WILDLAND FIRE MANAGEMENT PLAN

CRANE MEADOWS NWR

2003

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GREAT LAKES-BIG RIVERS REGION

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INTRODUCTION

This plan establishes the Fire Management Program for Crane Meadows NWR (Refuge) and is written as an operational guide for managing the Refuge's wildland fire and prescribed fire programs. It defines levels of protection needed to ensure safety of employees, the visiting public and refuge neighbors, protect facilities and resources, and restore and perpetuate natural processes, given current understanding of the complex relationships in natural ecosystems. It is written to comply with a Department-wide requirement that refuges with burnable vegetation develop a fire management plan (FMP) (620 DM 1).

Wildland fire suppression and the use of prescribed fire is addressed in this plan. Due to the size of the Refuge (13,540 total proposed acres) and the timelag involved in acquisition from willing sellers, Wildland Fire Use will not be considered in this plan.

Refuge purposes include:

- Protect, restore, and enhance wetlands that contribute to the economy, water quantity and quality, flood control, and a diversity of fish, wildlife, and plant resources.
- Provide resting, feeding, and nesting habitat for migratory and breeding waterfowl and other migratory birds.
- Protect habitat for endangered and threatened species.
- Preserve and enhance biological diversity.
- Increase public opportunities for outdoor recreation and environmental education that are compatible with the Refuge's natural resource purposes.
- Protect important Native American archeological sites found throughout the Refuge area.
- Work with local landowners to encourage the use of soil and water conservation practices in their farming operations.

As this Refuge is in the early stages of acquisition, there is limited local staff available for extensive fire management operations. For wildland fire suppression, it is expected that the response by Minnesota Department of Natural Resources (MNDNR) will continue with assistance by available Sherburne-Crane Meadows Complex staff. Local fire department assistance is normally restricted to structure protection. Agreements with both state and local cooperators will be become a part of this plan.

COMPLIANCE WITH USFWS POLICY

The selected alternative in the Environmental Assessment for acquisition included fee purchase of lands within the 13,540 acre Refuge boundary. Refuge establishment is based on the Emergency Wetlands Resources Act of 1986. This act recognizes the importance of wetlands and their role in providing public benefits.

Upon establishment, management of refuge operations is guided by the Refuge Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997. These acts state the mission of the National Wildlife Refuge System to "administer a national network of lands and waters for the conservation, management, and restoration of fish, wildlife and plant resources and their habitats".

Since establishment in 1992, approximately 1,800 acres of the 13,540 acres (13%) within the boundary have been acquired. The Conceptual Management Plan included in the EA is the current management document which this FMP supports.

Authority and guidance for implementing this plan are found in:

- Protection Act of September 20, 1922 (42 Stat. 857; 16 U.S.C.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.
- Economy Act of June 30, 1932: authorizes contracts for services with other Federal agencies.
- 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 assistance in the vicinity of agency lands in suppressing fires when no agreement exists.
- 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.
- National Wildlife Refuge System Administrative Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd et seq.: 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. It also establishes a conservation mission for the Refuge System, defines guiding principles and directs the Secretary of the Interior to ensure that biological integrity and environmental health of the system are maintained and that growth of the system supports the mission.
- Federal Fire Prevention and Control Act of October 29, 1974 (88 Stat. 1535; 15 U.S.C.2201): provides for reimbursement to state or local fire services for costs of firefighting on federal property.
- Wildfire Suppression Assistance Act of 1989. (PL. 100-428, as amended by PL. 101- 11,

April 7, 1989).

- Departmental Manual (Interior), Part 620 DM, Chapter 1, Wildland Fire Management: General Policy and Procedures (April 10, 1998): defines Department of Interior fire management policies.
- Service Manual, Part 621, Fire Management (February 7, 2000): defines U.S. Fish and Wildlife Service fire management policies.
- National Environmental Policy Act of 1969: regulations implementing the National Environmental Policy Act (NEPA) encourages the combination of environmental comments with other agency documents to reduce duplication and paperwork (40 CAR 1500.4(o) and 1506.4).
- Clean Air Act (42 United State Code (USC) 7401 et seq.): requires states to attain and maintain the national ambient air quality standards adopted to protect health and welfare. This encourages states to implement smoke management programs to mitigate the public health and welfare impacts of wildland and prescribed fires managed for resource benefit.
- Endangered Species Act of 1973.
- U.S. Fish & Wildlife Service Fire Management Handbook.

The authority for funding (normal fire year programming) and all emergency fire accounts is found in the following authorities:

> Section 102 of the General Provisions of the Department of Interior's annual Appropriations Bill provides the authority under which appropriated monies can be expended or transferred to fund expenditures arising from the emergency prevention and suppression of wildland fire.
>
> PL. 101-121, Department of the Interior and Related Agencies Appropriation Act of 1990, established the funding mechanism for normal year expenditures of funds for fire management purposes.
>
> 31 US Code 665(E)(1)(B) provides the authority to exceed appropriations due to wildland fire management activities involving the safety of human life and protection of property.

Authorities for procurement and administrative activities necessary to support wildland fire suppression missions are contained in the Interagency Incident Business Management Handbook.

The National Environmental Policy Act (NEPA) documentation on which the program is based is the Final Environmental Assessment (EA) for acquisition dated April 17, 1992. This plan has been reviewed by the U.S. Fish and Wildlife Service for Endangered Species Act, Section 7 compliance. Review of the plan to meet National Historic Preservation Act (NHPA) requirements has also occurred.

FIRE MANAGEMENT GOALS

The overall goals for fire management are to promote a program to ensure firefighter, visitor and adjacent property owner safety, to ensure appropriate suppression response to protect refuge resources, and to initiate use of prescribed fire to manage habitat and reduce hazardous fuels. Specific fire management goals are:

- Protect life, property, and resources from wildland fires at costs commensurate with resource values at risk.
- Use prescribed fire to reduce hazard fuel accumulation, and to restore fire to fire-dependent ecological communities.
- Use appropriate suppression tactics and strategies that minimize long-term impacts of suppression actions, particularly related to aquatic resources.

DESCRIPTION OF REFUGE

GENERAL ENVIRONMENT

The refuge encompasses the Rice and Skunk Lakes wetland complex in Morrison County in central Minnesota, located approximately 8 miles southeast of the community of Little Falls. The area is 30 miles north of St. Cloud, MN and 100 miles northwest of Minneapolis/St. Paul. The land around the wetland complex is generally flat with predominately light, sandy soils. Four small rivers or streams; Rice Creek, Skunk River, Buckman Creek and the Platte River, flow into Rice and Skunk Lakes. Water leaves the area via the Platte River which joins the Mississippi River approximately 15 miles to the southwest.

The refuge lies in the transition zone between the mixed forest land to the north and east, and the original prairie to the south and west. Habitats range from lakes, extensive sedge meadows, small wetlands, and bogs in the lowlands to scattered oak, aspen (*Populus tremuloides*), brush, croplands, and grasslands on the uplands.

Access to the area is provided by a well developed network of county and township roads, ranging from blacktop surfaced highways to unimproved dirt roads. U.S. Highway 10, a major four-lane travel corridor from the Twin Cities through central and northwestern Minnesota, is located about 5 miles west of the refuge. An abandoned railroad right-of-way, recently acquired by Morrison County for an all-season trail, traverses the Rice and Skunk Lakes area from northeast to southwest.

Figure 1 on page 6 shows the Refuge in relation to major highways. Figure 2 on page 7 illustrates the acquisition boundary, cooperator lands and access by state, county and township roads.

NATURAL RESOURCES

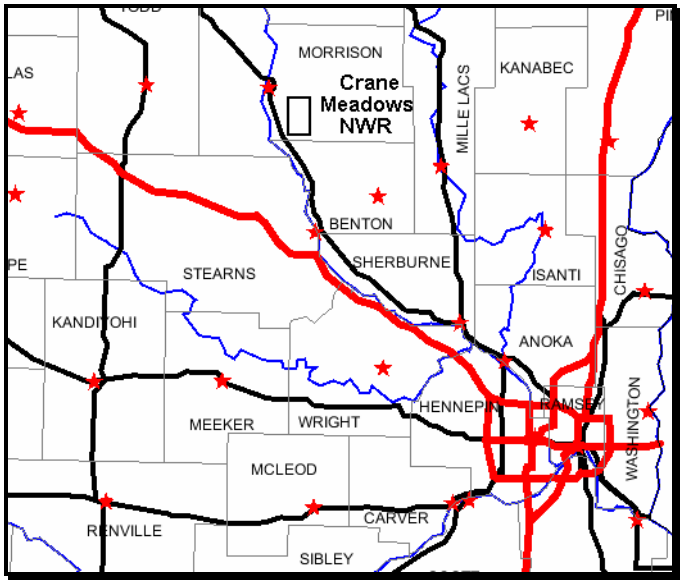
Vegetation

A wide variety of vegetative cover types is found in the Rice and Skunk Lakes area. Dense stands of wild rice (*Zizania aquatica*), cattails (*Typha latifolia*), and scattered phragmites (*Phragmites spp*.) occur in the water and along the edges of lakes and streams. The lowland marshes and meadows, where the soil is wet or covered with shallow water, is dominated by sedges (*Carex spp*.) and blue joint grass (*Calamagrostis canadensis*). Shrubs such as willow (*Salix spp*.), red-osier dogwood (*Cornus stolonifera*), and bog birch (*Betula pumila*) can be found at the edges of these marshes and floating sedge mats. Upland wooded areas contain a mixture of jack pine (*Pinus banksiana*), northern pin oak (*Quercus palustris*), bur oak (*Quercus macrocarpa*), and aspen. Pockets of open prairie and oak savannas can be found throughout the area.

Remnant communities of sand prairie and oak savanna, very rare communities in Minnesota, are scattered throughout the refuge. Although often altered by past cultivation or grazing, these areas contain native sand prairie species including big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*), little bluestem (*Andropogon scoparius*), porcupine grass

(*Hesperostipa spartea*), and June grass (*Koeleria macrantha*). Common native forbs include hairy puccoon (*Lithospermum caroliniense*), prairie violet (*Viola pedatifida*), rough blazing star (*Liatris aspera*), prairie larkspur (*Delphinium virescens*), heath aster (*Aster ericoides*), black-eyed Susan (*Rudbeckia hirta*), stiff goldenrod (*Oligoneuron rigidum*), lead plant (*Amorpha canescens*), and purple prairie clover (*Dalea purpurea*).

Figure 1 - Location Map



Plant species on the State's list of special concern that may occur within the refuge acquisition boundary include Hill's thistle (*Cirsium hillii*), blunt sedge (*Carex obtusata*), small white lady slipper (*Cypripedium candidum*), and matricary grapefern (*Botrychium matricariifolium*). A complete set of tables showing both Federal and state threatened or endangered species is found in Appendix H.

Fish and Wildlife

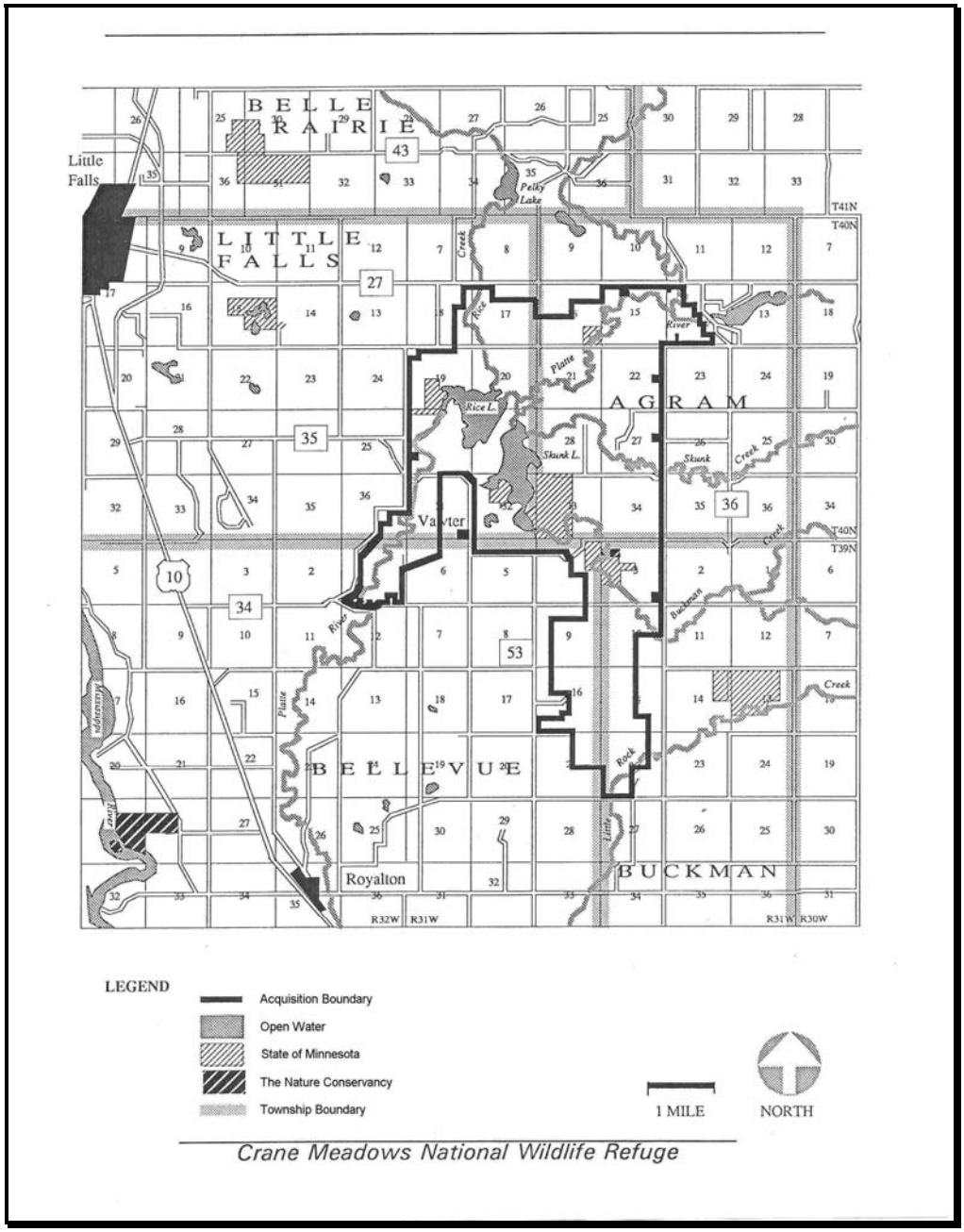
Birds

The abundance of wetland habitat on the Refuge is used by scores of wetland dependent birds. One of the most notable inhabitants of the area is the greater sandhill crane (*Grus canadensis tabida*), a bird that had all but disappeared from Minnesota at the beginning of the twentieth century. The first modern day sighting of cranes in the area was in 1958. Cranes have been recorded every year since and the area has become one of the most important nesting areas for cranes in central Minnesota. An estimated 30 pairs of cranes use the area in and around the refuge.

Waterfowl are generally abundant and include most species found in the Prairie Pothole Region of Minnesota. The most common nesting ducks are mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), and wood duck (*Aix sponsa*). During spring and fall migration, thousands of ducks may be present on Rice and Skunk Lakes and surrounding wetlands. Notable concentrations of American wigeon (*Anas americana*), gadwall (*Anas strepera*), mallards, blue-

winged teal, pintail (*Anas acuta*), shoveler (*Anas clypeata*), canvasback (*Aythya valisineria*), redhead (*Aythya americana*), green-winged teal (*Anas crecca*), and mergansers have been documented. Canada geese (*Branta canadensis*) are common breeders and also frequent the area during migration.

Figure 2 - Refuge Map



Other wetland-dependent birds found in the area include great blue heron (*Ardea herodias*), pied-billed grebe (*Podilymbus podiceps*), American bittern (*Botaurus lentiginosus*), common loon (*Gavia immer*), double-crested cormorant (*Phalacrocorax auritus*), common snipe (*Gallinago gallinago*), sora (*Porzana carolina*), sedge wren (*Cistothorus platensis*), and northern harrier (*Circus cyaneus*).

Common upland birds found on the area include; ring-necked pheasant (*Phasianus colchicus*), wild turkey (*Meleagris gallopavo*), red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*Buteo lagopus*), great horned owl (*Bubo virginianus*), barred owl (*Strix varia*), and over 200 species of songbirds. The diversity of bird life is directly linked to the diversity of habitat within the area in and around the refuge.

Mammals

White-tailed deer (*Odocoileus virginianus*) are abundant in the area due to the mix of grassland, woodland, brushland and cropland. Cattail and phragmites in and around wetlands provide optimum cover during severe winter weather. Other large mammals common to the area include gray fox (*Urocyon cinereoargenteus*), badger (*Taxidea taxus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), and black bear (*Ursus americanus*). Muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), river otter (*Lutra canadensis*), and mink (*Mustela vison*) are common in wetland habitat, while uplands harbor a variety of mice, voles, shrews, and ground and tree squirrel species.

Reptiles and Amphibians

A 1991 survey by MNDNR recorded 11 species of reptiles and amphibians in the Rice and Skunk Lakes area. Another survey was conducted in 1996 and 1997. One State listed threatened species, Blanding's turtle (*Emydoidea blandingii*); one State listed endangered species, northern cricket frog (*Acris crepitans*) were found. State species of special concern reported include snapping turtle (*Chelydra serpentina*), western hognose snake (*Heterodon nasicus*), and gopher snake (*Heterodon nasicus*).

Fisheries

Survey by MNDNR show 35 fish species in the lakes and rivers of the area. Game fish species include northern pike (*Esox lucius*), walleye (*Stizostedion vitreum*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and black crappie (*Pomoxis nigromaculatus*). A large population of carp (*Cyprinus carpio*) and other roughfish also exists.

Threatened and Endangered Species

Bald eagles (*Haliaeetus leucocephalus*), a Federal threatened species, are commonly sighted during spring and fall migration periods on Rice and Skunk Lakes. An active bald eagle nest exists within the acquisition boundary on privately owned land. Documented packs of gray wolf (*Canis lupus*), a Federally threatened species, exist within 10 miles of the refuge. Although none have been documented, the area is within the historic range of the Karner blue butterfly (*Lycaeides melissa samuelis*) and the piping plover (*Charadrius melodus*). The refuge is also on the edge of the range of the Federally threatened Canada lynx (*Lynx canadensis*).

There are four Federal threatened or endangered plants in Minnesota; Leedy=s roseroot, (*Sedum integrifolium ssp. leedyi*), Minnesota dwarf trout lily, (*Erythronium propullans*), Prairie Bush-clover, (*Lespedeza leptostachya*), Western Prairie Fringed Orchid, (*Platanthera praeclara*) whose ranges overlap the refuge area. Although none have been reported in this area, there is some potential for discovery.

Bird species recorded in the area, but not necessarily within the acquisition boundary, that are on the Minnesota's List of Endangered, Threatened and Special Concern Species include: common moorhen (*Gallinula chloropus*), red-shouldered hawk (*Buteo lineatus*), yellow rail (*Coturnicops noveboracensis*), marbled godwit (*Limosa fedoa*), Wilson's phalarope (*Phalaropus tricolor*) and loggerhead shrike (*Lanius ludovicianus*).

Region 3 has published a Fish & Wildlife Resource Conservation Priorities document (2002), which lists numerous other species deserving attention of refuge staff when undertaking any management action, including fire management. A copy of this document is on file in the Refuge office.

CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to consider the effects of their undertaking on properties meeting the criteria for the National Register of Historic Places. The regulations in 36 CFR Part 800 describe how federal agencies are to identify historic properties, determine effect on significant historic properties, and mitigate adverse effects.

American Indian Religious Freedom Act of 1978 iterates the right of Native Americans to free exercise of traditional religions and use of sacred places. Indian Sacred Sites Executive Order 13007 (1996) requires federal agencies to accommodate access to and ceremonial use of sacred sites, to avoid adverse effects and avoid blocking access, and to enter into early consultation.

Service policy to comply with historic preservation laws requires the Project Leader to inform the Regional Historic Preservation Officer (RHPO) of any potential undertakings or other activities early enough to allow complete consultation with all involved parties.

According to the EA prepared for refuge establishment, the Rice and Skunk Lakes area is rich in cultural resources, including both archeological and historical sites. The area has evidence of considerable use by prehistoric native peoples, various historic and modern Indian tribes, explorers such as Zebulon Pike, traders and trappers, lumbermen, and early settlers. At least 54 prehistoric Indian mounds are present in the vicinity of Rice and Skunk Lakes, with a number on the large peninsula between the lakes.

Morrison County has had 22 properties placed on the National Register of Historic Places. Of these, two are adjacent to the refuge. Up to 29 farmsteads, homesteads, and isolated buildings are also located within the acquisition boundary of the refuge and some of those built before 1950 may have historical significance.

PHYSICAL RESOURCES

Soils and Geology

Soils found on the area are generally of the Hubbard-Duelm-Isanti Association. The association is described as "nearly level or gently sloping, excessively drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained, sandy and loamy soils; on outwash plains and valley trains." (Soil Survey of Morrison County, Minnesota, 1994)

Specific soil classifications fall into either a sandy loam or muck category. Wetlands are generally found on the muck soils while grasslands and woodlands generally occur on the sandy, better drained soils. Peat occurs commonly in the wetland basins.

Hydrology

Two lakes, Rice and Skunk, are located on the refuge. Water levels in both are partially controlled by a concrete stop-log structure and sheet piling dam built across the Platte River by MNDNR at the outlet of Rice Lake. The facilities were installed to maintain minimum levels for wild rice production, waterfowl habitat and recreational use. Significant siltation has reduced the value of the dam and modified the benefits derived immediately upstream.

Permanent streams supplying the lakes and surrounding wetland complex include: Skunk River, Rice Creek, Buckman Creek and the Platte River. Heavy rainfall or high spring runoff can cover much of the wetland-meadow complex. In addition, Little Rock Creek, designated a trout stream by MNDNR, cuts across the extreme southeast portion of acquisition boundary.

Wetlands

Wetlands within the refuge acquisition boundary cover approximately 7,000 acres. The largest concentration of wetlands is located along the rivers and creeks, and at their confluence with Rice and Skunk Lakes forming a large wetland complex. Some wetlands in the refuge have been subjected to past drainage.

Air Quality

This part of Minnesota is considered to be Class II air quality meaning that air quality, overall, meets Environmental Protection Agency guidelines. There should be no significant deterioration of air quality resulting from implementation of this plan.

Structures and Facilities

On Service owned lands, structures are being declared as excess are sold, or in the case of structures with no saleable value removed, and the site restored. Generally speaking, within a year of purchase structures are gone from the property.

There is a headquarters and maintenance facility complex containing 5 buildings. Private lands, not yet acquired, within the acquisition boundaries contain numerous structures. A site containing a house used for the volunteer program and three other buildings is located near the north edge of the refuge. In addition, a former farmstead containing a house and detached garage exists in the southwest portion of the Refuge.

There are currently 40 occupied residences within the acquisition boundary. Numerous privately owned buildings, both residential and outbuildings are adjacent to the boundary.

Primary structure protection is the responsibility of the local fire department under state law. Several semi-permanent firebreaks have been constructed around structures on Refuge property, to form burn unit boundaries, and to protect adjacent private homes.

FIRE MANAGEMENT PROGRAM

FIRE GOALS

Two goals provide direction to the fire management program at Crane Meadows.

1. Protect the habitats on the Refuge as well as the adjoining property from unwanted wildland fire.
2. Apply prescribed fire to achieve Refuge management needs.

HISTORIC ROLE OF FIRE

Little is known of the fire history in the vicinity of the refuge. From the history found in the Soil Survey of Morrison County, it appears that most of the county was forested prior to European settlement. The Refuge area was mainly comprised of oak savanna, wet meadows and wet prairie (Marschner, 1930). Fire would have been a factor in shaping the habitat prior to settlement.

Pre-settlement fires

Fires, either lightning-caused or anthropogenic, would have affected the extent of prairie and oak savanna in the area. The fire regime as described in Heinselman, (1981) would likely have been class 2 (frequent light surface fire 1 to 25 year return interval) on the majority of the Refuge. No estimates are available for the areal extent of pre-settlement fires.

Post-settlement Fire History

Fire suppression began when European settlers began to farm the area. Potential exists for the creation of classic Wildland-Urban Interface situations for both structural and wildland fire agencies due to development pressure. Presently, numerous farm fields, roads and wetland areas provide a buffer between the meadows and residential/farm structure areas.

The fire season in Morrison County is from early April to late May or early June. There may be a second season in the fall generally lasting from the first frost until snowfall. This second season is not normally as active as the spring season. Table 1 shows wildland fire occurrence compiled from various sources. Fires reported are located within the Refuge acquisition boundary.

Table 1 - Wildland Fire History

Year	Month	Number of Fires	Acres
1985	April	4	16.6
1986	April	3	47.0
1987	March	3	32.0
	April	1	795.0
	June	1	0.5
1988	April	2	344.0
	June	1	10.0
1990	March	1	35.0

Year	Month	Number of Fires	Acres
	April	1	62.0
1991	May	1	2.0
1992	April	6	944.0
1994	April	2	8.0
1995	April	1	88.0
	May	1	160.0
1996	April	2	1.3
	May	2	27.0
1997	April	2	350.0
1998	March	5	989.0
	December	1	0.0
1999	November	1	3.0
2000	May	1	1.0
	No Date	1	1.0
2001	November	1	0.0
Totals		**44**	**3,916.4**

PRESCRIBED FIRE HISTORY

Prescribed fire would generally be applied during the spring in refuge habitats. Exact dates would, of course, depend on weather conditions, the desired results and fuel conditions. Table 2 shows prescribed fire activity on the refuge since start of acquisition.

Table 2 - Prescribed Fire History

Year	Month	Acres
1996	4/18/96	135
1998	4/10/98	130
1999	4/8/99	25
	4/8/99	5
	4/12/99	60
2000	4/18/00	450
	4/25/00	260
Total		**1,065**

RESPONSIBILITIES

Crane Meadows NWR does not have a dedicated fire management organization. The Sherburne Fire Management Officer (FMO) is responsible for planning and implementing the fire management program on the refuge. The Zone Fire Management Officer (Zone FMO) located at Big Stone NWR in Ortonville, MN is responsible for fire management program oversight. Preparedness planning and work is accomplished by staff from Crane Meadows and Sherburne in accordance with national and regional fire management direction under guidance from the Zone FMO.

Emergency wildland fire suppression actions are handled by Crane Meadows qualified staff and

MNDNR from the Little Falls office. The Zone FMO will be immediately notified of all emergency actions. Additional information and direction is included in the Fire Dispatch Plan (Appendix E).

The suppression of unwanted wildland fires is given priority over all activities except the safeguarding of human life (620 DM 1 1.4A). It is expected that all fire-trained Refuge employees will be available to assist with emergency suppression and prescribed fire activities , as needed, on the Refuge. Fire duty assignments will include only those duties for which each employee is qualified according to guidelines specified in the National Interagency Fire Qualification Subsystem guide (PMS 310-1). Individuals must meet training, experience, and physical fitness requirements. Depending on fire complexity, several non-line support functions may be necessary. These positions will be activated as needed.

All staff are responsible for their own physical conditioning and if physically able, as determined by a physical exam, must qualify annually for fire activities by passing either the pack or field tests.

Project Leader

- Responsible for implementation of all fire management activities on the Refuge and ensures compliance with Department and Service policies.
- Selects the appropriate management responses to unwanted wildland fire.
- Approves any Prescribed Burn Plan.
- Coordinates Refuge programs to ensure personnel and equipment are made available and utilized for fire management activities including fire suppression, preparedness projects, prescribed fire, and fire effects monitoring.
- Ensures that the fire management program has access to other Service resources when needed.
- Ensures that the fire management program is considered during Refuge related planning and project implementation.
- Identifies preparedness projects and biological objectives to FMO, notifies FMO of project constraints, and ensures that Refuge resources are available to accomplish preparedness projects.
- Acts as, or designates, the primary Refuge Resource Management Specialist during fire management planning and operations.
- Ensures fire-effects monitoring is being implemented; and is responsible for posting and enforcing fire restriction regulations.
- Participates in fire management activities commensurate with training, experience and qualifications.

Fire Management Officer

- With assistance from other specialists represents the Refuge and coordinates fire related activities with other refuges, the regional fire management coordinator (RFMC), Zone FMO, State and other federal fire organizations and local cooperators.
- Maintains training and qualification records for Refuge personnel, coordinates Refuge fire training, maintains fire records and systems, and with the Zone FMO coordinates mobilization of resources for off-Refuge assignments.

- Prepares an annual report detailing fire occurrences and preparedness activities undertaken in each calendar year. This report will serve as a post-year's fire management activities review, as well as provide documentation for development of a comprehensive fire history record for the Refuge.
- Directs monitoring activities related to the fire program.

Biological/Range Technicians & Maintenance Staff

- Responsible for maintenance of fire related equipment, fire breaks, and maintaining Refuge fire caches.
- As individual qualifications and certifications allow, they may serve as prescribed fire burn boss, engine operators, or prescribed fire crew members, or as initial and/or extended attack incident commanders or fire fighters on wildfires.

Administrative Officer

- Responsible for posting of firefighter time and meeting procurement needs at the Refuge during an on-going incident.
- Serves as dispatcher for on-going wildfires and prescribed fires.
- Maintains a unit log during these events.

Incident Commander

- Incident Commanders (of any level) use strategies and tactics as directed by the Project Leader and Wildland Fire Situation Analysis (WFSA) where applicable to implement selected objectives on a particular incident. A specific Limited Delegation of Authority (Appendix C) will be provided to each Incident Commander prior to assuming responsibility for an incident. Major duties of the Incident Commander are given in the National Wildfire Coordinating Group (NWCG) Fireline Handbook, including:
  - Brief subordinates, direct their actions, and provide work tools.
  - Ensure that safety standards identified in the Fire Orders, the Watch Out Situations, and agency policies are followed at all times.
  - Personally scout and communicate with others to be knowledgeable of fire conditions, fire weather, tactical progress, safety concerns and hazards, condition of personnel, and needs for additional resources.
  - Order resources to implement the management objectives for the fire.
  - Inform appropriate dispatch of current situation and expected needs.
  - Coordinate mobilization and demobilization with dispatch and the FMO.
  - Perform administrative duties, i.e., approving work hours, completing fire reports for command period, maintaining property accountability, providing or obtaining medical treatment, and evaluating performance of subordinates.
  - Assure aviation safety is maintained to the highest standards.
  - Is responsible for preparation of fire reports following the suppression of wildland fires and for preparedness projects requiring such.

Initial Attack Modules

Due to shared staff with Sherburne NWR, Initial Attack Modules, if any, would be assisted by Sherburne.

INTERAGENCY COORDINATION

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

The local Fire Departments for structural and wildland fires, and MNDNR for wildland fires, will generally provide fire suppression on the refuge. Table 3 lists the fire cooperators and their primary area of coverage. Various agreements between local fire departments are also in place. Station equipment currently consists of a Type 6 engine, 725 gallon tanker and 6 wheel ATV that can be equipped with a 50 gallon slip-on unit.

Table 3 - Table of Cooperators

Cooperator	Area of Responsibility
MNDNR Little Falls Office	All Wildlands
Little Falls Fire Department	Structures, northwest portion of the Refuge
Royalton Volunteer Fire Department	Structures, south ½ of the Refuge
Pierz Volunteer Fire Department	Structures, northeast portion of the Refuge

Crane Meadows will use the Incident Command System (ICS) as a guide for fireline organization. Individual fire qualifications will be determined in accordance with DOI Wildland Fire Qualifications and Certification System, part of National Interagency Incident Management System (NIIMS) and the National Wildfire Coordinating Group (NWCG) Wildland and Prescribed Fire Qualification Guide (PMS 310-1). Depending on fire complexity, some positions may be filled by the same person.

There are no fire-related cooperative agreements with local fire departments in effect on the Refuge. These will be developed as time permits and be included in Appendix E. The term of agreements will be five years with provision for annual review and renewal.

PROTECTION OF SENSITIVE RESOURCES

Habitat

The streams and wetlands on the refuge are the most sensitive habitat to protect. Ground disturbance (use of tractor plows etc.) adjacent to stream banks should be kept to a minimum. In addition, foam or retardant should not be used within 200 feet of open water. Fish have been shown to be extremely sensitive to the presence of these agents (Gaikowski et al, 1996). An agreement with cooperators to enumerate restrictions on retardant use within the refuge watershed is needed. Environmental guidelines for foam or retardant use, taken from a paper published by the Forest Service's Missoula Technology and Development Center, are found in Appendix K.

Cultural/Archeological

Preparation for prescribed fires such as constructing fire lines are subject to Section 106 of the

National Historic Preservation Act. The procedures in the Regional Notice dated December 8, 1999, "Historic Preservation Responsibilities," apply to the planning and preparation for conducting prescribed fires.

Efforts to control unwanted wildland fires (including prescribed fires that get out of control) are also subject to Section 106 of the National Historic Preservation Act. We will meet our obligations under this act in the following ways:

When the land covered by a wildland fire has been inventoried to identify cultural resources, and the cultural resources have been evaluated for significance according to the criteria for the National Register of Historic Places, the Fire Management Officer will direct ground disturbing fire suppression efforts around (will avoid impacting) historic properties. Nevertheless, evidence of a previously undetected cultural resource may be encountered. The project leader shall immediately notify the Regional Historic Preservation Officer (RHPO). The RHPO will take immediate steps to have the cultural resource evaluated and protected, as appropriate, to the extent required by law and policy. This may require arranging for a qualified professional to visit and evaluate the site's importance and recommend a course of action. An evaluation and decision on the disposition of the cultural resource should be made within 48 hours of the discovery unless the project's schedule allows greater flexibility.

When the land covered by a wildland fire has not been inventoried for cultural resources and wildfire suppression activities do result in ground disturbing activities, we will take the following action. Soon after fire control, the project leader will contact the RHPO to arrange for an archeologist to investigate the disturbed areas to determine if sites were affected.

Refuge operations and maintenance funds (sub-activity 1261) will pay the cost of these activities unless the action is an emergency archeological and historic property survey in unstable areas prone to further degradation (i.e., erosion) following a wildland fire or in association with an emergency fire rehabilitation treatment. Emergency archeological and historic property surveys in unstable areas prone to further degradation (i.e., erosion) following a wildland fire or in association with an emergency fire rehabilitation treatment, and archeological, historic structure, cultural landscape, and traditional cultural property resource stabilization and rehabilitation can be funded with emergency rehabilitation funding.

Impacts to archeological resources by fire 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.

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

Wildland Fires

- Minimum Impact Suppression Tactics (MIST) will be used to the fullest extent possible.
- Resource Advisors will inform fire suppression personnel of any areas with cultural resources. The Resource Advisor should contact the RHPO and/or his/her staff for more detailed information.

- Foam use will be minimized in areas known to harbor surface artifacts.
- Mechanized equipment should not be used in areas of known cultural significance.
- The location of any sites discovered as the result of fire management activities will be reported to the RHPO.
- Rehabilitation plans will address cultural resources impacts and will be submitted to the RHPO for review.

Prescribed Fires

- The Refuge Fire staff will submit a request to the RHPO and/or his/her staff as soon as the burn area is identified (i.e., as soon as feasible).
- Upon receipt of the request, the RHPO and/or his/her staff will be responsible for consulting with the FMO and evaluating the potential for adverse impacts to cultural resources.
- When necessary, the RHPO and/or his/her staff will coordinate with the State Historic Preservation Officer (SHPO). The SHPO has 30 days to respond. The Refuge will consider all SHPO recommendations.
- Mechanized equipment should not be used in areas of known cultural significance.
- The location of any sites discovered as the result of fire management activities will be reported to the RHPO.

WILDLAND FIRE ACTIVITIES

Fire program management describes the operational procedures necessary to implement fire management at Crane Meadows. Program management includes: fire prevention, preparedness, emergency preparedness, fire behavior predictions, step-up staffing plan, fire detection, fire suppression, minimum impact suppression, minimum impact rehabilitation, and documentation.

All fires not classified as prescribed fires are unwanted wildland fires and will receive appropriate suppression action. Normal suppression operations would consist of response by Refuge staff and equipment, MNDNR and/or the local fire department.
Records from MNDNR show that fire season is typically split with the early (spring) season extending from early April to late May. The late (fall) season occasionally runs from the first killing frost until snow cover is present depending on how dry conditions are. Depending on the specific weather of any particular year the seasons may be shorter or longer and, therefore, may start earlier or last longer.

WILDLAND FIRE GOALS

Following are the goals for the wildland fire suppression program.

- All unplanned ignitions are suppressed, by either direct or indirect attack, as soon as possible, to minimize risk to life and property
- No losses to private property from wildland fires leaving the Refuge
- Minimize losses to Refuge improvements or structures will be minimal.

FIRE MANAGEMENT STRATEGIES

Although resource impacts of suppression alternatives must always be considered in selecting a fire management strategy, managing fire for resource benefit will not be a consideration. Appropriate suppression action will be taken to ensure firefighter safety, public safety, and protection of the resources on all wildland fires.

An underground petroleum pipeline crosses the northeastern quadrant of the Refuge and suppression operations in or adjacent to the right-of-way must be conducted so as not to jeopardize the safety of firefighters or any others in the area. As acquisition continues, the right-of-way will be a concern in selecting suppression tactics and providing for firefighter safety. In addition, power lines parallel many of the roads providing access to the area. While none are of extremely high voltage, downed lines and the potential for flashover due to smoke and use of water along the firebreaks offered by the roads must always be considered. In all cases, the primary concern of fire suppression personnel shall be safety, and if needed, all individuals not involved in the suppression effort may be evacuated.

Suppression strategies should be applied so that the equipment and tools used to meet the desired objectives are those that inflict the least impacts upon the natural and cultural resources. MIST will be employed to protect all resources. Natural and artificial barriers will be used as much as possible for containment. When necessary, fire line construction will be

conducted in such a way as to minimize long-term impacts to resources. Sites impacted by fire suppression activities or by the fire will be rehabilitated as necessary, based on an approved course of action for each incident.

Specific fire management strategies for Crane Meadows are:

- All wildland fires will be controlled using the appropriate suppression strategy which considers safety, property, natural resources, and economics.
- Mechanical treatment will be used to reduce hazardous fuels around structures and improvements annually.
- Prescribed fire will be utilized to meet the ecological needs of the Refuge.
- Known cultural resource areas will be excluded from all fire management activities including fire line location, retardant drops, and other adverse fire effects.
- The water resources on the refuge (Platte River, Rice Creek, Skunk River, Buckman Creek, and Rice and Skunk Lakes) will be protected from application of foam or retardant agents within 200 feet of the water.

PREPAREDNESS

Preparedness is the work accomplished prior to fire occurrence to ensure that the appropriate response, as directed by the Fire Management Plan, can be carried out. Preparedness activities include: budget planning, equipment acquisition, equipment maintenance, dispatch (Initial attack, extended, and expanded), equipment inventory, personnel qualifications, and training. The preparedness objective is to have a well trained and equipped fire management organization to manage all fire situations within the Refuge. Preparedness efforts are generally accomplished in time frames outside normal fire season dates.

Historical Weather Analysis

There is no historic fire weather data for the refuge. Figure 3, below shows the climatic range and distribution of long-term averages for annual temperatures and precipitation at Little Falls, MN collected under the National Weather Service Cooperative Observer Program.

Average annual precipitation is 26.6 inches. Annual snowfall averages about 41 inches although snow cover at any time will vary considerably. The average length of the growing season is 127 days. (Soil Survey of Morrison County, 1994) Approximately 20% of the annual precipitation falls during the spring fire season (April-May) with roughly the same amount during the fall season.

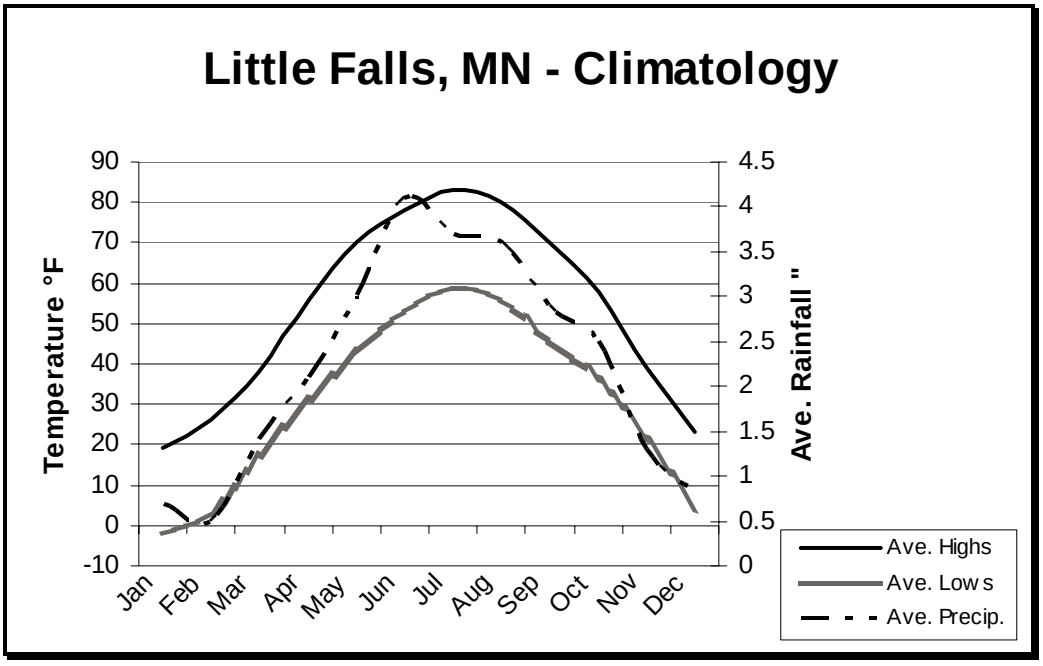
Fire Prevention

Wildland fire Ignition sources are likely to be from human visitation. Arson in some of the meadow areas, primarily in the northeast quadrant, has been a problem in the recent past and is expected to continue. An active fire prevention program will be conducted, as needed, in conjunction with cooperators to protect human life and property, and prevent damage to cultural resources or physical facilities.

A program of internal and external education regarding potential fire danger may be implemented. Visitor contacts, bulletin board materials, handouts and interpretive programs can be utilized to increase visitor and neighbor awareness of fire hazards.

During periods of extreme or prolonged fire danger emergency restrictions affecting refuge operations, or area closures may become necessary. Such restrictions, when imposed, will usually be consistent with those implemented by cooperators.

Figure 3 - Little Falls, MN Climatology



Hazard Reduction for Structure Protection

Hazard reduction may be conducted to prevent wildland fires from spreading to structures owned by the FWS. For Crane Meadows, there is an administrative complex with five buildings; office and shop/storage. This complex is in an area that is mowed several times a year and has a disked firebreak surrounding it. A second complex of buildings containing a house used by Refuge volunteers is located near the north edge of the Refuge. Several other buildings are associated with this site. This area is surrounded by woodlands and is mowed around the buildings and has a disked firebreak maintained on the perimeter.

Staffing Priority Levels

Staffing classes will be obtained from the Minnesota Department of Natural Resources at Little Falls.

In conjunction with Local, Regional and National Preparedness Levels, fire prevention actions will be mirror those of MNDNR on their nearby lands. A Step-up Plan for prevention and preparedness actions is found in Appendix F.

Training

Departmental policy requires that all personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG). Refuge

staff will conform strictly to the requirements of the wildland fire management qualification and certification system and USFWS guidelines.

Basic wildland fire training refreshers are offered annually for red-carded firefighters and records kept in a centralized database. Additional training is available from surrounding agencies in pump and engine operation, power saws, firefighter safety, fire weather and fire behavior, helicopter safety, and prescribed fire objectives and activities. On-the job training is encouraged and will be conducted at the field level. Whenever appropriate, the use of fire qualification position task books will be used to document fire experience of trainees. The Zone FMO will coordinate fire training needs with those of other nearby refuges, cooperating agencies, and the Regional Office.

Fire suppression is an arduous duty. Poor physical condition of crew members can endanger safety and lives during critical situations. Personnel performing fire management duties will maintain a high level of physical fitness. This requires successful completion of a fitness pack test.

Supplies and Equipment

Station equipment currently consists of a Type 6 engine, 725 gallon tanker and 6 wheel ATV that can be equipped with a 50 gallon slip-on unit. Other fire supplies and equipment are shared with Sherburne NWR. Please see the appropriate sections in the Sherburne FMP for details. The lists of NUS and engine tools are included in Appendix G of Sherburne FMP.

DETECTION

Detection in this portion of Minnesota has traditionally been by public reporting with occasional detection flights when fire danger is very high to extreme. Public or other agency detection will provide primary detection.

The Fire Management Plan does not discriminate between human-caused and lightning-caused fire. All wildland fires will be suppressed. However, detection shall include a determination of fire cause. Moreover, human-caused fires will require an investigation and report by law enforcement personnel. For serious human-caused fires, including those involving loss of life, a qualified arson investigator will be requested.

COMMUNICATIONS

Please refer to Appendix B of the Sherburne FMP. Due to frequent personnel changes, all complex communications call signs and other contacts will be maintained in that plan.

PRE-ATTACK PLAN

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

- The Incident Commander (IC) will locate, size-up, and coordinate suppression actions.
- Provide for public safety.
- Considering the current and predicted fire conditions, the Incident Commander will assess the need for additional suppression resources and estimate the final size of the fire. The potential for spread outside of the Refuge should be predicted, as well

as the total suppression force required to initiate effective containment action at the beginning of each burning period.

- The Incident Commander will assess the need for law enforcement personnel for traffic control, investigations, evacuations, etc. and make the request to local authorities.
- Document decisions and provide sufficient information to the Refuge staff to complete the fire report (DI-1202).
- Should a wildland fire move into an extended attack a Delegation of Authority will be invoked. Once a Delegation of Authority has been authorized the Incident Commander will make the final decisions pertaining to the fire. A sample copy of a Limited Delegation of Authority is in Appendix C.

FIRE MANAGEMENT UNITS

With the similarity of habitats, small size of currently owned parcels and values at risk on neighboring lands, the entire acquired portion of the Refuge will be considered one Fire Management Unit. Due to the scattered nature of Refuge lands and small size of individual parcels, this plan does not recommend wildland fire managed for resource benefit as an appropriate management response. Wildland fires will be suppressed using an appropriate suppression response.

Prescribed fires will be used to reduce hazardous fuels and to meet resource management objectives. When practical, efforts will be made to coordinate prescribed fire application with adjoining property owners to reduce costs and improve treatment efficacy.

Fire Effects

Unwanted wildland fire effects are expected to be limited due to the mostly moist conditions found on the Refuge. Effects on forest vegetation are not expected to be severe unless significant drought conditions are present. Areas that are grass covered would recover within a growing season or less depending on the time of fire occurrence.

Effects of fire on wildlife may be divided into two categories. Large mammals and birds are not likely to be directly affected as they are highly mobile and most fires in the area would be expected to be relatively slow moving. Smaller mammals may be more subject to fire because of limited mobility. Most reptiles would be in wetter areas that would not be likely to burn or in burrows where temperatures are cooler. Effects on small mammals would be more pronounced in the grass fuels and in the ecotone between grass and forest or brush fuels where escape is difficult. Some small mammals such as field mice and voles may be caught by the flame front but mortality is not expected to be heavy (Kelleyhouse, 1979). Regeneration of vegetation provides excellent habitat for these small species and natural reproduction will quickly repopulate the area (Schramm, et al, 1983).

Prescribed fire application is expected to improve vegetative health, restore fire dependent habitat. Efforts to restore oak savanna habitat may require some prescribed fire that is quite intense. In the area of intense fire, small mammal, reptile and insect populations may be affected adversely, but the effects are expected to be relatively short-term with population recovery within one or two years.

Fuel Types

Northern Hardwoods - this type is best represented by Northern Forest Fire Laboratory (NFFL) Fuel Models 9 and 10. This fuel covers some of the acquired parcels and consists of litter and understory growth with a 65 to 90 % crown closure. Species found in this fuel complex include aspen, red maple (*Acer rubrum*), northern pin oak, bur oak and others. With local adjustments based on observations from restoration efforts in the area, this fuel type is appropriate for oak savanna also.

Grass - represented by Fuel Model 3, much of the grass on the refuge is a remnant of the farms that covered the area after settlement. A number of old fields contain remnants of native prairie with species including: Bluejoint (*Calamagrostis canadensis*), reed canary grass (*Phalaris arundinacea*), Indian grass (*Sorghastrum nutans*), big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and cordgrass (*Spartina pectinata*). A number of introduced grasses may also be found. Wet meadows are included in this fuel type.

Lowland brush - represented best by fuel model 5, these areas are wet and contain primarily alder (*Alnus spp*.) and willows.

In addition, peat is found in the wetland basins. During the spring fire season there is normally enough water at ground level that ignition of the peat is not likely. However, in the fall or during extremely dry periods in the summer, there is potential for peat ignition with the consequent control problems.

Fire Behavior

Normal fire behavior in the forest fuels on the refuge would be slow moving with minimal (1-2') flame lengths. Areas with a high percentage of conifers would be expected to burn somewhat faster, with longer flame length and more heat output under drier conditions. Grass areas, including sedge meadows, would see flame lengths of 2-5' with a rapid spread component depending on the stage of curing. Under normal conditions, the brush areas would see some creeping fire on higher areas, otherwise the type is generally wet enough to not support fire.

Extreme fire behavior in the hardwood areas would see flame lengths of 2-4 feet with potentially rapid spread depending on the season and condition of the litter layer. During the fall with cured fuels, flame lengths could run to 6+ feet with rates of spread high enough to require indirect attack. The areas with a high percentage of conifers could see flame lengths of 4-6' with the potential of crown fire development especially under dry conditions. With fuels cured, grass areas would see rates of spread that would require indirect attack.

The NWCG Fireline Handbook contains additional information about fire behavior predictions. Behave and other computer programs also provide modeling capability for fire behavior predictions.

SUPPRESSION TACTICS

Suppression involves a wide range of possible tactics from the initial attack to final control. To this end, all wildland fires will be suppressed in a safe, aggressive, and cost-effective manner to produce efficient action with minimal resource damage and limit smoke impacts to local

communities.

Typical initial attacks will be dependent on whether the Refuge or MNDNR arrives first. MNDNR would likely respond with one engine, the Refuge could respond with an engine and a low ground pressure tractor. All fires will be assessed by the first on-scene incident commander and attacked using minimum impact fire suppression tactics (MIST) for the refuge. Every attempt will be made to utilize natural and existing constructed barriers, including changing fuel complexes, in the control of wildland fire. Fireline construction and mop-up through riparian areas should consider long-term damage to vegetation. Unnecessary cutting and bucking should be replaced with alternative actions whenever possible. Back-fires and burnout operations should consider head fire intensities and attempt to avoid damaging soil or running fire into riparian areas. Where wildland fires cross roads, the burned area adjacent to the road should be mopped up and dangerous snags felled.

The Incident Commander will designate all overhead positions on fires requiring extended attack. As necessary, reference should be made to a Delegation of Authority (Appendix C).

Suppression Conditions

Full suppression, which requires containment and control of all wildland fires is the standard suppression strategy for the Refuge. Certain guidelines have been developed to assist with this strategy to protect the Refuge from unnecessary damage. Heavy equipment and aircraft/retardant use is restricted due to cultural, wildlife, and safety concerns. Unless life or property is at imminent risk, consultation with the resource advisor prior to their use is necessary. This decision is based on the fact that water quality in the Platte River, Skunk River, Rice and Buckman Creeks, and Rice and Skunk Lakes is critical to the refuge's mission to provide quality wetland habitat. The suburban location of the refuge should negate the need for camps, staging areas, and other suppression related facilities.

The primary restriction for suppression operations on this refuge is keeping foams or retardants at least 200 feet from open water.

Wildland Fire Situation Analysis

For wildland fires that cannot be contained in one burning period, a Wildland Fire Situation Analysis (WFSA) must be prepared. In the case of a wildland fire, the Project Leader, in conjunction with the FMO, will prepare the WFSA. Approval of the WFSA resides with the Project Leader.

Due to the small size of FWS parcels and the scattered nature of these lands, it is highly unlikely that any wildland fire will remain uncontained after the first burning period unless peat deposits are involved. A Refuge prepared WFSA would be required if containment is not possible in the first burning period.

Should a fire occur on Refuge lands and move to adjacent State or private lands, management of the incident will normally fall to MNDNR or local fire department and their procedures would be followed; a WFSA would not be required from the Refuge in that instance.

Safety

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

Aircraft Operations

Aircraft may be used in all phases of fire management operations. All aircraft used by Federal personnel must be Office of Aircraft Services (OAS) or Forest Service approved. An OAS Aviation Policy Manual is available from OAS. As in all fire management activities, safety is a primary consideration. Qualified aviation personnel will be assigned to all flight operations.

Helicopters may be used for reconnaissance, bucket drops and transportation of personnel and equipment. Natural helispots and parking lots are readily available within and adjacent to the Refuge boundary. Clearing for new helispots will be avoided.

REHABILITATION AND RESTORATION

There are 3 types of fire rehabilitation, Suppression Rehabilitation, Burned Area Rehabilitation, and Emergency Stabilization. Suppression rehabilitation restores and repairs property and resources affected by direct suppression activity damage, i.e. cut fences, dozer lines, and campsites. Burned area rehabilitation and emergency stabilization restores resources and property damaged or otherwise impacted by fire, i.e. burned waterlines, denuded hill sides, etc.

Suppression Rehabilitation

In the event of a wildland fire, rehabilitation of fire suppression damage should be accomplished immediately. An appropriate time is within 7 days after the fire is controlled unless the regional fire coordinator grants an extension. Funding for suppression rehabilitation is from the specific fire cost account as established by the FMO. The Incident Commander as agreed to by the Project Leader or Biologist will initiate suppression rehabilitation. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential hazards caused by the fire. These actions may include:

- Backfill control lines, scarify, and seed*.
- Install water bars and construct drain dips on control lines to prevent erosion.
- Restore natural ground contours that may have been altered.
- Remove all flagging, equipment and litter.
- Re-vegetation to restore sensitive areas impacted due to suppression actions*.

*If re-vegetation or seeding is necessary, only locally procured seeds of native plant species will be used.

A written suppression rehabilitation plan may be appropriate on larger incidents. Contractors or equipment may be hired to accomplish specialized work.

Emergency Stabilization Versus Rehabilitation

Emergency stabilization is the use of appropriate emergency stabilization techniques to protect public safety, 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. 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 or other funding.

Burned Area Emergency Stabilization and Rehabilitation (ESR) Plan

The goal of the ESR Plan is to protect public safety, stabilize, and prevent further degradation of natural and cultural resources, and to rehabilitate the stability, productivity, diversity, and ecological integrity of Refuge lands after a wildland fire as described in approved Refuge management plans. The ESR Plan is tiered to the Refuge Comprehensive Conservation Plan (CCP), Habitat Management Plan (HMP), Fire Management Plan (FMP), and operational or other step-down plans. Development of ESR Plan objectives is guided by resource management objectives, general management practices, and constraints identified in approved CCP, HMP, and/or supporting step-down plans.

If Burned Area Emergency Stabilization and Rehabilitation is required to reduce the effects of a wildland fire, then the Refuge should request appropriate funding through the Burned Area ESR fund. The Service representative at the National Interagency Fire Center administers the ESR fund. A rehabilitation and restoration survey, plan, and request must be prepared and submitted according to agency guidelines. Smaller incidents may only need simple plans prepared by Refuge staff. Larger incidents with extensive rehabilitation efforts should employ an ESR Team. An ESR Team is composed of personnel who specialize in key disciplines of resource management and are experts in ESR Plan preparation. A formal request for an ESR Team should be made in consultation with the Incident Management Team as soon as it appears damage may be significant. Instructions for ESR Team mobilization can be found in the National Wildfire Coordinating Group mobilization guide. Delays in making a request may hinder funding approval and magnify the damage. Once an ESR Team is employed, the Project Leader or their representative should provide guidance to the ESR team leader with expectations. The Project Leader, biologist, and FMO will review all ESR Plans. The final plan will be submitted to the Region for review prior to submission to the WO. Direction on ESR guidelines can be found in the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook.

REQUIRED REPORTING

The IC will be responsible for documenting decisions and supplying sufficient information to complete the fire report (e.g., ICS-214, paper DI-1202 and report in Fire Information Management System). The FMO will be responsible for completing any required reports.

FIRE INVESTIGATION

Fire management personnel will attempt to locate and protect the probable point of origin and

record pertinent information required to determine fire cause. They will be alert for possible evidence, protect the scene and report findings to the fireline supervisor. Prompt and efficient investigation of all suspicious fires will be carried out. However, fire management personnel should not question suspects or pursue the fire investigation unless they have a current law enforcement commission.

Personnel and services of other agencies may be utilized to investigate wildland fire arson or fire incidents involving structures. All fire investigations should follow the guidelines outlined in Section 4.1-2 of the Fire Management Handbook (2002).

PRESCRIBED FIRE ACTIVITIES

PRESCRIBED BURN PROGRAM GOALS

Prescribed fire is a useful tool for restoring and maintaining natural conditions and processes at Crane Meadows. In addition to the goal found in the section entitled Wildland Fire Situation, the following are additional goals related specifically to prescribed fire:

- Apply prescribed fire to restore and maintain fire-dependent plant communities and their associated wildlife.
- Reduce hazardous fuels to minimize adverse impacts from potential wildland fires.

Specific management needs for the Refuge as a whole and for specific areas will be determined annually. Specific burn objectives, fire frequency, firing methodology, and prescriptions may vary from year to year. Burn plans will be updated to reflect any variations. The Project Leader must approve prescribed fire plans.

Prescribed fire has been applied to habitats on the Refuge since 1996. In future years, continued use of prescribed fire for hazard fuel reduction and habitat improvement will continue. As new lands are acquired they will be examined and prescribed fire plans developed as necessary.

Prescribed fires involve the use of fire as a tool to achieve management objectives. Research burning may also be conducted when determined to be necessary for accomplishment of research project objectives. Actions included in the prescribed burn program include: the selection and prioritization of prescribed burns to be carried out during the year, prescribed burn plans, burn prescriptions, burn operations, documentation and reporting, and burn critiques. Measures to ensure the successful implementation of the prescribed fire program include:

- Conduct a vigorous prescribed fire program with the highest professional and technological standards;
- Identify the prescribed burn type most appropriate to specific situations and areas;
- Efficiently accomplish resource management objectives through the application of prescribed fire;
- Continually evaluate the prescribed fire program to better meet program goals by refining prescriptions treatments and monitoring methods, and by integrating applicable technical and scientific advancements;
- Conduct prescribed burns with an adequate number of qualified personnel to conduct the burn, meet contingency needs, and perform mop-up operations.

The Refuge reserves the option to utilize an interagency team approach for complex burns carried out on the boundaries and close to developed areas or burns of large acreage. The most highly qualified and experienced personnel in the regional interagency community would be requested to serve on this team.

FIRE MANAGEMENT STRATEGIES

Prescribed fire will be used to reduce hazard fuel accumulation and improve wildlife habitat where appropriate. All prescribed fire activity will comply with applicable Federal, state, and local air quality laws and regulations.

All prescribed fire projects will have a burn plan approved by the Project Leader. Each burn plan will be prepared using a systematic decision-making process, and contain measurable objectives, predetermined prescriptions, and reference an approved environmental compliance document. This Fire Management Plan is considered to be a Categorical Exclusion under NEPA according to Departmental and Service guidelines. Therefore, additional NEPA documentation will be necessary only for prescribed fire projects not meeting the criteria outlined in this Plan.

Prescribed Fire Burn Plans must include components such as a GO/NO-GO Checklist, contingency actions to be taken in the event the prescription is exceeded, and the need for alerting neighbors and appropriate public officials to the timing and the planning of the burn. A burn plan format meeting all required needs is located in Appendix I and also found in Exhibit 1.4.2 in the Fire Management Handbook.

Fire monitoring protocols found in the National Park Service Fire Monitoring Handbook have been established and will be used to evaluate the degree to which burn objectives are accomplished. Monitoring can assist managers in documenting success in achieving overall programmatic objectives and limiting occurrence of undesired effects.

PRESCRIBED FIRE PLANNING

Annual Activities

Prescribed fire activities will be reviewed annually. Necessary updates or changes to the Fire Management Plan will be accomplished prior to the next fire season. Any additions, deletions, or changes will be reviewed by the Project Leader to determine if such alterations warrant a re-approval of the plan.

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

Planning for each burn season begins the year prior to that season. Prescribed fire projects will be identified by the Refuge Manager and/or Biologist with assistance from the Station FMO based on the goals and objectives in this plan. Burn proposals will be written by the FMO and burn boss(es) with biological review. Budget requests will be prepared and submitted, by assigned deadlines, into FIREBASE.

Prescribed Burn Plan

The Prescribed Fire Burn Boss will conduct a field reconnaissance of the proposed burn location with the FMO, and appropriate Refuge staff to discuss objectives, special concerns, and gather all necessary information to write the burn plan. After completing the

reconnaissance, a Prescribed Fire Burn Boss qualified at the expected level of complexity will write the prescribed burn plan.

All prescribed fires will have prescribed burn plans. The prescribed burn plan is a site specific action plan describing the purpose, objectives, prescription, and operational procedures needed to prepare and safely conduct the burn. The treatment area, objectives, constraints, and alternatives will be clearly outlined. No burn will be ignited unless all prescription parameters of the plan are met. Fires not within those parameters will be suppressed. As part of the plan, minimum contingency resources will be listed.

Prescribed Burn Plans will follow the format contained in the FWS Fire Management Handbook. Each burn plan will be reviewed by the Biologist, Station FMO, Refuge Manager, Zone FMO, and Burn Boss. The Project Leader has the authority to approve the burn plan. The term "burn unit" refers to a specific tract of land to which a prescribed burn plan applies.

Strategies and Personnel

Prescribed fires will only be executed by qualified personnel. The Prescribed Fire Burn Boss will utilize qualified personnel to fill all positions required to conduct the burn. All personnel listed in the burn plan must be available for the duration of the burn from ignition to designation as controlled or the burn will not be initiated.

Weather and fuel moisture conditions must be monitored closely in planned burn units to determine when the prescription criteria are met. When all prescription criteria are within the acceptable range, the Prescribed Fire Burn Boss will select an ignition time based on current and predicted weather forecasts. A thorough briefing will be given by the Prescribed Fire Burn Boss and specific assignments and placement of personnel will be discussed. An updated spot weather forecast will be obtained on the day of ignition and all prescription elements will be rechecked to determine if they are still within the approved ranges (Go/No-Go Checklist, Appendix J). If all prescription elements are met, a test fire will be ignited to determine on-site fire behavior conditions as affected by current weather. If conditions are not satisfactory, the test fire will be suppressed and the burn will be rescheduled. If conditions are satisfactory the burn may continue as planned.

If the prescribed fire escapes the predetermined burn area, all further ignition will be halted except as needed for suppression efforts. Suppression efforts will be initiated, as discussed in the pre-burn briefing. The FMO will be notified immediately of any control actions on a prescribed fire. If the fire exceeds initial suppression efforts, the fire will be declared a wildland fire and suppressed using guidelines established in this plan. A WFSA will be completed and additional personnel and resources ordered as determined by the Incident Commander. If the fire continues to burn out of control, additional resources will be called from the local cooperating agencies via the servicing dispatch center. A management overhead team may be requested to assume command of the fire.

Monitoring and Evaluation

Monitoring of prescribed fires is intended to provide information for quantifying and predicting fire behavior and the resulting ecological effects on Refuge resources while building a historical

record. Monitoring measures the parameters common to all fires: fuels, topography, weather and fire behavior. In addition, ecological changes such as species composition and fuel structure changes will be monitored after a fire. This information will be very useful in fine-tuning the prescribed fire program.

During prescribed burning, monitoring should include mapping, weather, site, fuel measurements, and direct observation of fire characteristics such as flame length, rate of spread, and fire intensity. Operational monitoring provides a check to ensure that the fire remains in prescription and serves as a basis for evaluation and comparison of management actions in response to measured, changing fire conditions, and changes such as fuel conditions and species composition.

Monitoring vegetative response to fire management actions is also important. At present there are four forest plots and four grass/brush transects located on the Refuge at randomly selected points. The monitoring program, like that at neighboring Sherburne NWR, follows the protocol outlined in the National Park Service Fire Monitoring Handbook (2001). The plots/transects identify vegetative cover, stand density, fuel loading, and species composition.

Through this monitoring/evaluation process, management can determine if fire objectives are being met, and available information will assist in planning for future burns. Eventually it will identify whether or not the use of fire is meeting stated Refuge goals. This process may also identify the need for more detailed monitoring or research needs to help evaluate the effectiveness of the prescribed fire program.

Funding for the evaluation of fuels management and project effectiveness is now available as per the Fire Management Handbook (2.2.4). The Refuge may apply for these funds to help in the establishment of a proper prescribed burn monitoring program designed to document the project effectiveness.

Required Reports

All prescribed burn forms will be completed as outlined by the Prescribed Fire Burn Boss. A monitor will be assigned to collect predetermined information and complete necessary forms prior to, during, and after the burn. All records will be archived in the Refuge's fire records for future use and reference.

The Prescribed Fire Burn Boss will prepare a final report on the prescribed burn. Information will include a narrative of the burn operation, a determination of whether objectives were met, weather and fire behavior data, map of the burn area, photographs of the burn, number of work hours, and final cost of the burn.

Prescribed Burn Critique

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

AIR QUALITY/SMOKE MANAGEMENT GUIDELINES

The effects of smoke on air quality is of moderate concern on this Refuge. For prescribed fires smoke management is part of the planning process. Most burn units are capable of being completed in a day's time so residual smoke is not a significant problem. Unexpected wind shifts are the primary concern. Local residents close to the Refuge area are familiar with smoke and frequently conduct agricultural burns. Based on occurrence records (Table 1) most unwanted wildland fires are also of relatively short duration, generally one burning period.

Because the Refuge is bounded and crossed by both town and county highways, potential effects of smoke on travel may be significant. Although there are few residences within the acquisition boundary, numerous others are adjacent to, or within one mile of, the boundary. In a broader circle of ten mile radius, several small towns and the city of Little Falls with a total population of over 13,000 are potentially affected by smoke

The Refuge will comply with all applicable Federal, state and local air pollution control requirements as specified under Section 118 of the Clean Air Act, as amended (42 USC 7418).

All prescribed fires will follow these guidelines:

- Obtain any required State open burning permit.
- The operation will be conducted according to the terms and conditions of permits and the prescription in the plan.
- Prescriptions will be written to achieve mixing heights that will disperse smoke at sufficient altitude to minimize smoke impacts at ground level.
- No burning will occur if the state air quality agency or other government agency has issued an air pollution health advisory, alert, warning or emergency. This is expected to be an extremely rare occurrence.

FIRE RESEARCH

There are no fire related research projects in place or proposed currently. As prescribed fire operations take place, research needs, if any, will be developed and funding requested through normal Service channels.

At any time, if local sources are willing to fund research, the Refuge will assist to the extent possible subject to budget and personnel availability.

PUBLIC SAFETY

Crane Meadows is dedicated to ensuring the safety of each visitor and to all residents and property within and adjacent to the Refuge boundary. Road closures necessary during wildland or prescribed fires would be managed by local law enforcement.

As the Refuge acquires additional land and Refuge regulations are put in place, closures involving Refuge lands would follow those regulations with enforcement by Refuge staff.

Areas of fire activity will be clearly signed at the office and Refuge kiosks. Residents immediately adjacent to a planned burn unit will be notified in advance of the prescribed fire. Table 5 in Appendix E contains a list of adjacent landowners with contact information where available. This table is subject to frequent change and should be used accordingly.

Local law enforcement, fire, and emergency medical services offices will be notified prior to the ignition of any prescribed fire. The same offices will also be notified of the location of any unwanted wildland fires.

PUBLIC INFORMATION AND EDUCATION

Educating the public on the value of fire as a natural process is important to increasing public understanding and support for the fire management program. The Refuge will use the most appropriate and effective means to explain the overall fire and smoke management program. This may include supplemental handouts, signing, personal contacts, or media releases. When deemed necessary, interpretive presentations will address the fire management program and explain the role of fire in the environment. An excellent opportunity exists to develop a video or CD-ROM based presentation showing before, during, and after photos with an explanation of why fire is used.

The public information program will be developed as follows:

- Concepts of the prescribed burn program will be incorporated, as appropriate, in publications, brochures, and handouts.
- During periods when prescribed burns are ignited, handouts will be prepared and distributed to all visitors entering areas of fire activity.
- The fire management program may be incorporated into visitor contacts. Particular attention will be given when fires are conspicuous from roads or visitor use areas.
- News releases will be distributed to the media as appropriate.
- The public information outlets of neighboring and cooperating agencies and the regional office will be provided with all fire management information.
- The fire management program will be discussed in informal contacts with employees, volunteers, residents, and neighbors.

Prior to the ignition of any prescribed fire, information will be made available to visitors, local residents, and/or the press about what is scheduled to happen and why. Information will be available on-site to alleviate visitor concern about the apparent destruction of resources by fire or the impairment of views due to temporary smoke. This information will include prescribed burn objectives and control techniques, current fire location and behavior, effects caused by the fire, impacts on private and public facilities and services, and restrictions and closures.

FIRE CRITIQUES AND ANNUAL PLAN REVIEW

FIRE CRITIQUES

Fire reviews will be documented and filed with the final fire report. The Station FMO will retain a copy for Refuge files.

ANNUAL FIRE SUMMARY REPORT

The Station FMO will be responsible for completing an annual fire summary report. The report will contain the number of fires by type, acres burned by fuel type, cost summary (prescribed burns and wildland fires), personnel utilized, and fire effects.

ANNUAL FIRE MANAGEMENT PLAN REVIEW

The Fire Management Plan will be reviewed annually. Necessary updates or changes will be accomplished prior to the next fire season. Any additions, deletions, or changes will be reviewed by the Refuge Manager to determine if such alterations warrant a re-approval of the plan.

CONSULTATION AND COORDINATION

The following agencies, organizations and/or individuals were consulted in preparing this plan.

Beam, Ron	Maintenance Worker, Crane Meadows NWR, Little Falls, MN
Blair, Charles	Project Leader, Sherburne-Crane Meadows NWR Complex, Zimmerman, MN.
Gale, Cal	Fire Program Analyst, R.S. Staffing Services, Inc., Twin Cities, MN.
Vnuk, Chris	Summer Intern, Sherburne-Crane Meadows NWR Complex, Zimmerman, MN

APPENDICES

APPENDIX A: REFERENCES CITED

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APPENDIX B: DEFINITIONS

Agency Administrator. The appropriate level manager having organizational responsibility for management of an administrative unit. May include Director, State Director, District Manager or Field Manager (BLM); Director, Regional Director, Complex Manager or Project Leader (FWS); Director, Regional Director, Park Superintendent, or Unit Manager (NPS), or Director, Office of Trust Responsibility, Area Director, or Superintendent (BIA).

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

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

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

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

Bureau. Bureaus, offices or services of the Department.

Class of Fire (as to size of wildland fires):

Class A – ¼ acre or less.
Class B - more than ¼ but less than 10 acres.
Class C - 11 acres to 100 acres.
Class D - 101 to 300 acres.
Class E - 301 to 1,000 acres.
Class F - 1,001 to 5,000 acres.
Class G - 5,001 acres or more.

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

Extended attack. A fire on which initial attack forces are reinforced by additional forces.

Fire Suppression Activity Damage. The damage to lands, resources and facilities directly attributable to the fire suppression effort or activities, including: dozer lines, camps and staging areas, facilities (fences, buildings, bridges, etc.), handlines, and roads.

Fire effects. Any consequences to the vegetation or the environment resulting from fire, whether neutral, detrimental, or beneficial.

Fire intensity. The amount of heat produced by a fire. Usually compared by reference to the

length of the flames.

Fire management. All activities related to the prudent management of people and equipment to prevent or suppress wildland fire and to use fire under prescribed conditions to achieve land and resource management objectives.

Fire Management Plan. A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational procedures such as preparedness plans, preplanned dispatch plans, prescribed fire plans and prevention plans.

Fire prescription. A written direction for the use of fire to treat a specific piece of land, including limits and conditions of temperature, humidity, wind direction and speed, fuel moisture, soil moisture, etc., under which a fire will be allowed to burn, generally expressed as acceptable range of the various fire-related indices, and the limit of the area to be burned.

Fuels. Materials that are burned in a fire; primarily grass, surface litter, duff, logs, stumps, brush, foliage, and live trees.

Fuel loadings. Amount of burnable fuel on a site, usually given as tons/acre.

Hazard fuels. Those vegetative fuels which, when ignited, threaten public safety, structures and facilities, cultural resources, natural resources, natural processes, or to permit the spread of wildland fires across administrative boundaries except as authorized by agreement.

Initial Attack. An aggressive suppression action consistent with firefighter and public safety and values to be protected.

Maintenance burn. A fire set by agency personnel to remove debris; i.e., leaves from drainage ditches or cuttings from tree pruning. Such a fire does not have a resource management objective.

Natural fire. A fire of natural origin, caused by lightning or volcanic activity.

NFDRS Fuel Model. One of 20 mathematical models used by the National Fire Danger Rating System to predict fire danger. The models were developed by the US Forest Service and are general in nature rather than site specific.

NFFL Fuel Model. One of 13 mathematical models used to predict fire behavior within the conditions of their validity. The models were developed by US Forest Service personnel at the Northern Forest Fire Laboratory, Missoula, Montana.

Prescription. Measurable criteria which guide selection of appropriate management response and actions. Prescription criteria may include safety, public health, environmental, geographic, administrative, social, or legal considerations.

Prescribed Fire. A fire ignited by agency personnel in accord with an approved plan and under prescribed conditions, designed to achieve measurable resource management objectives. Such a fire is designed to produce the intensities and rates of spread needed to achieve one or more planned benefits to natural resources as defined in objectives. Its purpose is to employ fire scientifically to realize maximize net benefits at minimum impact and acceptable cost. A written, approved prescribed fire plan must exist and NEPA requirements must be met prior to ignition. NEPA requirements can be met at the land use or fire management planning level.

Preparedness. Actions taken seasonally in preparation to suppress wildland fires, consisting of hiring and training personnel, making ready vehicles, equipment, and facilities, acquiring supplies, and updating agreements and contracts.

Prevention Activities directed at reducing the number or the intensity of fires that occur, primarily by reducing the risk of human-caused fires.

Rehabilitation (1) Actions to limit the adverse effects of suppression on soils, watershed, or other values, or (2) actions to mitigate adverse effects of a wildland fire on the vegetation-soil complex, watershed, and other damages.

Suppression. A management action intended to protect identified values from a fire, extinguish a fire, or alter a fire's direction of spread.

Unplanned ignition. A natural fire that is permitted to burn under specific conditions, in certain locations, to achieve defined resource objectives.

Wildfire. An unwanted wildland fire.

Wildland Fire. Any non-structure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Situation Analysis (WFSA). A decision-making process that evaluates alternative management strategies against selected safety, environmental, social, economical, political, and resource management objectives as selection criteria.

Wildland/urban interface fire A wildland fire that threatens or involves structures.

APPENDIX C: SAMPLE DELEGATION OF AUTHORITY

Crane Meadows National Wildlife Refuge
Little Falls, MN

Limited Delegation of Authority

As of 1800, May 20, 2001, I have delegated authority to manage the Skunk Lake North fire, number 3102, Crane Meadows National Wildlife Refuge, to Incident Commander, John Doe and his Incident Management Team.

The fire which originated as an arson fire on May 18, 2001, is burning in habitat adjacent to the Refuge boundary. My considerations for management of this fire are:

1. Provide for firefighter safety using LCES concepts.

2. I would like the fire managed using MIST techniques that will cause as little environmental damage as possible protecting water quality.

3. Key features requiring priority protection are: adjacent private lands.

4. Restrictions for suppression actions are no tracked vehicles in the area of the creeks; no foam or retardant use within 200 feet of the creeks.

5. Minimum tools for use are Type II/III helicopters, and chainsaws.

6. My agency advisor will be Maintenance Worker Ron Beam.

7. Managing the fire cost-effectively for the values at risk is a significant concern.

_____

Charles Blair
Project Leader, Crane Meadows National Wildlife Refuge
May 20, 2001

APPENDIX D: COMPLIANCE DOCUMENTATION

Documents in this Appendix include: NEPA Categorical Exclusion, Intra-Service Section 7 Consultation and State Historic Preservation Officer clearance and are added at approval.

(Refuge gets section 7, RO gets the SHPO and NEPA documents for this section after public review)

APPENDIX E: ANNUAL UPDATE DOCUMENTS

Call Up List

See Appendix I In the Sherburne FMP.

APPENDIX E: CONTINUED

Cache Equipment Inventory

Table 4 - Cache Inventory

Location: Crane Meadows Cache					
Category	**Product**	**Supplier**	**On Hand**	**Reorder Level**	**Max Stocking**
Fittings	1.5" Gated Y	GSA	1	1	1
Fittings	Forester Nozzle	GSA	1	1	1
Hose	1.0" Hose - 100' roll	GSA	4	2	4
Hose	1.5" Hose - 100' roll	GSA	5	3	5
Hose	1.5" Suction Hose	GSA	1	1	1
Hose	2" Suction Hose	GSA	1	1	1
Tools	Backpack Pump	GSA	5	3	5
Tools	Council Rakes	GSA	2	1	2
Tools	Flappers	GSA	2	1	2
Tools	Float Pump	LOCAL PURCHASE	1	1	1
Tools	McCleod Tools	GSA	5	2	5
Tools	Pulaski	GSA	2	1	2

APPENDIX E: CONTINUED

Cooperator Contacts

Table 5 - Cooperator Contact List

Name	Phone Number
Little Falls Fire Department	(320) 632-4461
Royalton Fire Department	(320) 584-8265
Pierz Fire Department	(320) 468-6608
MNDNR	(320) 616-2450
Morrison County Sheriff	(320) 632-9233

APPENDIX E: CONTINUED

Adjacent Landowner Contact List

The following table is based on information derived from the Morrison County Plat Book and Directory (2001). Residents listed are those within the acquisition boundary or, adjacent to it. Adjacent residents that are separated by a road (i.e. north of Highway 27) are not included. This information is not to be considered complete as changes may occur frequently

Addresses and phone numbers are from the Yahoo.com people search engine. Locations by township, range and section are intended to assist in pre-burn contacts and wildland fire information dissemination

Table 6 - Adjacent Landowner Contact List

Resident	Address	Phone #
Location :T 39 N R 32 W Section 1		
Carroll Defries	18752 93rd St Royalton, MN	(320) 584-5412
Fred Pelzer	PO Box 172 Royalton, MN	(320) 584-5179
Clifford Modrynski	18248 93rd St Royalton, MN	(320) 584-5392
Manvel Hopwood	18500 93rd St Royalton, MN	(320) 584-5846
Location :T 40 N R 31 W Section 19		
Edward Peterson	19935 133rd St Little Falls, MN	(320) 632-8756
Location :T 40 N R 31 W Section 30		
Ray Laubach, Jr.	11596 190th Ave. Little Falls, MN	(320) 632-9472
Rich Winscher	12246 190th Ave. Little Falls, MN	(320) 632-2881
Location :T 40 N R 31 W Section 31		
Curt Boser	No Address	No Listing
John Monahan	19335 Iris Rd. Little Falls, MN	(320) 632-3011
Mel Eutenuer	No Address	No Listing
Raymond Schulte	10481 Hillton Rd. Little Falls, MN	(320) 632-8163
Wayne Scholl	10345 Hillton Rd. Little Falls, MN	(320) 632-2152
Location :T 40 N R 31 W Section 32		
Gerald Herman	11008 Iris Rd. Royalton, MN	(320) 632-6972

Resident	Address	Phone #
Peter Herman	10686 Iris Rd. Royalton, MN	(320) 632-8927
Robert Wenner	10424 Iris Rd. Royalton, MN	(320) 632-8567
Syl Super	10334 Iris Rd. Royalton, MN	(320) 584-5790
Location /T 40 N R 31 W Section 20		
Paulette Pappenfus	12951 210th Ave. Little Falls, MN	(320) 632-9382
Location /T 40 N R 31 W Section 18		
John Smith	19889 Highway 27 Little Falls, MN	(320) 632-6087
Location /T 40 N R 31 W Section 17		
John Belinsky	14037 123rd St. Little Falls, MN	(320) 616-9791
Mark Selinski	14091 210th Ave. Little Falls, MN	(320) 632-2737
Victor Bieniek	20313 State Highway 27 Little Falls, MN	(320) 632-9491
Reinhart Kimman	20537 State Highway 27 Little Falls, MN	(320) 632-9479
Gerry Palo	20629 State Highway 27 Little Falls, MN	(320) 632-3868
M. Palo	20629 Highway 27 Little Falls, MN	(320) 632-2792
Marvin Stuckmeyer	20879 Highway 27 Little Falls, MN	(320) 632-8583
Dan Otremba	20945 Highway 27 Little Falls, MN	(320) 632-6511
Location /T 39 N R 31 W Section 5		
Roger Ratke	Kettle Rd. Royalton, MN	No Listing
Tom Wagner	20890 Kettle Rd. Royalton, MN	(320) 584-5185
Location /T 39 N R 31 W Section 4		
Fred Zimmerman	21282 Kettle Rd. Royalton, MN	(320) 584-5296
Location /T 39 N R 31 W Section 16		
Allen Spath	7798 210th Ave. Royalton, MN	(320) 584-5317
Location /T 39 N R 31 W Section 22		

Resident	Address	Phone #
Chuck Schwab	22786 63rd St. Royalton, MN	(320) 584-5418
Location :T 39 N R 31 W Section 10		
Charles Zehlke	8896 220th Ave. Royalton, MN	(320) 468-2241
Edward Veith	22747 93rd St. Royalton, MN	(320) 468-6005
Location :T 39 N R 31 W Section 3		
Tim Pappenfus	9351 Lake Rd. Royalton, MN	(320) 468-2358
Ralph Henneken	22348 93rd St Royalton, MN.	(320) 468-9995
Scott Storkamp	Kettle Road Royalton, MN.	No Listing
Location :T 40 N R 31 W Section 34		
Don Laborde	22264 Kettle Rd, Pierz, MN	(320) 468-0068
Douglas Laborde	22378 Kettle Rd. Pierz, MN	(320) 468-6352
Lloyd Laborde	22378 Kettle Rd. Pierz, MN	(320) 468-0110
Location :T 40 N R 31 W Section 27		
Greg Leidenfrost	11631 230th Ave. Pierz, MN	(320) 468-0069
Herbert Leidenfrost	11575 230th Ave. Pierz, MN	(320) 468-6837
Location :T 40 N R 31 W Section 21		
Delroy Sweeney	21095 133rd St. Little Falls, MN	(320) 632-8934
Location :T 40 N R 31 W Section 22		
FWS Volunteers	133rd St. Pierz, MN	(320) 468-2090
Jim Gritzmacher	22693 133rd St. Pierz. MN	(320) 468-2386
Tom Stumpf	13271 230th Ave. Pierz. MN	(320) 468-2384
Roger Colombe	12737 230th Ave. Pierz. MN	(320) 468-6470
Location :T 40 N R 31 W Section 16		
Leo Zimmerman	133rd St.	No Listing

Resident	Address	Phone #
	Little Falls, MN	
Tyrone Umlauf	21739 Highway 27 Little Falls, MN	(320) 632-9204
Everett Smith	21421 Highway 27 Little Falls, MN	(320) 632-8241
Location :T 40 N R 31 W Section 14		
Lloyd Boeder	Lake Road Pierz, MN	(320) 468-2195
Roland Storkamp	23270 133rd St. Pierz, MN	(320) 468-2764
Roger Neu	13497 Lake Rd. Pierz, MN	(320) 468-6907
M. Meyer	13591 Lake Rd. Pierz, MN	(320) 468-6917
Maurice Faust	23041 Highway 27 Pierz, MN	(320) 468-2247
Roger Rauch	14066 Lake Rd. Pierz, MN	(320) 468-6836
Ernest Marshik	13909 Lake Rd. Pierz, MN	(320) 468-2604
John Happke	13857 Lake Rd. Pierz, MN	(320) 468-6254
Scott Boser	Lake Road Pierz, MN	No Listing

APPENDIX E: CONTINUED

Cooperative Agreements

No cooperative agreements currently in force.

APPENDIX E: CONTINUED

Wildland Fire Dispatch Plan

Crane Meadows National Wildlife Refuge
Dispatch Plan

When report of smoke or fire is received try to get as much information as possible from the caller. The following list should be filled in.

Location of smoke or fire:

Location of caller:

Name and telephone number of caller:

Color of smoke:

Size of fire:

Type of Fuel:

Character of fire (running, creeping, etc.):

Anyone on the fire:

See anyone in the area or vehicles leaving the area:

1. *Check map location and ownership/protection status*
2. *Call MNDNR and check if there is a special permit in area*
3. *If fire is on or threatening refuge call MNDNR in Little Falls*
4. *Notify Project Leader*
5. *Maintain log of all telephone communications.*
6. *Remain on duty and notify:*

Adjacent landowners: See Appendix E, Table 5

Refuge Personnel	*Position*	*Home Phone*
Charlie Blair	*Project Leader*	*(320) 632-1783*
Ron Beam	*Maintenance Worker*	*(320) 632-8590*

Richard Johnson	*FMO, Sherburne NWR*	*(763) 631-0070*

DIRECTORY

Regional Office

Brian McManus	*Fire Mgt. Coordinator*	*Office* *Home*	*(612) 713-5366* *(507) 263-8878*
Nita Fuller	*Chief, Division of Refuges*	*Office*	*(612) 713-5401*

NIFC

Phil Street	*FWS Coordinator*	*Office*	*(208) 387-2595*

MNDNR, Little Falls Dispatch	*Office*	*(320) 616-2450*

Other Services

Hospital

St. Gabriel's Hospital — *(320) 632-5441*
815 2nd St. SE, Little Falls, MN 56345

St. Cloud Hospital — *(320) 251-2700*
1406 6th Ave. N, St. Cloud, MN 56303

Ambulance — *911*
Gold Cross Ambulance — *(320) 632-6644*
111 5th St. SE, Little Falls, MN 56345

Sheriff — *911*
Morrison County — *(320) 632-9233*
1204 7th St. S, St. Cloud, MN 56303

State Patrol — *911*
1991 Industrial Park Rd. S., Baxter, MN 56425 — *(218) 828-2230*

Little Falls Fire Department — *911*
314 1st St. NE, Little Falls, MN 56345 — *(320) 632-4461*

Royalton Fire and Rescue — *911*
Royalton, MN 56373 — *(320) 584-8265*

Pierz Fire Department *Pierz, MN*	*911* *(320) 468-6608*

APPENDIX F: STEP-UP PLAN

The step-up plan only address public and visitor information needs. Adjective class will be obtained from MNDNR to insure consistency of information provided to the public.

Staffing Class	Adjective Class	Step up Actions
SC-1	Low	Normal tour of duty and operations
SC-2	Moderate	Normal tour of duty and operations
SC-3	High	Items in SC-2 and Daily contact with DNR Consider weekend duty Collateral staff may shift schedule to cover heat of the day Engine and operator available on site.
SC-4	Very High	Items in SC-3 and: Use of Emergency Preparedness Funds (PE03) with approval of Zone FMO Consider hiring one AD firefighter Personal contacts with visitors, bulletin board materials, and handouts will be utilized to increase visitor and neighbor awareness of fire hazards. Work schedules adjusted to provide optimum coverage. After 5 days prepare request for Severity Funding through RFMC. No off-unit assignments.

Staffing Class	Adjective Class	Step up Actions
SC-5	Extreme	Items in SC-4 and: Suspend all prescribed fire operations Adopt state fire regulations During periods of extreme or prolonged fire danger emergency restrictions regarding refuge operations, trail closures may become necessary.

APPENDIX G: COMMUNICATION PLAN

This appendix contains existing Frequency Sharing Agreements. Following is a sample agreement form for frequency sharing and coordination.

AGREEMENT TO SHARE RADIO FREQUENCIES BETWEEN

U.S. Fish & Wildlife Service

AND

Crane Meadows National Wildlife Refuge

The purpose of this agreement is to provide for the sharing of specific radio frequencies that are authorized/licensed to each agency. This agreement is needed to provide efficient, cost effective radio/communication support in protecting life and property under the management of the agencies making this agreement.

This agreement to share certain radio frequencies is entered under the authority of the NTIA Manual of Regulations Sections 7.3.1,7.3.4 and 7.5.1 and FCC Rules and Regulation Part 90, Sections 90.405 and 90.407.

The parties to this agreement hereby agree that the following conditions agree to govern the mutual use of their respective radio frequencies identified in an attachment to this agreement:

1. Each agency shall exercise control and be responsible for all radio transmissions on their authorized/licensed frequency. It shall be possible to immediately terminate the use of a specific frequency when it is deemed necessary by the controlling agency.

2. Local dispatch and management procedures between the agencies of this agreement will be used to provide for orderly control of each other's frequencies.

3. This agreement is for mobile, portable, and transportable radios only. Permanently installed base stations are not included in this agreement.

4. A radio frequency list for each agency is attached identifying the operating frequency, power output limitations, operational information regarding the use of the frequency.

5. Use of the listed frequencies under conditions other than identified in this agreement will be reported as interference, and appropriate action taken.

This agreement may be modified by written amendments with the mutual consent of the agencies.

Unless otherwise provided, this agreement continues indefinitely and is effective as of the date of signatures. A party can terminate this agreement by providing 30 days written notice.

Frequency:

Receive:	**Transmit:**
Frequency (MHz) 171.75000	171.75000
Squelch Type PL	PL
Code -Freq (Hz) 3A- 127.3	3A- 127.3

Agency _____

Signed _____

Title _____

Date _____

Agency _____

Signed _____

Title _____

Date _____

Frequency:

Receive:	**Transmit:**
Frequency-	
Squelch Type -	
Code -Freq -	

Agency _____

Signed _____

Title _____

Date _____

Agency _____

Signed _____

Title _____

Date _____

AGREEMENT TO SHARE RADIO FREQUENCIES BETWEEN

U.S. Fish & Wildlife Service

AND

Crane Meadows National Wildlife Refuge Morrison County Sheriff

The purpose of this agreement is to provide for the sharing of specific radio frequencies that are authorized/licensed to each agency. This agreement is needed to provide efficient, cost effective radio/communication support in protecting life and property under the management of the agencies making this agreement.

This agreement to share certain radio frequencies is entered under the authority of the NTIA Manual of Regulations Sections 7.3.1,7.3.4 and 7.5.1 and FCC Rules and Regulation Part 90, Sections 90.405 and 90.407.

The parties to this agreement hereby agree that the following conditions agree to govern the mutual use of their respective radio frequencies identified in an attachment to this agreement:

1. Each agency shall exercise control and be responsible for all radio transmissions on their authorized/licensed frequency. It shall be possible to immediately terminate the use of a specific frequency when it is deemed necessary by the controlling agency.

2. Local dispatch and management procedures between the agencies of this agreement will be used to provide for orderly control of each other's frequencies.

3. This agreement is for mobile, portable, and transportable radios only. Permanently installed base stations are not included in this agreement.

4. A radio frequency list for each agency is attached identifying the operating frequency, power output limitations, operational information regarding the use of the frequency.

5. Use of the listed frequencies under conditions other than identified in this agreement will be reported as interference, and appropriate action taken.

This agreement may be modified by written amendments with the mutual consent of the agencies.

Unless otherwise provided, this agreement continues indefinitely and is effective as of the date of signatures. A party can terminate this agreement by providing 30 days written notice.

Frequency:			**Frequency:**		
Receive:		**Transmit:**		**Receive:**	**Transmit:**
Frequency (MHz)	171.75000	171.75000	Frequency-	155.520	158.9550
Squelch Type	PL	PL	Squelch Type -	PL	PL
Code -Freq (Hz)	3A- 127.3	3A- 127.3	Code -Freq -	3Z	3Z

Agency	U.S. Fish and Wildlife Service	Agency	
Signed	/s/ Ron Beam	Signed	
Title	Maintenance Worker	Title	
Date	1/16/03	Date	

Agency	Morrison County Sheriff's Department	Agency	
Signed		Signed	
Title	Sheriff	Title	
Date	1/16/03	Date	

AGREEMENT TO SHARE RADIO FREQUENCIES BETWEEN

U.S. Fish & Wildlife Service

AND

Crane Meadows National Wildlife Refuge Little Falls Fire Department

The purpose of this agreement is to provide for the sharing of specific radio frequencies that are authorized/licensed to each agency. This agreement is needed to provide efficient, cost effective radio/communication support in protecting life and property under the management of the agencies making this agreement.

This agreement to share certain radio frequencies is entered under the authority of the NTIA Manual of Regulations Sections 7.3.1,7.3.4 and 7.5.1 and FCC Rules and Regulation Part 90, Sections 90.405 and 90.407.

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This agreement may be modified by written amendments with the mutual consent of the agencies.

Unless otherwise provided, this agreement continues indefinitely and is effective as of the date of signatures. A party can terminate this agreement by providing 30 days written notice.

Frequency:			**Frequency:**	
Receive:		**Transmit:**	**Receive:**	**Transmit:**
Frequency (MHz)	171.75000	171.75000	Frequency-	154.220
Squelch Type	PL	PL	Squelch Type -	
Code -Freq (Hz)	3A- 127.3	3A- 127.3	Code -Freq -	

Agency	U.S. Fish and Wildlife Service	Agency	Little Falls Fire Department
Signed	/s/ Ron Beam	Signed	
Title	Maintenance Worker	Title	Fire Chief
Date	1/21/03	Date	1/21/03

AGREEMENT TO SHARE RADIO FREQUENCIES BETWEEN

U.S. Fish & Wildlife Service

AND

Crane Meadows National Wildlife Refuge Pierz Fire Department

The purpose of this agreement is to provide for the sharing of specific radio frequencies that are authorized/licensed to each agency. This agreement is needed to provide efficient, cost effective radio/communication support in protecting life and property under the management of the agencies making this agreement.

This agreement to share certain radio frequencies is entered under the authority of the NTIA Manual of Regulations Sections 7.3.1,7.3.4 and 7.5.1 and FCC Rules and Regulation Part 90, Sections 90.405 and 90.407.

The parties to this agreement hereby agree that the following conditions agree to govern the mutual use of their respective radio frequencies identified in an attachment to this agreement:

1. Each agency shall exercise control and be responsible for all radio transmissions on their authorized/licensed frequency. It shall be possible to immediately terminate the use of a specific frequency when it is deemed necessary by the controlling agency.

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This agreement may be modified by written amendments with the mutual consent of the agencies.

Unless otherwise provided, this agreement continues indefinitely and is effective as of the date of signatures. A party can terminate this agreement by providing 30 days written notice.

Frequency:			**Frequency:**		
Receive:		**Transmit:**		**Receive:**	**Transmit:**
Frequency (MHz)	171.75000	171.75000	Frequency-	154.220	154.220
Squelch Type	PL	PL	Squelch Type -		
Code -Freq (Hz)	3A- 127.3	3A- 127.3	Code -Freq -	123.0 (3Z)	123.0 (3Z)

Agency	U.S. Fish and Wildlife Service	Agency	Pierz Fire Department
Signed	/s/ Ron Beam	Signed	/s/
Title	Maintenance Worker	Title	Fire Chief
Date	1/21/03	Date	1/21/03

Radio Frequency Sharing Agreement Attachment:

This form should be utilized to identify the specific frequencies and contact information contained in the Radio Frequency Sharing Agreement.

USFWS authorized radio frequencies identified for shared use under the provisions of this agreement:

Area of Operation:	Agency Contact:	Frequency:	Power Output Limit:	Unit ID:	Operational Guides:
Morrison County Sheriff	Sheriff Dispatch	155.520 MHz 158.955 MHz	100 Watts	Mutual Assist	
Little Falls Fire Department	Fire Chief	154.220 MHz 154.220 MHz		Mutual Assist	
Pierz Fire Department	Fire Chief	154.220 MHz 154.220 MHz		Mutual Assist	

APPENDIX H: RESOURCES OF CONCERN

Species of Concern

Not all species listed in the tables below have been documented on the refuge, they may be transients; or within their identified historic range. Table 7 Lists Federal Threatened and Endangered Species. Tables 8-10 contain state listed T&E species. Those species not likely to be affected by directly by fire including fish and mollusks, are not listed.

In addition to the information in these tables there is a list of species contained in the Regional Conservation Priorities document (USFWS, Region 3, 2002) that are of management concern. That document is available in Refuge files.

Table 7 - Federal Threatened or Endangered Species

Federal T&E Insects		
Common Name	**Scientific Name**	**Status**
Karner Blue Butterfly	*Lycaeides melissa samuelis*	E
Federal T&E Birds		
Bald Eagle	*Haliaeetus leucocephalus*	T
Piping Plover	*Charadrius melodus*	T
Federal T&E Mammals		
Canada Lynx	*Lynx canadensis*	T
Gray Wolf	*Canis lupus*	T
Federal T&E Plants		
Leedy's Roseroot	*Sedum integrifolium ssp. leedyi*	T
Minnesota Dwarf Trout Lily	*Erythronium propullans*	E
Prairie Bush-clover	*Lespedeza leptostachya*	T
Western Prairie Fringed Orchid	*Platanthera praeclara*	T

Table 8 - Minnesota Threatened and Endangered Amphibians/Reptiles

Minnesota T&E Amphibians/Reptiles		
Common Name	**Scientific Name**	**Status**
Blanding's Turtle	*Emydoidea blandingii*	T
Northern Cricket Frog	*Acris crepitans*	E
Wood Turtle	*Clemmys insculpta*	T

Table 9 - Minnesota Threatened and Endangered Birds

Minnesota T& E Birds		
Common Name	**Scientific Name**	**Status**
Common Tern	*Sterna hirundo*	T
Henslow's Sparrow	*Ammodramus henslowii*	E
Horned Grebe	*Podiceps auritus*	T
Loggerhead Shrike	*Lanius ludovicianus*	T
Peregrine Falcon	*Falco peregrinus*	T
Trumpeter Swan	*Cygnus buccinator*	T
Wilson's Phalarope	*Phalaropus tricolor*	T

Table 10 - Minnesota Threatened and Endangered Insects

Minnesota T&E Insects		
Common Name	**Scientific Name**	**Status**
Assiniboia Skipper	*Hesperia comma assiniboia*	E
Dakota Skipper	*Hesperia dacotae*	T
Garita Skipper	*Oarisma garita*	T
Ottoe Skipper	*Hesperia ottoe*	T
Persius Dusky Wing	*Erynnis persius*	E
Uhler's Arctic	*Oeneis uhleri varuna*	E
Uncas Skipper	*Hesperia uncas*	E

Table 11 - Minnesota Threatened and Endangered Mammals

Minnesota T&E Mammals		
Common Name	**Scientific Name**	**Status**
Eastern Spotted Skunk	*Spilogale putorius*	T

Table 12 - Minnesota Threatened and Endangered Plants

Minnesota T&E Plants		
Common Name	**Scientific Name**	**Status**
Alpine Bilberry	*Vaccinium uliginosum*	T
Alpine Milk-Vetch	*Astragalus alpinus*	E
Annual Skeletonweed	*Shinnersoseris rostrata*	T
Auricled Twayblade	*Listera auriculata*	E
Awlwort	*Subularia aquatica*	T
Ball Cactus	*Escobaria vivipara*	E
Beachgrass	*Ammophila breviligulata*	T
Beaked Spike-Rush	*Eleocharis rostellata*	T
Black Crowberry	*Empetrum nigrum*	E
Black Hawthorn	*Crataegus douglasii*	T
Blackfoot Quillwort	*Isoetes melanopoda*	E
Bladder Pod	*Lesquerella ludoviciana*	E
Blunt-Lobed Grapefern	*Botrychium oneidense*	E
Bog Adder's-Mouth	*Malaxis paludosa*	E
Bog Bluegrass	*Poa paludigena*	T
Braun's Holly Fern	*Polystichum braunii*	E
Broad Beech-Fern	*Phegopteris hexagonoptera*	T
Canadian Forked Chickweed	*Paronychia canadensis*	T
Carey's Sedge	*Carex careyana*	T
Chilean Sweet Cicely	*Osmorhiza berteroi*	E
Christmas Fern	*Polystichum acrostichoides*	T
Cloudberry	*Rubus chamaemorus*	T
Common Moonwort	*Botrychium lunaria*	T
Cross-Leaved Milkwort	*Polygala cruciata*	E
Davis' Sedge	*Carex davisii*	T

Minnesota T&E Plants		
Common Name	**Scientific Name**	**Status**
Diverse-Leaved Pondweed	*Potamogeton diversifolius*	E
Eared False Foxglove	*Agalinis auriculata*	E
Encrusted Saxifrage	*Saxifraga paniculata*	T
False Mermaid	*Floerkea proserpinacoides*	T
Fernleaf False Foxglove	*Aureolaria pedicularia*	T
Fescue Sedge	*Carex festucacea*	T
Floating Marsh-Marigold	*Caltha natans*	E
Forked Chickweed	*Paronychia fastigiata*	E
Frenchman's Bluff Moonwort	*Botrychium gallicomontanum*	E
Garber's Sedge	*Carex garberi*	T
Glade Mallow	*Napaea dioica*	T
Golden-Seal	*Hydrastis canadensis*	E
Gray Ragwort	*Senecio canus*	E
Hair-Like Beak-Rush	*Rhynchospora capillacea*	T
Hairy Fimbristylis	*Fimbristylis puberula* var *interior*	E
Hairy Lip-Fern	*Cheilanthes lanosa*	E
Hairy Water Clover	*Marsilea vestita*	E
Handsome Sedge	*Carex formosa*	E
Holboell's Rockcress	*Arabis holboellii* var *retrofracta*	T
Indian Ricegrass	*Oryzopsis hymenoides*	E
Iowa Golden Saxifrage	*Chrysosplenium iowense*	E
James' Polanisia	*Cristatella jamesii*	E
James' Sedge	*Carex jamesii*	T
Jointed Sedge	*Carex conjuncta*	T
Katahdin Sedge	*Carex katahdinensis*	T
Kitten-Tails	*Besseya bullii*	T
Knotty Pearlwort	*Sagina nodosa* ssp *borealis*	E
Lance-Leaved Violet	*Viola lanceolata*	T
Large-Leaved Sandwort	*Moehringia macrophylla*	T

Minnesota T&E Plants		
Common Name	**Scientific Name**	**Status**
Long-Leaved Arnica	*Arnica lonchophylla*	T
Maidenhair Spleenwort	*Asplenium trichomanes*	T
Marginal Shield-Fern	*Dryopteris marginalis*	T
Montia	*Montia chamissoi*	E
Mud Plantain	*Heteranthera limosa*	T
Narrow-Leaved Milkweed	*Asclepias stenophylla*	E
Narrow-Leaved Pinweed	*Lechea tenuifolia*	E
Narrow-Leaved Spleenwort	*Diplazium pycnocarpon*	T
Neat Spike-Rush	*Eleocharis nitida*	T
Nodding Saxifrage	*Saxifraga cernua*	E
Nodding Wild Onion	*Allium cernuum*	T
Northern Paintbrush	*Castilleja septentrionalis*	E
Northern Spikemoss	*Selaginella selaginoides*	E
Norwegian Whitlow-Grass	*Draba norvegica*	E
Olivaceous Spike-Rush	*Eleocharis olivacea*	T
Ovate-Leaved Skullcap	*Scutellaria ovata*	T
Pale Moonwort	*Botrychium pallidum*	E
Pale Sedge	*Carex pallescens*	E
Pigmyweed	*Crassula aquatica*	T
Plantain-Leaved Sedge	*Carex plantaginea*	E
Prairie Milkweed	*Asclepias hirtella*	T
Prairie Shooting Star	*Dodecatheon meadia*	E
Purple Crowberry	*Empetrum eamesii*	E
Purple Rocket	*Iodanthus pinnatifidus*	E
Ram's-Head Lady's-Slipper	*Cypripedium arietinum*	T
Red Saltwort	*Salicornia rubra*	T
Reniform Sullivantia	*Sullivantia sullivantii*	T
Rock Clubmoss	*Huperzia porophila*	T

Minnesota T&E Plants		
Common Name	**Scientific Name**	**Status**
Rocky Mountain Woodsia	*Woodsia scopulina*	T
Rough-Seeded Fameflower	*Talinum rugospermum*	E
Round-Stemmed False Foxglove	*Agalinis gattingeri*	E
Sea Milkwort	*Glaux maritima*	E
Short's Aster	*Aster shortii*	T
Short-Pointed Umbrella-Sedge	*Cyperus acuminatus*	T
Siberian Yarrow	*Achillea sibirica*	T
Slender Plantain	*Plantago elongata*	T
Slender-Leaved Scurf Pea	*Psoralidium tenuiflora*	E
Small False Asphodel	*Tofieldia pusilla*	E
Small White Waterlily	*Nymphaea leibergii*	T
Smooth Woodsia	*Woodsia glabella*	T
Smooth-Sheathed Sedge	*Carex laevivaginata*	T
Snailseed Pondweed	*Potamogeton bicupulatus*	E
Snowy Campion	*Silene nivea*	T
Spreading Sedge	*Carex laxiculmis*	T
St. Lawrence Grapefern	*Botrychium rugulosum*	T
Sterile Sedge	*Carex sterilis*	T
Sticky Locoweed	*Oxytropis viscida*	E
Sullivant's Milkweed	*Asclepias sullivantii*	T
Sweet-Smelling Indian-Plantain	*Cacalia suaveolens*	E
Tall Nut-Rush	*Scleria triglomerata*	E
Three-Flowered Melic	*Melica nitens*	T
Tooth-Cup	*Rotala ramosior*	T
Triangle Moonwort	*Botrychium lanceolatum*	T
Tubercled Rein-Orchid	*Platanthera flava* var *herbiola*	E

Minnesota T&E Plants		
Common Name	**Scientific Name**	**Status**
Tuberous Indian-Plantain	*Arnoglossum plantagineum*	T
Twisted Yellow-Eyed Grass	*Xyris torta*	E
Upland Boneset	*Eupatorium sessilifolium*	T
Valerian	*Valeriana edulis* var *ciliata*	T
Virginia Bartonia	*Bartonia virginica*	E
Western Jacob's-Ladder	*Polemonium occidentale* ssp *lacustre*	E
Whorled Nut-Rush	*Scleria verticillata*	T
Wild Chives	*Allium schoenoprasum* var *sibiricum*	T
Wild Quinine	*Parthenium integrifolium*	E
Wolf's Spike-Rush	*Eleocharis wolfii*	E
Yellow Prairie Violet	*Viola nuttallii*	T

APPENDIX I: PRESCRIBED FIRE PLAN

PRESCRIBED FIRE PLAN

Refuge or Station Crane Meadows NWR

Unit(s) _____ Subunit(s) _____

Prepared By: _____ Date:_____

Reviewed By: _____ Date:_____
District Fire Management Officer

Reviewed By: _____ Date:_____
Zone Fire Management Officer

Reviewed By: _____ Date:_____
Additional Reviewers (As Required)

Approved By: _____ Date:_____
Refuge Manager

The approved Prescribed Fire Plan constitutes the authority to burn, pending approval of Section 7 Consultations, Environmental Assessments, or other 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 conditions established in the plan are firm limits. Actions taken in compliance with the approved Prescribed Fire Plan will be fully supported, but personnel will be held accountable for actions taken which are not in compliance with the approved plan.

Prescribed Fire Plans approved in prior years must be recertified by the Refuge Manager in the year in which they are to be burned

I certify that I have re-reviewed this Prescribed Fire Plan, that conditions described in this Plan are substantially still the same, and that the plan is still valid

_____ Date:_____
Refuge Manager

Valid Until _____

PRESCRIBED FIRE PLAN

Refuge:			Refuge Burn Number:		
Sub Station:			Fire Number:		
Name of Area:			Unit Number:		
Acres to be Burned:			Perimeter of Burn:		
Legal Description:	Lat.:	Long.:	T	R	S
County:					

Is a Section 7 Consultation being forwarded to Fish and Wildlife Enhancement for review ?
Yes No (circle).

(Page 2 of this PFP should be a refuge base map showing the location of the burn on Fish and Wildlife Service land)

The Prescribed Fire Burn Boss/Specialist must participate in the development of this plan.

I. GENERAL DESCRIPTION OF BURN UNIT

Physical Features and Vegetation Cover Types (Species, height, density, etc.):

Primary Resource Objectives of Unit (Be specific. These are management goals):

1.

2.

3.

Objectives of Fire (Be specific. These are different than management goals):

1.

2.

3.

Acceptable Range of Results (Area burned vs. unburned, scorch height, percent kill of a species, range of litter removed, etc.):

1.

2.

3.

II. PRE-BURN MONITORING

Vegetation Type	Acres	%	FBPS Fuel Model

Habitat Conditions (Identify with transect numbers if more than one in burn unit.):

Type of Transects:

Photo Documentation (Add enough spaces here to put a pre-burn photo showing the habitat condition or problem you are using fire to change/correct. A photo along your transect may reflect your transect data.):

Other:

III. PLANNING AND ACTIONS

Complexity Analysis Results:

Site preparation (What, when, who & how. Should be done with Burn Boss):

Weather information required (who, what, when, where, how, and how much):

Safety considerations and protection of sensitive features (Adjacent lands, visitors, facilities, terrain, etc., and needed actions. Include buffer and safety zones. Be specific, indicate on a burn unit map. Map should be a USGS quadrangle if possible, so ridges, washes, water, trails,

etc. can be identified.)

Special Safety Precautions Needing Attention (Aerial ignition, aircraft, ignition from boat, etc.):

Media Contacts (Radio stations, newspaper, etc., list with telephone numbers):

Special Constraints and Considerations (Should be discussed with Burn Boss):

Communication and Coordination on the Burn (Who will have radios, frequencies to be used, who will coordinate various activities.):

IV. IGNITION, BURNING AND CONTROL

Scheduling	Planned or Proposed	Actual
Approx. Date(s)		
Time of Day		

Acceptable Range of Prescription Elements - Complete for Each Applicable Fuel Model

BEHAVE Fuel Model:	Low	High	Actual
Temperature			
Relative Humidity			
Wind Speed (20' forecast)			
Wind Speed (mid-flame)			
Cloud Cover %			
Wind Direction	Between:		
ENVIRONMENTAL CONDITIONS			
Soil Moisture			
1 hr. Fuel Moisture			
10 hr. Fuel Moisture			

BEHAVE Fuel Model:	Low	High	Actual
100 hr. Fuel Moisture			
Woody Live Fuel Moisture			
Herb. Live Fuel Moisture			
Litter/Duff Moisture			
FIRE BEHAVIOR			
Type of Fire (H, B, F)			
Rate of Spread			
Fireline Intensity			
Flame Length			
Energy Release Component			
NFDRS Fuel Model Used:			

Cumulative effects of weather and drought on fire behavior:

Ignition Technique (Explain and include on map of burn unit. Use of aerial ignition must be identified in this plan. Last minute changes to use aircraft will not be allowed and will be considered a major change to the plan. This will require a resubmission):

Prescribed Fire Organization (See Section VII, Crew and Equipment Assignments. All personnel and their assignments must be listed. All personnel must be qualified for the positions they will fill.)

Other (If portions of the burn unit must be burnt under conditions slightly different than stated above, i.e., a different wind direction to keep smoke off of a highway or off of the neighbors wash, detail here.)

Prescription monitoring (Discuss monitoring procedure and frequency to determine if conditions for the burn are within prescription):

V. SMOKE MANAGEMENT

- ! Make any Smoke Management Plan an attachment.
- ! Permits required (who, when):
- ! Distance and Direction from Smoke Sensitive Area(s):

- Necessary Transport Wind Direction, Speed and Mixing
- Height (Explain how this information will be obtained and used):
- Visibility Hazard(s) (Roads, airports, etc.):
- Actions to Reduce Visibility Hazard(s):
- Residual Smoke Problems (Measures to reduce problem, i.e., rapid and complete mop-up, mop-up of certain fuels, specific fuel moistures, time of day, etc.):
- Particulate emissions in Tons/Acre and how calculated
  - Estimated before the burn:
  - Actual after the burn:

VI. FUNDING AND PERSONNEL

Activity Code:

Costs

	Equipment & Supplies	Labor	Overtime	Staff Days
Administration (planning, permits, etc.)				
Site Preparation Ignition & Control				
Travel/Per Diem				

Total	0	0	0	0

VII. BURN-DAY ACTIVITIES

Public/Media Contacts on Burn Day (List with telephone numbers):

Crew & Equipment Assignments (List all personnel, equipment needed, and assignments. The following is not an all inclusive list for what you may need.)

- Burn Boss/Manager -
- Ignition Specialist -
- Ignition Crew -
- Holding Specialist -
- Holding Crew -
- Aircraft Manager -
- FWBS -
- Dispatcher-
- Other -

Crew Briefing Points (Communications, hazards, equipment, water sources, contingency plans, PPE, assignments, etc. To be done by Burn Boss. Refer to Safety Considerations in Planning Actions and points listed below):
Ignition Technique (Methods, how, where, who, and sequence. Go over what was submitted in Section IV and any changes needed for the present conditions.) Attach ignition sequencing map if necessary:

Personnel Escape Plan:

Special Safety Requirements:

Go-No-Go Checklist:

Holding and Control:
- Critical Control Problems:
- Water Refill Points:
- Other:

Contingency Plan:

- Holding Plan Failure (Are there dedicated crews standing by to initial attack or will

people doing other jobs be called upon to do initial attack, who must be called in case of an escape, what radio frequencies will be used, etc.)
    - ! Initial Escape
    - ! Escape Exceeding 1 Burning Period:
- ! Smoke Management Plan Failure
- ! Fire Behavior Outside Prescription
- ! Other

Mop Up and Patrol:

- ! Resources needed
- ! Duration

Rehabilitation Needs:

DI 1202 Submission Date:

Special Problems:

VIII. CRITIQUE OF BURN

Were burn objectives within acceptable range of results? (Refer to Section I):

What would be done differently to obtain results or get better results?

Was there any deviation from plan? If so, why?
Problems and general comments:

IX. POST-BURN MONITORING

Date: Refuge Burn Number:

Length of Time after Burn:

Vegetative Transects:

Comments on Habitat Conditions, etc.:

Photo Documentation:

Other:

X. FOLLOW-UP EVALUATION

Date: Refuge Burn Number:

Length of Time after Burn:

Vegetative Transects:

Comments on Habitat Conditions, etc.:

Photo Documentation:

Other:

APPENDIX J: GO/NO-GO CHECKLIST

NWCG
PRESCRIBED
FIRE

GO/NO-GO
CHECKLIST

Yes	No	Questions
		Are ALL fire prescription Elements Met?
		Are ALL smoke management specifications met
		Has ALL required current and projected fire weather forecast been obtained and are they favorable?
		Are ALL planned operations personnel on-site, available and operational?
		Has the availability of ALL contingency resources been checked, and are they available?
		Have ALL personnel been briefed on the project objectives, their assignments, safety hazards, escape routes, and safety zones?
		Have ALL pre-burn considerations identified in the prescribed fire plan been completed or addressed?
		Have ALL the required notifications been made?
		Are ALL permits and clearances obtained?
		In your opinion, can the burn be carried out according to the prescribed fire plan and will it meet the planned objective?

If all questions were answered “YES” proceed with a test fire. Document the current conditions, location, and results.

Prescribed Fire Burn Boss Date

Refuge Manager Date

APPENDIX K: ENVIRONMENTAL GUIDELINES FOR FOAM/RETARDANT USE

The following guidelines should be followed to minimize the likelihood of retardant chemicals entering a stream or other body of water.

- During training or briefings, inform field personnel of the potential danger of fire chemicals, especially foam concentrates, in streams or lakes.
- Locate mixing and loading points where contamination of natural water, especially with the foam concentrate, is minimal.
- Maintain all equipment and use check valves where appropriate to prevent release of foam concentrate into any body of water.
- Exercise particular caution when using any fire chemical in watersheds where fish hatcheries are located.
- Locate dip operations to avoid run-off of contaminated water back into the stream.
- Dip from a tank rather than directly from a body of water, to avoid releasing any foam into these especially sensitive areas.
- Use a pump system equipped with check valves to prevent flow of any contaminated water back into the main body of water.
- Avoid direct drops of retardant or foam into rivers, streams, lakes, or along shores. Use alternative methods of fire line building in sensitive areas.
- Notify proper authorities promptly if any fire chemical is used in an area where there is likelihood of negative impacts.
- While it is preferable that drops into or along any body of water not occur, it is possible that the fire location and surrounding terrain make it probable that some retardant may enter the water. The person requesting the retardant (such as the incident commander) must balance the impacts on the environment, i.e., potential fish kill, with the resources and values to be protected from the fire.