8. Maintain prairie by retarding the invasion of woody species and noxious weeds.
  9. Educate the public regarding the role of prescribed fire within the Refuge.
  10. Manage all forms of wildland fire (wildfire, wildland fire, and prescribed fire) to achieve identified management goals.
  11. Develop and implement a process to ensure the collection, analysis and application of high quality fire management
-

information needed for sound management decisions.

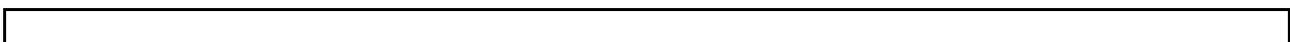
12. Prevent unplanned human-caused ignitions.
13. Restore and rehabilitate resources lost or damaged by fire or suppression activities.
14. Manage all wildland fire using the Incident Command System.

## **V. FIRE MANAGEMENT STRATEGIES**

It is the intention of the U.S. Fish and Wildlife Service to continue to suppress all wildfire occurring within Waubay NWR/WMD Complex, including natural lightning ignitions. Management ignited prescribed fire will be utilized under controlled conditions and defined weather variables to mimic the natural role of fire in sustaining ecosystem functions, improve habitat conditions for wildlife and reduce hazardous accumulations of dead fuels for fire prevention.

Fire management objectives will be achieved by making training and details available to station staff to enhance safety awareness and technical expertise to conduct fire operations. All prescribed burn plans will reflect the need for protection of staff, public, cultural resources, and facilities. Prescribed burn plans will have clear resource goals to benefit resources, with low risk of harm, built into each plan. Suppression activities will be minimized by developing good long-term habitat manipulation plans for each unit to avoid costly, short-term management “emergencies”, including burning. Station monitoring programs for vegetation and wildlife will be blended into burning activities to determine if specific burn plan objectives are realized by a specific burn. In summary, good training, planning, and monitoring will go a long way to further station fire management objectives.

- A. Waubay NWR/WMD will manage all wildfires using the Appropriate Management Response concept, suppressing all wildfires commensurate with values at risk. Strategies employing a range of suppression options will be considered. Minimum impact suppression techniques (MIST) will be used where and when appropriate. The primary suppression strategy employed will be aggressive control using 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 strategy will be employed utilizing natural and human-made features as wildfire control points. The Incident Commander will consider all factors when formulating a suppression response. The following table is meant to show a



range of options available to the Incident Commander.

**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 or during the fire.	1. Holding at natural and man-made barriers. 2. Burning out. 3. Observe and patrol.
1. Wildland fire on Service property with low values to be protected. 2. Wildfire burning 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. Patrol and mop-up of 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 and 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.

Strategies are as follows and will be employed to meet refuge fire management objectives:

1. All wildfire will be suppressed using the appropriate management response concept. Units within Waubay NWR/WMD range in size from 5000-acres to 10-acres. Most units are 160 to 300 acres in size. Response time to wildfires range from a few minutes to 1.5 hours. Many fires burn themselves out prior to Service crews getting to the site.



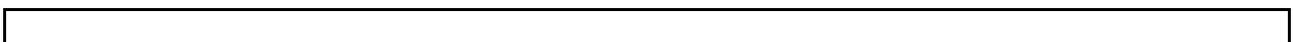
Suppression strategies and tactics will be unique to each wildland fire, predicated by weather parameters, fuel conditions safety considerations, availability of resources, and location of the fire in relation to structures and cultural resources..

2. Prescribed fire will be used to manipulate degenerated grasslands, help open up wetlands, and as a tool for hazard fuel reduction to compliment resource management objectives. Specific plans will be developed for each unit to achieve resource management objectives and outline a prescribed burning strategy to achieve it.
3. Suppress all unplanned ignitions in a safe and cost effective manner consistent with resources and values to be protected. Grazing and/or haying can often be used to compliment suppression activities. The cost of strategy implementation must be less than the value of the resource being protected.

Minimum impact strategies and tactics will be used when possible. However, utilization of heavy equipment remains an option for control of high intensity fires and fires threatening critical values such as historical structures, endangered species, cultural resources, private property, and the like. Use of heavy equipment (dozers, graders, discs, and plows) around cultural sites will only be used in fire suppression with approval of the Refuge Manager or his designee.

4. Conduct all fire management programs in a manner consistent with applicable laws, policies, and regulations.
5. Initiate cost effective fire monitoring which will tell managers if objectives are being met. Monitoring information will be used to refine burn prescriptions to better achieve objectives.
6. Develop Memorandums of Understanding (MOU) with local fire suppression agencies to provide for cooperative suppression action. Local fire departments, the Sisseton-Wahpeton Sioux Nation, South Dakota Game, Fish and Parks Department, and the Nature Conservancy are potential partners in this effort.

Containment strategies may be employed when resource values are



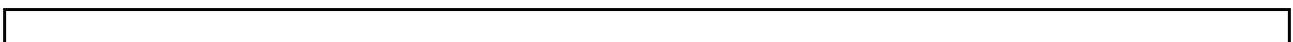
compromised more by suppression actions than by the fire. Examples include areas of archeological resources or endangered plant populations within the fire perimeter.

B. Constraints on the refuge fire management strategies include the following:

1. Smoke management must be carefully considered for any prescribed burn and will be addressed in all prescribed burn plans.
2. All fires occurring on the Refuge will have suppression resources on them until mopped-up and declared safe to demobilize.
3. The use of heavy equipment, such as dozers, in and around cultural sites must have approval of the Refuge Manager or his designee.
4. 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.
5. The use of prescribed fire to achieve management objectives must be conducted in a cost effective manner.
6. 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.

C. Rationale behind fire management strategies.

1. Grassy areas around the perimeter of the refuge could, if ignited, spread beyond the refuge staff's ability to control the fire. Consequently, MOUs will be maintained with local rural fire districts so that assistance can be sought in the event the refuge staff cannot contain these wildfire.
2. It may be necessary to reduce fuel loading in some areas for fire safety reasons to reduce the risk from wildfire damage. In areas where this is deemed necessary it must compliment resource management objectives.



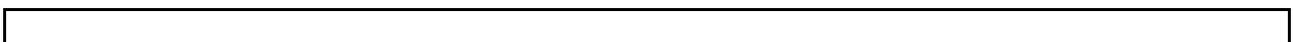
#### D. Impacts of Fire Management Activities

Over 96% of the landscape of Waubay Wetland Management District is held in private ownership, primarily agricultural producers. Nearly all private land is grazed, cropped, or hayed, with several notable exceptions. Abundant wetlands are often too wet for agricultural uses, but when dry, are heavily used for grazing, cropping, or haying. Significant portions of croplands, up to 25% of croplands in some counties, are planted to grasses as part of the Conservation Reserve Program. Most of these planted grasslands are idled for 10-15 year periods. About 4% of the landscape is federal or state ownership and managed primarily for wildlife production.

Significant fuel loads may occur on public lands and Conservation Reserve Program grasslands. Private grasslands (haylands and pastures) and croplands rarely build up enough burnable fuel to carry a fire. Wetlands, in drought situations, may have significant fuel loads.

The entire landscape is a patchwork of crop fields, pastures, hay fields, public lands, Conservation Reserve Program grasslands, wetlands, and an extensive network of roads that discourage the size potential of a wildfire. Abundant wetlands, crop fields, heavily grazed pastures, roads, and hayed grasslands serve as very effective fire breaks. In addition, the climate of northeastern South Dakota tends to be wetter than other portions of the Great Plains, to the west. This factor also discourages the potential of large wildfires. Most recent wildfires have been human caused, usually escaped fires from landowners burning roadsides, wetlands, or Conservation Reserve Program grasslands. However, most landowners are reluctant to use fire for these purposes, choosing instead to use other methods. The collective experience of the Waubay NWR/WMD Complex staff for the past 30 years can recall no fires that exceeded more than 3000 acres or the actual loss of a occupied building from a wildfire. Most fires are less than 200 acres in size. Injuries to humans, that have occurred, have been from persons fighting fires that were ill trained or unprepared for the task.

Farmsteads, consisting of a house, barn, and an assortment of outbuildings are common across the landscape. Nearly all landowners mow grass around their buildings, and/or have other natural firebreaks such as cattle yards, tree shelter belts, or other barriers to fire.



## VI. FIRE MANAGEMENT UNITS (FMUs)

Waubay NWR/WMD Complex has been divided into three fire management units. The decision to divide the Complex into three FMUs is based on: (1) capability of a fire to escape the unit (islands); (2) access and initial attack times and capability (WMD); (3) differences in values to be protected (i.e., cultural and archeological resources, and urban interface)

**Table 4: Fire Management Units**

Fire Management Unit	Management Units
FMU#1 - Islands Surrounded by Water	Units 1,2,3,&4
FMU#2 - Wetland Management Districts	Individual WPA's
FMU#3 - Grasslands adjacent to Refuge Boundaries	Units 5,5,7,&8

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

Each FMU has a pre-attack fire suppression plan developed which contain and specify the following:

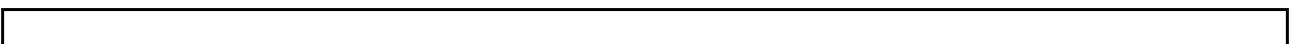
1. A detailed map of the unit showing roads, improvements, structures, cultural or historical sites and the best locations for containing a running wildfire within the unit.
2. Fire suppression objectives of the unit.
3. Primary control strategies and tactics to be utilized within the unit.

- B. Detailed strategies for each FMU are discussed below.

1. **FMU #1. (Fig. 3, Units 1,2,3,& 4) Islands Surrounded By Water.**

Most cover is burr oak woods with an understory of buckbrush, but there is some native prairie comprised of short grasses (less than 1.5 foot tall) mixed with buckbrush. The 96 acre island in the middle of Hillebrand's and Spring Lakes (joined) house the Refuge headquarters, maintenance

Figure 3: FMU 1



shop, a residence, and several outbuildings. Topography is generally flat, with some slopes of 15%. Normal fire behavior is slow-burning ground fires with low flame lengths. In fact, getting any kind of fire to burn in this moist fuel type (shade, duff, proximity to water) is difficult. Extreme fire weather conditions are necessary to carry a fire that will burn forest under stories.

Primary Resource Objective of the Unit: Provide viewing of diverse habitats and their associated wildlife for Refuge visitors.

Fire Objectives are:

- a. Stimulate upright growth of grasses and forbs in open prairies and woodlands.
- b. Remove litter accumulations.
- c. Discourage tree encroachment into prairies.
- d. Reduce fuel build-up to reduce dangers from visitor caused fires (arson or carelessness).

Safety considerations:

- a. Suppression crews will be alerted to importance of protecting structures and will also be informed of Fish Wildlife Service Policy that the Service does not fight structural fires but can take action to keep the fire from spreading to the structure from wildlands.
- b. Public traffic will be prevented from accessing the islands.
- c. Weather will be watched carefully, especially in unstable conditions when fire behavior can be very high.
- d. Wildfire behavior will be monitored and required data collected, and crews will be briefed 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.

The chance of a fire escaping from Islands is near zero. Direct attack using fire engines and hand tools will be the strategy when conditions allow. Under extreme burning conditions, indirect attack may consist of protecting structures until conditions change or the fire has burned into existing barriers.

## 2. **FMU #2. ( Fig. 4) Wetland Management Districts**



These areas are spread over six counties and vary in size from approximately 40 to 1000 acres covering approximately 40,000 acres. Fires occurring on these units may not be reported to the Fish and Wildlife Service until after the fire has been extinguished. In many cases they are extinguished by local residence or rural fire departments the same as other wildfire that occur on surrounding private property. Normal fire behavior of these grasslands is ROS of 100 chains/hour with flame lengths approaching 10-feet. However, in extreme fire weather conditions, very dangerous conditions can result with very fast fires, with high flame lengths.

The protection of the resource and private property is the main concern in these units. Fires will be completely suppressed using direct attack or from numerous existing barriers such as roads, plowed ground, etc..

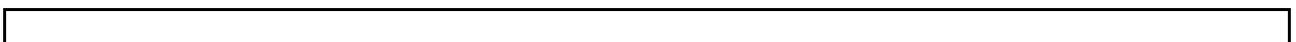
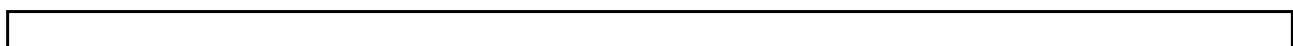


Figure 4: FMU 2



**3. FMU #3. (Fig. 5, Units 5,6,7,& 8) Grasslands around the boundaries of the Refuge:**

These units may include areas where, once ignited under favorable burning conditions, fire could escape into private property consisting mainly of wildland prairies. Normal fire behavior of these grasslands is ROS of 100 chains/hour with flame lengths approaching 10-feet. However, in extreme fire weather conditions, very dangerous conditions can result with very fast fires, with high flame lengths. During extended periods of drought and warm weather fire danger can be extreme. Because this FMU bounds private property, special care must be taken to prevent the spread of fire outside the refuge.

Most of the FMU is 2 foot high or less native prairie dominated by stipas, western wheat grass and buckbrush invaded with smooth brome.

Primary Resource Objectives are to provide quality nesting cover for waterfowl and prairie passerines.

Objectives of Fire:

- a. Remove litter accumulation in unit
- b. Stimulate upright growth of grasses and forbs.
- c. Encourage grass growth within monotypic buckbrush stands.

Safety considerations:

- a. Suppression crews will be kept apprised of weather conditions and potential fire behavior.
- b. Crews will be briefed 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.
- c. Alert crews to hazards of utility lines.
- d. Alert the Sheriff if the fire or smoke approach county roads,
- e. Post lookouts
- f. Each person will carry a hand held radio on the same standard frequency.

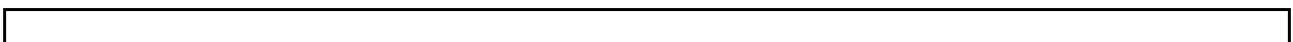


Figure 5: FMU3



Direct attack using engines will be the main strategy on fires in this unit unless conditions exist making direct attack unsafe. In these cases indirect attack and flanking action will be initiated.

## **VII. FIRE MANAGEMENT RESPONSIBILITIES**

A. Waubay NWR/WMD Complex does not have a dedicated Fire Management Staff. Fire Management responsibilities fall under the direction of the Refuge Manager. Primary wildland fire management responsibilities are:

1. to provide initial attack fire suppression capability and ensure all wildland wildfire receive some type of initial attack response.
2. conduct prescribed fire activities in support of refuge habitat management programs.
3. establish appropriate fire related agreements/contracts and ensure they are reviewed and updated on an annual basis.
4. monitor results of wildland and prescribed fires to assure they are meeting established objectives.
5. update fire management and associated plans (dispatch, training, etc.).
6. continue to develop "red-carded" firefighters for prescribed and wildland fire, trained and equipped to accomplish the fire management program.
7. assure fire equipment in a ready state.

The Refuge Manager of Waubay NWR is the primary line officer responsible for all aspects of the fire management program. The Project Leader approves the fire management plan, reviews and approves prescribed burn plans, and makes any necessary media contact. Also, ensures that the fire management program is carried out in accordance with Fish and Wildlife Service policies, regulations and guidelines. There are other non-fire management staff that must assist with the overall implementation of the fire management program.

B. The Station Fire Management Team

The station's fire management team consists of collateral duty firefighters.

The optimum staffing levels and current staffing levels are indicated in **Table 5**. Current staffing is listed in **Appendix H**.

**Table 5: Optimum Fire Staffing**

<b>Position</b>	<b>Number Required</b>
Burn Boss III (RXB3)	2
Incident Commander Type V (ICT5)	1
Engine Boss (ENGB)	2
Engine Operator (ENOP)	2
Ignition Specialist (RXI2)	2

This team has the primary responsibility for fire suppression and prescribed fire on the Complex. However, because of the distances involved in travel, especially to Waterfowl Production Areas, and for wildfire that occur when refuge staff are away from the job site or haven't been notified of a wildfire, the rural fire departments will be relied upon for suppression.

The Burn Boss is responsible for fire management decisions on a day to day basis. The engine operator is responsible for maintaining the fire pumpers. All fire management team members are responsible for maintaining their assigned personal protective equipment, following instructions, maintaining a level of fitness, passing annual fitness tests, and making appropriate decisions based on their knowledge and training.

C. Firefighting Equipment and Supplies



**Table 6: Normal Unit Strength - Equipment**

Item	Year Purchased	Percent of Fire Funding	Have	GVW	Need	GVW
Engine Module(s) medium (200 gal) medium (300 gal)	1999 1986	100% 100%	1 1	15K 12K	1	15K
Slip-on unit(s)						
Water Tender - (1000 gal)	unk		1			
Portable Pump(s) Standard float-a-pump			0 0		1 2	
Power Saw(s)		0%	4		0	
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

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 7: Normal Unit Strength - Cache Supplies**

Item	Number
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Flappers	12
Axes	2
Mcleod Tools	2
Backpack Pumps(Fedco)	4
Backpack	1
Drip Torches	4
Pulaski Tools	5
Fire Resistant Pants	
Fire Resistant Shirts	
Hard Hats	
Gloves	
Goggles	
Fire Shelters w/case	
Headlamps	
Packs, Personal Gear	
Packs, Line	
Water Bottles	
Rations	
Ear Plugs	

The Refuge will maintain a Normal Unit Strength (NUS) of two pairs of fire pants, gloves, and fire shirts for each qualified firefighter together with the following:

- |                       |                 |
|-----------------------|-----------------|
| Hard Hat              | Goggles         |
| Leather Gloves        | Fire Shelter    |
| 8' High Leather Boots | Hand-held Radio |
| Fire Pants            | Fire Shirt      |



## VIII. WILDLAND FIRE PROGRAM

### A. Fire Prevention

Wildfire prevention is accomplished through hazard reduction burning. Refuge roads are maintained for accessibility and as defensible firebreaks.

### B. Fire Season

The maximum wildfire season in dry year runs from March through mid-November. A more typical fire year will extend from April through October.

### C. Fire Behavior see **Appendix D, Rate of Spread, Fire Line Intensity, Flame Length)**

### D. Preparedness.

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

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.

There is required refresher training for all personnel that are involved with wildland fire activities. These requirements are found in the Service Fire Management Handbook under Training, Qualifications and Certification. Only employees meeting current fitness, training, and experience requirements will be dispatched to fires. Employees not meeting these

requirements may assist in support capacities, but are not permitted on the fire line.

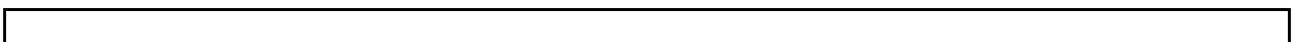
1. Annual Refresher Training

All personnel involved in Fire Management activities are required to participate in wildland fire management refresher training annually 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 courses Standards for Survival, Lessons Learned, Look Up, Look Down, Look Around, and others 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.

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 K** 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 appropriate first aid procedures must be on site during the test.

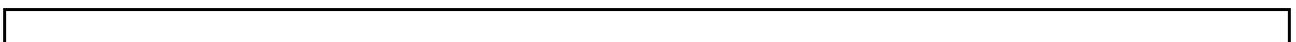
Wildland fire fitness tests shall not be administered to anyone who has obvious physical conditions or known heart problems that would place them at risk. All individuals are required to complete a pre-test physical activity readiness questionnaire prior to taking a physical fitness test. They must read and sign the Par-Q health screening questionnaire, an informed consent form (**Appendix K**). If an employee cannot answer NO to all the questions in the PA-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.



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. The cost of examination will be born by the Service and the results sent to the Region Personnel Department.



**Table 8: 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											
Issue PPE			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										
Weather Station Maintenance and Calibration												x		
Live Fuel Moisture Sampling							x	x	x	x				

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

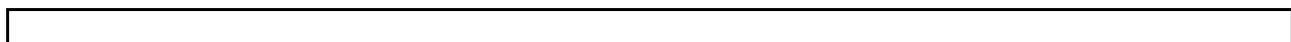
Station readiness will include checks of all fire cache equipment, trucks, and pumper units. Special attention will be devoted to pumper units, foam units, drip torches, chain saws, and other equipment regularly carried on pumper units. All checks will be conducted prior to the potential fire season.

4. Step Up Plan

Regional and national preparedness requirements will be reviewed annually to insure station readiness standards conform. Fire bulletins will be reviewed for potential equipment or maintenance warnings/tips. Minimum impact guidelines for Waubay NWR cultural resources will be reviewed to ensure protection of these resources during preparedness and fire-fighting activities.

5. Impacts of Drought and Regional and National Preparedness

Periods of drought can greatly impact fire behavior and resistance to suppression. For that reason the Rangeland Fire Danger Index, Palmer Drought Index, and the Keetch-Byram Drought Index will be monitored at a minimum on a weekly bases throughout the year. All are available on the Internet at <http://ndc.fws.gov>. The Refuge



fire staff can also contact the Custer Interagency Dispatch Center (605-673-9300) during periods of high fire danger to track indices and anticipate possible fire activity.

Northeastern South Dakota tends to be wetter than most of the rest of the Great Plains, but droughts do occur periodically. Seasonally, May and June tend to be the wettest months, with August and September the driest, during the growing season. However, during drought periods, cattle forage is at a premium, so livestock producers remove more available forage by haying or grazing, thus reducing the potential for wildfires. Larger acreages of Conservation Reserve Program grasslands and public lands are at most risk for wildfires during drought periods.

Local fire departments are usually the first line defense for wildfires. The flashy fuel nature of grasslands usually means fires extinguish themselves, or are extinguished by local forces, prior to mobilization of regional or national forces. Fires rarely last overnight in this locality.

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.

E. Pre-attack Plan.

The pre-attack plan will be reflected by Refuge maps which includes locations of structures, roads, and power lines. (**Figure 6**). Cultural resource sites are shown on **Figure 7**.

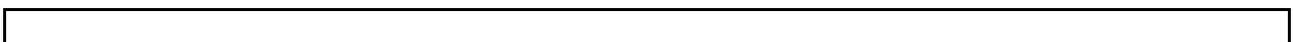


Figure 6: Map



Figure 7: Map



F. 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 increase the fire danger beyond what is normal. Severity funding is requested to prepare for abnormally extreme fire potential caused by unusual climate or weather events such as extended drought. Severity funds and emergency presuppression funds may be used to rent or preposition additional initial attack equipment, augment existing fire suppression personnel, and meet other requirements of the Step-up Plan.

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

G. Detection

There may be an occasion 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.

H. Suppression.

As spelled out in the Fire Management Units all wildfire will be aggressively and completely suppressed with minimum acreage burned as the goal. Service policy requires the Refuge to utilize the Incident Command System with firefighters meeting Service qualification

requirements for fires occurring on Service



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fires. Historical fire occurrence does not warrant seven day coverage so MOUs must be maintained annually with Rural Fire Districts. Resources responding from rural fire departments to Service fires must meet the standards of their department. If backup forces from Rural Fire Districts are needed to control a wildfire, they will be requested through the Sheriff's office. Waubay NWR maintains MOUs with the Waubay fire district (**Appendix E**) but needs to develop MOUs with the other county departments.

In the event a wildland fire escapes initial attack, a Wildland Fire Situation Analysis (WFSA) will be prepared.

I. Mop up Standards and Emergency Stabilization and Rehabilitation

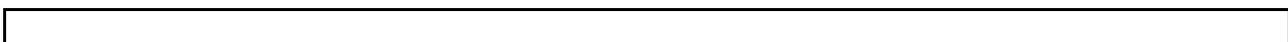
The IC will be responsible for mop-up and mitigation of suppression actions taken on Refuge fires. The mop-up standards established in the Fireline Handbook will be followed. Refuge fires will be patrolled or monitored until declared out.

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 **Emergency Stabilization and Rehabilitation Plan:** Because of the emergency nature of the fire event, the emergency stabilization section of the Emergency Stabilization and Rehabilitation Plan (ESR Plan) must be developed expeditiously and is frequently developed by a local unit or designated burned area ESR team. The rehabilitation section of the ESR Plan is not considered an emergency, and is developed as other refuge land use plans. The refuge manager is responsible for preparing all ESR Plans. In order to be funded, ESR Plans must meet resource management objectives and be approved by the Project Leader and the Regional Director.

J. Records and Reports.

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

## IX. PRESCRIBED FIRE MANAGEMENT

The approved Prescribed Fire Plan constitutes the authority to burn, pending approval of all required documents. No one has the authority to burn without an approved plan or in a manner not in compliance with the approved plan. Prescribed burning plan conditions established in the plan are firm limits. Actions taken in compliance with the approved Prescribed Fire Plan will be fully supported, but personnel will be held accountable for actions taken which are not in compliance with the approved plan.

The County Sheriff's Office will always be notified by the Burn Boss prior to any

prescribed burning. Private landowners adjacent to the proposed burn will also be notified.

A. Primary Objectives of the Prescribed Fire Program are as follows:

Stimulate upright growth of grasses and forbs in open prairies and woodlands.

Remove litter accumulations in prairies and woodlands.

Discourage tree encroachment into prairies.

Reduce fuel build-up to reduce dangers to public, and damage to structures and resources from catastrophic fire.

Goals of the Management Plan are as follows:

Produce feed for a diversity of migratory bird species.

Provide improved watchable wildlife viewing and waterfowl hunting opportunities for refuge visitors.

B. Planning

The Refuge Manager is responsible for identifying units (**Appendix F, Refuge Burn Units**) or areas in need of treatment, and for developing resource and treatment objectives for those units/areas based on refuge resource management goals and objectives. The Burn Boss is responsible for determining if prescribed fire can be utilized to meet the treatment objectives. Prescribed fire is just one of a combination of tools (fire, grazing, haying, manipulation, etc.) which will be considered.

Contingency plan guidelines for each prescribed burn will be developed in the event that weather, available fire personnel, or habitat response differs from the expected. For example, if wet weather prevents a planned spring burn, do we switch to a burn later in the summer or another management technique (grazing, for example). Or do we leave the unit idle and plan a similar burn the following spring? If an unlikely habitat response occurs, does the plan have the flexibility to take this into account? Several contingencies and sound guidelines should be written into plans to allow land manager flexibility to accomplish habitat goals.

Should prescribed fire be selected as the preferred treatment alone or in some combination with other treatments the Refuge Manager will develop a burn prescription and plan which will accomplish the desired objectives. All planned ignitions will be accomplished using qualified personnel.



Prior to implementing a prescribed burn plan, the effects of drought will be assessed using either the Palmer Drought Index or the Keetch-Bryam Drought Indicator. Either of these two drought indicators can be accessed on the internet at: <http://www.boi.noaa.gov/fwweb/fwoutlook.htm>

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.

The use of prescribed fire to achieve management objectives must be conducted in a cost effective manner.

C. Complexity.

Prescribed fires on the Refuge may vary from low to moderate complexity as determined by the Region 6 Complexity Analysis. Most prescribed fires, if not all, will be of low complexity with individual criteria, such as air quality, smoke management, fuel types, etc., addressed in the burn plan.

D. Monitoring and Evaluation

1. Introduction

Past monitoring and evaluation of prescribed fires has been limited due to funding and staffing limitations. Pre-burn evaluation was limited to general photographs and/or qualitative evaluation of fuel conditions and green up conditions. Burn day evaluations documented weather (many times not on site) and limited documentation of fire behavior. Subjective measurements (visual) such as the percent of fuel consumed were also made. Post burn evaluation was limited to subjective qualitative estimates of species response and effectiveness in achieving objectives.

Although little site specific data on the effects of fire for Waubay NWR exists, general conclusions can be made from the Fire Effects Information System. The internet can be used to determine the effects of fire on plant species that are found on Waubay NWR. This tool can be accessed on the internet at: <http://www.Fire.org/perl/tools.cgi>

Fire monitoring protocols for the Region or Service will be used at Seedskadee NWR. (**Appendix L**). When the fire management program proposed by this plan is fully funded, a more quantitative monitoring program will be implemented. Protocols will be

established determine if burn objectives are being met and monitor long term will be conducted to determine vegetation responses.

## 2. First Order Fire Effects Monitoring Program

- a. Environmental Conditions will be recorded at the site periodically prior to ignition and hourly during the burn. Conditions to be evaluated include Air Temperature, RH, and Wind speed and direction.
- b. Fuel moisture(s) will be measured or estimated using tables, charts, or other prediction system (BEHAVE).
- c. Fire Behavior such as flame length and rates of spread will be recorded.
- d. Post fire effects will be measured or estimated. These effects include scorch height, percent of area burned, percent of fuel consumed - based on fuel (time-lag) classification, amount of duff removed, etc.

## E. Potential Impacts.

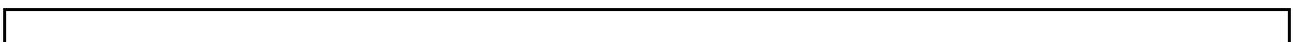
There are no known political, environmental, social or economic impacts, with the exception of an escaped burn going off refuge onto adjacent property. To mitigate escapes, weather variables and control lines will be monitored and included in the burn plan.

## F. Reporting and Documentation.

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

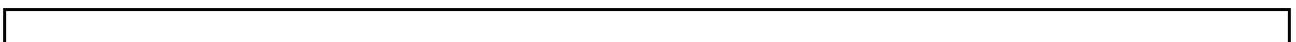
## X. AIR QUALITY/SMOKE MANAGEMENT GUIDELINES.

Visibility and clean air are primary natural resource values. The protection of these resources must be given full consideration in fire management planning and operations. Additionally, smoke can have serious health and safety effects



which must be considered during planning and approval processes.

In general, air quality of the area is good during the burning season. The management of smoke will be incorporated into the planning of prescribed fires, and, to the extent possible, in the suppression of wildfire. The State of South Dakota does not have a permit system for open agricultural burning.



## **XI. FIRE RESEARCH/MONITORING**

The refuge will continue collecting data and monitoring the success or failure of their burns to assure they accomplish objectives as outlined in Section IX.

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

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

## **XII. PUBLIC SAFETY**

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

The greatest threat to public safety from refuge fires is to people off refuge. Fire fronts in grass fuel models move rapidly and can be dangerous. However, most of the grass units on the Complex are small and fast moving fires can exit refuge lands rapidly. Neighbors who initiate their own suppression without proper training, equipment, or communication are the largest threat to public safety.

One of the worst fires in the recent history started on State land and spread through the refuge to private land before suppression action could be taken.

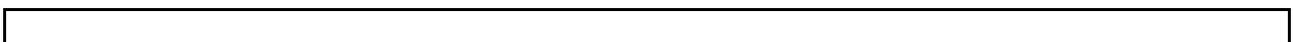
## **XIII. PUBLIC INFORMATION AND EDUCATION**

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

### **A. Wildland Fire Suppression**

During wildfire the IC is responsible for providing fire information to the public.

### **B. Prescribed Fire**



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

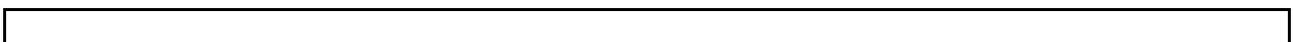
- Talk to local schools and students and groups that visit the refuge.
- Attendance at local volunteer fire department meetings
- Include prescribed fire message in interpretive publications.
- Personal contacts with bystanders during prescribed burns.

#### **XIV. ARCHEOLOGICAL/CULTURAL/HISTORIC RESOURCES**

A 1981 archeological survey found 27 known archaeological resource sites on the Refuge. The cultural inventory report concluded that four sites were significant and eligible for nomination to the National Register of Historic Places. There are three known Indian Burial Mounds on the refuge. None have been excavated so the refuge has no knowledge of their contents. Many artifacts were found on the Refuge including: lithics, ceramics, faunal remains, and stone tools. Archeological, cultural, and historic resources have been identified on a map and included in this Fire Management Plan as information for Incident Managers and Burn Bosses. In general, fires should have little impact on those resources known to exist within the Refuge because few exist above ground. One possible threat to these resources is the use of earth moving equipment. The use of earth moving equipment for suppression activities must be approved by the Refuge Manager.

#### **XV. ANNUAL FIRE PLAN REVIEW**

The fire management plan will be updated as major policy decisions and land acquisitions are made. At a minimum, this plan will be reviewed once a year by the individual on the refuge with fire responsibility to maintain the integrity of the plan. Amendments to the fire management plan itself will be made as needed by sending them to the Regional Office. Minor changes to the appendices, such as personnel changes, can be made at the refuge and attached to the plan during this yearly review process without involvement of the Regional Office.



A. Wildfire

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

1. Significant injury, accident, or fatality
2. Significant property or resource damage
3. Significant safety concerns are raised.
4. Extended attack

B. Prescribed Fire

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

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

## **XVI. CONSULTATION AND COORDINATION**

The Fire Management Plan will be made available to the following to provide them an opportunity to comment on this document;

Waubay Rural Fire District  
Webster Rural Fire District  
Regional Fire Management Coordinator

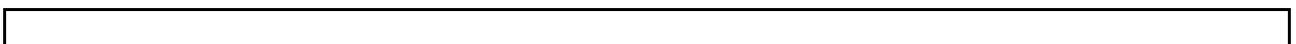
Managers of the Waubay Complex routinely discuss management practices with Federal, State, and local agencies. Various management practices are discussed with local Soil Conservation Service soil conservationists for their professional input.

Integrated weed management is coordinated with the various County Weed Supervisors. All supervisors are contacted each spring and given notification of Complex weed control plans for their county. District weed meetings are attended and information is traded concerning weed control accomplishments and methods.

Local sportsmen's club meetings are attended as opportunities arise, and policies and management practices are explained.

A Waterfowl Planning meeting was held in 1993 to discuss management

practices concerning long-term protection and improvement of habitat.



## Appendix H

### EMPLOYEE FIRE QUALIFICATION LEVELS

Position	Qualifications	Fitness Level	Name
Refuge Manager	Burn Boss, IC T5	Arduous	Doug Leschisin
Refuge Manager	FFT2	Arduous	Connie Mueller
Ass't Refuge Manager	FFT2	Arduous	Jarrod Lee
Tractor Operator	FFT2	Arduous	Mike Dargatz
Bio Tech	FFT2	Arduous	Christine Lousias
Maintenance Worker	Dozer Operator Engine Boss	Moderate	Thomas Siekaniec
	FFT2	Moderate	Laura Umbright

**APPENDIX K      FITNESS STANDARDS**



**APPENDIX L      MONITORING STANDARDS**

