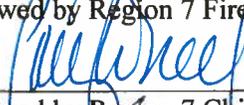
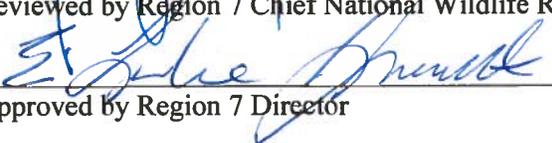


# Fire Management Plan

## *Tetlin National Wildlife Refuge*

April 2012

### Review and Approvals

 _____ Prepared by Tetlin NWR Fire Management Officer	<u>3/23/2012</u> Date
 _____ Submitted by Tetlin NWR Refuge Manager	<u>3-23-2012</u> Date
 _____ Reviewed by Region 7 Fire Management Coordinator	<u>3/30/2012</u> Date
 _____ Reviewed by Region 7 Chief National Wildlife Refuge System	<u>4.6.2012</u> Date
 _____ Approved by Region 7 Director	<u>4/9/2012</u> Date

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# 1. Introduction

## **1.1. Purpose and Need for Action**

This document is the Revised Fire Management Plan (FMP) for the Tetlin National Wildlife Refuge (Tetlin NWR). It replaces the management direction for Tetlin NWR described in the Tetlin National Wildlife Refuge Fire Management Plan adopted in October 2001. The FMP is written to meet United States Department of the Interior (DOI) and U.S. Fish and Wildlife Service (FWS) requirements that all agency lands with burnable vegetation must be managed under an approved Fire Management Plan (620 DM 1.4).

The goal of the U.S. Fish and Wildlife Service (Service) wildland fire management program is to plan and implement actions to help accomplish the mission of the National Wildlife Refuge System. The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. (095 FW 3.2)

To maintain currency, fire management plans must be reviewed each year using the nationally established annual review process. Plans must be revised when significant changes occur or substantial changes in management are proposed. Minor plan revisions may be accomplished through an amendment added to the plan and signed by the line officer and servicing fire management officer. Major scheduled revisions to fire management plans will follow the 15 year Comprehensive Conservation Plan revision cycle to provide consistency in objectives and management strategy formulation. Without a current FMP, prescribed fires cannot be conducted and response to unplanned ignitions can only consider suppression strategies. Preparedness and prevention activities can continue in the interim period as outlined in the 2001 plan. (FWS FMH 2010)

This FMP provides the planning framework for all refuge fire management decision-making, within the context of the Tetlin NWR Comprehensive Conservation Plan (CCP), approved in September 2008. It provides direction for activities including preparedness, appropriate management response, fire prevention and education, monitoring, research, and hazardous fuel reduction using prescribed fire and non-fire treatments. The goal of the FMP is to integrate these activities into a unified management strategy that protects human life and identified property values and to conserve, protect, and enhance habitats and maintain desired ecological conditions for the benefit of fish and wildlife on the Refuge.

## **1.2. General Description of the Tetlin NWR**

### **1.2.1. Location and Description**

The boundaries of the Tetlin National Wildlife Refuge encompass approximately 931,500 acres; however only 682,000 of these acres are owned and managed by the Refuge. The remaining lands belong to Native corporations, the State of Alaska, or private individuals. The Refuge is located northeast of the Alaska Range, adjacent to the U.S. - Canada border in the headwaters of the Tanana River. It is bordered to the south by Wrangell-St. Elias National Park and Preserve,

Canada to the east, and the Alaska Highway along its northeast border. The Refuge lies within the Nabesna/Chisana River Basin in the Upper Tanana Valley. (**Map 1**)

Tetlin Refuge is one of the most diverse interior refuges in Alaska. The vegetation is a complex mixture of spruce forests, mixed woodlands, shrub lands, and tussock peat lands that are interspersed with innumerable streams, ponds, lakes, and other wetlands. Most of the Refuge is rolling lowlands; however, the Mentasta Mountains in the southwest corner are rugged, glacier-carved peaks reaching elevations of 8,000 feet. The landscape provides valuable habitat for a wide variety of fish and wildlife species known to use the Refuge for at least part of the year; including 14 fish species, nearly 200 bird species, 44 mammal species, and one amphibian species. Wildland fire is a primary driver of the Refuge ecosystem.

### 1.2.2. History and Land Status

World War II brought enormous changes to the Alaska Territory. For the first time, Federal funds and labor (mostly from the War Department) were sent north to build roads, airports, and other facilities. At the same time, numerous land grants, withdrawals, and other land actions occurred near what was to become Tetlin Refuge. In 1941, the Federal government withdrew from the public domain large areas of land near Northway and along the Alaska Highway for various military and civilian purposes. In 1954, private citizens began acquiring lands for homesites and commercial activities under the *Trade and Manufacturing Act*. Four years later, the first homestead was approved. The following year, the State of Alaska began acquiring land in this area. In 1965, the Northway village site was officially deeded to the residents for a townsite, and two lots along the Alaska Highway were sold to private individuals. The Northway Airport was conveyed to the State of Alaska in 1966, and the first Native allotment was conveyed in 1967. Following the passage of the *Alaska Native Claims Settlement Act* (ANCSA) in 1971, village and regional corporations began selecting large blocks of land surrounding the village of Northway. The passage of the *Federal Land Policy and Management Act* in 1976 repealed the authority for new entries under public land disposal laws. The remaining unappropriated land was retained in Federal control.

Tetlin Refuge was established under the *Alaska National Interest Lands Conservation Act* (ANILCA) of 1980. A large amount of State and private property lie within the ANILCA boundary of the Refuge. Native corporations own or have claims on approximately 16 percent of Tetlin's ANILCA lands, while the State of Alaska claims roughly five percent. There are also numerous Native allotments and privately owned small parcels within the Refuge. The village of Northway is located within the Refuge ANILCA boundary. Other communities located near the Refuge include Tetlin, Last Tetlin, Northway Junction, Port Alcan, Tok, Tanacross, Mentasta, and the Yukon, Canada community of Beaver Creek.

Although there are still some land selections within the refuge boundary that have not been reviewed, the Bureau of Land management has processed most existing, private land claims over the last 25 years. Current land ownership patterns within the Refuge are unlikely to change substantially in the future (**Table 1 & Map 2**). The Refuge will administer approximately 4,000 acres of currently selected lands until their conveyance. The State of Alaska claims ownership of navigable waterways within the Refuge. This claim is currently being adjudicated.

Land Status Surface Estate	Acres Conveyed	Acres Selected	Acres Other	Acres Total	Percent Total
Northway Natives Incorporated					0.0%
Townsite	48	0	0	48	8.6%
ANCSA Village 12(a)(1)	76,280	4,083	0	80,363	
Doyon Limited					6.6%
ANCSA Regional 12(c)	60,565	1,296	0	61,861	
Ahtna Incorporated					0.0%
ANCSA 14(h)(1)	0	186	0	186	0.7%
ANCSA 14(h)(8)	0	6,669	0	6,669	
Native Allotments	6,957	1,449	0	8,406	0.9%
Private Landowners					
Highway Lots	12	0	0	12	0.0%
Homesites	13	0	0	13	0.0%
Trade & Manufacturing	76	0	0	76	0.0%
State of Alaska	45,070	971	0	46,041	5.0%
Withdrawals					
Civilian	0	0	185	185	0.0%
Military	0	0	45	45	0.0%
Submerged Lands			45,375	45,375	4.9%
Tetlin National Wildlife Refuge	0	0	682,604	682,604	73.3%
Overlapping Land Selections	0	-384	0	-384	0.0%
All Lands	189,021	14,270	728,209	931,500	100.0%

Table 1: 2008 Tetlin NWR Land Status

### 1.3. Significant Values to Protect

Human life is the single, overriding value to be protected by actions authorized under this plan. Priorities for the protection of human communities and community infrastructure, other property and improvements, and natural and cultural resources will be incident specific, and will be based on the values at risk, human health and safety, and the costs of protection.

Conservation of fish and wildlife populations and habitats in their natural diversity, including, but not limited to, waterfowl, raptors and other migratory birds, furbearers, moose, and caribou is one of the primary purposes for which the Tetlin National Wildlife Refuge was established. Thus, habitat diversity and species productivity within the Refuge and throughout the Upper Tanana Valley are the core natural resource values that the refuge fire management program is designed to protect. These values are largely dependent on the continued existence of a relatively natural fire regime.

Another purpose of the Refuge is to provide subsistence opportunities for local residents. Wildland fire may have both positive and negative short or long term effects on subsistence resources and infrastructure. Although periodic fire often increases habitat diversity and encourages productivity of some species leading to increased subsistence opportunities, large fires may temporarily decrease productivity in certain areas. The effects of fires on established trails and camps must also be considered.

Other values to protect include property and infrastructure in the communities of Northway, Tetlin, Last Tetlin, Northway Junction, Port Alcan, Tok, Tanacross, Mentasta, and Beaver Creek,

Canada. Protection of public and private property including Alaska Highway infrastructure, the Northway Airport, private and public telecommunications sites, refuge administrative cabins, ANSCA trust lands, and identified historic and cultural resources will also be considered in refuge fire management decisions (**Map 3**).

The preservation of water quality and quantity is another identified Refuge purpose taken into consideration by this fire management plan. Water quality issues relating to fire are unlikely on the Tetlin NWR, but may be addressed through Emergency Stabilization (ES) and Burned Area Rehabilitation (BAR). See Sections **4.1.5** and **4.1.6**.

Air quality is another important resource that will be considered in refuge fire management decisions. Public health, safety, and economic well-being can all be impacted by smoke from wildland fires. Although smoke is a natural component of the local environment, and cannot be eliminated, the refuge fire management program will seek to mitigate its negative effects through education and outreach.

#### **1.4. Effects of Climate on Biotic Composition**

It is widely accepted by the scientific community that the earth, which has always experienced climate variation, is now undergoing a period of rapid climate change that is enhanced by anthropogenic atmospheric carbon enrichment during the past 100 years (Inkley et al. 2004). Historical trends and projections of declining snow cover during this century portend changes in boreal and alpine ecosystems. If air temperatures increase at projected rates, alpine snow cover will likely recede (IPCC 1996). Even small amounts of warming may eliminate some wetland plant and animal species in alpine regions (Burkett and Kusler 2000). Interactions and changes in forest dynamics due to disease and insects are also very likely in areas where warming is greater (Inkley et al. 2004).

Such climate change has the potential to affect fish, wildlife, and plants throughout North America—either directly or indirectly through responses to changing habitat conditions. The geographic ranges of North American flora and fauna are expected to shift upwards in elevation and northward over the next 100 years (IPCC 2002). Although the response will be diverse, such shifts could cause significant restructuring of existing plant and animal communities (Inkley et al. 2004).

Climate change in boreal and arctic Alaska is well documented (Arctic Climate Impact Assessment 2005, IPCC 2007, Hinzman et al. 2005). Mean annual air temperature in interior Alaska has increased by 1.3° C in the last 50 years and is expected to increase another 3 – 7° C by the end of the 21<sup>st</sup> century (Chapin et al. 2010). The snow-free period has increased, up to 10 days in some areas, largely due to earlier spring snowmelt (Hinzman et al. 2005, Euskirchen et al. 2006). These changes will have numerous effects on vegetation, hydrology, insect occurrence, and wildlife that could fundamentally change boreal forest and tundra ecosystems. Effects include:

- Melting permafrost;
- Melting sea ice, which has implications for marine mammals and regional weather patterns (Hu et al. 2010);
- Drying wetlands (Riordan et al. 2006);

- Changing fire regimes (Kasischke et al. 2010), including changes in the initiation and end of fire season, and changes in the frequency and severity of fires;
- Shifts in distribution of plants and animals (Murphy et al. 2010, Beck et al. 2011);
- Increased likelihood for invasive plant establishment (Villano 2008), and
- Increased possibility of wildlife disease and insect outbreaks.

Research and modeling efforts provide insight on potential future conditions, but specific agency guidance on addressing these changes is limited. The Service has developed a strategic plan for responding to climate change that includes three broad approaches: adaptation, mitigation, and engagement (USFWS 2010). The core of the Service's response will be adaptation, defined as planned, science-based management actions, including regulatory and policy changes, taken to help reduce the impacts of climate change on fish, wildlife, and their habitats.

Tetlin's mandate to conserve fish and wildlife populations and habitats in their natural diversity presents a challenge for fire managers who must consider this and other legal mandates, as well as safety obligations in the face of changing climate and fire regimes.

A number of questions about the Service's response to these changes have yet to be answered:

- At what scale should diversity be addressed in management plans- the refuge or beyond?
- Should naturally occurring fires be suppressed to maintain natural diversity if old-growth or sensitive habitats become rare due to fire or other stressors?
- The primary goal for mitigation in the Service's strategic plan is to sequester carbon. How will sequestration objectives be applied in Alaska, where numerous species depend on fire and where many naturally occurring, landscape-scale fires are currently allowed to burn if they do not threaten life or property?

In the absence of specific guidelines, refuge fire management decisions will be based on guidance provided in refuge Comprehensive Conservation Plan and associated step-down plans, ANILCA, the Alaska Interagency Fire Management Plan, and evolving scientific data about the effects of climate change. Activities will be coordinated with Landscape Conservation Cooperatives and the regional Inventory and Monitoring Program when appropriate. Continued monitoring of fire effects and participation in research efforts will better inform management decisions in the face of climate change.

## **2. Policy, Land Management Planning and Partnerships**

### **2.1. Fire Policy**

See **Appendix L** for complete citations of policy documents.

#### **2.1.1. Federal Interagency Wildland Fire Policy**

Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, and across agency boundaries. Response to wildland fires is based on ecological, social and legal consequences of the fire. The circumstances under which a fire

occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate response to the fire.

This FMP implements the guiding principles of federal wildland fire policy excerpted from the *Review and Update of the 1995 Federal Wildland Fire Management Policy (January 2001)*:

- 1) Firefighter and public safety is the first priority in every fire management activity.
- 2) The role of wildland fire as an essential ecological process and natural change agent has been incorporated into the planning process. Federal agency land and resource management plans set the objectives for the use and desired future condition of the various public lands.
- 3) Fire management plans, programs, and activities support land and resource management plans and their implementation.
- 4) Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of an activity.
- 5) Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives,
- 6) Fire management plans and activities are based upon the best available science.
- 7) Fire management plans and activities incorporate public health and environmental quality considerations.
- 8) Federal, State, tribal, local, interagency, and international coordination and cooperation are essential.
- 9) Standardization of policies and procedures among federal agencies is an ongoing objective.

In addition, the following guidelines from *Guidance for Implementation of Federal Wildland Fire Management Policy (February 2009)* are considered in order to provide consistent implementation of federal wildland fire policy:

- 1) Wildland fire management agencies will use common standards for all aspects of their fire management programs to facilitate effective collaboration among cooperating agencies.
- 2) Agencies and bureaus will review, update, and develop agreements that clarify the jurisdictional inter-relationships and define the roles and responsibilities among local, State, tribal and federal fire protection entities.
- 3) Responses to wildland fire will be coordinated across levels of government regardless of the jurisdiction at the ignition source.
- 4) Fire management planning will be intergovernmental in scope and developed on a landscape scale.
- 5) Wildland fire is a general term describing any non-structure fire that occurs in the wildland. Wildland fires are categorized into two distinct types:
  - a) Wildfires – Unplanned ignitions or prescribed fires that are declared wildfires

- b) Prescribed Fires - Planned ignitions.
- 6) A wildfire may be concurrently managed for one or more objectives and objectives can change as the fire spreads across the landscape. Objectives are affected by changes in fuels, weather, topography; varying social understanding and tolerance; and involvement of other governmental jurisdictions having different missions and objectives.
  - 7) Management response to a wildfire on federal land is based on objectives established in the applicable Land/Resource Management Plan and/or the Fire Management Plan.
  - 8) Initial action on human-caused wildfire's will be to suppress the fire at the lowest cost with the fewest negative consequences with respect to firefighter and public safety.
  - 9) Managers will use a decision support process to guide and document wildfire management decisions. The process will provide situational assessment, analyze hazards and risk, define implementation actions, and document decisions and rationale for those decisions.

#### ***Federal Wildland Fire Cost Effectiveness Policy***

Maximizing the cost effectiveness of any fire operation is the responsibility of all involved, including those who authorize, direct, or implement operations. Cost effectiveness is the most economical use of resources necessary to accomplish mission objectives. Accomplishing fire operations objectives safely and efficiently will not be sacrificed for the sole purpose of "cost-saving." Care will be taken to ensure that expenditures are commensurate with values to be protected, while understanding that other factors may influence spending decisions, , including those from the social, political, economic, and biophysical environments. (2012 *Interagency Standards for Fire and Fire Aviation Operations, Chapter 1*).

### **2.1.2. National Fire Plan**

This FMP emphasizes the following overarching goals and performance measures described in A *National Cohesive Wildland Fire Management Strategy (2011)*

#### **Restore and Maintain Landscapes:**

**GOAL:** *Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.*

Outcome-based Performance Measure:

- Risk to landscapes is diminished.

#### **Fire Adapted Communities:**

**GOAL:** *Human populations and infrastructure can withstand a wildfire without loss of life and property.*

Outcome-based Performance Measure:

- Risk of wildfire impacts to communities is diminished.
- Individuals and communities accept and act upon their responsibility to prepare their properties for wildfire.

- Jurisdictions assess level of risk and establish roles and responsibilities for mitigating both the threat and the consequences of wildfire.
- Effectiveness of mitigation activities is monitored, collected and shared.

### **Wildfire Response:**

**GOAL:** *All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.*

Outcome-based Performance Measure:

- Injuries and loss of life to the public and firefighters are diminished.
- Response to shared-jurisdiction wildfire is efficient and effective.
- Pre-fire multi-jurisdictional planning occurs.

### **2.1.3. Department of the Interior (DOI) Fire Policy**

This FMP meets DOI policy in the *Departmental Manual (620 DM 1 and 620 DM 2)* by making full use of wildland fire as a natural process and as a tool in the planning process, and by providing for the following:

- Wildland fires, whether on or adjacent to lands administered by the Department, which threaten life, improvements, or are determined to be a threat to natural and cultural resources or improvements under the Department's jurisdiction, will be considered emergencies and their suppression given priority over other Departmental programs. (620 DM 1.6 B)
- Bureaus shall cooperate in the development of interagency preparedness plans to ensure timely recognition of approaching critical wildland fire situations; to establish processes for analyzing situations and establishing priorities, and for implementing appropriate management responses to these situations. (620 DM 1.6 E)
- Bureaus will enforce rules and regulations concerning the unauthorized ignition of wild land fires, and aggressively pursue violations. (620 DM 1.7) Wild land fire will be used to protect, maintain, and enhance natural and cultural resources and, as nearly as possible, be allowed to function in its natural ecological role (620 DM 1.4.D).

Additionally, this FMP implements the policy outlined in 620 DM 2.4 that sets out the lead fire protection role of the *Bureau of Land Management (BLM)* for the DOI agencies in Alaska.

“BLM will maintain and operate the Department of the Interior wildland fire suppression organization in Alaska with the primary intention of providing cost-effective suppression services and minimizing unnecessary duplication of suppression systems for Department of the Interior agencies. BLM will also provide consistency in State and Native wildland fire relationships and provide State-wide mobility of wildland fire resources.

BLM is authorized to provide safe, cost-effective emergency wildland fire suppression services in support of land, natural and cultural resource management plans on Department of the Interior administered land and on those lands that require protection under the Alaska Native Claims Settlement Act, as amended (43 U.S.C. 1620(e)), herein after referred to as Native land. BLM

will execute these services within the framework of approved fire management plans or within the mutually agreed upon standards established by the respective land managers/owners.”

- a. Nothing herein relieves agency administrators in the Interior bureaus of the management responsibility and accountability for activities occurring on their respective lands.
- b. Wildland fire suppression and other fire management activities provided on Native lands under the authority of the Alaska Native Claims Settlement Act, as amended (43 U.S.C. 1620(e)), will consider Native land managers on an equal basis with Federal land managers.
- c. Each bureau will continue to use its delegated authority for application of wildland fire management activities such as planning, education and prevention, use of prescribed fire, establishing emergency suppression strategies, and setting emergency suppression priorities for the wildland fire suppression organization on respective bureau lands.”

#### **2.1.4. U.S. Fish and Wildlife Service Fire Policy**

The goal of fire management as stated in the Service Manual (621 FW 1.2) is "to protect or enhance habitat and ecosystems for the benefit of fish and wildlife." Service policy (621 FW 1.3) states that the Service will use prescribed fire whenever it is an appropriate tool for managing Service resources, and will protect against wildland fire whenever it threatens human health, private property, or Service resources.

Any response to wildland fire occurring on Tetlin NWR will be based on direction provided in this FMP. The FMP addresses the management of all fire related activities, and considers a full spectrum of strategic options (from monitoring to intensive management actions) designed to meet Fire Management Unit (FMU) objectives. It fully applies procedures and guidelines in the *FWS Fire Management Handbook (FWS FMH 2011)* and the *Interagency Standards for Fire and Fire Aviation Operations (2011 Red Book)* and affirms these key elements of FWS fire policy:

- Firefighter and public safety is the first priority of the wildland fire management program and all associated activities.
- Only trained and qualified leaders and agency administrators will be responsible for, and conduct, wildland fire management duties and operations.
- Trained and certified employees will participate in the wildland fire management program as the situation requires; non-certified employees will provide needed support as necessary.
- Fire management planning, preparedness, wildfire and prescribed fire operations, other hazardous fuel operations, monitoring, and research will be conducted on an interagency basis with involvement by all partners to the extent practicable.
- The responsible agency administrator has coordinated, reviewed, and approved this FMP to ensure consistency with approved land management plans, values to be protected, and natural and cultural resource management plans, and that it addresses public health issues related to smoke and air quality.

- Fire, as an ecological process, has been integrated into resource management plans and activities on a landscape scale, across agency boundaries, based upon the best available science.
- Wildland fire is used to meet identified resource management objectives and benefits when appropriate.
- Prescribed fire and other treatment types may be employed when they selected as the appropriate tool to reduce hazardous fuels and the associated risk of wildfire to human life, property, and cultural and natural resources; and to manage our lands for habitats as mandated by statute, treaty, and other authorities.
- Response to Wildfires will consider firefighter and public safety, cost effectiveness, values to protect, and natural and cultural resource objectives.
- Staff members will work with local cooperators and the public to prevent human ignition of wildfires on service lands.

#### **2.1.4.1. Region 7 FWS Policy**

All activities authorized under this FMP will comply with Region 7 FWS policies, including but not limited to:

- *Region 7 Policy for Management of Permitted Cabins on National Wildlife Refuges in Alaska (August 2010) (RW-1)*
- *U.S. Fish and Wildlife Service Region 7 Bear Awareness and Firearms Safety Training Policy (February 22, 2008)*
- *U.S. Fish and Wildlife Service Region 7 Watercraft Safety and Training Annex (January 12, 2011)*

#### **2.1.5. Alaska Region Interagency Fire Management**

##### **Background on Fire Management Policy in Alaska Region(1939-2010):**

The history of fire control within Interior Alaska dates back to 1939 when the Alaskan Fire Control Service was established under the General Land Office. Headquartered in Anchorage, it was given responsibility for fire suppression on an estimated 225 million fire-prone acres of public domain lands in Alaska. When the Bureau of Land Management (BLM) was formed in 1946, it received the management authority for most of Alaska's federal lands and also absorbed the Alaska Fire Control Service. The BLM fire organization was based in Fairbanks and Anchorage and the two offices worked cooperatively but separately. The BLM also kept a Division of Fire Management at the State Office.

In 1959, the first of three big divestures of land managed by BLM-Alaska began and, with the changes in land management authority, issues regarding wildland fire suppression responsibilities arose.

- Under the Statehood Act 1959, the State was granted 104 million acres of land.
- Alaska Native Claims Settlement Act of 1971 (ANCSA) established Native corporations and an entitlement of 44 million acres for those corporations.

- The Alaska National Interest Lands Conservation Act of 1980 (ANILCA) transferred approximately 100 million acres from BLM administration to the National Park Service and Fish and Wildlife Service.

Under ANCSA, the federal government was directed to continue to provide wildland fire suppression on lands conveyed to Native regional and village corporations. In response to ANILCA, Secretarial Order #3077, dated March 17, 1982, creating “a fire line organization with headquarters in Fairbanks” was issued. BLM, Alaska Fire Service (AFS) was formed and, in Department of Interior Manual 620, AFS was assigned the fire suppression responsibility for all Department of Interior-administered lands in Alaska and Native Corporation land conveyed under ANCSA. Department of Interior-administered lands include land managed by the BLM, the National Park Service, Fish and Wildlife Service, and the Bureau of Indian Affairs. Each agency remained accountable for following its agency's mandates and policies for resource and wildland fire management. The role of AFS is to implement each agency's direction.

BLM Anchorage and Fairbanks districts fire suppression authority was delegated to AFS. The Division of Fire Management in the State Office was phased out. Today, in conjunction with his interagency role, the AFS Manager works directly for the BLM State Director and serves as the BLM State Fire Management Officer. The BLM Field Offices<sup>1</sup> retain the fire management responsibilities; AFS implements the fire direction given by the Field Offices and provides technical fire management expertise. This same principal applies to FWS and NPS lands. The State of Alaska established a wildland fire suppression organization in the Department of Natural Resources, Division of Forestry, and, in the mid-1970s, began to gradually assume suppression responsibilities in the Anchorage area and on the Kenai Peninsula.

A reciprocal fire protection agreement was signed by the BLM, AFS and the State to cooperatively provide fire suppression operations in fire-prone areas. (AFS also has an agreement with the U.S. Army-Alaska for wildland fire suppression on BLM-managed lands withdrawn for military use.) Under the State agreement, AFS has the suppression responsibility for wildland fires in the northern half of the Alaska, regardless of ownership. The State has the suppression responsibility for wildland fires in Southcentral, most of Southwestern Alaska and portions of the Central Interior including Tetlin NWR. Most State protection areas are lands previously protected by the BLM Anchorage District; most of AFS protection is in areas once protected by the BLM Fairbanks District. As of 1985 when the State took over protection responsibilities for 66 million acres in southwest Alaska, the State and AFS each protect roughly half of the fire-prone lands in Alaska. The Forest Service protects State, Federal, and Native lands within the boundaries of Chugach and Tongass National Forests.

An Interagency fire response plan, the **Alaska Interagency Wildland Fire Management Plan 2010 (AIWFMP)**, was developed in Alaska during the 1980s and 1990s in order to help prioritize initial attack responses, and allow for some fires to be managed for resource benefit.

In 2010 the reciprocal fire protection agreements between the protection agencies (DNR, BLM AFS and USFS) and the individual memorandum of agreement between land management agencies (FWS, NPS, BIA) were consolidated into the **Alaska Master Cooperative Wildland Fire Management and Stafford Act Response Agreement 2010 (Master Agreement)**. The

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<sup>1</sup> BLM Districts are now called Field Offices.

Master Agreement and its exhibits (including the AIWFMP) define the roles and responsibilities of the jurisdictional and protection agencies as well as operating procedures for fire management in Alaska.

## **2.2. Land/Resource Management Planning**

### **2.2.1. Tetlin NWR Comprehensive Conservation Plan (CCP)**

This FMP steps down from the Tetlin NWR Comprehensive Conservation Plan (2008). The land and resource management goals and objectives that form the basis of this FMP have been identified in the CCP (See Section 3.1.1).

### **2.2.2. Compliance with Regulatory Acts**

The management direction and actions specified in this FMP were evaluated in the approved Refuge CCP (2008), in accordance with National Environmental Policy Act of 1969 (NEPA), and Sections 304 and 810 of ANILCA. Public participation in the CCP process was used in the development of alternatives and in the selection of a preferred management alternative.

Prescribed fires and fuel reduction activities authorized under this FMP require completion of an initial NEPA Compliance Checklist in order to determine whether additional NEPA documentation is necessary. Fire suppression activities are normally categorically excluded from further Environmental Assessment analysis (516 DM 2 and 16 DM 6); however, before implementing any fire management project not categorically excluded, an EA or EIS will be prepared. Fire management activities authorized within the scope of this plan will also comply with all of the following Regulatory Acts:

- *Endangered Species Act of 1973 (ESA)*
- *National Historic Preservation Act of 1966 (NHPA)*
- *Archeological Resources Protection Act of 1979 (ARPA)*
- *Alaska National Interest Lands Conservation Act of 1980 (ANILCA)*
- *Alaska Native Claims Settlement Act of 1971 (ANCSA) [43 USC 1620(e)]*
- *Director's Order 172: Migratory Birds*
- *Subsistence Evaluation and Finding, Section 810 - Alaska Lands Act*

## **2.3. Fire Management Partnerships**

### **2.3.1. Internal Partnerships**

This plan has been developed with input from the Tetlin NWR Biological, Subsistence, and Visitor Services programs, as well as from other Alaska refuges. It has been reviewed by the USFWS Region 7 Fire Management Program. The Endangered Species Act Section 7 Interagency cooperation consultation along with cultural resources review and State Historic Preservation Officer approval will be handled through the Regional Office staff prior to implementation of any site-disturbing activities associated with prescribed fires or planned treatments.

## **2.3.2. External Partnerships**

### **2.3.2.1. Alaska Interagency Coordinating Groups**

#### ***2.3.2.1.1 Alaska Interagency Coordination Center (AICC)***

National fire resource coordination is accomplished through the National Interagency Coordination Center (NICC) located in Boise, ID and through eleven Geographic Area Coordination Centers (GACCs) located throughout the country. AICC is Alaska's GACC, located on Fort Wainwright in Fairbanks. The principal mission of AICC is to provide safe, cost effective, and timely response of national and area resources for all aspects of wildland and prescribed fire management activities, and other emergency management activities within Alaska.

#### ***2.3.2.1.2 Alaska Wildland Fire Coordinating Group (AWFCG)***

The Alaska Wildland Fire Coordinating Group (AWFCG) group provides coordination and recommendations for all interagency fire management activities in Alaska. Membership, procedures, and guidelines are documented in the AWFCG Memorandum of Understanding and Standard Operating Procedures available at <http://fire.ak.blm.gov/administration/awfcg.php>. The Region 7 Fire Management Coordinator represents the Service on this group.

#### ***2.3.2.1.3 Alaska Multi Agency Coordinating Group (AMAC)***

The Alaska Multi-Agency Coordination Group (AMAC) provides a forum to discuss actions to be taken to ensure that an adequate number of resources are available to meet anticipated needs and to allocate those resources most efficiently. When activated and as warranted, the AMAC is tasked with the following: incident prioritization; resource allocation; coordination of state and federal disaster responses; political interfaces; media and agency information; anticipation of future resource needs; and the identification and resolution of issues. The *AMAC Operations Handbook* is available at <http://fire.ak.blm.gov/administration/mac.php>. The Region 7 Fire Management Coordinator represents the Service on this group.

### **2.3.2.2. Interagency Agreements and Planning Documents**

#### ***2.3.2.2.1 Alaska Master Cooperative Wildland Fire Management and Stafford Act Response Agreement 2010 (Master Agreement)***

The Master Agreement and its exhibits define the roles and responsibilities of the jurisdictional and protection agencies as well as operating procedures for fire management in Alaska. It documents the commitment of its signatories to improve the efficiency of fire management activities in Alaska by facilitating the coordination and exchange of personnel, equipment, supplies, services, and funds. The Master Agreement also facilitates improved coordination regarding other incidents covered under the National Response Framework (NRF).

Signatories include:

- The State of Alaska, Department of Natural Resources (DNR)
- The United States Department of Agriculture Forest Service, Region 10 (USFS)

- The United States Department of the Interior, National Park Service, Alaska Region (NPS)
- The United States Department of the Interior, Fish and Wildlife Service, Alaska Region (Region 7) (FWS)
- The United States Department of the Interior, Bureau of Indian Affairs, Alaska Regional Office (BIA)
- The United States Department of the Interior, Bureau of Land Management, Alaska (BLM)
- The United States Department of the Interior, Bureau of Land Management, Alaska Fire Service (AFS)

#### ***2.3.2.2.2 Alaska Statewide Annual Operating Plan (Alaska AOP)***

The *Alaska AOP*, exhibit C of the Master Cooperative Agreement addresses cooperation, interagency working relationships and protocols, financial arrangements, and joint activities. The *Alaska Interagency Mobilization Guide* and the *Alaska Interagency Wildland Fire Management Plan* are incorporated by reference into the *Alaska AOP*. Signatories to the *Alaska AOP* include: State Forester, AFS Manager, USFS Regional Forester, FWS, NPS, BLM and BIA Regional Director.

#### ***2.3.2.2.3 Alaska Interagency Wildland Fire Management Plan 2010 (AIWFMP)***

The purpose of the *Alaska Interagency Wildland Fire Management Plan 2010 (AIWFMP)* is to promote a cooperative, consistent, cost-effective, interagency approach to wildland fire management in Alaska and it is the interagency reference for wildland fire operational information. It has been incorporated by reference into the *Alaska AOP*

The AIWFMP specifies direction for the response to a wildland fire that is based on a management option designation, and provides guidelines to jurisdictional and protection agencies for decision support requirements as the complexity of a wildland fire increases. The *AIWFMP* is designed to be used in conjunction with this FMP which contains definitive objectives and constraints for the Tetlin National Wildlife Refuge.

The following AIWFMP fire management objectives were developed to meet and support agencies' goals and to provide implementation guidance for fire operations:

- Protect human life.
- Prioritize areas for protection actions and allocation of available firefighting resources without compromising firefighter safety.
- Use a full range of fire management activities (fire suppression, monitoring, prescribed fire, thinning and other vegetation treatment projects, prevention and education programs, scientific studies, etc.) to achieve ecosystem sustainability including its interrelated ecological, economic, and social components.

- Use wildland fire to protect, maintain, and enhance natural and cultural resources and, as nearly as possible, enable fire to function in its ecological role and maintain the natural fire regime.
- Manage vegetation through various fuels treatment techniques to reduce and mitigate risks of damage from wildland fire.
- Balance the cost of suppression actions against the value of the resource warranting protection and consider firefighter and public safety, benefits, and resource objectives.
- Consider short and long-term cost effectiveness and efficiencies while maintaining responsiveness to Jurisdictional agency objectives and within the scope of existing legal mandates, policies and regulations.
- Minimize adverse environmental impact of fire suppression activities.
- Maintain each Jurisdictional agency's responsibility and authority for the selection and annual review of fire management options for the lands that they administer.
- Adhere to state and federal laws and regulations.

The AIWFMP provides for a range of suppression responses to wildfire that protects human life and property and other identified resources and developments, balances suppression costs with values at risk and is in agreement with Refuge resource management objectives. The result is that developed areas and other high resource value areas are protected and the natural occurrence of fire in the ecosystem is maintained in remote areas with minimal and cost-effective intervention. Currently many special concern areas (such as archaeological/cultural/historic sites and administrative sites/cabins) have been identified and taken care of through the process of changing the fire management option to one that provides the level of suppression needed to protect the resource(s) at risk. As new areas become known, they will be assigned a protection level and their locations provided to AFS.

Four wildland fire management options are established in the AIWFMP.

- **Critical** is the highest priority area/sites for suppression actions and assignment of available firefighting resources.
- **Full** is the second highest priority area/sites for suppression actions and assignment of available firefighting resources.
- **Modified** is a high priority for surveillance, suppression, and site protection during the peak of the fire season and less priority (often surveillance only) after a designated conversion date in the latter stages of the fire season, normally after July 10.
- **Limited** requires only a surveillance response as long as fires within this designation do not threaten to escape into higher priority areas; if a threat is ascertained, a suppression response may be initiated.

The **Critical management option** was specifically created to give the highest priority to suppression action on wildland fires that threaten human life, inhabited property, designated physical developments and to structural resources designated as National Historic Landmarks. Fires that threaten a critical site have priority over all other wildland fires. These areas are the

priority for detection coverage. The initial response to wildland fire is to provide protection to the area/sites. Use of wildland fire would only be appropriate in extraordinary circumstances.

The **Full management option** was established for the protection of cultural and paleontological sites, developed recreational facilities, physical developments, administrative sites and cabins, uninhabited structures, high-value natural resources, and other high-value areas that do not involve the protection of human life and inhabited property. Structures on or eligible for inclusion on the National Register of Historic Places and non-structural sites on the National Register are placed in this category. Fires occurring within or immediately threatening this designation will be high priority for initial action depending on the availability of firefighting resources but are less priority than wildland fires within or threatening a Critical Management Option area. The intent is to control wildland fires at the smallest acreage reasonably possible.

The **Modified management option** is intended to be the most adaptable option available to land managers. This option provides a higher level of protection when fire danger and probability of significant fire growth are high. A lower level of protection is considered when the fire danger and potential for fire growth decrease. Unlike the Full management option, the intent is not to minimize burned acres but to balance acres burned with suppression costs and to accomplish land and resource management objectives. After the conversion date (usually around July 10), the default action for all fires occurring within this option will be surveillance and assessment to ensure that identified values are protected and that adjacent higher priority management areas are not compromised.

In the **Limited management option** fire may be allowed to function in its ecological role while providing for the protection of human life and site-specific values. Most natural ignitions will be managed for maintaining fire's natural role in the ecosystem. Low impact or indirect suppression methods will be used whenever possible, if suppression action is needed. The intent is to reduce overall suppression costs through minimum resource commitment without compromising firefighter safety.

The AIWFMP allows the land manager to authorize the Protecting Agency to provide an increased or decreased level of suppression action depending on the situation at hand (non-standard response). Additionally, the selected fire management option area should be re-evaluated during the next annual review period. The AWFCG may approve departures from the selected management options during periods of "unusual fire conditions" for a specific geographic area(s). These decisions will be based not only on fires and acres burning, but also on anticipated fire behavior and acreage likely to be burned, existing and anticipated smoke problems, probability of success, the experience and judgment of Service and Protecting Agency personnel, and decisions of the Multi-agency Coordinating Group (MAC Group).

Signatories include:

- The State of Alaska, Department of Natural Resources (AKDNR)
- The State of Alaska, Department of Environmental Conservation (ADEC)
- The State of Alaska, Department of Fish and Game (ADF&G)
- The United States Department of the Interior, National Park Service, Alaska Region (NPS)

- The United States Department of the Interior, Fish and Wildlife Service, Alaska Region (Region 7) (FWS)
- The United States Department of the Interior, Bureau of Indian Affairs, Alaska Regional Office (BIA)
- The United States Department of the Interior, Bureau of Land Management, Alaska (BLM)
- The United States Department of Agriculture Forest Service, Region 10 (USFS)
- The Association of Village Council Presidents
- Tanana Chiefs Conference, Inc. (TCC)
- Chugachmiut, Inc.
- Anchorage Fire Department

#### ***2.3.2.2.4 Alaska Interagency Mobilization Guide (AIMG)***

The *Alaska Interagency Mobilization Guide (AIMG)* identifies policy and agreements that establish the standard procedures that guide the operations of multi- agency/jurisdictional logistical support activities. The guide is an extension of Agency Manuals, Handbooks, Directives, and Instructional Memorandums relating to logistical support. The guide is intended to promote uniformity of logistical support communications, facilitate interagency dispatch coordination, and ensure that the most timely and cost effective support services are provided. It is designed to accommodate amendments and will be recognized as currently applicable until amended.

#### ***2.3.2.2.5 2009 Alaska Enhanced Smoke Management Plan (ESMP)***

The *Alaska Enhanced Smoke Management Plan (ESMP)* developed by the Alaska Department of Environmental Conservation (ADEC) in coordination AWFCG helps fulfill Alaska's responsibilities for protection of air quality and human health under federal and state law and reflects the *Clean Air Act* requirement to improve regional haze in Alaska's Class I areas. Under state regulation all agencies, corporations and individuals that burn areas larger than forty acres of land a year, whether slash or *in situ*, require a controlled burn approval application and written approval from ADEC. The *ESMP* outlines the process and identifies issues that need to be addressed by ADEC and land management agencies or private landowners / corporations to help ensure that prescribed fire (e.g. controlled burn) activities minimize smoke and air quality problems. Adoption of this document enables the State to certify to the U.S. Environmental Protection Agency (EPA) that we are implementing a smoke management plan which addresses elements of the EPA's *Interim Air Quality Policy on Wildland and Prescribed Fire, April 23, 1998 (EPA's Interim Policy)*. The *ESMP* and accompanying volume of appendices have been adopted by ADEC and participating Wildland owners and managers through a Memorandum of Understanding (MOU).

### **2.3.2.3. Local Government Partners**

Village Councils serve as local governments for most Tok Area communities. The Refuge fire management program has a history of cooperation with both the Northway Village Council and

the Tetlin Village Council. The community of Tok has no local government; however the Tok Umbrella Corporation functions as a conduit for moving state and federal funds into the community. Tetlin NWR and AK DOF, Tok Area work closely with each of these organizations to coordinate fire management services in the area.

The only certified structural fire department in the area is the Tok Volunteer Fire Department (Tok VFD). Tetlin NWR and AK DOF coordinate training and operations with the Tok VFD.

The Alaska State Troopers (AST) maintain a post in Tok. Any law enforcement issues arising from activities authorized under this plan, not within the jurisdiction of federal law enforcement officers will be coordinated by AST. AST will be the primary contact when there is a need to activate Tok Emergency Medical Services (EMS) or any search and rescue operation.

### 2.3.2.4. Non-governmental Organization Partners

The Refuge also cooperates with numerous non-Governmental organizations with fire management interests, including the Tanana Chiefs Conference and the following ANCSA Native Corporations:

Regional Corporations	
Corporation	Region
Doyon, Limited	Koyukuk, Middle and Upper Yukon Rivers, Upper Kuskokwim, Tanana River
Ahtna, Incorporated	Copper Center, Glennallen, Chitina, Mentasta
Village Corporations	
Corporation	Village
Northway Natives Inc.	Northway
Tetlin Indian Reservation	Tetlin
Nabesna Native Group Inc.	Nabesna
Tanacross Inc.	Tanacross
Ahtna (Mentasta Inc.)	Mentasta Lake

Table 2: Upper Tanana Native Corporations

## 3. Tetlin Refuge Fire Management Unit Characteristics

A Fire Management Unit (FMU) is a land management area definable by management objectives and constraints, topographic features, access, values to protect, political boundaries, fuel types, major fire regime groups, or other characteristics that set it apart from an adjacent FMU.

Under this FMP the Tetlin NWR is managed as a single fire management unit. Within the Tetlin NWR FMU four AIWFMP Fire Management Options defining default initial responses have been identified (**Map 3**).

Fire Management Option	Critical	Full	Modified	Limited	Total
Tetlin NWR Acres	54	53,997	73,976	590,798	718,825

**Table 3: Tetlin NWR Acres by Fire Management Option**

In many cases, refuge land management objectives are best met by allowing fires to burn naturally. Fires in Limited protection and those in Full and Modified protection that escape initial attack should be managed to limit their incursion on neighboring properties, but may be allowed to grow within Refuge lands when feasible. The proximity of allotments, Full and Critical protection lands near Northway and Tetlin, the Yukon Territory community of Beaver Creek, and Alaska Highway corridor values, including those within Canada, must be considered in all fire management decisions. A one-mile Modified strip along the Canada border is designed to buffer the Full and Critical Zones across the border in Canada.

### **3.1. Fire Management Goals, Strategies, and Guidance**

#### **3.1.1. Fire Management Goals, Strategies, and Guidance from the Refuge CCP**

The 2008 Revised Tetlin NWR CCP provides broad policy guidance and establishes management directions for the Refuge. It defines long-term goals and objectives and identifies which uses are appropriate and may be compatible with the purposes of the Refuge and mission of the National Wildlife Refuge System.

The following CCP goals are the primary drivers of the Refuge’s fire management program:

- Maintain a fire management program for Tetlin Refuge that reflects the natural role of wildland fires in maintaining diversity and productivity in the boreal forest and supports refuge purposes and habitat management goals, while providing an appropriate level of protection for human life, property, and identified cultural and natural resources.
- Through partnerships with agencies and institutions in the United States and Canada, continue to coordinate research and monitoring efforts to expand our understanding of the underlying ecological mechanisms related to fire and how these mechanisms effect change in vegetation and animal populations within the Upper Tanana Valley and the boreal forest ecosystem.

Additional CCP goals that help to guide the fire management program include:

- Conserve fish and wildlife populations representative of the natural diversity of the Upper Tanana Valley and the boreal forest ecosystem.
- Conserve plant populations and habitats representative of the natural diversity of the Upper Tanana Valley and the boreal forest ecosystem.
- Contribute to the protection and preservation of the cultural heritage and natural history of the Upper Tanana Valley.

- Provide subsistence opportunities for rural residents, compatible with other refuge purposes.
- Maintain the integrity and environmental health of waters and aquatic habitats within the upper Tanana River drainage.
- Enhance stewardship of natural resources through strong local, State, tribal, national, and international partnerships.
- Enhance understanding and appreciation of Tetlin Refuge's purposes, special values, and management goals, and promote stewardship of natural and cultural resources through comprehensive environmental education and interpretation programs and visitor services facilities.
- Improve collaboration and communication with and support for local resource users and the communities of the Upper Tanana Valley through development of a "Good Neighbor Policy" that is sensitive to social, political, cultural, and economic needs within the local area.

Tetlin CCP Objectives specific to the fire management program include:

- In collaboration with local partners, annually assess the Alaska Interagency Wildland Fire Management Plan (AWFCG 1998) management option boundaries within the Refuge, and submit necessary change recommendations to the Alaska Wildland Fire Coordinating Group.
- Within two years of the Plan's approval, revise the Refuge Fire Management Plan (TNWR 2001) to reflect changes in the Revised Comprehensive Conservation Plan and in national fire policy, and to reflect the best available knowledge and experience regarding use of natural and prescribed fire as tools for habitat management.
- Within two years of the Plan's approval, update GIS data relevant to fire management, and have data readily available on a portable external hard drive to be used by Refuge fire personnel and by incident management teams during fires.
- Within five years of Plan's approval, inventory and map structures and other cultural resources in and around the Refuge at risk from wildland fire and/or fire management activities.
- Within five years of approval of the Plan, and in cooperation with the affected communities and landowners, develop individual mitigation plans for communities and other sites identified as being at risk from wildland fire originating on the Refuge.
- Within 10 years of the Plan's approval, assess the effectiveness of thinned fuel breaks in the Upper Tanana Valley and monitor long-term changes in thinned fuels and any unanticipated consequences of thinning such as insect infestation or invasive species spread.
- Within 10 years of the Plan's approval, evaluate weather data from the current refuge weather system and determine whether additional stations will significantly improve the system's predictive capability.

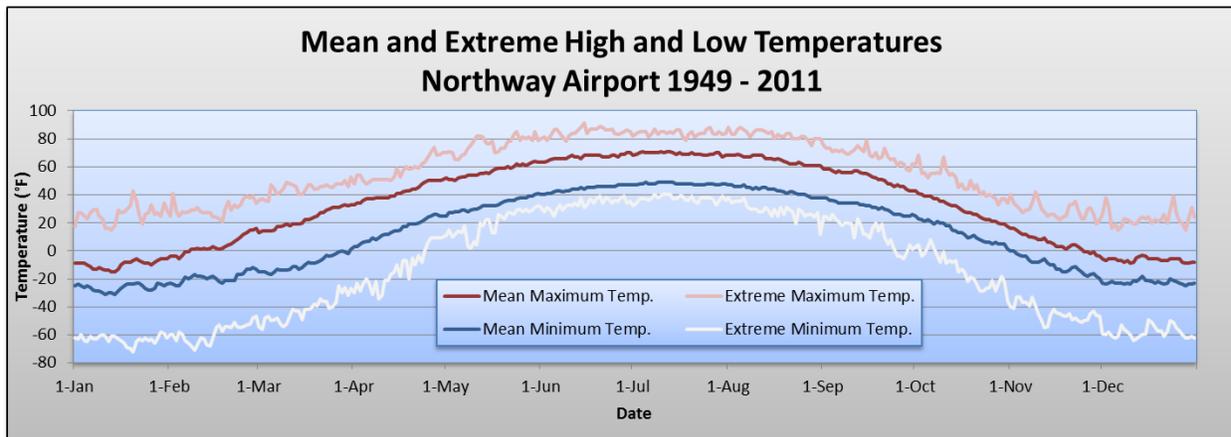
## 3.2. Characteristics of the Tetlin NWR FMU

### 3.2.1. Climate

The continental subarctic climate of Tetlin Refuge is characterized by large seasonal temperature extremes. Maximum summer temperatures may be as high as 90 degrees Fahrenheit, although mean maximum temperatures for June, July, and August are between 65 and 70 degrees Fahrenheit (**Table 4, Figure 1**). Winter temperatures recorded at Northway are frequently the lowest in the state, occasionally dropping below -70 degrees Fahrenheit. Winds are uncommon during these very cold and dry periods. These conditions make the Upper Tanana Valley one of the coldest inhabited places in North America.

<b>NORTHWAY FAA AIRPORT, ALASKA (506586)</b>													
Period of Record Monthly Climate Summary													
Period of Record : 9/ 1/1949 to 10/31/2011													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	-9.8	3.2	22.6	41.9	56.9	67	69.5	64.9	52.4	29.6	5.4	-6.6	33.1
Average Min. Temperature (°F)	-26.5	-19.3	-8.9	15.1	32.9	44.4	48	42.9	31.4	13.3	-10.5	-22.4	11.7
Average Total Precipitation (in.)	0.28	0.24	0.17	0.21	0.93	1.97	2.6	1.46	1	0.5	0.35	0.28	9.98
Average Total SnowFall (in.)	5.4	4.9	3.3	2.2	0.8	0	0	0.2	1.1	6.8	6.4	5.9	37
Average Snow Depth (in.)	14	16	16	7	0	0	0	0	0	2	7	11	6
Percent of possible observations for period of record: Max. Temp.: 97.1% Min. Temp.: 97% Precipitation: 97.1% Snowfall: 96.4% Snow Depth: 96.5%													

**Table 4: Northway, AK Monthly Climate Summary**



**Figure 1: Tetlin NWR Temperatures**

More than half of the 9.77 inches average annual precipitation occurs during June, July, and August; usually the result of thunderstorms (**Table 4, Figure 2**). Though recent summers have been very dry, extended rainy periods do occur during some summers.

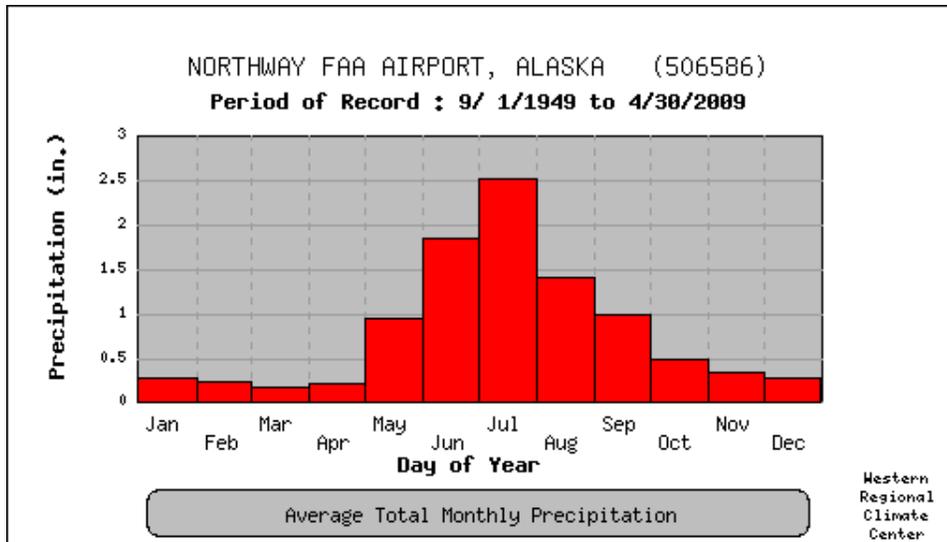


Figure 2: Tetlin NWR Precipitation

In addition to rain, summer convective storms also produce lightning, the primary natural cause of fires within and around the Refuge. Surface moisture and differential heating due to topography and vegetation are contributors to convective activity (Dissing and Verbyla 2004). South of the Refuge, the Nutzotin Mountains are too high and cool to produce much lightning. The broad flat topography that characterizes most of the Refuge produces a much greater density of lightning strikes than the high country to the south but significantly fewer strikes than the more mountainous terrain of the Fortymile and Ladue river basins to the north (**Map 11**).

Snow can occur during any month, but only rarely between mid-June and mid-August. The Refuge is usually free of accumulation between late April and the end of September. Average annual snowfall is 37 inches with normal winter accumulations between 15 and 24 inches (**Table 4, Figure 3**). Snow in the region typically has a low density, resulting in low water content.

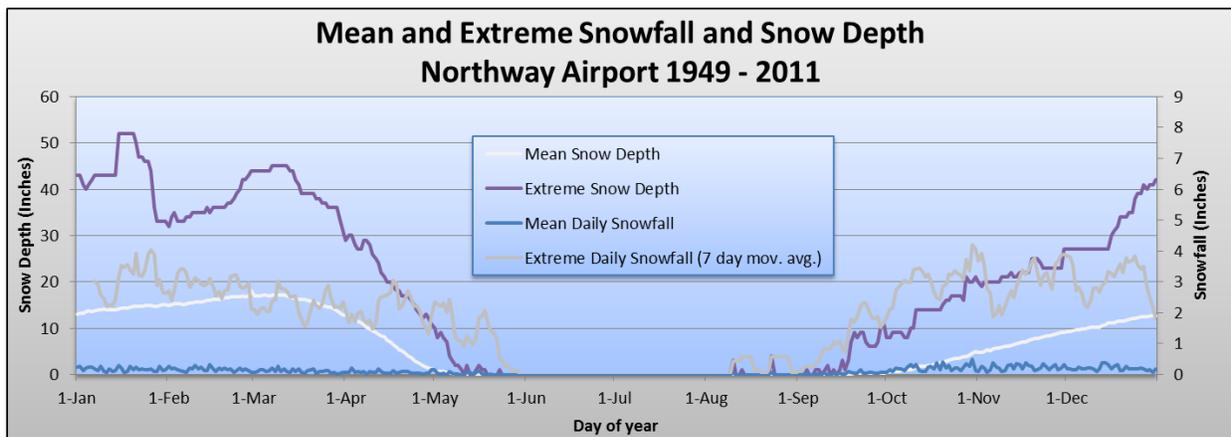


Figure 3: Tetlin NWR Snowfall and Snow Depth

### 3.2.2. Fire Weather

The Alaska Interagency Coordination Center (AICC) Predictive Services website <http://fire.ak.blm.gov/predsvcs/weather.php> maintains links to statewide fire weather forecasts and weather data. Fire weather briefing products including Red Flag Warnings and Fire Weather

Watches are posted daily on the site throughout the fire season, and a link is included to the National Weather Service Spot Forecast Request page.

Alaska Red Flag Warning & Fire Weather Watch Criteria (if combined with burnable fuels)		
1.	<b>Strong Wind:</b>	Wind* $\geq$ 25 mph & RH $\leq$ 30%
2.	<b>Low Humidity:</b>	RH $\leq$ 15%
3.	<b>Strong Wind Low Humidity:</b>	Wind* $\geq$ 25 mph & RH $\leq$ 15%
4.	<b>Dry Thunderstorms:</b>	Dry thunderstorms w/ scattered coverage (25% Areal) and < 0.10" rainfall
* Wind is defined as frequent gusts or sustained for one hour or more		

**Table 5: Alaska Red Flag Warning & Fire Weather Watch Criteria**

Tetlin NWR maintains two permanent, Weather Information Management System (WIMS) compliant Remote Automated Weather Stations (RAWS) on the Refuge (**Map 12**). The Eastern Interior FMO is responsible for maintaining station catalog information for these stations to meet NFDRS standards (green up date, cured, freeze date, etc. Daily observation into WIMS dispatch responsibility.

- The Jatahmund Lake RAWS was activated in July 1990 and does a fair job of representing the portion of the Refuge south of the Black Hills.

[http://mesowest.utah.edu/cgi-bin/droman/meso\\_base.cgi?stn=TETA2&time=GMT](http://mesowest.utah.edu/cgi-bin/droman/meso_base.cgi?stn=TETA2&time=GMT)

- The Mile 1244 Alcan Highway RAWS was activated June 1990 and represents the Refuge north of the Black Hills and east of Northway flats. The station is located atop a vegetated dune and fuel moistures are usually low relative to the surrounding area. Winds tend to be localized as well.

[http://mesowest.utah.edu/cgi-bin/droman/meso\\_base.cgi?stn=TWRA2&time=GMT](http://mesowest.utah.edu/cgi-bin/droman/meso_base.cgi?stn=TWRA2&time=GMT)

WIMS compliant fire weather data are available from human stations at the Division of Forestry compound in Tok and the Northway Airport:

- The Northway Airport FAA weather station is human recorded, but represents one of the longest and best climatological records in the State. The station represents the Northway Flats portion of the Refuge.

[http://mesowest.utah.edu/cgi-bin/droman/meso\\_base.cgi?stn=PAOR&time=GMT](http://mesowest.utah.edu/cgi-bin/droman/meso_base.cgi?stn=PAOR&time=GMT)

- Data from the DNR Tok Station is only collected during fire season.

Additional weather data that are not WIMS compliant are available from several sources:

- National Climatic Data Center (NCDC) Seaton Roadhouse site (AK Tok 70 SE FWS, Tetlin National Wildlife Refuge)

<http://www.ncdc.noaa.gov/crn/station.htm;jsessionid=25104369A071134186E755E76B944CD3.lwf2?stationId=1779>

- Beaver Creek Airport (CYXQ) METAR  
[http://www.flightplanning.navcanada.ca/cgi-bin/Fore-obs/metar.cgi?NoSession=NS\\_Inconnu&format=raw&Langue=anglais&Region=can&Stations=CYXQ](http://www.flightplanning.navcanada.ca/cgi-bin/Fore-obs/metar.cgi?NoSession=NS_Inconnu&format=raw&Langue=anglais&Region=can&Stations=CYXQ)
- Alaska Department of Transportation (AK-DOT) Road Weather Information System (RWIS) Alaska Highway @ Canadian Border MP 1221.8 site  
<http://www.dot.state.ak.us/iways/roadweather/forms/SiteSum.html?areaId=4&perspectiveId=1&siteId=187>

### 3.2.3. Fire Danger

Since the 1990s, fire danger indices in Alaska have been calculated using the Canadian Forest Fire Danger Rating System - Fire Weather Index (CFFDRS - FWI) instead of the National Fire Danger Rating System (NFDRS) used throughout most of the rest of the U.S. For most purposes the CFFDRS focus on duff moisture better represents Alaskan fuels than the NFDRS woody fuels classes. However, the reliance of FSPRO and other fire behavior modeling tools has prompted Alaskans to ensure that fire weather stations are cataloged and maintained in WIMS as NFDRS stations.

#### 3.2.3.1. CFFDRS - FWI

The Canadian Forest Fire Weather Index (FWI) tracks the effects of weather on forest fuels. In doing so, it gives an estimation of potential fire danger and fire behavior in the area adjacent to a weather station at which the weather is recorded. It is based on the moisture content of three classes of surface forest fuels, plus the effect of wind, on fire behavior. The FWI system is probably best explained as a bookkeeping system in which, for a particular weather station, fuel moisture is added in the form of precipitation and subtracted in the form of drying. Precipitation is the only input component that will add to fuel moisture while the other inputs of temperature, relative humidity, wind speed, and time of year, control the rate of drying.

The system consists of six components; three primary indexes, or codes, representing fuel moisture for each of the three fuel layers, two intermediate indexes representing rate of spread and fuel consumption, and a final index representing fire intensity as energy output per unit length of fire front. Each year, for each representative weather station the system is initiated three days following the station's snow-free date; and shut down following the station's freeze-up date.

**1. The Fine Fuel Moisture Code (FFMC)** represents the moisture content of litter and cured fine fuels, 1-2 cm deep. It expresses the ease of ignition and fuel flammability. FFMC is sensitive to daily changes in temperature, rainfall, relative humidity, and wind speed. Time lag is 2/3 day, which means that it takes two thirds of a day for the fine fuels to react to a change in the weather.

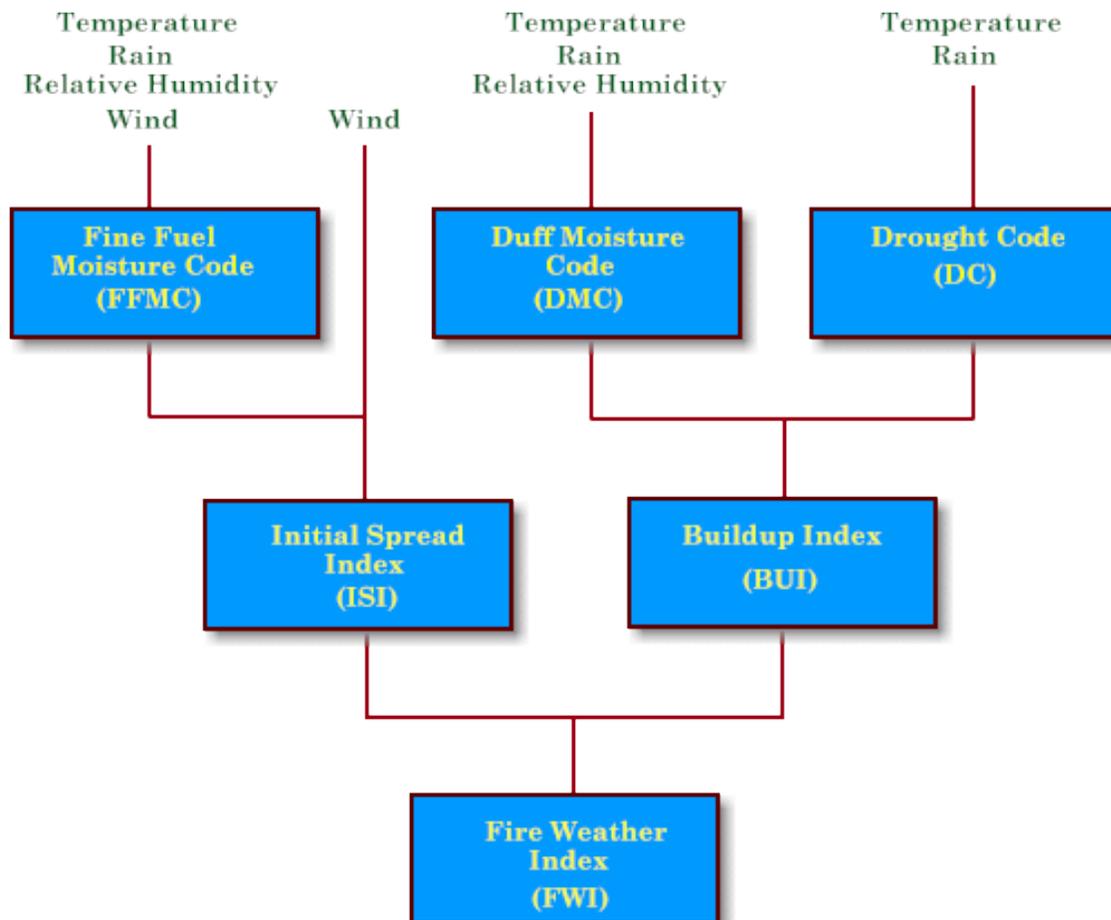
**2. The Duff Moisture Code (DMC)** represents the moisture content of loosely compacted, decomposing organic matter, 5-10 cm. deep, which determines resistance to control. DMC is sensitive to temperature, rainfall, and relative humidity. Time Lag is 12 days.

**3. The Drought Code (DC)** represents the deep layer of compacted organic matter, 10-20 cm. deep, which determines resistance to extinguishment. It indicates seasonal drought and smoldering fires in deep duff or large logs. DC is sensitive to temperature and rainfall. Time lag is 52 days.

**4. The Initial Spread Index (ISI)** represents a numerical rating of fire spread immediately after ignition without the influence of variable fuel quantity (the fuel type isn't considered). It fluctuates with wind speed and time of day. ISI is a combination of FFMC and wind.

**5. The Build Up Index (BUI)** represents total fuel available for combustion. In the absence of rain, BUI fluctuates little throughout the day. BUI is a combination of DMC and DC.

**6. The Fire Weather Index (FWI)** represents the intensity of a spreading fire. FWI is a combination of ISI and BUI.



**Figure 4: CFFDRS Fire Weather Index (FWI) system**

Fuel Moisture Code	Soil horizon	Water capacity mm	Rain fall thresholds mm	Timelag* days	Nominal fuel depth cm	Bulk density Mg/m <sup>3</sup>
FFMC	L	0.62	0.6	2/3	1.2	0.021
DMC	F	15	1.5	15	7	0.071
DC	H	100	2.9	53	18	0.139

\* A fuels time-lag is expressed as that amount of time required for the fuel to lose  $1 - 1/e$  (about 2/3) of the free moisture above equilibrium on a standard day (noon temperature of 21.1<sup>o</sup>C, relative humidity of 45%, 13 km/h wind, during the month of July) (Merrill and Alexander 1987).

**Figure 5: Properties of the FWI System’s fuel moisture codes. (Wilmore 2001)**

Weather readings taken at 13:00 solar noon local standard time (14:00 daylight savings time in Alaska) at weather stations for temperature, rainfall, relative humidity, and wind speed are used as inputs into a computer program that calculates the six indices for each station.

### 3.2.3.1. NFDRS

Fire weather station WIMS catalogs require annual Green-up and Freeze-up dates to be entered in order to maintain WIMS compliance and properly generate NFDRS indices.

### 3.2.4. Fire Return Interval

Large (natural) fires in the boreal forest are caused by lightning that occurs during persistent high-pressure systems that dry out fuels, and fire frequency is driven by climate rather than an age-dependent probability of burning (Johnson et al. 2001, Duffy et al. 2005). The classical approach to computing fire frequency implies an underlying stability of frequency, but this situation does not exist in the Alaskan boreal forest because the annual area burned is driven so strongly by weather patterns (P. Duffy, pers. commun. 2011).

Nevertheless, it is useful to examine known patterns in fire history, keeping in mind the effects of periodic large scale climate processes (e.g., Pacific Decadal Oscillation) and climate change. Relatively little empirical information is available about average forest stand age in interior Alaska, although there have been some studies that use tree rings to reconstruct fire history. Fires in Alaskan spruce forests are typically stand-replacing, making it difficult to find fire-scarred trees for aging purposes. Tree ring analysis of a study site in the Porcupine River drainage indicated stand ages of 36 years for black spruce and 113 years for white spruce (Yarie 1981). Fastie et al. (2002) estimated fire intervals of 100 to 250 years for upland forests in interior Alaska.

### 3.2.5. Fire History

There is evidence of fire through most of Tetlin National Wildlife Refuge lands below 2,500 feet elevation. From the establishment of the Refuge in 1980 through 2011 a total of 40 wildland fires encompassing 121,661 Service acres (**Table 6, Map 4**) have been recorded. The mean annual number of refuge fires over the 32 year period is 1.3, ranging from zero in 11 years to four fires in 2005 and again in 2007. The mean refuge acreage burned is 3,802, ranging from zero in 11 years to 42,909 in 2003.

Refuge fires of note include:

- The 2003 Black Hills fire, which burned 42,800 acres, is the largest single fire on record for the Refuge. It occurred in a remote area, was managed for resource benefits, and received no active suppression action. The number of assigned personnel never exceeded six persons throughout the life of the fire. The Black Hills Fire was the first incident in Alaska to officially be managed under the now obsolete Federal Fire Use policy. One abandoned cabin was destroyed by the fire.
- By contrast, the 1982 Kennebec Fire burned 31,430 acres prior to the advent of the AIWFMP. It also occurred in a relatively remote area and did not threaten any developed areas other than a permitted cabin. Despite this, it was actively suppressed as a Type 1 incident in accordance with policy at that time.
- The 3,300 acre Deep Lake Fire in 1986 resulted from an escaped refuge prescribed fire. Although the fire posed minimal threat to any values it was managed as a Type 2 incident and actively suppressed.
- The 1989 Trail Lake Fire also resulted from an escaped refuge prescribed fire. The fire burned a total of 6,894 acres. Most of the burned acres were within the burn unit; however all were recorded as wildfire acres in accordance with policy at the time. No values were threatened and no active suppression action was required.
- In 1991, the Wellesley Lake fire burned 18,750 acres, including 750 acres in Canada. This fire received a surveillance-only response for most of the summer; however, a rapid wind driven run toward the Alaska Highway prompted the assignment of a Type 2 Incident Management Team (IMT) later in the season in order to protect structures along the highway.
- In 1993, the Nabesna fire burned 4,100 acres. This fire was managed as a Type 2 incident and required extended crew action to protect a permitted cabin and to prevent the fire from burning onto nearby Tetlin Native lands. This fire jumped the Nabesna River when pushed by high wind.
- In 1994, the Spring Lake fire burned 8,045 acres, but required no action beyond surveillance.

### 3.2.6. Ignitions/Cause

Human-caused fires have accounted for approximately 30% of all refuge fire starts from its establishment in 1980 through 2011 (**Table 6, Figure 6, Map 7**). Most human-caused fires occur in proximity to the Alaska Highway and developed areas near the village of Northway. Due to accessibility, higher response levels (Critical, Full, and Modified), and rapid detection, these fires are more likely to be suppressed before they became large. Fires occurring in other, more remote areas of the Refuge are usually started by lightning. These remote fires generally have lower response levels (Limited), and may also take longer to detect and to get suppression forces on the ground, leading to larger final acreages. Approximately 92% of the total refuge acreage burned from 1980 through 2011 has been the result of lightning caused fires (**Table 6, Figure 7**).

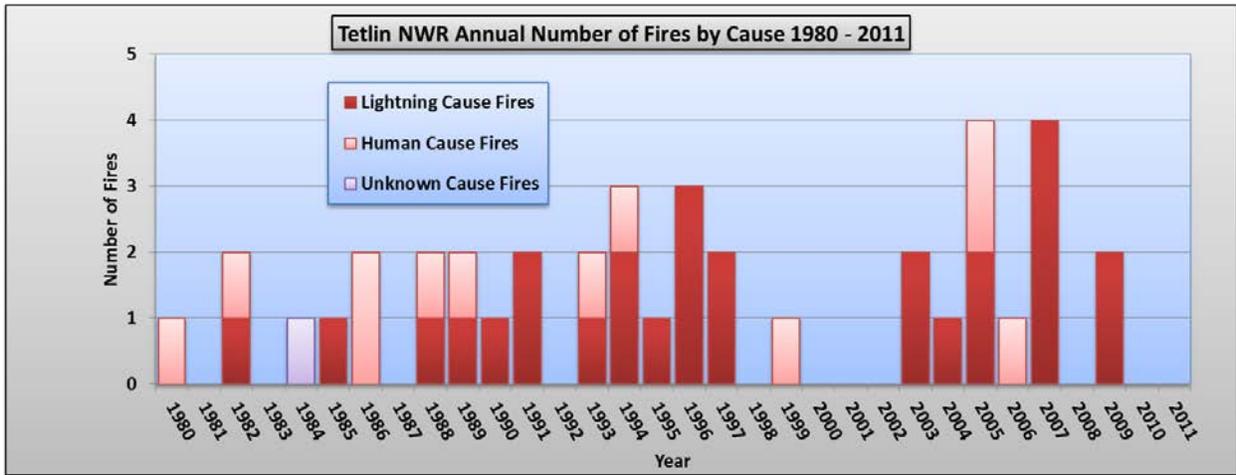


Figure 6: Tetlin NWR Fire Discoveries by Cause

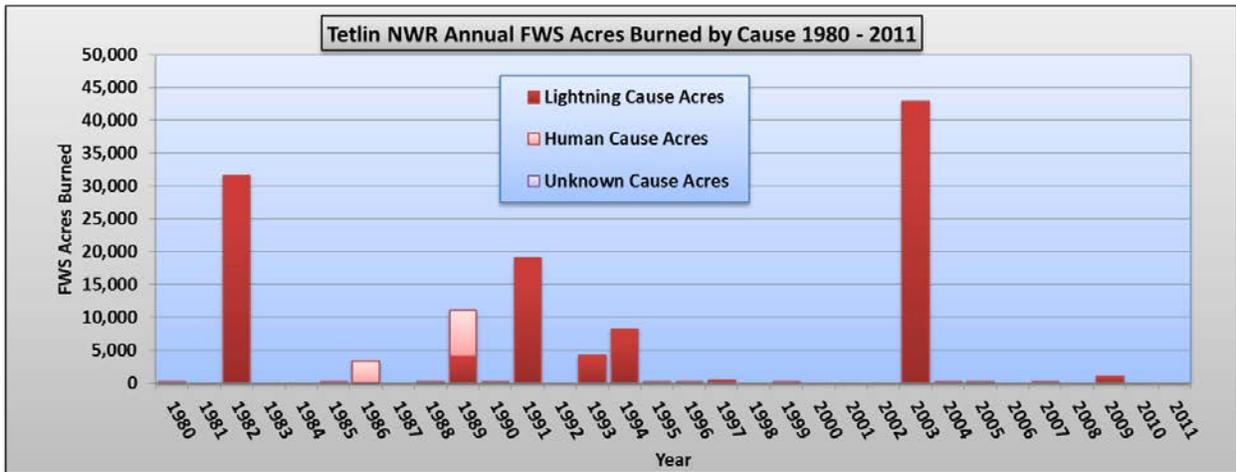


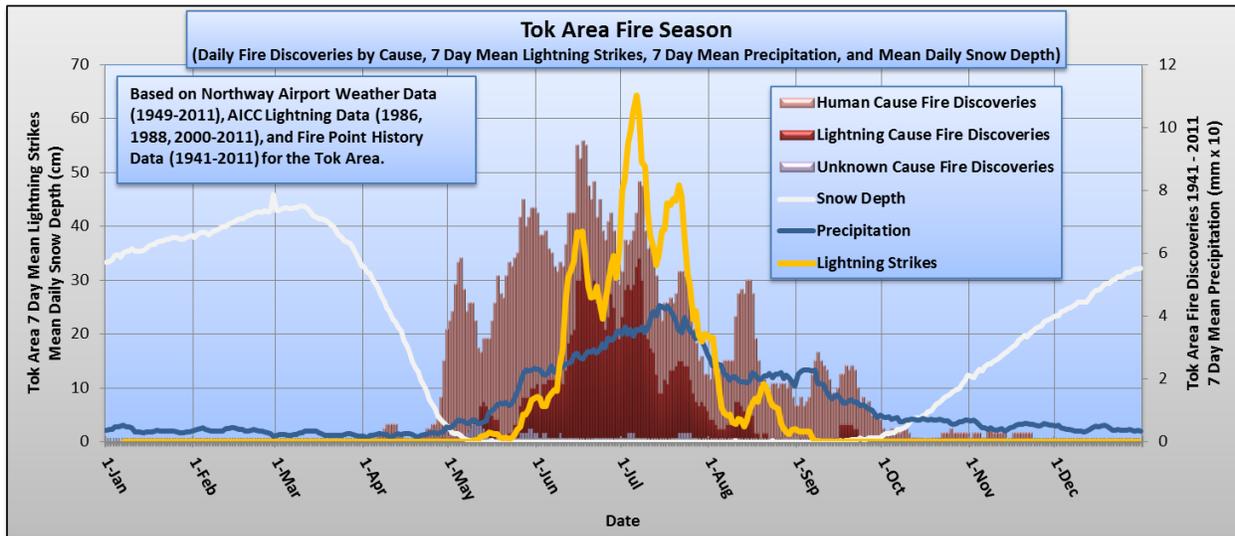
Figure 7: Tetlin NWR Acres Burned by Cause

Tetlin NWR Fire Statistics 1980 - 2011								
	All Causes		Lightning Cause		Human Cause		Unknown Cause	
	Fires	Acres	Fires	Acres	Fires	Acres	Fires	Acres
<b>Total:</b>	<b>40</b>	<b>121,661</b>	<b>27</b>	<b>111,454</b>	<b>12</b>	<b>10,207</b>	<b>1</b>	<b>0</b>
<b>Mean:</b>	<b>1.3</b>	<b>3,802</b>	<b>0.8</b>	<b>3,483</b>	<b>0.4</b>	<b>319</b>	<b>0.0</b>	<b>0</b>
<b>Percent by Cause:</b>			<b>68%</b>	<b>92%</b>	<b>30%</b>	<b>8%</b>	<b>3%</b>	<b>0%</b>
Year	All Causes		Lightning Cause		Human Cause		Unknown Cause	
	Fires	Acres	Fires	Acres	Fires	Acres	Fires	Acres
2011	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2009	2	1,097	2	1,097	0	0	0	0
2008	0	0	0	0	0	0	0	0
2007	4	2	4	2	0	0	0	0
2006	1	0	0	0	1	0	0	0
2005	4	1	2	0	2	0	0	0
2004	1	15	1	15	0	0	0	0
2003	2	42,909	2	42,909	0	0	0	0
2002	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
1999	1	0	0	0	1	0	0	0
1998	0	0	0	0	0	0	0	0
1997	2	465	2	465	0	0	0	0
1996	3	164	3	164	0	0	0	0
1995	1	1	1	1	0	0	0	0
1994	3	8,095	2	8,095	1	0	0	0
1993	2	4,100	1	4,100	1	0	0	0
1992	0	0	0	0	0	0	0	0
1991	2	19,075	2	19,075	0	0	0	0
1990	1	1	1	1	0	0	0	0
1989	2	10,994	1	4,100	1	6,894	0	0
1988	2	6	1	1	1	5	0	0
1987	0	0	0	0	0	0	0	0
1986	2	3,301	0	0	2	3,301	0	0
1985	1	1	1	1	0	0	0	0
1984	1	0	0	0	0	0	1	0
1983	0	0	0	0	0	0	0	0
1982	2	31,431	1	31,430	1	1	0	0
1981	0	0	0	0	0	0	0	0
1980	1	5	0	0	1	5	0	0

Table 6: Tetlin NWR Fire Statistics

### 3.2.7. Fire Season

State statute defines fire season in Alaska as the period between April 1<sup>st</sup> and August 31<sup>st</sup>. However, nearly all fires in the Tok Area, including the Refuge, occur between late April or early May when snow cover disappears and late September or early October when the Refuge once again becomes snow covered (**Figure 8**).



**Figure 8: Tok Area Fire Season**

Prior to green-up, fires are generally human-caused. These fires are usually wind-driven and do not burn deeply in the duff which is often still frozen a short distance below the surface. Black spruce may be moisture distressed and have relatively low live fuel moisture at this time of year, promoting active crown consumption. Hardwoods are more susceptible to burning prior to leaf-out than later in the season when canopy cover shades the litter layer and live fuel moistures are greater. Early season fires are often short-lived due to high relative humidity recovery and moderate daytime temperatures, however if not suppressed, they can smolder through green-up and flare up later in the season when fuels are dry.

As green-up progresses through mid to late May fire activity decreases somewhat; but increased daylight contributes to drying as well as convection, and by the first or second week of June lightning fires begin to occur with increasing frequency. Mid June through early July is normally the period of highest human and lightning fire activity in the area. Fires starting prior to the second week of July account for a large proportion of final burned acres.

Decreasing daylight through July leads to less convection, fewer lightning strikes, and longer periods of recovery. Fire occurrence diminishes, but active fires continue to grow in dry years. In most years, low pressure systems bring significant moisture by late July or the first week in August. Most late season fire starts are human-caused, often related to hunting, fishing and other subsistence or recreational activities. Problems from fires during August and September are infrequent, and are generally associated with wind events; however dry Augusts in 2003, 2004 and 2005 allowed existing fires additional burning days and contributed to active fire seasons in each of these years.

### 3.2.8. Landcover & Fuels

As in most of Alaska’s boreal forest ecosystem, Tetlin Refuge is a mosaic of forest, shrublands, and extensive riparian areas and wetlands. Alpine tundra can be found at higher elevations. The southern portion of the refuge is primarily forested uplands, while the northern half consists of low floodplain, including large expanses of muskeg (**Table 7**).

Tetlin NWR / Scottie Creek Earth Cover (Ducks Unlimited 2008) based on 1999 Landsat 5 TM satellite imagery					
Class_Name	Acres	Percent	Class_Name	Acres	Percent
Closed Needleleaf	67,995	8.4%	Wet Graminoid	21,766	2.7%
Open Needleleaf / Lichen	341	0.0%	<b>Wet Graminoid Total</b>	<b>21,766</b>	<b>2.7%</b>
Open Needleleaf / Other	428,370	52.8%	Moss	1,545	0.2%
Woodland Needleleaf / Other	70,943	8.7%	<b>Moss Total</b>	<b>1,545</b>	<b>0.2%</b>
<b>Needleleaf Forest Total</b>	<b>567,649</b>	<b>70.0%</b>	Sparse Vegetation	10	0.0%
Closed Mixed Needleleaf/Deciduous	35,496	4.4%	Rock/Gravel	19,082	2.4%
Open Mixed Needleleaf/Deciduous	4,873	0.6%	Non-Vegetated Soil	355	0.0%
<b>Mixed Forest Total</b>	<b>40,369</b>	<b>5.0%</b>	Urban	1,545	0.2%
Closed Deciduous - General	25,241	3.1%	<b>Sparse or No Vegetation Total</b>	<b>20,993</b>	<b>2.6%</b>
Closed Aspen	460	0.1%	Recent Burn	1,954	0.2%
Open Deciduous - General	12,440	1.5%	<b>Recent Burn Total</b>	<b>1,954</b>	<b>0.2%</b>
Closed Deciduous - Willow/Alder Tree	2,471	0.3%	Aquatic Bed	3,518	0.4%
<b>Deciduous Forest Total</b>	<b>40,613</b>	<b>5.0%</b>	Emergent Vegetation	10,245	1.3%
Tall Shrub - General	38,066	4.7%	Clear Water	32,559	4.0%
<b>Tall Shrub Total</b>	<b>38,066</b>	<b>4.7%</b>	Turbid Water	26,356	3.2%
Low Shrub - Willow	11,011	1.4%	<b>Water Total</b>	<b>72,678</b>	<b>9.0%</b>
Low Shrub - Other	77,785	9.6%	Snow/Ice	357	0.0%
<b>Low Shrub Total</b>	<b>88,797</b>	<b>10.9%</b>	<b>Snow/Ice Total</b>	<b>357</b>	<b>0.0%</b>
Low Shrub - Tussock Tundra	29,398	3.6%	Cloud/Shadow	4,260	0.5%
Tussock Tundra	1	0.0%	<b>Shadow Total</b>	<b>4,260</b>	<b>0.5%</b>
<b>Tussock Tundra Total</b>	<b>29,399</b>	<b>3.6%</b>			
Dwarf Shrub Other	6,067	0.7%			
<b>Dwarf Shrub Total</b>	<b>6,067</b>	<b>0.7%</b>	<b>Grand Total</b>	<b>810,961</b>	<b>acres</b>

**Table 7: Tetlin NWR Landcover**

Several landcover datasets are available that include partial or complete coverage of the Tetlin NWR at various resolutions:

- Landfire Refresh 2008, Zone 74- Tanana Zone
  - 30 meter resolution
  - Based on 1999-2001 Landsat 7 imagery – corrected for fires through 2008
  - Complete statewide coverage
  - Distinguishes between black and white spruce
- Ducks Unlimited – FWS (**Map 8**)
  - 30 meter resolution
  - Based on 1999 Landsat 7 imagery
  - Refuge field training sites

- Complete Refuge coverage – includes Yukon borderlands
- Does not distinguish between black and white spruce
- Draft NPS Wrangell-St. Elias
  - 30 meter resolution
  - Based on 1999 Landsat 7 imagery
  - No Refuge field training sites
  - Complete Refuge coverage
  - Distinguishes between black and white spruce
- NPS Wrangell-St. Elias - Nabesna quadrangle
  - 50 meter resolution
  - Based on MSS satellite imagery
  - Produced in 1984.
  - Incomplete coverage of the northern portion of the Refuge.
- FWS landcover Landsat-facilitated vegetation map and vegetation reconnaissance of Tetlin NWR, 1984
  - 50 meter resolution
  - Based on September, 1977 LANDSAT Multi-Spectral Scanner (MSS) Imagery.
  - Complete Refuge coverage, including field work
  - Broad, generalized landcover categories
  - Still available for use, but utility is limited by age and coarse resolution.

In addition, hard copies of several sets of aerial photography covering all or part of the Refuge are available:

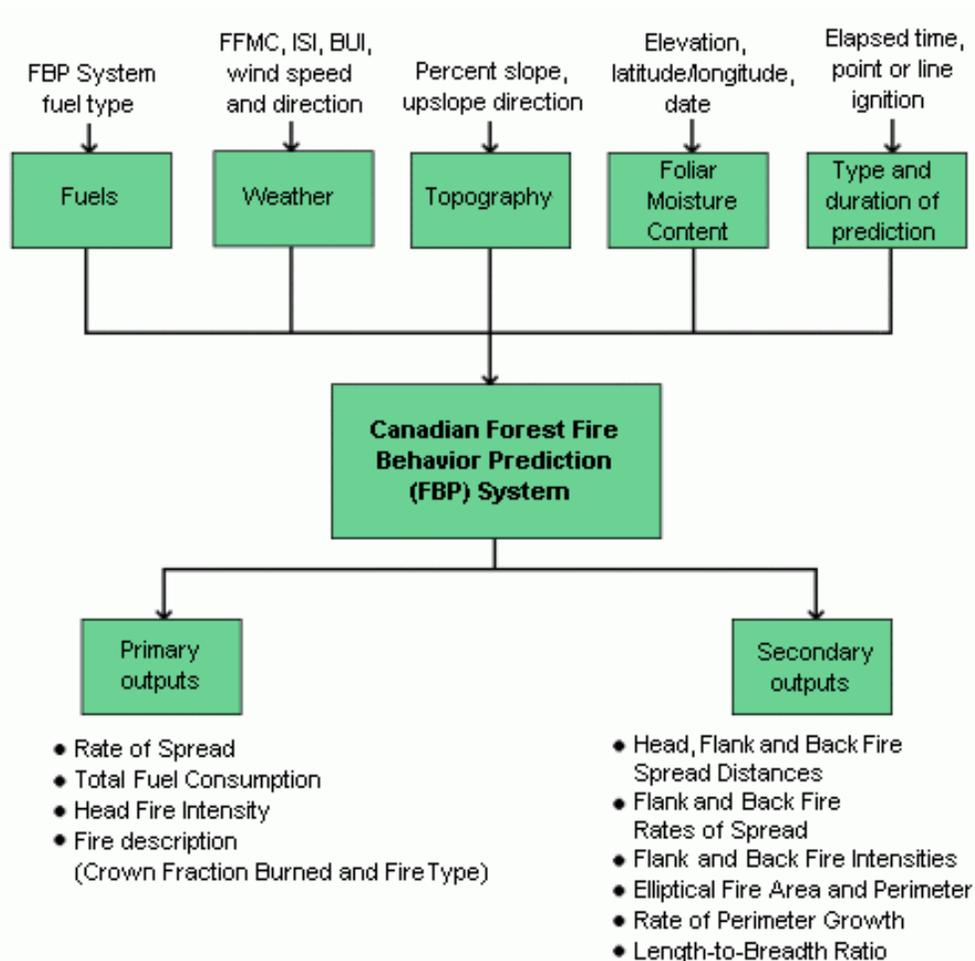
- 1970-80s Color Infrared
  - Complete Refuge coverage
- 1993-94 Color Infrared
  - Nearly complete Refuge coverage
- 2004 True Color
  - Coverage of Refuge highway corridor + 2003 Black Hills Fire

### **3.2.8.1. Fire Behavior**

Several modeling systems are available for predicting fire behavior in Alaska. The thirteen original National Forest Fire Laboratory (NFFL) fuel models have been applied directly, as well as with adjustment factors (Norum 1982).

A custom Black Spruce model based on NFFL parameters has also been developed. The 40 model extension of the original 13 models, released in 2005, provides additional flexibility for adapting the NFFL system used in Behave Plus modeling software to Alaska fuels. All of these models, however, are driven by 1 hour woody fuels and/or leaf litter and do not directly address the characteristics of feathermoss duff fuels that drive surface fires over much of interior Alaska.

The Canadian Fire Behavior Prediction System (FBP) offers several fuel types based on feathermoss duff. FBP relies on Canadian Forest Fire Danger Rating System (CFFDRS) Fire Weather Index System FWI inputs, which are officially tracked in Alaska, instead of the NFDRS inputs commonly used in the Lower-48.



**Figure 9: CFFDRS FBP Structure**

Intensity and spread rate outputs in the FBP also account for the effect of aerial fuels, unlike NFFL which only models surface behavior. Unfortunately fire modeling tools such as Farsite and FSPro do not currently support the FBP system.

The *Fuel model guide to Alaska vegetation* (Cella et al. 2008) includes crosswalks from *The Alaska Vegetation Classification* (Viereck et al. 1992) to fuel models from each of these systems (**Table 8**). The Guide should be used as a starting point for Alaska fuel modeling exercises but should not be considered as definitive. Departures from the Guide should be documented.

<b>Tetlin NWR Fuel Model Crosswalk (condensed from The Fuel Model Guide to Alaska Vegetation)</b>					
<b>Guidebook Group #</b>	<b>Description</b>	<b>Primary Carrier of Fire</b>	<b>Fuel Model</b>		
			<b>40</b>	<b>13</b>	<b>CFFDRS</b>
2	Closed White Spruce Forest	feather moss, litter, duff	TU1	10	C3
3	Closed Black Spruce Forest	feather moss	TU3	9 ADJ	C2
5	Open White Spruce Forest	shrub & litter	TU5	10	C7
6	Open Black Spruce Forest	feather moss	TU4	9 ADJ	C1
7	Open Black Spruce-Tamarack Forest	feather moss & shrub	TU5	10	C1
9	White Spruce Woodland	feather moss & shrub	TU5	10	C1
10	Black Spruce Woodland with tussock	shrub & tussocks	GR2	1	O1
11	Black Spruce Woodland with lichen-moss	feather moss & lichen	TU4	9 ADJ	C2
12	Closed Red Alder Forest	leaf litter	TL2	8	M2
13	Closed Black Cottonwood-Balsam Poplar Forest	leaf litter	TL2	8	M2
14	Closed Paper Birch-Quaking Aspen Forest	leaf litter & sparse grass	TU1	8	M2
15	Open Paper Birch Forest	leaf litter & grass	TU1	9	M2
16	Open Quaking Aspen Forest	leaf litter, grass, shrub & slope	TL2	8	D1
17	Open Balsam Poplar (Black Cottonwood) Forest	leaf litter	TL2	8	M2
18	Woodland Paper Birch-Balsam Poplar	lichen or grass & leaf litter	GR1	1	O1A
19	Spruce-Paper Birch-Balsam Poplar	leaf litter	TL6	8	M2
20	White Spruce - Paper Birch - Balsam Poplar - Spruce	leaf litter & herbaceous plants	TU1	8	M2
22	Dwarf Tree Black Spruce Scrub	feather moss & shrub	TU4	9	C2
23	Closed Tall Alder Willow Shrub	leaf litter & woody debris	TU1	6	M2
24	Closed Tall Birch Shrub	shrubs	SH3	6	M1
25	Tall Shrub Swamp	herbaceous, shrub & leaf litter	SH1	1	O1A
26	Open Tall Willow Alder Shrub	grass & shrub litter	TU1	5	M2
27	Open Tall Birch/Birch-Willow Shrub	shrubs	SH3	5	M1
28	Closed Low Birch/Birch-Willow/Ericaceous Shrub	shrub	SH2	5	M1
29	Closed Low Willow/Alder-Willow Shrub	grasses	TU1	6	M2
30	Open Low Mixed Shrub-Sedge Tussock Tundra/Bog	tussocks	GR2	1	O1
31	Open Low Birch-Ericaceous Shrub/Bog	grass & dwarf birch	GR3	1	O1
32	Open Low Birch-Willow/Ericaceous Shrub/Bog	grass & shrub	GR2	1	O1
33	Open Low Willow/Sweetgale	herbaceous	GR1	1	O1A
34	Open Low Alder/Alder-Willow Shrub	grass & low shrubs	GS1	1	O1
35	Sagebrush-Juniper	juniper	SH2	8	O1A
36	Sagebrush-Grass	grass & shrub	GS1	2	O1
37	Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
38	Elymus	grass	SH4	8	O1A
39	Grass-Shrub	short grass	GR2	1	O1
40	Grass-Herb	short grass & herbaceous	GR1	1	O1A
41	Bluejoint Meadow	grass	GR4	3	O1
42	Bluejoint Shrub Herb	grass	GR2	1	O1
43	Tussock Tundra	tussocks	GR3	3	O1
44	Mesic Sedge-Grass-Herb Meadow Tundra	grass & herb	GR2	1	O1
45	Sedge Willow Dryas Tundra	herbaceous	GR1	1	O1A
46	Sedge-Birch Tundra	herbaceous & shrub	GR2	1	O1
47	Wet Meadow Tundra	herbaceous	GR1	1	O1A
48	Wet Sedge-Grass Meadow-Marsh	grass	GR1	1	O1A
49	Wet Sedge Meadow-Bog-Shrub	herbaceous	GR1	1	O1A
50	Dry Species - Non Burnable		NB7	99	
51	Wet Species - Non Burnable		NB6	99	
52	Mesic Forb Herbaceous		GR1	1	O1A
53	Foliose and Fruticose Lichen		GR1	1	O1A
54	Crustose Lichen		NB9	99	
55	Aquatic Herbaceous		NB8	99	
56	Downed Beetle-killed spruce	downed woody fuel	SB1	11	M4

\* The NB7 fuel model is a custom model for drier vegetated areas that typically do not burn.

\*\* The NB6 fuel model is a custom model for wet vegetated areas that typically do not burn.

**Table 8: Tetlin NWR Fuel Model Crosswalk**

### 3.2.8.2. Fire Effects

Site characteristics, including biotic and abiotic factors, are important factors in determining forest resilience and what may become re-established on a site following fire. For example, poorly drained sites underlain by permafrost where stands of open black spruce are prevalent will likely return to that vegetation type following fire. Shifts in the fire regime to more severe or more frequent fires may lead to alternate successional pathways in black spruce forests, but this vegetation type will likely persist in landscape positions that favor moist, cool conditions (Johnstone et al. 2009). Availability of a seed source or ability of plants to re-sprout following fire will also strongly influence what comes back; if no willows are present on a site prior to fire, one cannot expect willows to significantly appear after fire.

Recent work has highlighted the role of burn severity in seedling establishment, survival, and subsequent vegetation patterns (Johnstone and Chapin 2006, Johnstone and Kasischke 2005). Variation in burn severity, measured by depth of the remaining organic layer, can have a strong influence on tree recruitment and succession on stand and landscape levels. Based on a number of field observations and modeling efforts from various studies, (Barrett et al. 2011) summarized forest recovery relative to post-fire organic soil depths as follows: sites with >10 cm of organic soil post-fire are expected to regenerate as black spruce, with permafrost eventually recovering; sites with 3-10 cm of organic soil are expected to come back as mixed hardwood/spruce stands with longer recovery of permafrost; and sites with <3 cm of organic soil remaining are expected to become dominated by deciduous trees with no permafrost.

Information regarding the effect of fire on specific plant and wildlife species is summarized in the national Fire Effects Information System (FEIS) database, accessible through the Internet at <http://www.fs.fed.us/database/feis/>. Information is available for many bird, mammal, and plant species which occur on the Refuge.

Descriptions of common Refuge habitats along with general discussions of fire behavior and fire effects follow.

#### 3.2.8.2.1 *Black Spruce (Picea mariana)*

Black spruce is found most commonly on cold, poorly drained lowland sites and north-facing slopes, often associated with the presence of permafrost. Black spruce occurs in closed ( $\geq 60\%$  canopy cover), open (25-59% cover), and woodland (10-24% cover) stands (Viereck et al. 1992). On better drained sites, some mixing with white spruce (*P. glauca*) and paper birch (*B. neoalaskana*) occurs.

A carpet of feather mosses and lichens is very common as a primary component of the understory. Graminoid tussocks, various shrubs, including willows (*Salix* spp.) and ericaceous shrubs such as blueberry (*Vaccinium uliginosum*), crowberry (*Empetrum nigrum*), and Labrador tea (*Ledum decumbens*) may also be present. Sphagnum moss may be present on moister sites.

Dead lichen-covered branches are often present on live tree boles from the forest floor to the tree canopies, creating flammable ladder fuels. Live lower branches may also reach the ground, where they can take root, called "layering," creating clusters of smaller trees around parent trees. Litter is primarily composed of a light loading of needles and understory leaves.

Fires characteristically burn in black spruce forests with relatively high intensities and slow, predictable rates of spread. Fires in black spruce are generally carried by surface fuels such as feather mosses, lichens and graminoids. Ignition of the tree crowns (individuals or groups of torching trees) will occur just behind the flaming fire front if flame lengths are sufficient enough to ignite the lower lichen covered black spruce branches. During dry years, the combination of dryness, lichens on the tree branches and fine surface fuels, results in more persistent flammability throughout the fire season than any other fuel type on the Refuge. Long duration smoldering is usually limited to red squirrel middens and peat accumulations unless conditions are very dry. Areas where fire has only partially burned surface fuels may be susceptible to re-burns. Spotting by aerial firebrands from torching trees is common. Instability of the atmosphere, surface winds, and fuel moisture of receptor fuels are critical factors influencing the degree and scope of spotting.

Mosaics of varying burn severity are common. Black spruce are easily killed by fire even in low severity burns. However, seeds from the semi-serotinous cones normally survive and provide a readily available seed source for a few years following fire. Seedling establishment is most effective where mineral soil is exposed, but seeds will germinate on numerous substrates if there are favorable moisture levels. Aerial stems of shrubs are often killed, but resprouting and regeneration are stimulated if root systems are not destroyed. The low shrub layer quickly regenerates in lightly burned areas. Lichens may not return in the short term unless residual fragments are present in unburned or very lightly burned areas. Common feathermosses in spruce forests are obligate climax species (*Hylocomium splendens*, *Pleurozium schreberi*) and are generally killed by fire although small patches may survive low-severity fire. Neither of these species will spread until tree canopy is reestablished.

#### 3.2.8.2.2 *White Spruce (Picea glauca)*

White spruce is commonly found on warmer well-drained sites and on alluvial deposits along major river courses on the Refuge. White spruce also forms stringers along streams and around lakes, but on better drained sites than those on which black spruce is found. White spruce may reach 70 feet in height. On lowland sites, paper birch and balsam poplar (*Populus balsamifera*) may be components of the overstory, with quaking aspen (*Populus tremuloides*) as a component on upland sites. The understory may include tall shrub willow, alder (*Alnus* spp.), prickly rose (*Rosa acicularis*) and a shallow carpet of feather mosses. Smaller white spruce with larger components of willow, ericaceous shrubs, and sphagnum moss occur on moist marginal sites.

White spruce forest often transitions into scrub lands and broadleaf forests on upland sites. Dead downed woody fuels are predominantly white spruce logs and cast white spruce branch, needle and cone litter, but willow may also significantly contribute to loading where concentrations in the understory are heavy.

Fires in white spruce generally are slow spreading and burn with lower intensities than in black spruce. Smoldering fires in the root systems are common. Increased canopy cover and shading results in less fine fuels in the understory and tempers the response of fine fuels to changes in relative humidity. Ladder fuels of dead lichen-covered branches are not as prevalent in white spruce as they are in black spruce. Crowning only occurs under very dry conditions, especially in proximity to jackpots of dead fuels.

Mature white spruce stands may be replaced by broadleaf forest stands following fire—quaking aspen on drier sites and paper birch on moister sites—but white spruce will ultimately return. Open stands on dry sites may be replaced by shrub or broadleaf vegetation types if white spruce seed is not available. Crown fires can destroy seed-bearing cones. As fire intensity increases, survivability of aerial shrub stems decreases. Smoldering fires in root systems of mature white spruce can result in substantial blowdown following fire.

Plants possessing light, easily airborne seeds such as willow, birch, aspen, grasses and fireweed (*Chamerion angustifolium*) will readily invade burned areas. Sucker shoots from willow, alder, birch and aspen may encroach short distances into burned areas. Decadent tall shrubs will be stimulated by removal of dead stems and old growth in low to moderate intensity burns. Growth of herbaceous plants such as field horsetail and grass that were present pre-fire may be stimulated in low intensity burns

### 3.2.8.2.3 *Broadleaf Forest and Mixed Spruce/Broadleaf*

Broadleaf forest types occurring on the Refuge include paper birch, quaking aspen and balsam poplar.

- Aspen stands typically occur on dry south-facing slopes on the Refuge with an understory commonly including willow, kinnikinnick (*Arctostaphylos uva-ursi*) and fireweed (*Chamerion angustifolium*).
- Paper birch occurs on a wide range of upland sites. Birch generally grows on moister, cooler sites than aspen. On drier sites, lichens are an important component of the understory. On moist sites, alder, willow and field horsetail (*Equisetum spp.*) may predominate in the understory.
- Mixes of birch and aspen are found on moderately warm sites, generally as a mid-successional stage to climax white spruce forests. Prickly rose, graminoids and bearberry are common in the understory.
- Stands of balsam poplar occur on the river floodplains with willow, alder and graminoids common in the understory.

Mixed spruce/broadleaf forests are especially common on drier upland sites. This is normally a mid-successional stage of climax white spruce or black spruce forests. Tree components can include combinations of white spruce, black spruce, quaking aspen and paper birch. Elevation, aspect, drainage and successional stage of the site are important determinants of which coniferous and broadleaf trees are established. Plants common in the understory in mixed forests include willow, alder, bearberry, prickly rose, graminoids, and field horsetail.

Dead leaves and smaller branches cast from trees and shrubs are major contributors to the continuous litter layer on the forest floor. Since surface loading of dead fuels is low and is composed primarily of leaf litter, fires which occur in this fuel type are slow spreading and burn with relatively low intensities. Fuel and soil moisture are commonly higher in this fuel type than in black spruce fuel types due to increased shading and forest floor leaf litter cover. Except under very dry conditions, broadleaf forests often serve as natural fire breaks for fires spreading into them from adjacent black spruce stands, because of the significant reductions in intensity and rate of spread. Crowning spruce fires will normally drop to the forest floor when encountering a broadleaf forest stand. Smoldering fire in root systems, punky downed logs and in

standing dead or partially dead broadleaf trees can also occur. In mixed spruce-broadleaf forests, fire intensities generally increase in relation to the proportion and density of spruce within the stand.

Following fire, this vegetation type will generally replace itself. Broadleaf seedlings and shoots, willow seedlings and shoots, and invaders such as fireweed and field horsetail will re-establish first, with other herbaceous vegetation slowly returning via seed sources from outside the burn. The herbaceous stage will ultimately be replaced by a shrub stage and then a tree stage. In the tree stage, broadleaf trees will initially predominate, with white spruce usually increasing in dominance over time.

#### 3.2.8.2.4 *Tussock Tundra*

Tussock tundra is dominated by tussock-forming sedges, usually tussock cottongrass (*Eriophorum vaginatum*) but sometimes Bigelow's sedge (*Carex bigelowii*). Tussocks are commonly 4-12 inches tall and 12-24 inches wide; vegetation between tussocks is comprised of low and dwarf shrubs, mosses (feathermoss and Sphagnum), and lichens (Vioreck et al 1992). Tussock tundra can be a climax community in many areas, but tussocks can get overrun by mosses and shrubs. Fire may be necessary to maintain tussock tundra, particularly in southern portions of the interior.

The predominance of fine flashy fuels in this fuel type, especially substantial accumulations of cured graminoids common in tussocks, in combination with wind can result in fires with potentially high rates of spread and high intensities. Taller tussocks correspond with higher rates of spreads and intensities. Long term smoldering occurs only occasionally in root systems of shrubs present. Depth of burn into the organic layer is dependent primarily upon subsurface moisture, fine fuel moisture, and flaming front duration.

*E. vaginatum* can regenerate quickly following fire, often within the same year. The growing tips are protected from fire to a certain extent as they are within an insulating shield of dead and living plant material, sheaths, and scales; if the fire does not reach the growing tips, they quickly produce new stems. In very dry years, high intensity burns may kill the tussocks, leaving only burned tussock "stumps." If the tussock survives, new growth, including flower production, can be significantly stimulated by the removal of buildups of dead thatch, which helps to increase surface and soil temperatures, and increased nutrient availability.

#### 3.2.8.2.5 *Tall Shrub – Birch*

Shrub birch is found on the Refuge in open boggy areas in association with ericaceous shrubs, labrador tea, sweetgale and sedges as well as on sub-alpine sites near tree line. Upland shrub birch will carry moderate to high intensity fires, especially with a well-developed grass, moss, lichen, and/or ericaceous understory. Floodplain shrub birch sites with ericaceous associates react to fire similarly to other open ericaceous sites.

#### 3.2.8.2.6 *Climate Change: Long-Term Effects on Vegetation*

An analysis of vegetation and fire regime response to projected future climate conditions was conducted for the Refuge in 2009 (Rupp and Springsteen 2009); similar analyses were conducted for other interior Alaska refuges. The analysis used the computer model Boreal Alaska Frame Based Ecosystem Code (ALFRESCO), which simulates the responses of subarctic and boreal

vegetation to climate change (<http://www.snap.uaf.edu/downloads/boreal-alfresco>). It simulates five vegetation types (upland tundra, black spruce forest, white spruce forest, deciduous forest, and grassland-steppe) at a resolution of 1 x 1 km on annual increments. Historical climate-fire data are used to inform the model, and future conditions are simulated using six different future climate scenarios. Only one greenhouse gas emissions scenario was used in the simulation: A1B represents rapid economic growth, a global population that peaks at 9 billion in 2050 then gradually declines, new and efficient technologies, and a conversion of income and way of life among global regions (IPCC 2007). Results of the simulation for interior Alaska predict that the landscape will become more flammable in the next 100 years. Precipitation is expected to increase, but it will be accompanied by increased evaporation and drying due to higher temperatures. Increased fire and vegetation response will result in a change from a spruce dominated landscape to one dominated by deciduous vegetation, with current expanses of mature unburned spruce replaced by a patchy distribution of deciduous forest and younger spruce (**Figure 10**). This change will likely occur more slowly in Tetlin Refuge (mid and late century) than in other parts of the interior, which are expected to experience the most change in the next few decades.

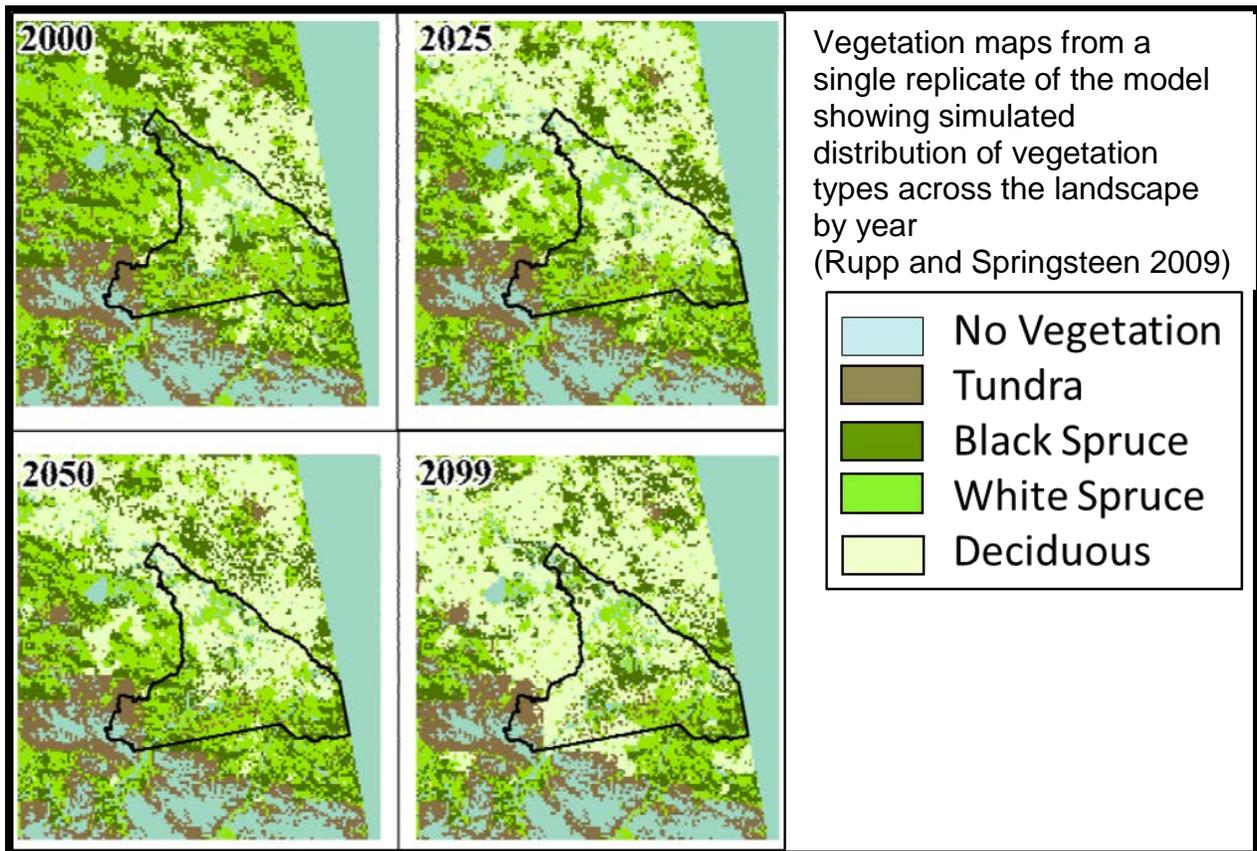


Figure 10: Tetlin NWR - ALFRESCO Landcover Modeling

### **3.2.9. Wildlife**

The greatest overall benefits to wildlife from fire occur in stable fire-dependent ecosystems when fires burn with variable intensities and leave significant unburned inclusions for escape cover. Positive responses by wildlife to large catastrophic fire occurrence (high intensity with few unburned inclusions) are much slower. Research is needed to improve understanding of the interactions between fires, habitats, and wildlife.

#### **3.2.9.1. Moose**

It is widely recognized that fire can favorably affect moose habitat. Willows and deciduous trees such as paper birch are used as moose forage, particularly during the stressful winter season. These species can readily resprout from rootstocks that survive low to moderate intensity burns. Higher severity burns that kill the roots will need to revegetate via seed and will take much longer to recover. A GIS study of early winter female moose density and distribution in interior Alaska indicated that moose density was higher in burns between 11-30 years old compared to older or younger sites (Maier et al. 2005). Proximity to existing use areas also plays a role in moose distribution; moose will not readily utilize burned areas unless these areas are either adjacent to or within their current range. Edge effect is also an important factor. Moose prefer to utilize feeding areas which are near cover.

#### **3.2.9.2. Caribou**

Four different herds currently winter on or near the Refuge (Nelchina, Fortymile, Mentasta, and Macomb herds), although actual use of Refuge lands in a given year may be low. In addition, individuals from the Chisana herd may occasionally use the Refuge. There is some controversy regarding the effect of fire on caribou populations and caribou range. Caribou lichens (*Cladonia* genus, subgenus *Cladina*) can comprise the majority of caribou winter diet in interior Alaska. Even fires of relatively low intensity destroy these slow-growing lichens, leading to concerns that widespread fire on caribou winter range could have a negative effect on caribou at the population level. Research in Canada and Alaska indicate the recovery period for lichens to pre-fire levels of cover can take 50-100 years or more; 80 years is a commonly used figure. However, lichens in the boreal forest have evolved with fire and may become decadent or overgrown by mosses if there are exceptionally long periods with no disturbance. Fire can also temporarily stimulate growth and nutritional value of other plants that are also eaten by caribou to a lesser extent in winter. Sedge tussocks that survive burning can resprout soon after fire, and the fire removes dead material from the tussock, providing a potential source of protein-rich forage that remains green at the base under the snow. This type of forage can be particularly important in late winter and early spring after caribou have been subsisting on protein-poor lichens throughout the winter.

#### **3.2.9.3. Furbearers and Small Mammals**

Predators such as lynx and fox respond to effects of fire on their primary prey species. Snowshoe hare populations thrive in a mosaic of herbaceous plants and low shrubs for food, and spruce, willow and alder thickets for cover. This habitat can be maintained by the occasional occurrence of low to moderate intensity fires. Hares are the primary prey species of lynx, and increases in local snowshoe hare populations will normally result in increases in numbers of lynx

unless other factors such as heavy trapping pressure restrict the response. A study of lynx use of habitat on the Refuge indicated that the optimal lynx habitat occurs approximately 30 years following fire occurrence (Paragi et al. 1997).

Red foxes are not as prey-specific as lynx and thrive in many habitat types in and out of burned areas, feeding on snowshoe hares, rodents, and to a lesser extent, birds, fruits and berries. Fire that creates a mosaic of burned and unburned areas is probably the most beneficial to red foxes. Periodic fire may help to maintain habitat for many prey species of red fox. Red foxes should benefit during the first 10 to 20 years following fire due to the increase in northern red-backed voles (*Clethrionomys rutilus*) and meadow voles (*Microtus pennsylvanicus*) (Kelleyhouse 1979).

Most studies on American marten – habitat relationships indicate that marten require mature coniferous forest with greater than 30% canopy cover, and that marten avoid open areas such as burns. However, there is evidence that indicates marten will use burns that lack canopy cover but have post-fire deadfall (Johnson et al. 1995).

Microtines repopulate burned areas relatively rapidly, especially in lightly burned areas and near burn perimeters. Yellow-cheeked voles are large rodents, found only in Alaska and Canada, that can weigh up to 6 ounces and form colonies in burns, providing a high density of prey.

#### **3.2.9.4. Birds**

Birds that nest in mature habitat may be displaced by fire. Raptors benefit from fires which create abundant early successional habitat favored by prey species such as microtines, and some passerine birds. Woodpeckers, particularly black-backed and three-toed woodpeckers, and other birds which feed upon tree-boring and bark-inhabiting insects are associated with burns providing that snags remaining standing. Sharptailed grouse and ruffed grouse flourish in young broadleaf and mixed forest habitat subject to periodic low intensity burning. Ptarmigan repopulate burned areas as birch, willow and other shrubs revegetate and produce buds they utilize as a food source.

The response of waterfowl to fire corresponds with effects of fire on habitat utilized for nesting and feeding. Timing is important; fire that occurs in nesting habitat immediately prior to nesting, during incubation, or before the young leave the nest can be very detrimental in the short term. Fires occurring outside of the nesting period can promote increased productivity of graminoids used both for cover and for a food source. Fires occurring along marsh margins can inhibit or set back the development of peatland bogs and maintain suitability for waterfowl habitat by removing decadent or dead plant materials.

#### **3.2.10. Hydrology**

Much of the Tetlin Refuge is covered in water including rivers, streams, lakes, and ponds. Flooding is a natural disturbance process that helps to maintain habitat complexity and recharge lake and riparian nutrients. Flooding occurs after ice breakup during spring runoff in the non-glacial streams. Ice jams commonly block rivers already swollen by snowmelt runoff. Although the flood waters quickly recede, vegetation patterns, water quality, and drainage patterns may be altered over large portions of the Refuge, affecting habitat availability and quality for many fish and wildlife species. Along with fire, this annual flooding is responsible for creating and maintaining the diverse habitats that support the rich wildlife community of this Refuge.

Watersheds on Tetlin Refuge are poorly defined, as the land between major rivers has very low relief (Lyons 2002). The Refuge is drained by the Nabesna and Chisana rivers. Both rivers originate from glaciers in the Wrangell Mountains within the Wrangell-St. Elias National Park and Preserve, south of the Refuge. They braid and meander north to their confluence near Northway Village, where they form the Tanana River.

Discharge from the glacial Nabesna and Chisana rivers begins to increase in late April or May due to melting snowpack. By the time the snow is gone, the glaciers begin to melt and the discharge continues to increase. The peak in the annual discharge normally occurs in late July to early August, with variations each day as the headwater glaciers thaw each day and freeze each night. By late August to early September, the discharge steadily decreases to winter low flow conditions.

Non-glacial streams are smaller and originate in the foothills that lie both north and south of Tetlin Refuge. In general, non-glacial discharge increases rapidly in May with the melting snowpack, peaking by early June, and then returning to a medium to low flow. Sharp spikes in the discharge may be expected during the summer in response to thunderstorms.

Lakes and ponds range in size from less than an acre to nearly 3,000 acres. The northern portion of Tetlin Refuge is almost entirely occupied by wetlands. Smaller wetlands can be found near the eastern boundary along Scottie and Desper creeks, Mirror Creek, and American Wellesley Lakes. On the southern plateau, there are also small concentrations of ponds around Jatahmund Lake and Pickerel Lake. Fish and wildlife productivity is greatest in the lowland complexes of ponds, marshes, and streams in the northern portion of the Refuge.

### **3.2.11. Geology/ Hypsography**

Formed by glacial processes, the large and flat Northway basin of the Upper Tanana Valley is filled with sediments deposited in moraines and outwash plains. These sediments, comprised of silt, sand, and gravel were carried directly by huge glaciers from the massive ice cap covering the Wrangell Mountains, or indirectly by their meltwater streams and waterbodies. The resulting landscape is dominated by lakes, ponds, wetlands, streams and the braided, glacier-fed Nabesna and Chisana Rivers. Several small receding remnant glaciers remain in the southwest corner of the Refuge on high peaks at the head of the Cheslina River drainage. Eolian deposits of sand and silt (loess) carried by winds off the glaciers formed dunes along much of the Alaska Highway corridor in roughly parallel waves. Today these dunes are mostly vegetated.

The soils of Tetlin Refuge are dominated by fine-grained silts and clays mixed with pockets of sand, gravel and organic deposits. Drainage through these soils is generally poor, resulting in discontinuous layers of permafrost at or near the surface. On south and west facing slopes, and along the fringes of larger waterbodies greater soil warmth and/or better drainage often reduces or eliminates surface permafrost.

Fire occurrence does affect the depth of organic soils, the active layer and permafrost where present. After a fire burns off vegetation cover, soils receive increased heat and thaw more quickly in the summer. Where permafrost is present, it may melt, causing characteristic slumping of soil. Trees and other standing live or dead vegetation may collapse, significantly contributing to the surface fuel loading within the burned area. The exposure of mineral soil, on the other hand, encourages the reproduction of a variety of plant species unable to grow on moss and so contributes to vegetation diversity.

Permafrost temperatures in boreal Alaska are 0 to -4 ° C. The closer the permafrost temperature is to 0 ° C, the more susceptible it is to climate change or surface disturbance (Hinzman et al. 2006). Fire can exacerbate melting of permafrost by reducing albedo and increasing surface temperature, thus increasing the depth of the active layer (thawed ground) in summer. A thicker active layer results in improved drainage, which leads to drier surface conditions and has been implicated in the draining of wetlands. As vegetation recovers, albedo increases and the active layer will shrink. The degree to which fire will affect the active layer is highly dependent on burn severity.

### 3.2.12. Humans & Human Activity

Local attitudes regarding fire vary. Protection of life and property is a major concern. Subsistence users are concerned about the impacts of wildland fire and prescribed fire on harvest levels. For some, firefighting provides necessary income. Smoke impacts are a concern during active fire seasons.

Fire effects on trapping and potential threats to private property are the biggest concerns expressed. Although trapping on the Refuge is not currently a widespread economic endeavor, it remains an important subsistence activity for residents of Northway and Tetlin Village.

There is controversy about fire effects on trapping. Although most local trappers recognize that fires can produce habitat variety and edges favorable for furbearer populations in the long run, there is concern that large fires leaving few unburned inclusions could have a near term negative impact on furbearers and consequently on trapping success. Burned over trails may require extensive work to reopen (Johnson et al. 1995).

Despite potential negative effects of fire, there is also recognition that fire does play a beneficial role in hazard reduction and wildlife habitat enhancement. The public has been generally supportive of the Refuge fire management program.

Since 1980, eight large wildfires have threatened local communities (**Table 9, Map 4**) and required incident management teams. As a result, local people have developed an awareness of hazard reduction needs for their homes and communities. Thinning for hazard reduction within the wildland/urban interface is a management choice that is receiving wider recognition and implementation by local, federal, tribal and state organizations. Firewise, a program to educate homeowners about fire hazard reduction needs has been adapted to Alaska and is being implemented in local communities.

<b>Year</b>	<b>Fire</b>	<b>IMT Type</b>	<b>Acres</b>	<b>Communities at Risk</b>	<b>Refuge Fire</b>
2010	Eagle Trail	IMT 2	17,958	Tanacross, Tok	No
2005	Island Lake	IMT 2	1,450	Port Alcan	No
2004	Chicken #1	IMT 2	320,156	Chicken	No
2004	Wall Street	IMT 2	89,280	Chicken, Boundary	No
2004	Porcupine	IMT 2	284,595	Tok, Tanacross, Mansfield Village	No
2004	Gardiner Creek	IMT 2	125,740	Northway, Northway Junction	No
2004	Billy Creek	IMT 2	463,994	Dot Lake, Mansfield Village	
2003	Tok River	IMT 2	5,600	Tok	No
1993	Nabesna	IMT 2	4,100	Tetlin, Northway	Yes
1991	Wellesley Lake	IMT 2	18,750	Port Alcan, Beaver Creek	Yes
1990	Tok River	IMT 1	103,275	Tanacross, Tetlin, Tok	No
1990	Porcupine	IMT 1	11,670	Tok	No
1986	Deep Lake	IMT 2	3,300	Northway	Yes
1982	Kennebec Fire	IMT 1	31,430	Northway	Yes

**Table 9: Tok Area IMT Deployments 1980 - 2011**

### **3.3. Specific Values to Protect**

#### **3.3.1. Priority to Protect Human Life**

Human life is the single, overriding value to be protected by actions authorized under this plan. Priorities for the protection of human communities and community infrastructure, other property and improvements, and natural and cultural resources will be incident specific, and will be based on the values at risk, human health and safety, and the costs of protection.

### 3.3.2. Communities and Other Adjacent Infrastructure

A partial list of specific sites on neighboring lands includes:

- Northway Village
- Northway Airport
- Northway Road properties
- Tetlin Village
- Last Tetlin Village
- Beaver Creek community (Yukon, Canada)
- Alaska Highway properties
- Port Alcan facilities
- Cabins, Camps
- Cultural/ Historic Sites
- Trails
- Telecommunications sites

### 3.3.3. Native Allotments

Allotments in the vicinity of Tetlin Refuge are trust lands under the jurisdiction of the Bureau of Indian Affairs (BIA). Titles to these parcels are held by individual Alaska Natives referred to as allottees. As trustee of these lands, the United States Government must ensure that these lands and their resources are maintained in perpetuity for the benefit of their Indian owners. One element of the trust responsibility is the protection of the land and resources from damaging wildland fires.

The Tanana Chiefs Conference (TCC), through an Indian Self Governance Compact, has assumed management of fire preparedness activities for allotments in the TCC service area which includes Tetlin Refuge. All allotments in the vicinity of Tetlin Refuge currently receive protection commensurate with the Full or Critical Fire Management Option. Allottees may authorize changes to the fire management option assigned to their allotment through the TCC fire program.

There are 117 Native Allotments within one mile of the Tetlin Refuge ANILCA boundary (**Map 3**). Most are adjacent to lakes, waterways, or the Alaska Highway. Whenever an allotment is threatened by fire, the protection agency (Tok DOF) FMO will notify BIA directly, or through TCC of the threat. It will be the responsibility of the BIA to contact all current allottees and to keep them informed of the situation throughout the incident.

### 3.3.4. Adjacent Lands

All Refuge fire management decisions will consider impacts to neighboring landowners. The Fire Management Option for Refuge lands near some boundaries has been elevated in order to reduce the risk of fire spread and damage to neighboring values in Full and Critical Management Option lands. Neighboring landowners include:

- Northway Village Native Corporation (NVC)
- Doyon Regional Native Corporation
- Tetlin Native Corporation
- Tetlin Village Council
- Alaska Department of transportation (ADOT)

- Alaska Department of Natural Resources
- National Park Service, Wrangell-St. Elias National Preserve
- U.S. Customs and Immigration Service, Port Alcan
- Yukon Territory, Canada
- Private landowners

In addition:

- Two parcels totaling 240 acres near Pickerel Lakes. Both parcels have been selected by AHTNA, but have not yet been conveyed. The parcels are currently managed by the Service and fall within the Limited Fire Management Option.
- BLM managed pipeline easement that runs roughly parallel to the Refuge's northern border both on and off Refuge lands.
- Tanana Valley State Forest timber resources have been identified (but not inventoried) north of the Alaska Highway in the hills above the upper Scottie Creek drainage.

### 3.3.5. Refuge Infrastructure

A copy of the Refuge Real Property Inventory is included in **Appendix I**

#### 3.3.5.1. Critical Refuge Infrastructure

The following refuge infrastructure sites will receive protection commensurate with the Critical Fire Management Option. They will be included in the AICC Known Sites database and will be identified as **Critical Structure**. (**Map 3**):

#### **Tok Properties**

- The Refuge Headquarters Complex is located on a ten-acre Service parcel off-Refuge in Tok. Current structures include an office building, garage, six bunkhouse cabins, and several outbuildings. The adjacent 10-acre parcel to the north is also Service owned.
- Current Refuge housing consists of four single-family residences and two duplexes on Service lands off-Refuge in Tok. Two homes are located adjacent to the Refuge Headquarters. The others are located on five acre parcels elsewhere in Tok.
- The Refuge hangar is currently being leased and is located off-Refuge at Tok Airport. Purchase negotiations for the hangar are in progress.
- The site for the planned APLIC Visitor Center is located on a Service parcel, off-Refuge in Tok.

#### **Refuge Visitor Center**

- The Refuge Visitor Center is located on a Service parcel at Milepost 1229 of the Alaska Highway.

#### **Northway Bunkhouse Complex**

- The Northway Bunkhouse Complex is located on a Service Parcel at 0.1 mile on the Northway Road. The Complex consists of a common living center, a warehouse, and four bunkhouse cabins.

### **3.3.5.2. Full Protection Refuge Infrastructure**

The following refuge infrastructure sites will receive protection commensurate with the Full Fire Management Option and their estimated replacement value, and will be considered for fuels reduction treatments. These sites will be included in the AICC Known Sites database and will be identified as **Full Other Site Type**. (**Map 3**):

#### **Seaton Climate Monitoring Station**

This station was installed in September 2011 on Refuge lands near the Seaton Roadhouse site at Milepost 1234.7. It is owned and operated by the National Oceanic and Atmospheric Administration (NOAA).

#### **Seaton Recreational Site**

This recently developed site at Milepost 1234.7 includes walking trails, boardwalks, two wooden footbridges, picnic facilities, wooden viewing platforms, outhouses, and interpretive kiosks.

#### **Refuge Repeaters**

The Refuge maintains two mountaintop radio repeaters. The Cheslina repeater is located on Refuge lands and the Bitters repeater is located on State lands north of the Refuge (**Map 13**). Both sites are accessible by helicopter. A trail from the highway to the Bitters site may cross private lands.

#### **Refuge Remote Automated Weather Stations (RAWS)**

The Refuge maintains two permanent RAWS (**Map 12**). The Alcan Highway Milepost 1244 RAWS is accessible from the Alaska Highway via a ¼-mile foot trail. The Jatahmund Lake RAWS is accessible by helicopter or by foot from the south end of the lake.

#### **Refuge Campgrounds**

The Refuge manages two campgrounds, both of which are located on State lands. Deadman Lake Campground is accessed by a 1 mile road at Milepost 1249.4. Lakeview Campground is located on Yarger Lake west of the float base and is accessed via a ½-mile road at milepost 1256.6.

#### **Yarger Lake Float Base**

A steep ¼-mile long road east of the DOT maintenance station at milepost 1256.3 accesses the Yarger Lake float base. A 1,000-gallon avgas tank is located in a locked enclosure near the lakeshore.

#### **Interpretive Kiosks**

Interpretive Kiosks are located at campgrounds and at numerous pullouts along the Alaska Highway.

#### **Hidden Lake Recreational Site**

Access to Hidden Lake is via a 1-mile foot trail at milepost 1240.0. Infrastructure includes boardwalks and an interpretive kiosk.

## Chisana Boat Ramp

This Refuge maintained ramp and kiosk is located on the north banks of the Chisana at the Northway Road bridge. The site is on State owned lands.

## Administrative Cabins

Three Administrative cabins exist on the Refuge to support the Refuge mission. All three are available secondarily for public use. The cabin sites, located on Jatahmund Lake, Wellesley Lake, and the Nabesna River, have had fuels mitigation work done in the past and will continue to receive fuels maintenance work in the future. The Jatahmund and Wellesley cabin sites will receive protection commensurate with the Full Fire Management Option and their estimated replacement value (**Appendix I**). The Nabesna cabin will not be protected due to its poor condition and limited use. Administrative cabins will be included in the AICC Known Sites database and will be identified as **Full Structure**. (**Map 3**)

## Cultural/Historical Sites

The Alaska Office of History and Archaeology (OHA) carries out the responsibilities of the State Historic Preservation Office. The National Historic Preservation Act of 1966 set up the position of State Historic Preservation Officer (SHPO) for each state, to be appointed by the Governor. In Alaska, the Governor has designated the Chief of the Office of History and Archaeology as the SHPO. OHA maintains The Alaska Heritage Resources Survey (AHRs), a restricted statewide inventory of Alaska's reported historic, prehistoric, and archaeological resources. This inventory of cultural resources includes objects, structures, buildings, sites, districts, and travel ways, with a general provision that they are over 50 years old. The fundamental use of the AHRs is to protect cultural resource sites from unwanted destruction. Various state and federal agencies and private companies use the inventory when planning or reviewing development projects. By knowing of reported cultural remains prior to construction, efforts can be made to avoid project delays and prevent unnecessary destruction of these non-renewable resources. Listing on the AHRs does not, in and of itself, provide protection for sites. But it does allow for knowledgeable decisions to be made concerning the future of these sites.

A 2010 OHA assessment of potential historic sites on the Refuge considered 46 properties (Lochart 2010). Each site was assessed for historical significance with respect to the guidelines of the National Register of Historic Places (NRHP). The only site determined to be eligible to the NRHP is the Seaton Roadhouse site at Milepost 1234.7. Other than the Climate monitoring station and the recreational site improvements described above, little remains from the site that would require fire protection. This site will be included in the AICC Known Sites database and will be identified as **Full Historical**. (**Map 3**) No protection will be provided for the other 45 properties.

### 3.3.5.3. Other Sites on Refuge Lands

#### Permitted Cabins

Eight cabins are currently permitted for subsistence or commercial use on the Refuge. The *Region 7 Policy for Management of Permitted Cabins on National Wildlife Refuges in Alaska (RW-1)* states that, "the Service does not guarantee protection of a permitted cabin or its

*contents in the event of fire. Public and firefighter safety is the first priority in wildland fire activities and decisions. Firefighter safety will not be compromised for structure protection.*

*Current cabin permittees will be authorized to establish defensible space around the permitted cabin/structure using Alaska Wildland Fire Coordinating Group Fire Wise standards. New permits for cabins may be issued without authorizing Fire Wise standards because of other resource concerns. In all cases, the cabin permit must clearly state that the permittee understands the inherent risk in wildfire and that the cabin and its contents may not be protected in the event of a wildfire.”*

Permitted cabins will be included in the AICC Known Sites database and will be identified as **Full Structure. (Map 3)**

### **Unpermitted/Abandoned Cabins**

Unpermitted or abandoned cabins on Refuge lands will not be protected except on a case by case basis with Refuge Manager approval and Incident Commander concurrence. Known unpermitted/abandoned cabins will be included in the AICC Known Sites database and will be identified as **Non-Sensitive Structure. (Map 3)**

### **3.3.5.4. Other Refuge Infrastructure**

#### **Trails**

Trails within the Refuge may provide opportunities for low impact holding lines. Trails may also require Emergency Stabilization action, and/or post fire Burned Area Rehabilitation to clear deadfall following the passage of a fire or identify and eradicate invasive species. A partial list of trails is included below.

- Airs Hill hiking trail
- Milepost 1285 17B Access trail
- Northway to Nabesna winter trail (east of the Nabesna River)
- Northway to Nabesna winter trail (west of the Nabesna River).

#### **Roads**

The only road on Refuge lands is the ¼ mile access to the Seaton Recreational Site. The roads to Deadman Lake and Yarger Lake are on State lands and are maintained by the Refuge. Post-fire Burned Area Rehabilitation may be required to remove deadfall and tree hazards from roadways.

### **3.3.6. Subsistence Values**

An important purpose of the Refuge is to provide subsistence opportunities for local residents. Wildland fire may have both positive and negative effects on subsistence resources and infrastructure. Although periodic fire often increases habitat diversity and encourages species productivity leading to increased subsistence opportunities, large fires may temporarily decrease productivity in certain areas. The effects of fires on established trails and camps must also be considered.

### 3.3.7. Refuge Lands and Natural Values

#### 3.3.7.1. Natural Diversity

Conservation of fish and wildlife populations and habitats in their natural diversity, including, but not limited to, waterfowl, raptors and other migratory birds, furbearers, moose, and caribou is one of the primary purposes for which the Tetlin National Wildlife Refuge was established. Thus, habitat diversity and species productivity within the Refuge and throughout the Upper Tanana Valley are the core natural resource values that the refuge fire management program is designed to protect. These values are largely dependent on the continued existence of a relatively natural fire regime.

Natural barriers within and adjacent to the Refuge make it unlikely that a single fire could affect a large percentage of total Refuge area, however large percentages of refuge lands burning within a short period of years may also be considered to have an undesirable effect on refuge habitat diversity. If additional lands within the Tok Area also burn during this period, this effect may extend to the Upper Tanana area. During the 2004 season Upper Tanana fires burned over 1 million acres. Although Refuge lands were not seriously affected that year (less than 200 acres burned), nearly 12% of the basin's area was converted to early successional post-fire habitat. In the future, when numerous large fires occur on the Refuge or within the Upper Tanana Valley, consideration may be given to non-standard suppression responses, or to realignment of Management Option (FMU) boundaries.

#### 3.3.7.2. Raptor Nesting Sites

Numerous gravel pits & road cuts along the Alaska Highway provide nesting sites for raptors, especially peregrine falcons. River corridor bluffs, snags, and open summits also may host nests. Although wildland fire is unlikely to adversely affect nesting sites, fire management and other actions undertaken in and around these locations may have negative effects. Gravel pits and summits are often likely locations for helispots. Gravel pits may also be used as slash burning sites. Disturbance of known nesting sites will be avoided during fire management activities. Known raptor nesting sites will be identified in the Statewide Known Sites database as **Avoid T&E Species**. (Map 3) Any raptor nests discovered during fire management activities should be reported to refuge biologists.

#### 3.3.7.3. Rare Plants

None of the 29 plant species identified in the Alaska Rare Plant Field Guide:

<http://aknhp.uaa.alaska.edu/botany/alaska-rare-plant-field-guide/>

have been found on the Refuge. However, *Cryptantha arcticum* is found within a 150 mile radius of the Refuge and may occur on Refuge lands. It is unlikely that fire or fire related activities will have any effect on this species, as its preferred habitat is considered non-burnable or at low risk of burning.

#### 3.3.7.4. Riparian Balsam Poplar Forest

Riparian balsam poplar forest, comprising approximately 12,500 acres on the Refuge is the only sensitive biological community noted in the CCP. This vegetation type is used for nesting and

migration by a variety of neotropical migrant birds whose populations are currently in serious decline. This community has a low probability of being adversely affected by fire except during periods of extreme drought. Protection of this community will be considered in fire management decisions as appropriate.

### **3.4. Communications**

Cellular communications in the Upper Tanana Valley are currently limited to the immediate area of Tok. Satellite phones work reasonably well though mountainous terrain may block signal. VHF FM radio is the primary method of communication for refuge operations and the Refuge maintains a Project-25 (a public safety communications standard dedicated to ensuring interoperability in communications) compliant digital-narrowband VHF FM system. In addition, the Alaska DOF repeater system provides coverage for the area. Most communications for fire suppression operations will take place on the DOF system. See Error! Reference source not found. for Repeater Coverage Map and **Appendix C** for Radio Channel Guide.

#### **DOF/Interagency Fire Communications**

In canyons and on south and east facing slopes DOF repeater coverage on the Refuge is limited. The DOF C (Charlie) repeater is co-located on a hill above Beaver Creek with the Alascom tower north of the Refuge.

- Coverage may be spotty where nearby hills interfere.
- Support resources along the Alaska Highway may have better success with the DOF D (Delta) repeater due to interference with nearby hills.
- Coverage should be relatively good in the Nabesna drainage.
- Coverage in the Cheslina River drainage may be spotty except near summits.
- Should provide good coverage over portions of the unit north of the Black Hills.
- Coverage south of the Black Hills may be blocked by terrain.

The DOF D (Delta) repeater is located 25 miles to the northwest of the Refuge on Mt. Neuberger and may provide limited coverage of some areas.

- Probably blocked by terrain in most areas on the Refuge.
- Provides good coverage along the Alaska Highway between Tok and Midway Lake.
- East of Midway Lake coverage Alaska Highway may be spotty due to interference with nearby hills.

DOF A (Alpha) located on Mt. Fairplay 40 miles to the north may also provide coverage to some portions of the Refuge.

#### **Tetlin NWR Digital/ Analog Communications**

In canyons and on south and east facing slopes FWS repeater coverage on the Refuge is limited. Coverage in the Cheslina River drainage will be spotty except on upper slopes and summits. The Refuge is served by two FWS digital repeaters and a base station located at Refuge Headquarters in Tok. The repeaters are linked so that line of sight communication with either repeater will

allow communication across both repeaters and with the base. The system includes an Analog mirror that allows non-digital radios to communicate with Refuge resources, and supports radio voice transmission (RTV) for Refuge RAWs and a radio-telephone interface.

- The Tetlin NWR Bitters repeater is located on a hilltop several miles north of the Refuge and should provide good coverage of most of the Refuge north of the Black Hills.
  - Resources along the Alaska Highway may have better success with the Cheslina Repeater located 35 miles to the south due to interference with nearby hills.
- The Tetlin NWR Cheslina Repeater is located within this Refuge, west of the Nabesna River.
  - Coverage should be relatively good in the Nabesna drainage.
  - May also provide coverage within the northern portion of the Unit, where it is not blocked by the Black Hills.

### **3.5. Safety Considerations**

The Refuge Manager is ultimately responsible for the safety of all Refuge wildland fire operations. Refuge prescribed fire and mechanical fuels treatment safety is managed by the burn boss or project manager according to Service policy and regulations. Wildfire safety is managed by the IC and will be in accordance with protection agency policy and regulation.

#### **3.5.1. Communications Safety**

Poor radio communications in portions of the Refuge may complicate fire management activities unless an incident repeater is deployed.

- Steep terrain in Cheslina drainage may block communications at lower elevations.
- Distance from repeaters and terrain effects may block communications along the Canada border and in the upper Chisana drainage; especially on east and south slopes.
- Alaska Highway communications from Tok to the Canada border may be spotty where terrain blocks repeaters.

#### **3.5.2. Smoke Safety**

Wildfire incident commanders and prescribed fire burn bosses are responsible for managing smoke produced by their incident. The Tok Area FMO will facilitate wildland fire smoke issues while RX fire smoke issues will be facilitated by the Service. Burn bosses and ICs will both ensure that Tok Area dispatch is kept apprised of smoke issues.

- Wildland fire smoke may lead to limited visibility and adverse driving conditions along the Alaska Highway both in Alaska and Canada and along the Northway Road. Coordinate with the Alaska Department of Transportation (ADOT), the Alaska State Troopers (AST), and the Royal Canadian Mounted Police (RCMP).
- Private and commercial air traffic along the Alaska Highway corridor including Northway Airport and Beaver Creek Airport in Canada may be adversely affected by smoke. Coordinate with FAA in Northway.

- Wildland fire smoke may lead to adverse health conditions in Northway Village, Tetlin, Beaver Creek (Canada), Port Alcan, and Alaska Highway developments. Coordinate with communities, the Alaska Department of Environmental Conservation (ADEC) and the Alaska State Troopers. If requested and available, the Service can support air quality monitoring with a portable Environmental Beta Attenuation Monitor (E-BAM).

### **3.5.3. Transportation Safety**

Although the Alaska Highway runs along the Refuge's northern border, most Refuge lands are relatively remote. Road accessible sites are forty to one hundred highway miles from Tok, with driving response times up to two hours. Refuge lands lie 25 to 80 air miles from Tok, with response times that may be greater than one hour.

#### **Highway Vehicle Safety**

- Highway safety is the jurisdiction of the Alaska Department of Transportation (AKDOT) and the Alaska State Troopers (AST)
- Motorhome traffic on the Alaska Highway may lead to delays.
- Frost heaves and potholes are common on the Alaska Highway
- The Northway Road and other graveled roads can be extremely slick when wet.
- Road repair and construction operations are common on the Alaska Highway

#### **Aviation Safety**

- Aerial hazards include towers, overhead wires, and bridges (**Map 14**)
- Private and commercial air traffic in and out of Beaver Creek, Northway Airport and along the Alaska Highway corridor may impact aviation operations.
- Temporary Flight Restrictions (TFRs) are commonly in effect during fire season. Check NOTAMs prior to departure.
- Availability of jet fuel and avgas at Northway should be confirmed prior to missions
- Smoke may impact Northway Airport

#### **Boat Safety**

- Agency approved PFDs must be worn at all times by boat operators and passengers.
- Fire Extinguisher and First Aid Kit are required.
- Manifest boat passengers similar to aviation missions

## **3.6. Refuge Access**

During fire season access to most of the Refuge is accomplished by helicopter, float plane, or boat (**Map 1**). Limited hiking trails exist south of the Chisana and Tanana rivers. ATVs and UTVs are only permitted on Refuge lands with specific permission from the Refuge Manager.

## **Boat Access**

- The Tanana River access at Riverside near milepost 1281 is dangerous and should not be used.
- Small riverboat access along Moose Creek.
- Small riverboat access along Scottie and Desper Creeks.
- Riverboat access along the Nabesna River.
- Small riverboat access along the Nabesna and Chisana rivers.
- Riverboat access along the Tanana River and for several miles up the Kalutna River.
- Small riverboat access along the Chisana River.
- Possible access overland and along Mirror Creek through Canada.

## **Trail Access**

- The 17B easement trail near milepost 1285 may be too wet to be passable during fire season. The Northway to Nabesna winter trail will likely be too wet to use for access during fire season.
- The Airs Hill trail may provide limited ATV access with prior approval.
- The Northway to Nabesna trail is impassable during fire season.

## **Air Access**

- Helicopter transport
- Float plane transport for areas near larger lakes

## **4. Wildland Fire Operational Guidance**

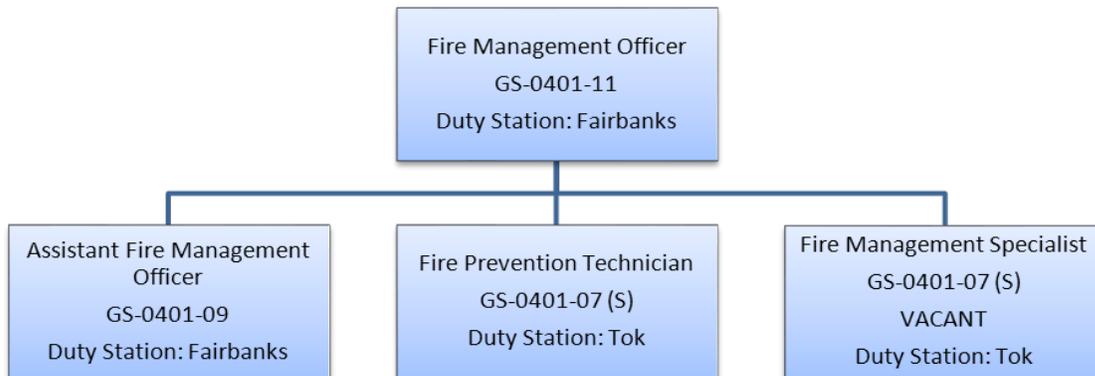
The national policy and procedure guidance in the current edition of the *Interagency Standards for Fire and Fire Aviation Operations*,<sup>2</sup> (Red Book) is incorporated into this plan, and must be followed. Alaska operational guidance for the management of fires is located in the Alaska Interagency Annual Operating Plan (AOP). Guidance that is more specific can be found in AK-DOF's *Annual Tok Area Fire Preparedness Staffing & Action Guide*.

### **4.1. Management of Wildfires**

Initial response to Refuge fires will be carried out according to the procedures and guidelines in the *Alaska Interagency Wildland Fire Management Plan* (AIWFMP). All wildfire management decisions will include consideration of risks to public and firefighter safety, threats to the values to protect, costs of various mitigation strategies and tactics, and potential wildfire benefits.

### 4.1.1. Staffing

The Eastern Interior Refuges District includes Tetlin Refuge, along with Arctic, Kanuti, and Yukon Flats Refuges. The District shares fire management staff duty stationed in Tok and Fairbanks. All positions are currently funded through the Kanuti cost center.



**Figure 11: Eastern Interior Refuges fire management staffing**

The Fire Management Officer (FMO), duty stationed in Fairbanks, is supervised by the Kanuti Refuge Deputy Manager. Refuge Managers from each of the Eastern Interior Refuges delegate specific fire management duties and responsibilities to the FMO (**Appendix G**). In addition, the incumbent takes an active role in fire management activities on the refuges, cooperating and coordinating with the appropriate protection agency - Alaska Division of Forestry (DOF) for Tetlin, and Alaska Fire Service (BLM-AFS) for the other three refuges, as well as with incident management teams (IMTs). The FMO is responsible for providing refuge managers with up to date fire information and for advising them on fire management decisions.

The Assistant Fire Management Officer (AFMO) is also duty stationed in Fairbanks, assists with overall program management, and serves as acting FMO when the FMO is assigned to fires or otherwise absent. The AFMO and FMO rotate duty officer responsibility during the fire season.

The Fire Management Specialist, duty stationed in Tok, is currently vacant. The incumbent is primarily responsible for coordinating fuels reduction projects, managing agreements in order to accomplish treatments, and field supervision of the Fire Prevention Technician (FMO retains official supervisory duties).

The Fire Prevention Technician duty stationed in Tok works closely with the Tok Area DOF counterpart to implement refuge specific prevention and outreach efforts and assist with local Community Wildland Fire Protection Plan (CWPP) efforts. The incumbent has primary responsibility for maintenance of the Refuge cache and Type 5 engine.

Due to limited fire program staffing, most prescribed fire and mechanical fuels treatments require outside assistance. Qualified Service personnel from other Refuges and programs, interagency partners, and assistance agreement cooperators play key roles in treatment accomplishment. Fire program and other qualified personnel may be available for Local, Regional and National fire assignments with supervisory approval.

The Regional Office in Anchorage has a fire management staff to assist the Refuge with fire ecology and fire research needs, fire planning, outreach and public information, and fuels

management. Regular communication between Refuge staff, the Regional Fire Coordinator, and other Regional fire program staff provide for two-way information flow between the Refuge, the Region, and other Regional fire programs.

#### **4.1.2. Training and Qualifications**

Refuge personnel will meet *National Interagency Incident Management System Wildland Fire Qualification System Guide, PMS 310-1* training, experience, and fitness levels for prescribed fire and suppression positions. All personnel funded with fire funds who are hired under a position description containing firefighting duties will meet PMS 310-1 requirements for the appropriate fire position. Individuals will not be assigned to duties for which they lack training and qualification. All personnel hired as primary firefighters must meet the arduous fitness standard to maintain full fire funding and if the position is career status, arduous is required to meet special retirement considerations for fire. Additional training policy and guidance is available in the *Interagency Standards for Fire and Fire Aviation Operations* and in the *U.S. Fish and Wildlife Service Fire Management Handbook*.

##### **4.1.2.1. Incident Qualifications and Certification System**

The Eastern Interior Fire Management Officer is responsible for input and maintenance of all pertinent Refuge employee data into the Incident Qualifications and Certification System (IQCS), and for ensuring that employees are trained, qualified, and certified at levels which meet preplanned needs for appropriate management response, initial attack and prescribed fire, and for ensuring the accuracy of annual Incident Qualification Cards.

The Eastern Interior FMO has been delegated the duties of the Certifying Official from the Refuge Manager (**Appendix G**), and confirms through the issuance of an incident qualification card that an individual is qualified to perform in a specified position. The Incident Qualification Card has a currency of 12 months. Current fire qualifications for fire program and collateral duty employees will be documented annually in the Refuge Preparedness/ Dispatch Plan (**Appendix C**).

Only PMS 310-1 and USFWS specific positions are approved for use by agency employees. IQCS Account Managers will proactively maintain organization codes for which they are responsible. Employees that are no longer employed by the FWS should be placed in INAC upon termination of duty.

##### **4.1.2.2. National Incident Management System (NIMS) Training Requirements**

Service personnel, who may become involved in emergency response activities, including wildland fire, are required to meet minimum training requirements established by the Department of Homeland Security in order to be NIMS compliant. Information regarding specific position requirements is outlined in the Service NIMS required training memorandum from the Director dated December 5, 2008 and the DOI Bulletin dated May 31, 2007.

### 4.1.2.3. Interagency Fire Program Management (IFPM) Requirements

Service personnel in IFPM covered positions must meet the NWCG qualification and additional required training requirements identified for their positions. Minimum qualification standards for Eastern Interior Fire Management positions is as follows:

Position	IFPM Position Standard	IFPM Complexity
Fire Management Officer	Unit Fire Program Manager	Moderate
Assistant Fire Management Officer	Wildland Fire Operations Specialist	Low
Fire Management Specialist	Prescribed Fire Fuels Specialist	Low
Fire Prevention Technician	N/A	N/A

Information regarding specific position requirements is available at <http://www.ifpm.nifc.gov/>.

### 4.1.2.4. Physical Fitness and Conditioning

Employees serving in wildland fire positions that require a fitness rating of arduous as a condition of employment are authorized one hour of duty time each work day for physical fitness conditioning. Employees not having a fitness rating of arduous as a condition of employment, but who are required by a Critical Performance element or other written agreement to maintain an arduous level, will be authorized three hours per week of duty time for physical fitness condition. All other wildland firefighting personnel holding qualifications requiring ratings of moderate or arduous may be authorized, by their supervisor, up to three hours per week of duty time for fitness conditioning. Prior to any duty time being allowed for physical fitness conditioning, employees and supervisors must agree, in writing, what physical conditioning activities the employee will engage in, and when and where they will occur (**Appendix K**). Activities outside of the agreement will not be authorized or allowed. A combination of activities designed to increase both physical strength and aerobic fitness, while minimizing the possibility of physical injury, should be utilized.

### 4.1.3. Preparedness

Annual preparedness activities are documented in the *Eastern Interior Refuges Preparedness/Dispatch Plan* (**Appendix C**).

#### 4.1.3.1. Delegation of Authority to Fire Management Officer

The Refuge Manager will annually provide the Fire Management Officer a written delegation of authority to perform fire management duties for the Refuge. See (**Appendix G**).

#### 4.1.3.2. Preparedness Planning

The Refuge Fire Preparedness Level will be determined by Tok Area DOF and will be based on the criteria established in the current year *Tok Area Fire Preparedness Staffing and Action Guide*. Regional and National preparedness levels will be as identified in the AICC Daily Situation Report, and the NICC Situation Report respectively. The *Eastern Interior Refuges Preparedness/Dispatch Plan* (**Appendix C**) will identify step up actions to be taken when these preparedness levels change.

#### **4.1.3.3. Equipment and Supply Levels**

The Refuge maintains a Hazard Fuels funded engine and a five person fire cache for the support of prescribed fire and other fuels reduction activities. The engine and cache are also available for support of initial attack response to wildfires when requested by AK-DOF. The standard equipment inventory is maintained in the *Eastern Interior Refuges Annual Preparedness/Dispatch Plan (Appendix C)*.

#### **4.1.3.4. Communications**

All Wildfire radio communication for Refuge and other Tok Area fires will take place on the Alaska DOF radio network. Prescribed fire and other fuels project communications will normally be conducted on the Refuge radio network; however, interagency projects and communications with Tok Area Interagency Dispatch Center will occur on the Alaska DOF network. Telephone contacts and radio channel plans appear in the *Eastern Interior Refuges Annual Dispatch/Preparedness Plan (Appendix C)*

#### **4.1.3.5. Aviation Management**

The Refuge aviation program primarily supports resource missions and is not under fire management control. Refuge aircraft may sometimes be used to perform fire related missions including detection, fire reconnaissance, and logistical support at the request of the protection agency. Air crew and passengers will be appropriately briefed prior to performing fire related missions. All fire-related aviation operations will follow applicable guidelines of the DOI National Business Center - Aviation Management Directorate. All fire-related Refuge aviation activity will coordinate with the DOF Tok Area Dispatch Center.

Refuge personnel performing fire-related aviation missions in cooperator aircraft will meet DOI standards and will additionally comply with cooperator policy and procedures when they are more stringent than DOI policy.

#### **4.1.3.6. Fire Detection**

Detection services for the Tok Fire Management Area including the Refuge are the responsibility of the protection agency – Tok Area DOF. Fixed-wing detection aircraft are normally contracted from a local operator. Detection flights are scheduled based on area lightning detections and fire danger rating, and are often combined with reconnaissance of ongoing fires. At the request of Tok Area DOF, refuge aircraft and/or personnel may be used to perform detection missions. An aircraft resource order/ request number (A-number) will be issued by the local dispatch center if the refuge is charging flight time to the detection flight or a specific fire.

#### **4.1.3.7. Initial Report of Fire and Initial Response Dispatching**

The Tok Area Interagency Dispatch Center (AK-TASC) will be responsible for initial attack dispatching on all refuge fires occurring between May 1 and August 15. During this period, the Center will operate from 08:00 to 18:00 hours, 7 days per week. Center season and hours will be extended as needed and an after-hours contact protocol will be included in the *Eastern Interior Refuges Annual Preparedness/Dispatch Plan (Appendix C)*. The Alaska Interagency Coordination Center (AICC) will be responsible for dispatching outside of AK-TASC's operating season.

Upon discovery of a fire, AK-TASC is responsible to determine, verify and document the incident location, management option, and cause, and implement the initial response based on the management option designation as described in the AIWFMP and mapped on the Map atlas maintained by AICC. Notification procedures are addressed in the AIWFMP and Clause 24 of the Alaska AOP and can be summarized as follows:

Fire notifications are required to the jurisdictional agency for any fires occurring on federal lands and Alaska Native village and regional corporations lands. A Wildland Fire Decision Support System (WFDSS) entry by the Protecting Agency, as described in **Section 4.1.4.6**, is required as part of the notification process. The following notification protocols will be followed:

- When a fire occurs on refuge lands, the Refuge FMO or Duty Officer will be notified promptly by phone or other pre-arranged contact method.
- When a fire occurs on non-Service lands but threatens to burn onto refuge lands, the Refuge FMO or Duty Officer will be notified.
- As a courtesy, the Refuge FMO or Duty Officer should be notified when a fire occurs within five miles of the Refuge ANILCA boundary.
- The Refuge FMO or Duty Officer will be notified of all false alarms and natural outs reported on Refuge lands.

All notification attempts should be documented. The notification process should not delay any initial response necessary within AIWFMP guidelines; however a non-standard response should not be initiated until the Refuge Manager or designee has been consulted, unless life or property are immediately threatened. AK-TASC will initiate WFDSS documentation for all Refuge fires and will transfer ownership to the Refuge FMO or Duty Officer. At a minimum, fire notification will include the following information:

- State Fire Number
- DOI Fire Number
- Fire Name
- Management Option
- Date and Time Fire Reported
- Geographic Coordinates (Latitude/ Longitude)
- Legal Description (¼ ¼ Section, Township, Range, Meridian)
- Current Size
- Fuels
- Values Threatened

Initial response to Refuge fires will be in accordance with the AIWFMP procedures. Non-Standard responses will be approved by the Refuge Manager unless threats to life or property preclude this. Non-standard responses will be documented through a decision in the WFDSS process.



- Assess potential management by suppression and/ or by wildfire for resource benefits as incident objective(s) and contact the DOF FMO with recommendations which will be relayed to the Refuge Manager.
- Use guidance in this FMP and/or a Delegation of Authority, implement selected response and manage an organization to implement effective strategies and tactics. Minimize suppression impacts where possible without reducing the effectiveness of the actions being undertaken.
- Determine resource needs and order as needed through local dispatch.
- Ensure that all resources assigned to the incident and those incoming receive a briefing and document these briefings. Refer to the Briefing Checklist in the IRPG.
- Continually re-assess incident complexity using the checklist in the IRPG. When a more qualified IC is needed, inform dispatch and delegated unit administrator and place the order for a higher level IC.
- Depending on incident complexity, additional responsibilities may apply. The NWCG Fireline Handbook provides a more detailed description of IC responsibilities.
- All resources, including mutual aid resources, will report to the IC (in person or by radio) and receive an assignment prior to tactical deployment.
- All Refuge fires must be investigated to determine fire cause, and if negligence or criminal intent were factors. If the IC suspects a fire cause is suspicious the point of origin will be protected and the Refuge Manager will be consulted regarding further investigative actions.

#### **4.1.3.9. Mutual Aid and/or Cross-Boundary Operations**

##### **4.1.3.9.1 *BLM AFS / Yukon 10 Mile Border Corridor Initial Attack Agreement***

This agreement allows protection agencies in Alaska and Canada to commence initial attack activity on any wildland fire within ten miles of either side of the border between the Alaska and the Yukon Territory.

##### **4.1.3.9.2 *Northwest Wildland Fire Protection Agreement (Northwest Compact)***

Canadian resources may be ordered by DNR under the terms of the *Northwest Wildland Fire Protection Agreement* (Northwest Compact). While in Alaska, those resources must remain under the operational control of DNR unless inspected and certified by the appropriate federal agency.

##### **4.1.3.9.3 *AK DOF / Tok Volunteer Fire Department (Tok VFD)***

Under the terms of an agreement between the Tok Area DOF and the Tok Volunteer Fire Department, VFD resources may respond to Tok Area fires without a resource order during the first six hours of the incident. After six hours a resource order will be required. It is unlikely

that VFD resources will respond to Refuge fires under this agreement due to the distance of the Refuge from the VFD response area.

#### **4.1.4. Incident Management**

##### **4.1.4.1. Dispatching Beyond IA**

The IC will notify AK-TASC whenever it appears a fire will escape initial attack efforts, cross Service boundaries, or when fire complexity will exceed the capabilities of command or operational forces. When additional resources are needed, they will be ordered through the AK-TASC, which will mobilize any additional resources, including higher level ICs and Incident Management Teams.

AK-TASC or the Tok Area DOF FMO will notify the Refuge Duty Officer who will notify and provide technical assistance to the Refuge Manager through the decision making process:

- Assisting the Refuge Manager to complete a WFDSS analysis.
- Assisting the Refuge Manager to complete a Delegation of Authority for Type 3 and higher complexity incidents.

##### **4.1.4.2. Delegation of Authority to Incident Commander (IC)**

The Master Agreement will serve as the Delegation of Authority from the Refuge Manager to Tok Area DOF to implement initial response activities in accordance with the AIWFMP. A written delegation will be developed jointly by the Tok Area DOF FMO and the Refuge Manager with the assistance of the Eastern Interior FMO for All Type 1, 2, and 3 complexity fires. The delegation will be jointly signed by the Tok Area DOF FMO and the Refuge Manager.

Tok Area DOF and Tetlin NWR will participate in IMT in-briefings to provide information on local issues, personnel, facilities and identify key representatives. Tok Area DOF will authorize and provide oversight for incident resources regardless of the complexity level and will assign a liaison to out-of-state IMT Type 1 & 2. Tetlin NWR may assign Resource Advisors and/or an Agency Administrator Representative.

Tok Area DOF and Tetlin NWR will be given timely notification and will participate in IMT closeouts. Each agency may contribute to the written evaluation of IMTs' performance in the implementation of the direction contained in the Delegation of Authority. Lessons learned will be included as an Interagency Fall Fire Review agenda item. IMTs will be provided written After Action Reviews.

See the current Red Book for supporting guidelines including an Agency Administrators Briefing to an IMT. **Appendix H** displays a Sample Delegation of Authority from Agency Administrator to Incident Management Team.

##### **4.1.4.3. Minimum Impact Suppression**

See minimum impact suppression guidelines (**Appendix E**).

- Retardant use on refuge lands other than to mitigate an immediate threat to human life must be authorized by the Refuge Manager on a case by case basis. Any use is subject to minimum impact suppression guidelines (**Appendix E**).

- All-terrain Vehicle (ATV) and All-terrain Utility Vehicle (UTV) use on refuge lands other than to mitigate an immediate threat to human life must be authorized by the Refuge Manager on a case by case basis. Any use is subject to minimum impact suppression guidelines (**Appendix E**).
- The use of fireline explosives on refuge lands must be authorized by the Refuge Manager on a case by case basis.
- The use of bulldozers, excavators, or other heavy equipment on refuge lands other than to mitigate an immediate threat to human life must be authorized by the Refuge Manager on a case by case basis. Any use is subject to minimum impact suppression guidelines (**Appendix E**).

#### 4.1.4.3.1 *Reporting Requirements of Wildland Fire Chemicals into Waterways*

Any fire chemicals aerially applied into a waterway or within 300 feet of a waterway require prompt upward reporting to incident management and the Refuge Manager. Notifications will also be made for any spills or ground applications of fire chemicals into waterways or with potential to enter the waterway.

If it is believed that fire chemicals have been introduced into a waterway, personnel should immediately inform their supervisor. The incident or host authorities must immediately contact appropriate regulatory agencies and specialists within the local jurisdiction.

#### **4.1.4.4. Resource Allocation and Prioritization**

Initial Attack priorities will be based on the following:

- AIWFMP Management Option
- Values at risk
- Resource Availability

Fire resources will be allocated and prioritized based on procedures outlined in the Alaska Statewide Annual Operating Plan. Under Alaska Preparedness Levels 1-3, the Protecting Agencies' fire operation leads set resource allocation priorities; under Preparedness Levels 4 and 5, the AMAC determines those priorities. Reference AMAC Handbook:

<http://fire.ak.blm.gov/administration/mac.php>

and Alaska Preparedness Levels in the AIMG:

<http://fire.ak.blm.gov/logdisp/aimg.php>

#### **4.1.4.5. Regulatory Compliance for Managing Unplanned Ignitions**

NEPA analysis is not required for wildfires because they are unplanned events. Suppression activities are Categorical Excluded from NEPA (516 DM 8.5(5)).

No endangered species or critical habitat on the Refuge are likely to be impacted by wildland fire or by fire management actions; however, restrictions may be placed on suppression aircraft

flyover altitudes of certain waterfowl and raptor nesting areas depending upon time of year and amount of flyovers required.

Smoke assessments are the responsibility of both Tok Area DOF and Tetlin NWR. The need for air resource advisors is increasing and additional technical expertise for addressing air quality and health related issues may be available through the DEC. The AWFCG-approved “Smoke Effects Mitigation and Public Health Protection Protocols” are available at:

<http://fire.ak.blm.gov/administration/awfcg.php>.

For current smoke information, forecasts, regulations, advisories, and educational materials, refer to the DEC website:

<http://www.dec.state.ak.us/air/anpms/index.htm>.

The *Alaska Enhanced Smoke Management Plan for Planned Fire* (ESMP) was developed by DEC in coordination with the AWFCG Air Quality Committee. The ESMP and its appendices are located at:

[http://fire.ak.blm.gov/administration/awfcg\\_committees.php](http://fire.ak.blm.gov/administration/awfcg_committees.php).

The ESMP outlines the process and identifies issues that need to be addressed by DEC and federal and state agencies or private landowners/corporations to help ensure that prescribed fire activities minimize smoke and air quality problems. The ESMP Appendices provide additional assistance for interagency sharing of information, the applicability and availability of current smoke management techniques, monitoring protocol, public education strategies, and emission reduction techniques.

#### **4.1.4.6. Use of Decision Support Tools**

Decisions for extended response, non-standard responses and escaped prescribed fires will be documented using the Wildland Fire Decision Support System (WFDSS), and will support the objectives listed in the AIWFMP and the Refuge Fire Management Plan. Tok Area DOF will initiate the WFDSS process by entering the required information into the Incident Information tab within the WFDSS program. Tok Area DOF will transfer the “ownership” as defined within WFDSS to the refuge WFDSS contact; both Tok Area DOF and the Refuge will work collaboratively to complete documentation as required. For all incidents:

- Public and firefighter safety issues will continue to be the primary consideration.
- Tok Area DOF and the Refuge will jointly complete a complexity analysis or operational needs assessment to determine the management level of the incident.
- Tok Area DOF will authorize and provide oversight for all incident resources regardless of the complexity level.
- Operational guidelines for special management considerations are contained in the AIWFMP and in this FMP.
  - No retardant will be used on federal lands without prior approval of the agency administrator unless there is an immediate threat to life.
  - Each agency’s structure and site protection policies will be reviewed and applied as directed by the Refuge Manager and based on priorities, the overall statewide fire situation and resource availability.

- IMT in-briefings and close-outs will be conducted jointly with Tok Area DOF as the lead.

Approval authority for WFDSS decisions rests with the Refuge Manager. Tok Area DOF may develop and implement incident tactics based on verbal approval from the Refuge FMO or Refuge Manager while WFDSS approvals are being finalized. WFDSS decisions exceeding two million dollars will additionally require BLM approval of costs with a CC to the FWS Region 7 Fire Management Coordinator. Tok Area DOF will notify the Refuge when costs are approaching approval thresholds.

#### **4.1.4.7. Wildfire Reporting Requirements**

Accurate and timely completion of the Incident Status Summary is a critical factor in the allocation of available resources during multiple fire situations. The information included on the form often determines the priority of a given fire, and thus its share of the resources available.

Reports are generally required for incidents where life and/or real property are threatened or destroyed, on incidents with high resource damage potential, and complex incidents that could have political ramifications. Reports are filed on a daily basis until the incident is declared controlled. In addition to the national standard, Alaska requires an Incident Status Summary (ICS 209) for all fires (whether in Critical, Full, Modified or Limited) that have a commitment of 17 or more personnel for more than one burning period (overnight). ICS 209s are the primary source of Alaska fire activity information for national fire managers. Zone AK-TASC is responsible for completing ICS 209s in the event that the Incident Commander fails to submit one. Alaska ICS-209's should be submitted by 10:00 p.m. (2200 hrs.) Alaska DST.

The Alaska Interagency Coordination Center may also request ICS 209s for other fires not covered by the above criteria as determined by the Predictive Services section. Managers determine the allocation of firefighting resources on a national basis. ICS 209s are therefore an essential element in our ability to obtain national resources such as smokejumpers, airtankers, helicopters, and type 1 crews.

Fires with Resource benefit acres will be documented in the National Fire Plan Operations and Reporting System (NFPORS) by the FMO. For all wildland fires, a Fire Management Information System (FMIS) report will be submitted by the Refuge FMO within five days of receiving the final fire report from AICC or the burn boss.

#### **4.1.4.8. Suppression Damage Repair**

Repairing the impacts of suppression activities is the responsibility of the Incident Commander and is funded by the wildfire account. Such work should be completed by incident resources prior to final demobilization whenever practical. However, it may be more cost-effective and practical to delay repairs to improve the probability of success. It is the responsibility of the Refuge Manager/line officer to ensure that suppression activity damage repair is completed.

Repair of suppression damage can include:

- Removing all trash from incident facilities, work areas and firelines,
- Replace soil dug from any trenched firelines to refill them to level; add water bars as needed,

- Fell and buck up hazardous trees and snags,
- Flush cut all stumps as close to ground level as practicable,
- Roll back and compact sod and peat overturned by plowing (with a grader or by hand) to preserve native grass rootstock and reduce thawing of permafrost by retaining the insulative properties of the vegetation mat.

#### **4.1.5. Emergency Stabilization (ES)**

Natural recovery is the preferred choice for recovery following unplanned ignitions. However, when natural recovery is not likely, ES treatments may be needed to prevent further degradation of cultural and natural resources in the burned area and downstream influence areas from erosion and invasion of undesirable species. ES uses emergency appropriations and activities must be completed within one year of fire containment. An IC may initiate ES actions before the fire is demobilized, as delegated by the agency administrator. Emergency stabilization activities were not used in Alaska until after the 2004 fire season. The Regional Fire Ecologist will be the primary contact person for ES activities in Region 7 and should be consulted if a plan is anticipated.

##### **4.1.5.1. ES Planning and Post-Fire Assessments**

Because of the emergency nature of the fire event, the Emergency Stabilization Plan (ES) must be developed expeditiously and is frequently developed by a local unit or designated burned area Emergency Stabilization Rehabilitation (ESR) team. The Refuge Manager/Line Officer is responsible to order or assign teams to develop ES plans. The first step in developing a plan is to review available data about the fire and affected resources. Field inspections will likely be necessary to assess values at risk as a result of the fire. The Refuges/unit may not have sufficient expertise to conduct burned area assessments; resource specialists from cooperating units or from the Region may be needed to assist in developing a plan.

The ES Plan specifies treatments approved to implement post-wildfire emergency stabilization on a single incident. The plan specifies only emergency activities and treatments to implement within one year of wildfire containment, although emergency stabilization funding can be used for up to three years following containment of the fire in order to monitor treatment effectiveness or to replace/repair emergency stabilization treatments if failure to do so would imperil watershed functionality or result in serious loss of downstream values. Funding beyond the first year requires an approved amendment to the plan. Funding beyond the first year cannot be used to continue seeding, plantings, or invasive plant treatments. The plan must be completed within seven calendar days of wildfire containment and approved within six business days of receipt by the approving office. An interdisciplinary team prepares this plan during or immediately after wildfire containment. Information and a plan template are at:

<http://fire.r9.fws.gov/ifcc/esr/home.htm>.

A DOI Memo (September 5, 2007) states that “all Emergency Stabilization planning must adhere to Department of the Interior policy (620 DM 3.6.B) requiring that standard treatments are to be used that have been validated by monitoring data from previous projects, or when there is documented research establishing the effectiveness of such actions. All plans must justify proposed treatment(s) with existing research or monitoring documentation that demonstrates that

the proposed treatment(s) are significantly more effective in achieving the emergency stabilization objective than natural recovery...” Reports of previous stabilization efforts in Alaska can be consulted for information about techniques.

#### **4.1.5.2. ES Post-Wildfire Issues and Values to Protect**

Wildfire damage to improvements is a concern. Developments are typically protected from fire damage, but dispersed improvements such as fences, public use facilities, and gates are likely to be damaged by severe or large fires.

ES actions likely to be needed deal with erosion, invasive plant infestation, or loss of sensitive and protected species habitat or native vegetation post-fire, as identified in 620 DM 3, include

- 3.7 M (2) placing structures to slow soil and water movement,
- 3.7 M (7) seeding or planting to prevent permanent impairment of designated Critical Habitat for Federal and State listed, proposed or candidate threatened and endangered species,
- 3.7 M (10) direct treatment of invasive plants,
- 3.7 M (12) monitoring of treatments and activities for up to three years.

Few invasive plants have been documented on the Refuge, but they are spreading throughout the state. Disturbed areas, such as burns, provide a favorable substrate for establishment of invasive plants. Invasive plants are associated with areas of human activity (e.g., trails, roads, cabins, airstrips), so these areas are likely seed sources. Fire crews, particularly those from outside the state, may import seeds of non-native, invasive plants on clothing and equipment. Helicopter buckets and tanks, and Canadair CL2-15 tanks are required to be cleaned prior to scooping water in Alaska to prevent the spread of aquatic invasive species. ES funds can be used to control invasive plants only if an approved management plan and existing program are in place addressing non-native invasive species control. It is allowable to conduct assessments to determine the need for treatment if there are known infestations, possibility of new infestation due to management actions, or there are suspected contaminated equipment use areas. Systematic inventories are not allowed under ES funding. See the 2006 Interagency Burned Area Emergency Response Guidebook for additional information ([http://www.fws.gov/fire/ifcc/esr/Policy/es\\_handbook\\_2-7-06.pdf](http://www.fws.gov/fire/ifcc/esr/Policy/es_handbook_2-7-06.pdf)). The Alaska Exotic Plants Information Clearinghouse (AKEPIC; <http://aknhp.uaa.alaska.edu/botany/akepic>) provides information about invasive plants, including species information, known location of infestations, and field data sheets.

Cultural resource sites, including prehistoric ones, can be exposed after fire removes vegetation and thick organic layers. Exposure of these sites can lead to loss of important artifacts and further degradation. The regional archaeologist should be contacted if you think cultural sites may have been exposed by fire. Efforts should be concentrated on known or suspected cultural sites; systematic inventories or surveys are prohibited.

Trail systems on the Refuge serve as more than a platform for recreational activities; winter trails are often primary inter-village transportation routes. Hazard trees can obstruct trails, making

travel difficult or impossible. It is not allowed to use ES funds to improve a trail to a standard above its pre-fire condition.

#### **4.1.5.3. ES Treatment Maintenance and Monitoring**

Treatment monitoring protocols and maintenance requirements will be specified within individual ES plans. The Regional Fire Ecologist can help with developing these plans. See **Section 5.2** for an overview of effects monitoring.

#### **4.1.5.4. ES Reporting Requirements**

Annual accomplishment reports are required for ES activities, and accomplishment reports including treatment and activity information are also required in the National Fire Plan Operations and Reporting System (NFPORS). A Final Accomplishment Report documenting all accomplishments, implementation costs, and monitoring results will be archived in the Refuge project files with electronic copies sent to the RFMC and Branch of Fire Management in Boise, Idaho, no later than 3 years and 60 days following wildfire containment. The Eastern Interior FMO will be responsible for initiating ES reports and entering accomplishments in NFPORS prior to October 1 of the fiscal year in which they occur.

#### **4.1.6. Burned Area Rehabilitation (BAR)**

Burned Area Rehabilitation activities are “undertaken within three years of containment of a wildland fire to repair or improve fire-damaged lands unlikely to recover naturally to management approved conditions or to repair or replace minor facilities damaged by fire” (620 DM 3.3M). Information on the BAR process can be found in the 2006 Interagency Burned Area Rehabilitation Handbook ([http://www.fws.gov/fire/ifcc/Esr/Policy/BAR\\_Guidebook11-06.pdf](http://www.fws.gov/fire/ifcc/Esr/Policy/BAR_Guidebook11-06.pdf)).

Rehabilitation treatments include only the following allowable actions:

1. Repair or improve lands unlikely to recover naturally from wildland fire damage by emulating historical or pre-fire ecosystem structure, function, diversity, and dynamics consistent with existing land management plans.
2. Chemical, manual, and mechanical removal of invasive species, and planting of native and non-native species, consistent with DM 3.8F, restore or establish a healthy, stable ecosystem even if this ecosystem cannot fully emulate historical or pre-fire conditions.
3. Tree planting to reestablish burned habitat, reestablish native tree species lost in fire, prevent establishment of invasive plants, and regenerating Indian trust commercial timberland as prescribed by a certified silviculturalist to not regenerate for ten years following the fire.
4. Repair or replace fire damage to minor operating facilities (e.g., campgrounds, interpretive signs and exhibits, shade shelters, fences, wildlife guzzlers, etc.). Rehabilitation may not include the planning or replacement of major infrastructure, such as visitor centers, residential structures, administration offices, work centers and similar facilities. Rehabilitation does not include the construction of new facilities that did not exist before the fire, except for temporary and minor facilities necessary to implement burned area rehabilitation efforts.

#### **4.1.6.1. BAR Planning**

A BAR plan is a document that specifies treatments required to implement post-fire rehabilitation policies; it is separate from the ES plan. A BAR plan may be developed at any time within three years from the containment date as long as work can be completed by the third anniversary of containment, but it will likely be developed in conjunction with the ES plan. BAR funds are competitive among DOI Bureaus. Refuge rehabilitation plans will be prepared by an interdisciplinary team of specialists; prior to developing a BAR plan, the refuge should consult with the regional fire ecologist. Information and a BAR plan template are at the DOI ESR website at <http://fire.r9.fws.gov/ifcc/esr/home.htm>.

#### **4.1.6.2. BAR Issues and Values to Protect**

Likely post-wildfire BAR issues on the Refuge include:

- The establishment of invasive species within the burned area
- Damage to existing trails
- Damage to interpretive signs and exhibits
- Damage to campgrounds

Partial lists of specific values to protect within the Refuge FMU can be found in **Section Error!** Reference source not found. Allowable actions concerning invasive species are similar to those allowed under ES funding. BAR funds cannot be used for restoration of any cultural resource or heritage site. Other issues correctable by any of the four allowable actions listed in **Section 4.1.6** may also merit BAR action.

#### **4.1.6.3. BAR Regulatory Compliance**

Two Categorical Exclusions (CX) may apply to BAR. The first is a DOI CX (516 DM 2, Appendix 1(1.13)) and the second is a FWS CX (516 DM 8.5(5)). When utilizing the FWS Categorical Exclusions, the Refuge/unit staff will complete and submit the most recent version of the NEPA Compliance Checklist (FWS Form 3-2185) with the BAR plan. Before using the DOI Cat X, consult with the Regional Office regarding its use.

BAR projects must comply with NHPA. Plans will be submitted to Regional archeologist for review and cultural / archeological clearance. To the greatest extent possible, project implementation will follow recommendations of the Regional archeologist and/or SHPO. BAR projects that may affect Threatened & Endangered species/their habitats must comply with Section 7 of the ESA. Any such projects will be submitted for Section 7 consultation.

Routine BAR operations on the Refuge will be conducted using non-motorized means to the extent practical. Motorized equipment may be used with Refuge Manager approval.

#### **4.1.6.4. BAR Monitoring Protocols**

Treatment monitoring protocols and maintenance requirements will be specified within individual BAR plans. The Regional Fire Ecologist can help with developing these plans. See **Section 5.2** for an overview of effects monitoring.

#### **4.1.6.5. BAR Contact Information**

In addition to the Eastern Interior FMO, Refuge biologists would be involved in creating and implementing a BAR plan. Assistance would also be sought from the Regional Fire Management Coordinator and the Regional Fire Ecologist. See the Communications section of the *Eastern Interior Refuges Annual Preparedness/Dispatch Plan* (**Appendix C**) for specific names and contact numbers.

#### **4.1.6.6. BAR Public Information and Public Concerns**

Meetings in Northway, Tetlin, and/or Tok to inform the public of planned activities, obtain input from local communities and neighbors, and identify issues needing further discussion and resolution should be held early in the BAR plan development process.

#### **4.1.6.7. BAR Reporting Requirements**

Reporting requirements for BAR are similar to those for ES treatments. An Annual Accomplishment Report is required for funding in years two and three. Detailed Annual Accomplishment Reports will be completed by fiscal year end to document actual accomplishments, costs and monitoring results. Reports will be kept in field unit project files, with a copy of the Annual Accomplishment Report sent to the Regional office and to the national office in Boise. Annual accomplishments are also summarized and reported in the NFPORS treatment/activity form. The final accomplishment report must be completed no later than 3 years and 60 days following containment of the fire. NFPORS Accomplishment updates are the responsibility of the Refuge FMO; they are to be completed by the 23<sup>rd</sup> of every month and at the end of the fiscal year until the project is shown as completed.

### **4.2. Management of Planned Fuels Treatments**

The Refuge's primary method of fuels reduction and habitat treatment is to allow wildfires to burn for resource benefit wherever possible. From 1986 through 2002, the Refuge conducted an active landscape scale prescribed fire program as authorized under the original 1987 CCP. Annual acreage targets were identified in the CCP, and landscape-scale prescribed fires were planned and implemented throughout this period. The 2008 CCP process identified Refuge and local concerns about the appropriateness of landscape-scale prescribed fire in an ecosystem identified as being relatively intact, and as having a functional natural fire regime. Treatment emphasis has shifted to appropriately scaled mechanical and prescribed fire treatments in the immediate vicinity of values at risk. Often these values are located off Refuge, and the bulk of Refuge fuels treatments are now planned and implemented on an Interagency basis and are located on State and private lands (**Map 6**). Potential treatment areas are identified in the Eastern Interior Multi-year Treatment Plan (**Appendix D**). Some projects are accomplished with Refuge force account labor, but most are carried out under agreements or contracts with the State, Village Councils, and/or private entities.

#### **4.2.1. Processes to Identify and Prioritize Hazardous Fuels Treatments**

Hazardous fuels reduction planning for the Tok Area, including the Refuge, is based on Community Wildfire Protection Plans (CWPPs) for local communities, and is accomplished on an interagency level. Partners include Tok Area DOF, Tetlin NWR, the Tanana Chiefs

Conference, and individual communities. Potential treatment areas are identified in the Eastern Interior Multi-year Treatment Plan (**Appendix D**) and are often located on State and private lands (**Map 6**). Refuge sponsored treatments will be identified in NFORS by April of the fiscal year prior to implementation.

#### **4.2.2. Prescribed Fire Project Implementation**

Prescribed fire implementation will follow the standards set forth in the *FWS Fire Management Handbook*, the *Redbook*, and the *Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide 2008 (Prescribed Fire Guide)*, which is available for download at [www.nifc.gov/fire\\_policy/rx/rxfireguide.pdf](http://www.nifc.gov/fire_policy/rx/rxfireguide.pdf).

##### **4.2.2.1. Prescribed Fire Planning**

Prescribed fires may be used to accomplish hazardous fuels objectives and land and resource management objectives in accordance with the Refuge CCP and will be carried out only under a written and approved Prescribed Fire Plan.

Hazardous fuels treatment projects must be identified in advance and entered into the National Fire Plan Operations & Reporting System (NFORS) for funding consideration.

All prescribed fire plans will comply with the Alaska Enhanced Smoke Management Plan, and will include monitoring for smoke impacts. Test fires will be used to assess smoke dispersal. When necessary and available, spot weather forecasts will be obtained the day of the burn to aid in decision making for implementation.

Project planning generally begins six to ten months in advance of implementation. Preparation of treatment areas may be assigned to qualified personnel or a contractor. If a project requires pre-burn preparation, this will be identified in the burn plan.

It is the responsibility of the Burn Boss to provide timely notification to and place orders with the AK-TASC and to adhere to the DEC open burn approval stipulations. AK-TASC will be notified daily of location planned ignition time and planned acreage; a point and method of contact will be established; and the contingency forces identified including their location and point of contact. The Burn Boss is responsible to order and inform the contingency forces of any planned burning and ensure their availability.

##### **4.2.2.2. Prescribed Fire Operations**

During the project, the Burn Boss will report acres burned to AK-TASC each evening so that the information may be included in the AICC Daily Situation Report. Billing procedures and charge codes will be established prior to orders being placed and included in the project plan. Extended hours for AK-TASC will be negotiated prior to ignition. Reimbursable costs may include required dispatch staffing beyond normal business hours, travel and transportation expenses, crew salaries, and other project expenses incurred by Tok Area DOF.

Ignition of prescribed fires is subject to National and Alaska Preparedness Levels. (Reference AIMG for Alaska Preparedness Level information.) Prescribed fires may be ignited during Regional or National Preparedness Levels 4 or 5 if requirements specified in the AIMG and the National Interagency Mobilization Guide are met.

Cooperators, contractors, and casual hires (AD) may be used to implement prescribed fires. ADs must meet FWS standards. Cooperators, such as members of Volunteer Fire Departments, must have appropriate qualifications certified by their agency. Those who supervise FWS employees during prescribed fires must meet *National Interagency Incident Management System Wildland Fire Qualification System Guide* (PMS-310-1) standards.

#### **4.2.2.3. Prescribed Fire Public Notification**

The public will be kept informed about the Refuge prescribed fire program through news releases, interpretive messages, and educational programs. Public notification of planned prescribed fire ignitions will be made according to the timeframes specified in the burn plan.

#### **4.2.2.4. Multiple Prescribed Fire Projects**

A burn boss may not manage multiple prescribed fires in non-adjacent burn blocks where ignition or active holding is being implemented.

#### **4.2.2.5. Prescribed Fire on State and Private Lands**

Refuge sponsored fuels projects on State and private lands may include prescribed fire treatments. Prescribed fires will be planned, conducted, and reported based on the policy of the Agency having operational control of the burn. The jurisdictional agency representative (i.e. mayor, 1<sup>st</sup> Chief) is the signing and responsible official for burn plans conducted on their lands.

#### **4.2.2.6. Prescribed Fire Conversions and Reviews**

If a Refuge prescribed fire is declared a wildfire, the Tok Area DOF FMO will assume operational control with the cooperation of the Burn Boss and burn resources. A wildfire number will be assigned and all wildfire management costs will be charged to that number. The same analysis and WFDSS decision support documentation that applies to all wildfires is required.

As dictated by individual agency policy, the Refuge Manager is responsible for conducting the appropriate level of investigation when a prescribed fire is declared a wildfire. The level and scope of the review will be determined by policy and procedures of the *Interagency Standards for Fire and Fire Aviation Operations* and the *FWS Fire Management Handbook*.

#### **4.2.2.7. Planning, Preparing and Implementing Non-Fire Hazardous Fuels Treatments**

Refuge sponsored fuels projects typically include mechanical treatments followed by prescribed fire (often pile burns). Emphasis is on appropriately scaled treatments in the immediate vicinity of values at risk. Often these values are located off Refuge, and the bulk of Refuge fuels treatments are now planned and implemented on an Interagency basis and are located on State and private lands. Some projects are accomplished with Refuge force account labor, but most are carried out under agreements or contracts with the State, Village Councils, and/or private entities.

As with prescribed fires, non-fire treatments must be identified in advance and entered into the National Fire Plan Operations & Reporting System (NFPORS) for funding consideration. Project planning generally begins six to ten months in advance of implementation. Preparation of treatment areas may be assigned to qualified personnel or a contractor.

## 4.2.3. Hazardous Fuels Treatment Regulatory Compliance

### 4.2.3.1. NEPA

Fire management activities were analyzed in the Refuge CCP. The FMP is a step-down plan based on that document and is in compliance with DOI's wildland fire management policy (Departmental Manual (DM) 620 1-2) and the National Environmental Policy Act of 1969 (NEPA). NEPA requires that the environmental effects of proposed major federal actions be considered in the decision-making process. Fire suppression activities are normally categorically excluded from this requirement (516 DM 2 and 16 DM 6). Prescribed fires and fuel reduction activities require completing an initial NEPA Compliance Checklist. This usually results in a categorical exclusion for the project (621 FW 2), but if necessary the project will require an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). Before implementing any fire management project, an EA or EIS will be prepared for those activities not categorically excluded.

### 4.2.3.2. Compliance with other Legislative Mandates

Refuge fire management activities must comply with all applicable laws including the Wilderness Act, the National Historic Preservation Act, the Wild and Scenic Rivers Act, the Endangered Species Act, the Alaska National Interest Lands Conservation Act (ANILCA), and the Clean Air Act.

Section 106 of the National Historic Preservation Act requires review of any project funded, licensed, permitted, or assisted by the federal government for impact on significant historic properties. The agencies must allow the State Historic Preservation Officer and the Advisory Council on Historic Preservation, a federal agency, to comment on a project. The Alaska Historic Preservation Act contains a provision similar to Section 106 ([A.S.] 41.35.070) which mandates that any project with state involvement be reviewed in a similar manner. For cooperative projects off Refuge lands the process may be initiated by the Service or the State.

Through the Section 106 review process, OHA staff work with federal and state agencies during the early stages of project planning to protect cultural resources. They do this by providing information on the location of sites and on cultural resources surveys previously done in an area. If the potential to discover unknown sites is high, a survey may be recommended. When there are sites in a project area, OHA consults with the agency on National Register eligibility, on how the project will affect sites, and on ways to lessen unavoidable damage. A copy of the Request for SHPO Section 106 Review (36 CFR 800) form appears in **Appendix I**.

### 4.2.3.3. Smoke

The *Alaska Enhanced Smoke Management Plan for Planned Fire* (ESMP) was developed by DEC in coordination with the AWFCG Air Quality Committee. The ESMP and its appendices are located at [http://fire.ak.blm.gov/administration/awfcg\\_committees.php](http://fire.ak.blm.gov/administration/awfcg_committees.php). The ESMP outlines the process and identifies issues that need to be addressed by DEC and federal and state agencies or private landowners/corporations to help ensure that prescribed fire activities minimize smoke and air quality problems. The ESMP Appendices provide additional assistance for interagency sharing of information, the applicability and availability of current smoke management techniques, monitoring protocol, public education strategies, and emission reduction techniques.

The AWFCG-approved “Smoke Effects Mitigation and Public Health Protection Protocols” are available at <http://fire.ak.blm.gov/administration/awfcg.php>. For current smoke information and forecast, regulations, advisories, and educational materials, refer to the DEC website <http://www.dec.state.ak.us/air/anpms/index.htm>.

By reference, this section incorporates the text of the Red Book related to Smoke Management and Air Quality and will follow recommendations of the latest edition of the *NWCG Smoke Management Guide for Prescribed and Wildland Fire*.

#### **4.2.4. Fuels Treatment Monitoring**

##### **4.2.4.1. Pre-treatment monitoring**

For prescribed fires, the Burn Boss will review current and forecast weather prior to Burn Day. On Burn Day morning, a spot weather forecast from the local National Weather Service will be requested that will include time periods to complete ignition and holding and immediate mop-up needs.

Prescribed fires and mechanical treatments may be monitored for pre-treatment condition using similar protocols to post-treatment effects monitoring described in Section 5.2. When followed up with post-treatment effects monitoring this has the benefit of allowing direct comparison of treatment states.

##### **4.2.4.2. Burn-day monitoring (Prescribed fire only)**

Burn day monitoring will document that the fire is within prescription. Weather variables typically monitored are dry bulb temperature, relative humidity, mid-flame wind speed and direction, and cloud cover. Measurements are taken immediately prior to test fire ignition and at intervals specified in the burn plan. Documentation of first order fire effects such as rate of spread, flame length, etc. are desired if personnel are available.

##### **4.2.4.3. Effects monitoring**

Treatment effects monitoring protocols and maintenance requirements will be specified within individual treatment plans. The Regional Fire Ecologist can help with developing these plans. See Section 5.2 for an overview of effects monitoring.

#### **4.2.5. Fuels Treatment Reporting Requirements**

##### **4.2.5.1. Prescribed Fire Reporting**

The burn plan is a primary report for an individual prescribed fire. In it, a Burn Boss will document fire and weather observations, actions and decisions, and assess attainment of project treatment objectives. A fire report must also be completed for the Service FMIS within one week of project completion.

##### **4.2.5.2. Non-fire Treatment Reporting**

Treatments completed under an agreement or contract typically have financial and accomplishment reporting requirements specified in the agreement or contract document. A treatment report must be completed for the Service FMIS within one week of project completion.

#### **4.2.6. Fuels Committees and other Collaborative Groups**

Hazardous fuels reduction planning for the Tok Area, including the Refuge, is based on CWPPs for local communities, and is accomplished on an interagency level. Partners include Tok Area DOF, Tetlin NWR, the Tanana Chiefs Conference, and individual communities. Consideration is given to the AWFCG Fuels Committee State-wide prioritization of communities, though this list is currently out of date and not considered to be a true reflection of priorities.

#### **4.2.7. Fuels Treatment Funding Processes**

The fuels funding process is based on the Eastern Interior Multi-year Treatment Plan (**Appendix D**). Potential projects and treatments for individual refuges are identified in the plan, approved by the appropriate Refuge Manager, and entered into NFPORS. Individual projects are capped at \$500,000 per year with no limit on the amount of treatments proposed. Projects are typically entered into NFPORS by April 1<sup>st</sup> of the year prior to funding.

Projects throughout the region are annually compared and prioritized according to FWS and DOI criteria. Project goals and objectives (i.e. WUI, Protects Treasured Landscapes, Hazardous Fuels, and Habitat) are extracted from NFPORS data entry and used in scoring the projects. The criterion for project scoring comes from the Office of Wildland Fire in negotiation with the DOI Bureaus and is subject to annual change.

The Region's program of work (POW) is usually fully developed by August, with room for nominal project substitution in September. Refuge units should have an estimation of funded projects at the start of the fiscal year.

#### **4.2.8. Debris Burning**

Debris burns may be implemented under State laws and regulations, and are not required to comply with prescribed fire requirements. In order to be exempt from prescribed fire requirements debris burners must:

- Burn no more than four piles at a given time.
- Limit pile size to less than 16' in diameter and 10' high.
- Have a valid State issued burn permit for the burn location and comply with its direction.
- Comply with all State laws and regulations pertaining to burning practices.

([AS 41.15.010-41.15-170](#) and [11 AAC95 Article 6](#)).

- Call Tok Area Forestry the day of the burn to confirm restrictions, suspensions, and closures are not in effect.

### **4.3. Prevention, Mitigation and Education**

#### **4.3.1. Wildfire Investigation and Trespass Policies**

The inadvertent or intentional ignition of wildland fuels by humans is illegal. Agency policy requires any wildfire to be investigated to determine cause, origin, and responsibility. All fires suspected of being human-caused will be investigated to the degree possible by the initial response Incident Commander. The Refuge Manager will be notified immediately of suspected

human-caused fire. The Refuge Manager will determine if the fire scene is to be formally investigated, and if so, will direct that an investigator be ordered. The Service will pursue any legal actions deemed necessary. When incidents impact multiple agencies lands, collections will be pursued jointly and cooperatively by each affected agency to the extent practical. The Incident Commander will:

- Locate and protect the point of origin of fire.
- Search for and protect evidence.
- Identify and document witnesses and other persons at fire scene (Name and contact information, if possible).
- Document observations, actions, and findings.

Wildland fire trespass refers to the occurrence of unplanned ignitions on Service lands where the source of ignition is tied to some type of human activity. Fire trespass is a legal/law enforcement activity and the appropriate local law enforcement authorities should be contacted and standard criminal and/or civil investigative procedures and reports used. The Red Book as well as the FWS Fire Management Handbook provides detailed information regarding investigation and trespass procedures.

#### **4.3.2. Prevention/Mitigation Program**

Since the establishment of the Refuge in 1980, 12 fires (or about 30% of the total) that have occurred on Tetlin Refuge managed lands have been human-caused. Recreational and subsistence users accounted for most of these human-caused starts. Most human-caused fire activity in the area is concentrated along the Alcan Highway and in proximity to populated portions of the Refuge around Northway.

To date, the Refuge has not had a formally established fire prevention program. Prevention and Firewise homeowner defensible space messages have been incorporated into fuels treatment agreements and outreach products whenever possible, but without planned goals and objectives. The Refuge relied primarily upon AK-DOF prevention officers for prevention services at Refuge facilities.

In FY 2012 the Refuge has established and filled a Prevention Technician position with the intent of establishing a formal prevention program for the Refuge. The Refuge Prevention Technician will work with AK-DOF, local communities, and other Refuge programs to develop and implement Refuge specific prevention goals and objectives.

It is intended that specific prevention goals and objectives will be presented in the 2013 review of this FMP. Wildland fire prevention activities outlined in the plan will be coordinated with interagency partners and with other Tetlin Refuge and Regional programs.

Fire prevention activities for 2012 will include:

- Daily updates to the fire danger display at the Refuge Visitor Center to reflect current fire danger.
- Fire prevention literature and brochures will be made available at Refuge public use sites.

- Training in fire prevention and reporting procedures will be provided to Refuge employees.
- Fire danger restrictions will be posted at Refuge campgrounds and facilities.
- Prevention staff will participate in local CWPP efforts.
- Prevention staff will monitor fuel moisture conditions in the local area.
- Prevention staff will coordinate with AK-DOF prevention personnel to provide a consistent prevention message in an efficient manner.
- Prevention staff will work with interagency partners and local communities to identify and prioritize areas in need of fuels mitigation treatment.
- Trail and/or area closures may be implemented by the Refuge Manager during periods of extreme fire danger.

#### **4.3.3. Education/Outreach Activities**

Informing the public is an important part of fire suppression, fire prevention, and the FWS mission. During wildfires occurring on Service lands coordination among agencies is crucial in communicating with the public about fire. The following language in the Alaska Statewide Annual Operating Plan provides direction on how this coordination will occur.

*The Protecting Agency and the Incident Management Team, when assigned, are responsible for the release of operational and public safety information to the media and public during the initial response to and during ongoing wildfires. The Protecting Agency and Incident Management Team will coordinate with the Jurisdictional Agency on the release of fire information, specific Jurisdictional Agency direction will be stipulated in the Delegation of Authority. Releases will be approved by the Incident Commander prior to release and copies distributed to all stakeholders. Jurisdictional Agency policy and messaging will be included when requested by the agency administrator. Policy questions will be referred to the Jurisdictional Agency. A suggested format for incident news releases can be found in the Alaska Statewide Annual Operating Plan appendix.*

The goal of Refuge fire management outreach efforts is to enhance knowledge and understanding of wildland fire management policies and fire effects through internal and external communication and education. Information about fire ecology and the differences between planned and unplanned ignitions will be incorporated into outreach programs and informal contacts. Information and education are critical to increasing support for prescribed fires. Education and outreach programs will include components of the nationally sanctioned FIREWISE program. Information about this program is available at [www.firewise.org](http://www.firewise.org).

Public education is an important Refuge mission. At every opportunity the fire management staff will actively develop and contribute to fire education efforts on the Refuge and incorporate fire education efforts within fire management activities. These activities have included, but are not limited to:

- Communicating information on the role of fire in the boreal forest. The Fire Information and Resource Education Program includes prepared teacher packets (the statewide Role of Fire In Alaska Curriculum) emphasizing the important role natural and prescribed fires

play in Alaska with particular regard to wildlife habitat enhancement. The packets include reference material and classroom activities for various grade levels. Fire effects field kits which include learning aids to supplement the curriculum are also available to be checked out. <http://alaska.fws.gov/nwr/visitor/fire/curriculum.htm>

- The Fire Management Slide Show and portable Fire Management Program display are used to provide information to the public. The Fire Management Program display is set up at the Tetlin National Wildlife Refuge Visitor Center, but is portable and can be taken to meetings or put on display elsewhere. There is also a permanent interagency fire management display at the Alaska Public Lands Information Center in Tok.
- Dispensing information on the Refuge and Service fire management program and educating the public on the role of fire in Alaska by the Refuge visitor center staff.
- Wildland fire interpretive displays are maintained at the Refuge Visitor Center and at Kiosk locations along the Alaska Highway.
- Maintaining a library of fire education materials on the refuge headquarters.
- Supporting the GLOBE Protocol learning initiative (<http://classic.globe.gov/>)
- Supporting local and national interagency fire prevention efforts by participating in local carnivals and fire prevention meetings (i.e. Firewise)
- Facilitating the attendance of Refuge fire management and public education personnel at fire education and scientific conferences

## 5. Monitoring and Evaluation

Monitoring and evaluation are the functions used to determine if the FMP is being implemented as planned to meet its goals and objectives as well as to determine whether the goals, objectives, strategies, and procedures outlined in the FMP and other plans remain relevant. Wildland fire is one of the primary sources of disturbance on the Tetlin Refuge. As such, it is integral to the management of the refuge's wildlife and plant communities. Through monitoring and evaluation methods, we seek to better understand the relationships between fire and other refuge resources. Monitoring also helps us improve our WUI and Hazardous fuels treatment techniques, and provides documentation to show how we address our performance measures.

This chapter is divided into two primary sections:

- Fire Management Plan Monitoring - covers the five management components in this fire management plan, and provides guidance to insure that our actions within these areas meet the goals of the Refuge and are in compliance with other national and service policies.
- Effects Monitoring - focused on the ecological effects that result from fire management activities on the Refuge.

## **5.1. Fire Management Plan Monitoring**

### **5.1.1. Annual FMP Review**

The Fire Management Plan is monitored for compliance with the National Fire Plan and resulting performance standards, National Wildlife Refuge System, Wildland Fire Management Program Strategic Plan, Alaska Interagency Wildland Fire Management Plan, compatibility with refuge plans, support of the applicable National Wildlife Refuge promises, and national and region policies of the Fish and Wildlife Service.

FMPs are intended to be dynamic and reflect current situations and policies; therefore, to maintain currency, FMPs must be reviewed each year using the nationally established annual review process (**Appendix F**). Plans must be revised when significant changes occur or substantial changes in management are proposed. Minor plan revisions may be accomplished through an amendment added to the plan and signed by the Refuge Manager and Eastern Interior Fire Management Officer. Major scheduled revisions to fire management plans will follow the 15 year Comprehensive Conservation Plan revision cycle to provide consistency in objectives and management strategy formulation. Major revisions are reviewed by the Regional Fire Management Coordinator and approved by the Region 7 Chief of Refuges. Without a current FMP, prescribed fires cannot be conducted and response to unplanned ignitions can only consider suppression strategies. Preparedness and prevention activities can continue in the interim period as outlined in the expired plan. All new FMPs and those needing revisions due to significant change in land use or other circumstances will use the most recent Interagency Fire Management Plan Template and apply the most recent Service-specific guidance.

The following partners should be given the opportunity to review major revisions to the FMP:

- Bureau of Land Management, Alaska Fire Service
- Alaska Department of Natural Resources, Division of Forestry.
- Northway Village Council
- Northway Native Corporation
- Tetlin Village Council
- Tetlin Native Corporation
- Doyon Native Corporation
- Tanana Chiefs Conference

### **5.1.2. Preparedness/Step-up Plan Review and Update**

The Refuge Preparedness/Step-up Plan will be reviewed annually, and updated as necessary.

### **5.1.3. Fire Management Options Review and Update**

A review of refuge Fire Management Options will be completed annually by March 1. Changes will be submitted in accordance with procedures outlined by the AIWFMP. Mid-season Management Option boundary changes will rarely be necessary but may be accommodated as outlined in the AIWFMP.

### 5.1.1. Known Sites Review and Update

A review of known sites on the Refuge and their default protection level will be completed annually by April 1. Changes will be submitted in accordance with procedures outlined by AWFCG.

## 5.2. Effects Monitoring

Effects monitoring can apply to all aspects of the fire program that involve changes on the ground. The goals of effects monitoring may include the following:

- Develop data that helps quantify the relationship of fire with Refuge resources.
- Develop data that helps quantify fire effects associated with a specific vegetation/fuel type in order to improve predictive capabilities for modeling fire distribution, spread, and behavior.
- Evaluate the effectiveness of a treatment (prescribed fire, mechanical treatment, or suppression action) in order to determine whether objectives have been met.
- Document unexpected treatment results.

This FMP outlines four management components that may require some level of effects monitoring and evaluation:

- Wildfire
- Prescribed fire
- Non-fire fuels treatment
- Emergency stabilization and rehabilitation

Similar monitoring methods and protocols can be applied to each of these activity types. The following sources are available for guidance if a post-fire monitoring program is implemented:

- AWFCG Fire Effects Monitoring Protocol. Contains Alaska-specific guidance. [http://fire.ak.blm.gov/administration/awfcg\\_committees.php](http://fire.ak.blm.gov/administration/awfcg_committees.php) or <http://frames.nacse.org/5000/5585.html>
- FWS Fuel and Fire Effects Monitoring Guide. <http://www.fws.gov/fire/downloads/monitor.pdf>
- National Park Service Fire Monitoring Handbook. [http://www.nps.gov/fire/download/fir\\_eco\\_FEMHandbook2003.pdf](http://www.nps.gov/fire/download/fir_eco_FEMHandbook2003.pdf)

For wildfires and prescribed fires, an evaluation of burn severity can provide a useful measure to understand fire effects and to predict vegetation response. For long-term monitoring sites detailed information on burn severity should be collected (for example the Composite Burn Index protocols by NPS <http://fire.org/firemon/lc.htm> or [burn severity transects described in the FETG Fire Effects Monitoring Protocol](#)).

Remote sensing techniques are available for development of burn severity maps for fires greater than 300 acres. The normalized burn ratio technique (dNBR) developed by the NPS is described on the FIREMON website at <http://fire.org/firemon/lc.htm>.

Unfortunately recent research, some of it conducted on the Refuge, suggests that this method does not adequately differentiate along the range of moderate to high burn severity in Alaskan boreal forests. Caution should be used in interpreting dNBR and ground-based validation should be invested in if the objective is to develop a burn severity map that captures the full range of variability in site conditions and provides a basis for predicting vegetation change in boreal forests (Murphy *et al.* 2008).

Monitoring protocols will be treatment/ incident specific and will be detailed in the appropriate planning document (prescribed fire plan, treatment plan, ES plan, BAR plan).

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## *Appendix A. List of Acronyms*

Terminology in this Plan is defined in the National Wildfire Coordinating Group Glossary of Wildland Fire, located at <http://www.nwccg.gov/pms/pubs/glossary/index.htm>. Additional terms that appear in this document but are not listed in the glossary are defined below:

AD= Administratively Determined Pay Plan

ADEC = Alaska Department of Environmental Conservation

ADF&G = Alaska Department of Fish and Game

AFS = Alaska Fire Service

AICC = Alaska Interagency Coordination Center

AIWFMP = Alaska Interagency Wildland Fire Management Plan

AK-DOF = Alaska Department of Natural Resources, Division of Forestry

AMAC=Alaska Multi-agency Coordination (Group)

AMD = (DOI) Aviation Management Directorate

AMR = Appropriate Management Response

ANCSA = Alaska Native Claims Settlement Act

ANILCA = Alaska National Interest Land Conservation Act

AOP= Annual operating plan

ATV= All-terrain Vehicle

AWFCG = Alaska Wildland Fire Coordinating Group

BAR= Burned Area Rehabilitation

BIA = Bureau of Indian Affairs

BLM = Bureau of Land Management

BUI = buildup index

CCP = comprehensive conservation plan

CDI = Canadian drought index

CFFDRS = Canadian Forest Fire Danger Rating System

CFR= Code of Federal Regulations

DC = drought code

Department = U.S. Department of the Interior

DM = departmental manual

DMC = duff moisture code

DNR=(State of Alaska) Department of Natural Resources

DOF= (State of Alaska) Division of Forestry  
DOI = U.S. Department of the Interior  
EA = environmental assessment  
EFF = Emergency Firefighter  
EIS = Environmental Impact Statement  
ES= Emergency Stabilization  
ESMP= (Alaska) Enhanced Smoke Management Plan  
ESR= Emergency Stabilization Rehabilitation  
FFMC = fine fuel moisture code  
FMIS = (FWS) Fire Management Information System  
FMO = fire management officer  
FMP = fire management plan  
FMU = fire management unit  
FRCC = fire regime and condition class  
FWS= U.S. Fish and Wildlife Service  
IC= Incident Commander  
IMT = Incident Management Team  
IQCS= Incident Qualifications and Certification System  
IRPG= Incident Response Pocket Guide  
MAC = multi-agency coordination  
MIST = minimum impact suppression tactics  
MMA = maximum manageable area  
mph = miles per hour  
NEPA = National Environmental Protection Act  
NFDRS = National Fire Danger Rating System  
NFORS= National Fire Plan Operations and Reporting System  
NPS- National Park Service  
NWR – National Wildlife Refuge  
POW= Program of Work  
Refuge = Tetlin National Wildlife Refuge  
Refuge Manager = Refuge Manager, or, if unavailable, the Deputy Refuge Manager, or Refuge  
FMO, or their designee  
RFMC = Regional Fire Management Coordinator

RH – relative humidity

Service = U. S. Fish and Wildlife Service

TES= threatened, endangered and sensitive(species)

UTV= All-terrain Utility Vehicle

VFD= Volunteer Fire Department

WFDSS= Wildland Fire Decision Support System

WFIP = Wildland Fire Implementation Plan (obsolete)

WFSA = Wildland Fire Situation Analysis (obsolete)

WFU = Wildland Fire Use (obsolete)

WUI= Wildland/ Urban Interface

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*Appendix B. Maps*

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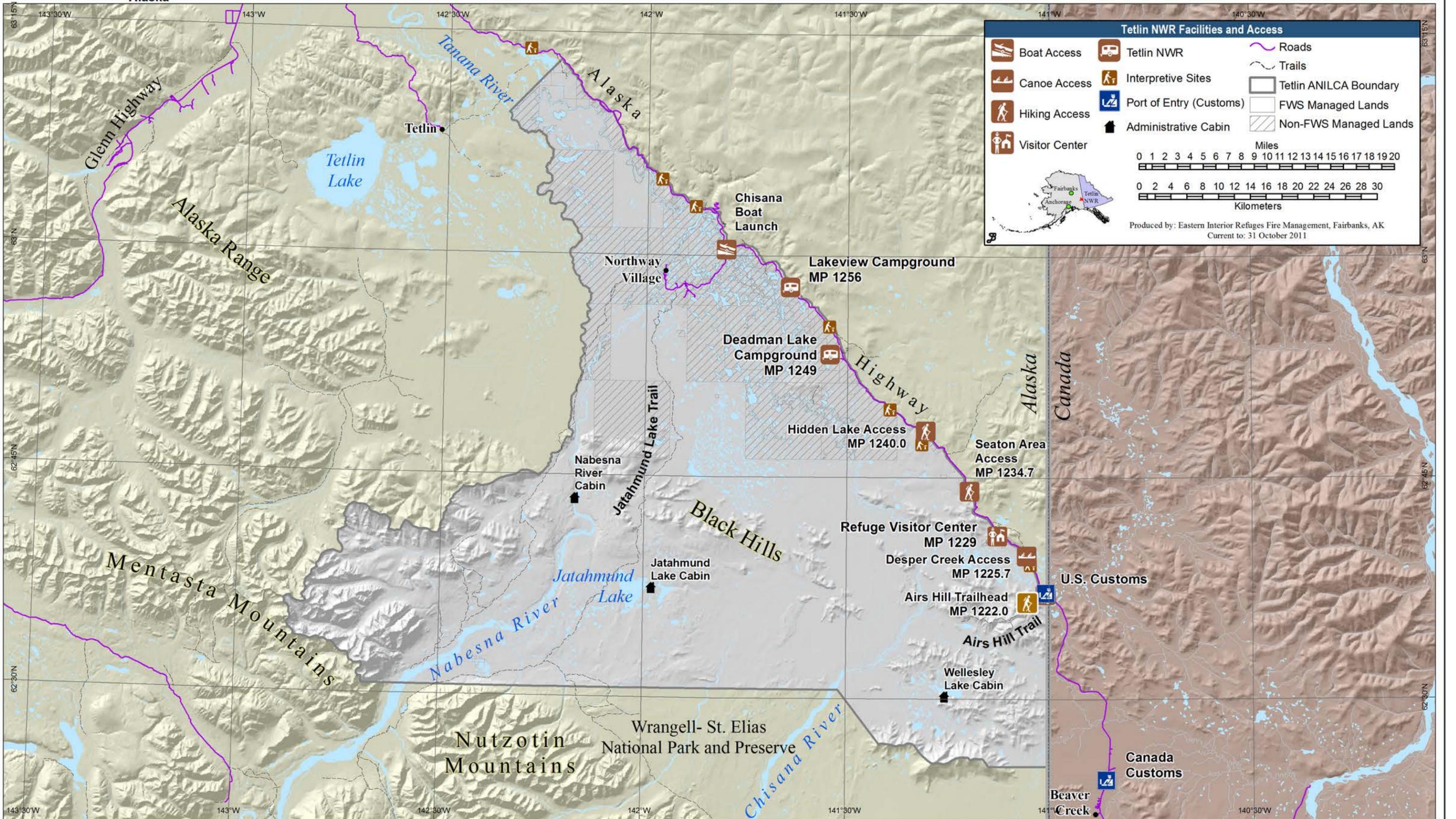
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Alaska



**Tetlin NWR Facilities and Access**

	Boat Access		Tetlin NWR		Roads
	Canoe Access		Interpretive Sites		Trails
	Hiking Access		Port of Entry (Customs)		Tetlin ANILCA Boundary
	Visitor Center		Administrative Cabin		FWS Managed Lands
					Non-FWS Managed Lands

Miles: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Kilometers: 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

Produced by: Eastern Interior Refuges Fire Management, Fairbanks, AK  
Current to: 31 October 2011

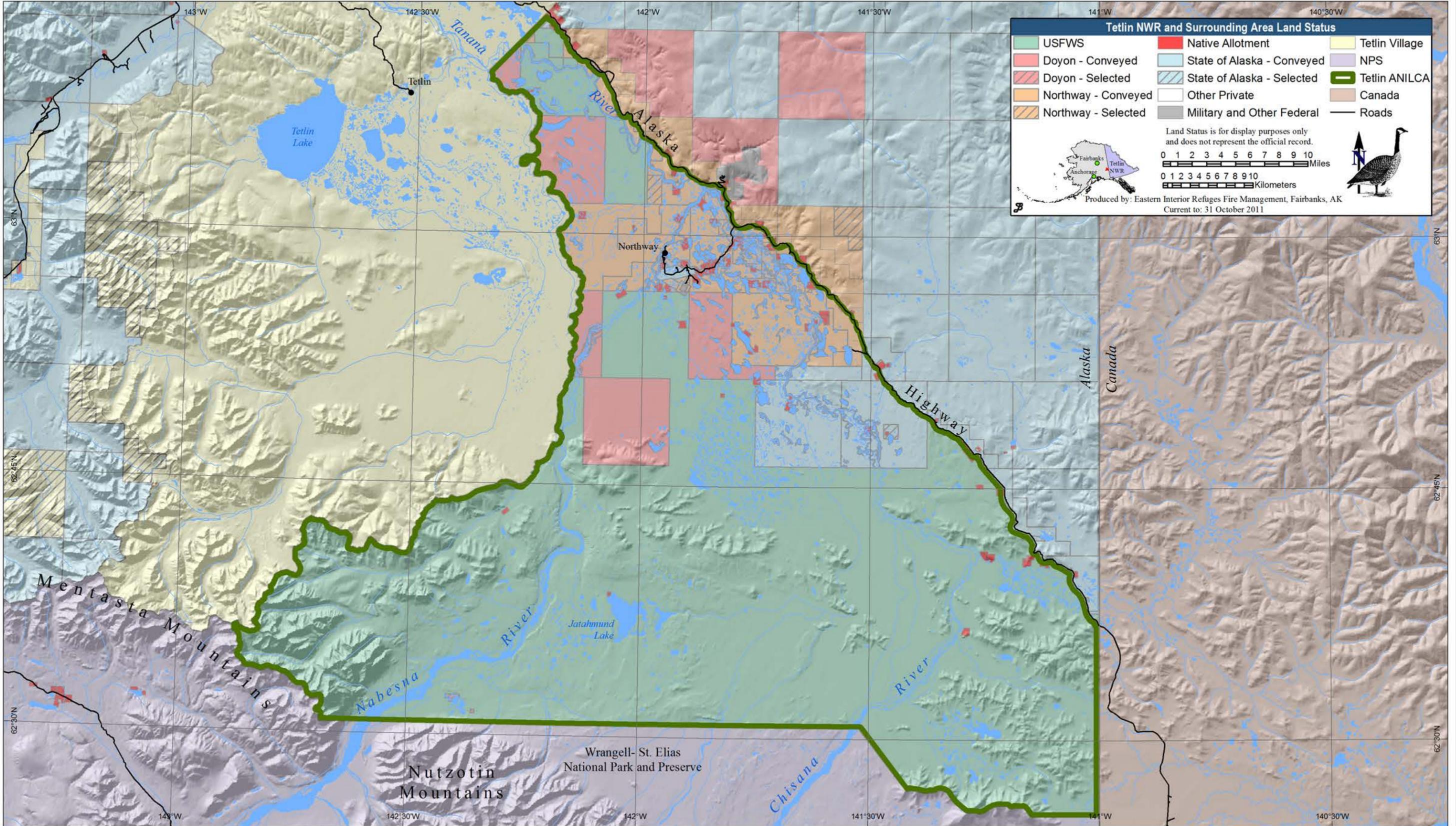




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# Tetlin National Wildlife Refuge

Alaska





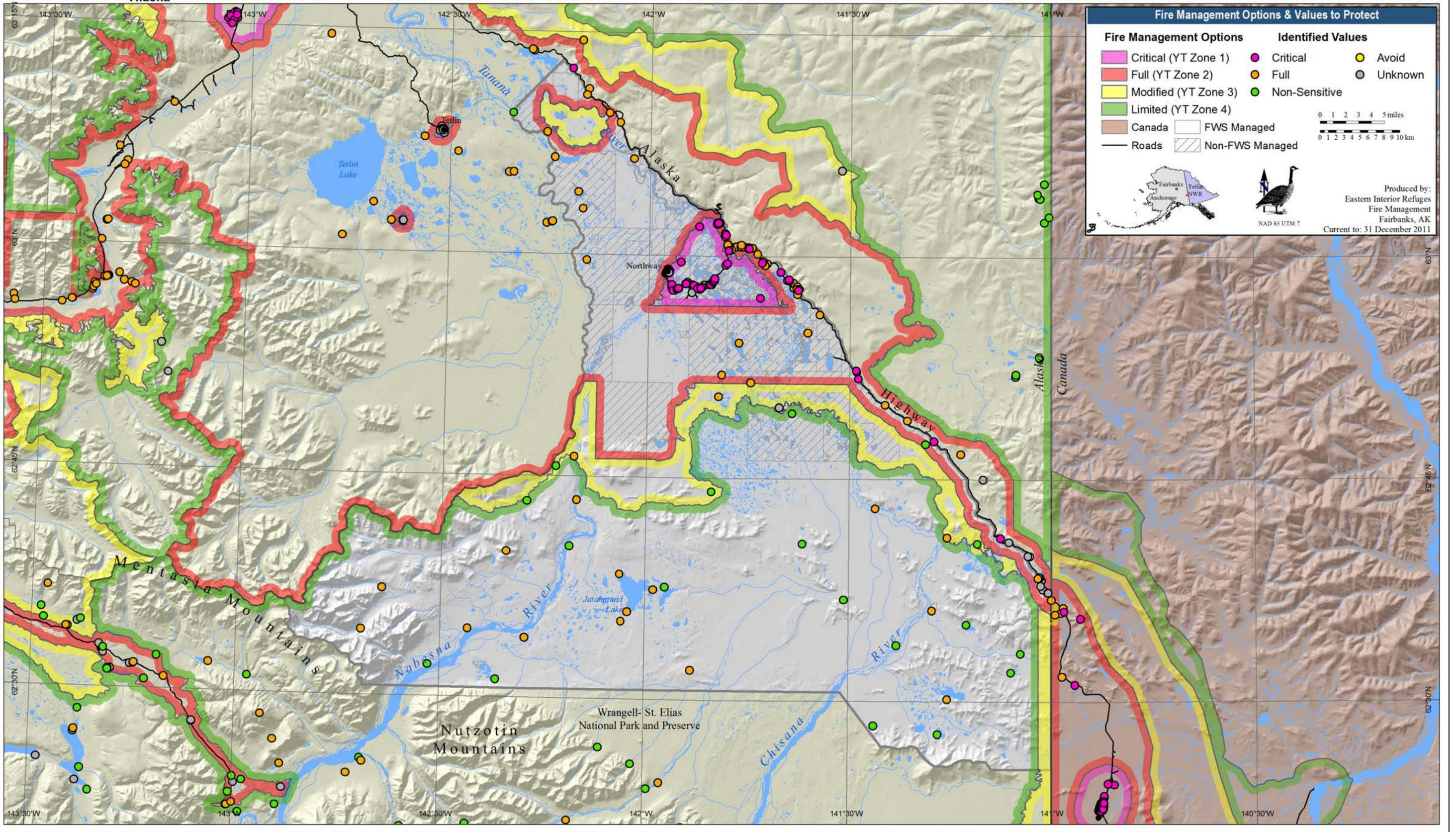


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# Tetlin National Wildlife Refuge

Alaska

## Fire Management Plan Map #3 Fire Management Options and Values to Protect



**Fire Management Options & Values to Protect**

Fire Management Options		Identified Values	
Critical (YT Zone 1)	Critical	Avoid	Unknown
Full (YT Zone 2)	Full	Non-Sensitive	
Modified (YT Zone 3)			
Limited (YT Zone 4)			
Canada	FWS Managed		
Roads	Non-FWS Managed		

Scale: 0 1 2 3 4 5 miles / 0 1 2 3 4 5 6 7 8 9 10 km

Produced by:  
Eastern Interior Refuges  
Fire Management  
Fairbanks, AK  
Current to: 31 December 2011

NAD 83 UTM 7



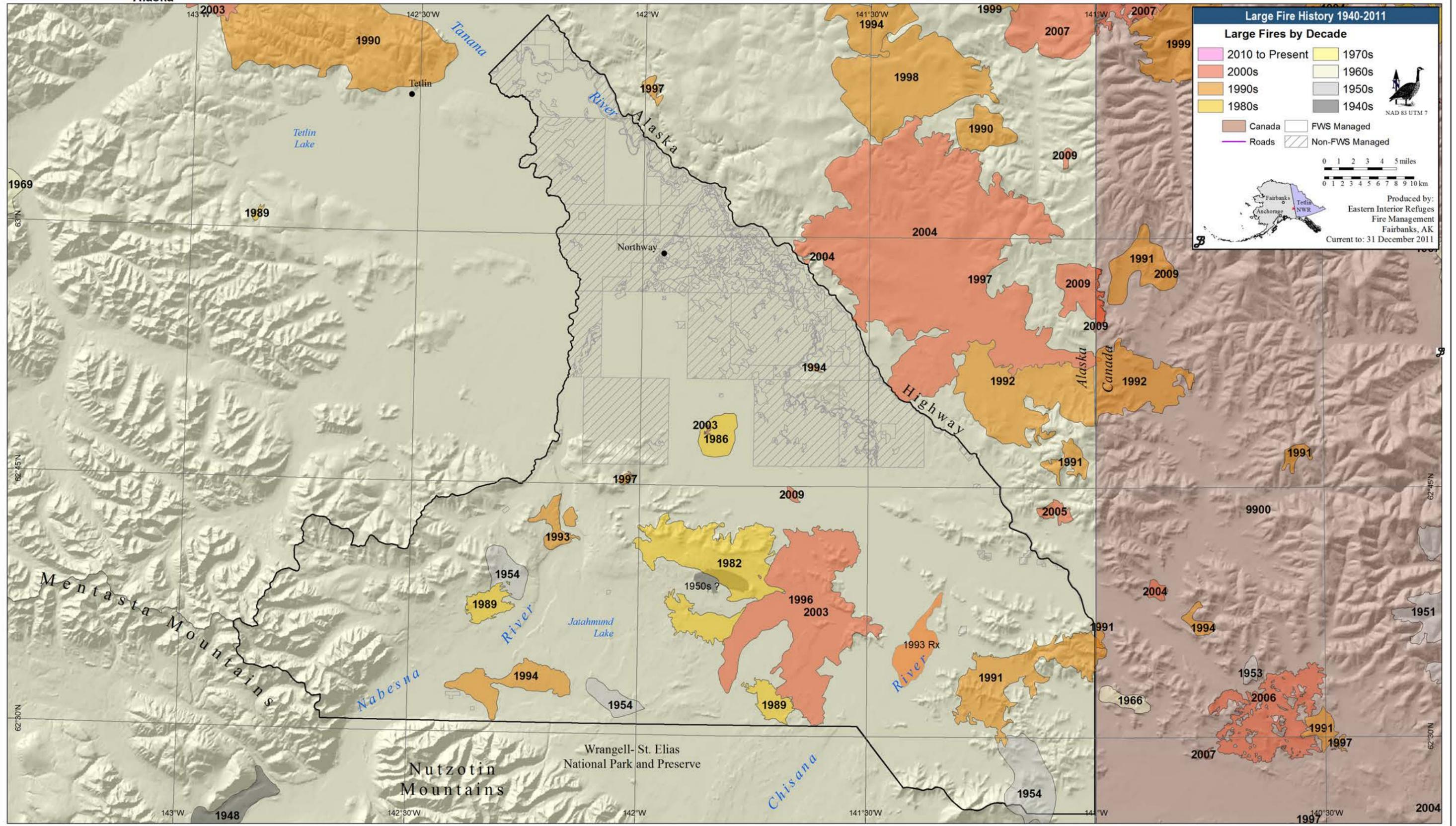


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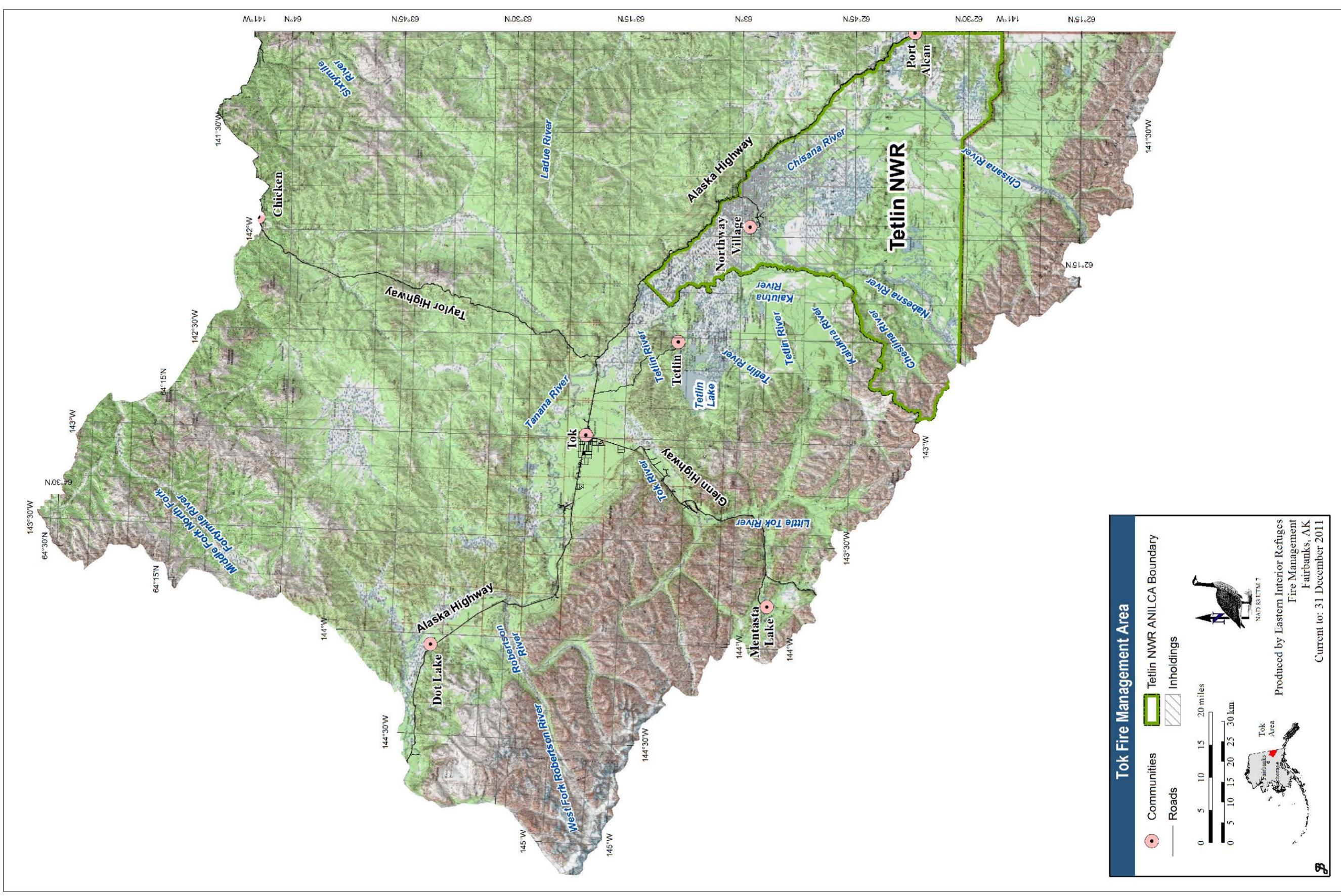
# Tetlin National Wildlife Refuge

Alaska

## Fire Management Plan Map #4 Large Fire History







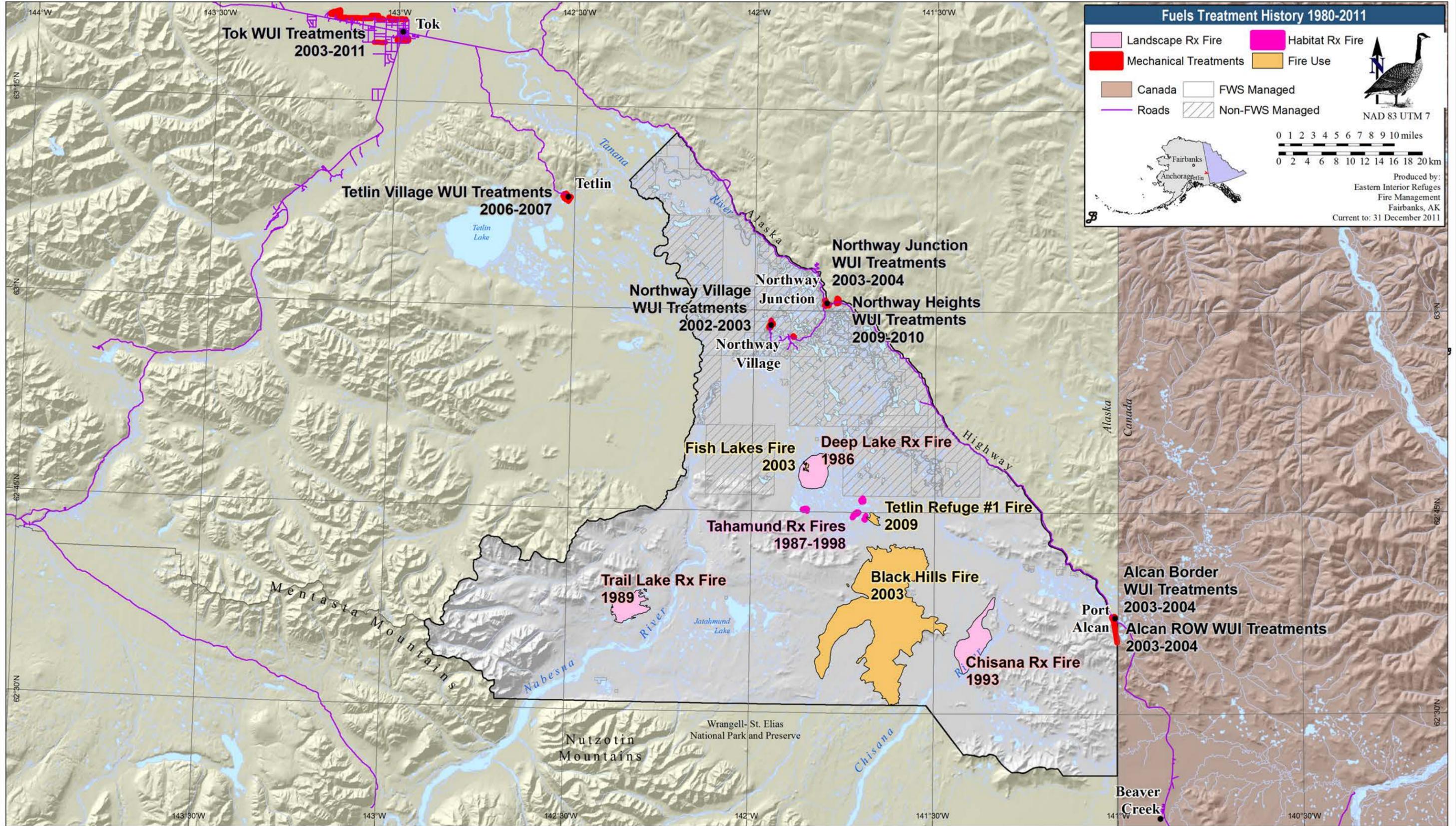




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Alaska



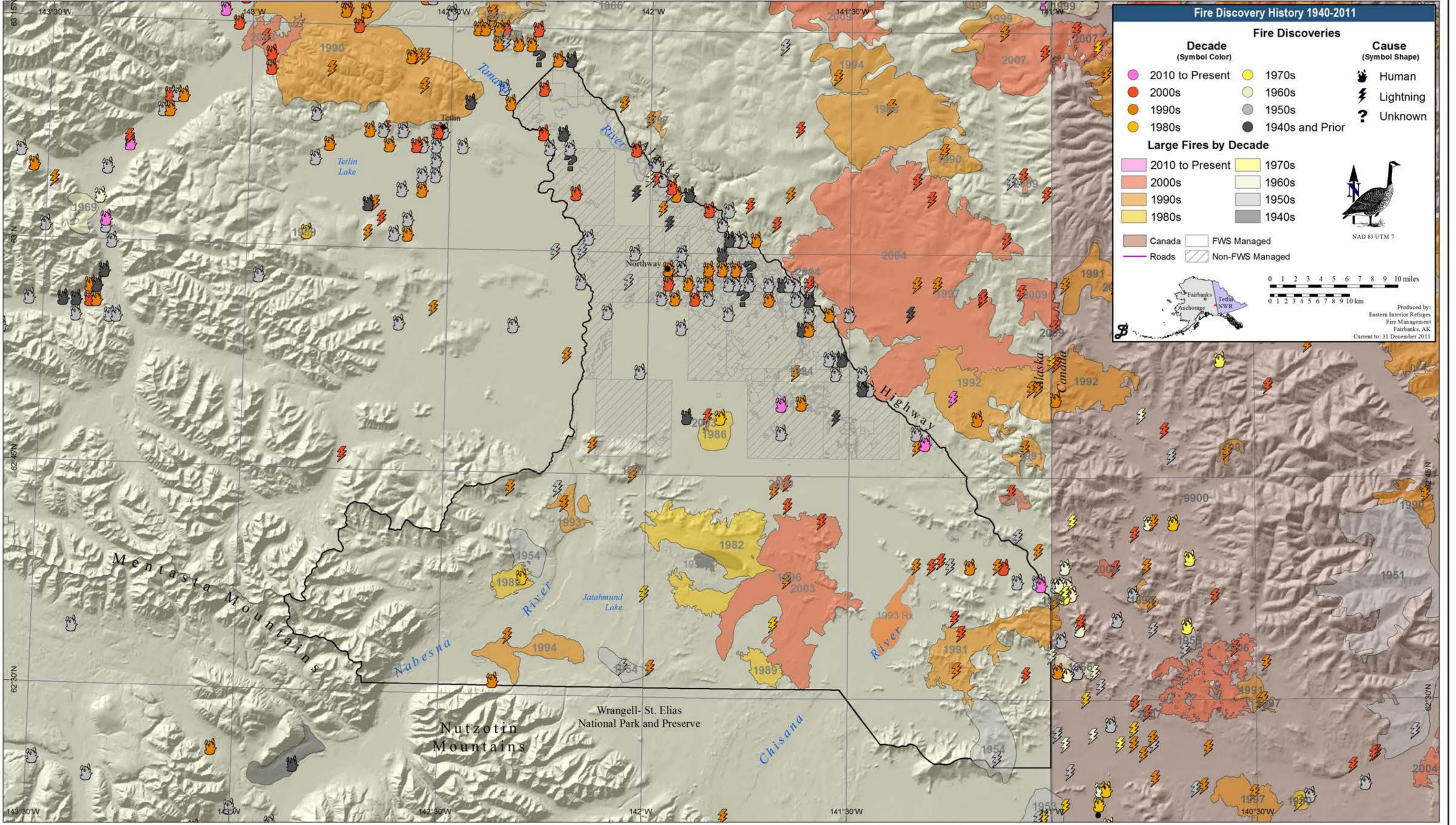




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# Tetlin National Wildlife Refuge Alaska

## Fire Management Plan Map #7 Fire Discovery History



**Fire Discovery History 1940-2011**

Fire Discoveries		Cause (Symbol Shape)
Decade (Symbol Color)	Fire Discoveries	
● 2010 to Present	● 1970s	👤 Human
● 2000s	● 1960s	⚡ Lightning
● 1990s	● 1950s	❓ Unknown
● 1980s	● 1940s and Prior	

**Large Fires by Decade**

■ 2010 to Present	■ 1970s
■ 2000s	■ 1960s
■ 1990s	■ 1950s
■ 1980s	■ 1940s

■ Canada    ■ FWS Managed  
 — Roads    ▨ Non-FWS Managed

NAD 83 UTM 7  
 0 1 2 3 4 5 6 7 8 9 10 miles  
 0 1 2 3 4 5 6 7 8 9 10 km

Produced by:  
 Eastern Interior Refuges  
 Fire Management  
 Fairbanks, AK  
 Current to: 31 December 2011



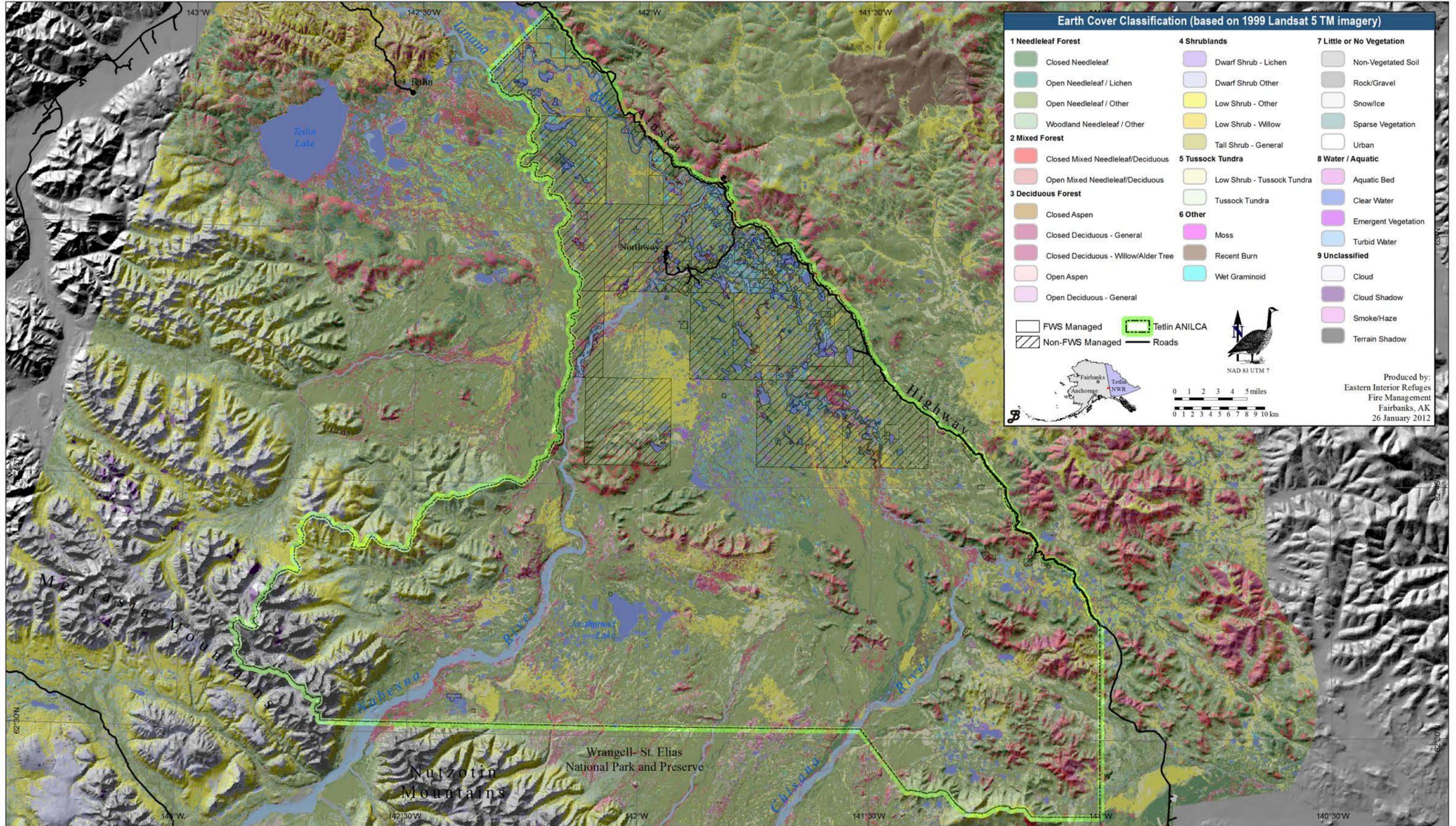


U.S. Fish & Wildlife Service

# Tetlin National Wildlife Refuge

Alaska

## Fire Management Plan Map #8 Tetlin NWR / Scottie Creek Earth Cover Classification



**Earth Cover Classification (based on 1999 Landsat 5 TM imagery)**

<b>1 Needleleaf Forest</b>	<b>4 Shrublands</b>	<b>7 Little or No Vegetation</b>
<ul style="list-style-type: none"> <li>Closed Needleleaf</li> <li>Open Needleleaf / Lichen</li> <li>Open Needleleaf / Other</li> <li>Woodland Needleleaf / Other</li> </ul>	<ul style="list-style-type: none"> <li>Dwarf Shrub - Lichen</li> <li>Dwarf Shrub Other</li> <li>Low Shrub - Other</li> <li>Low Shrub - Willow</li> <li>Tall Shrub - General</li> </ul>	<ul style="list-style-type: none"> <li>Non-Vegetated Soil</li> <li>Rock/Gravel</li> <li>Snow/Ice</li> <li>Sparse Vegetation</li> <li>Urban</li> </ul>
<b>2 Mixed Forest</b>	<b>5 Tussock Tundra</b>	<b>8 Water / Aquatic</b>
<ul style="list-style-type: none"> <li>Closed Mixed Needleleaf/Deciduous</li> <li>Open Mixed Needleleaf/Deciduous</li> </ul>	<ul style="list-style-type: none"> <li>Low Shrub - Tussock Tundra</li> <li>Tussock Tundra</li> </ul>	<ul style="list-style-type: none"> <li>Aquatic Bed</li> <li>Clear Water</li> <li>Emergent Vegetation</li> <li>Turbid Water</li> </ul>
<b>3 Deciduous Forest</b>	<b>6 Other</b>	<b>9 Unclassified</b>
<ul style="list-style-type: none"> <li>Closed Aspen</li> <li>Closed Deciduous - General</li> <li>Closed Deciduous - Willow/Alder Tree</li> <li>Open Aspen</li> <li>Open Deciduous - General</li> </ul>	<ul style="list-style-type: none"> <li>Moss</li> <li>Recent Burn</li> <li>Wet Graminoid</li> </ul>	<ul style="list-style-type: none"> <li>Cloud</li> <li>Cloud Shadow</li> <li>Smoke/Haze</li> <li>Terrain Shadow</li> </ul>

FWS Managed (white box)    Non-FWS Managed (hatched box)    Tetlin ANILCA (dashed green box)    Roads (black line)

NAD 83 UTM 7

0 1 2 3 4 5 miles  
 0 1 2 3 4 5 6 7 8 9 10 km

Produced by:  
 Eastern Interior Refuges  
 Fire Management  
 Fairbanks, AK  
 26 January 2012

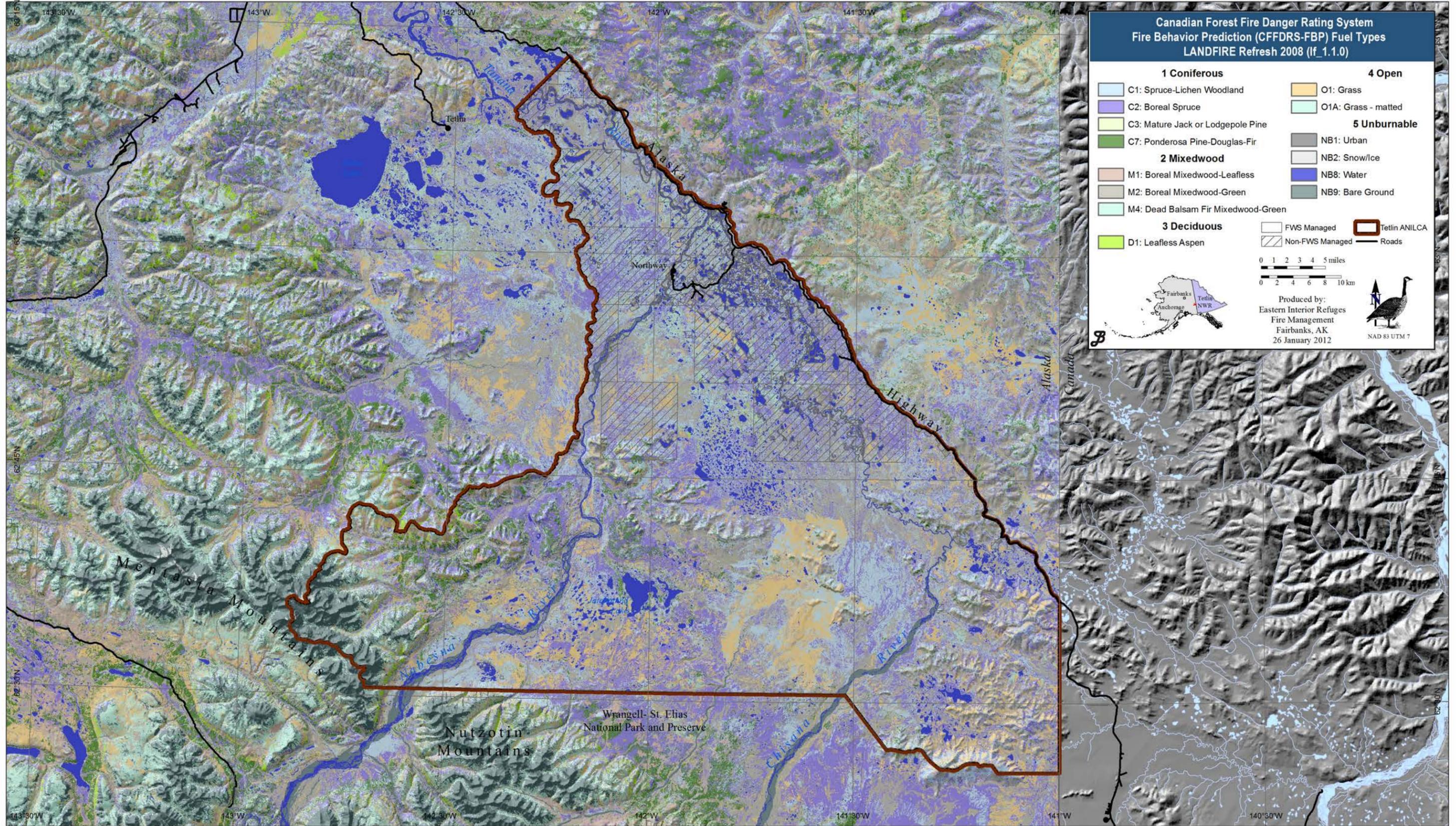




U.S. Fish & Wildlife Service

# Tetlin National Wildlife Refuge Alaska

## Fire Management Plan Map #9 Tetlin NWR Fire Behavior Fuel Types (CFFDRS-FBP)



**Canadian Forest Fire Danger Rating System  
Fire Behavior Prediction (CFFDRS-FBP) Fuel Types  
LANDFIRE Refresh 2008 (lf\_1.1.0)**

<b>1 Coniferous</b>		<b>4 Open</b>	
C1: Spruce-Lichen Woodland	C2: Boreal Spruce	O1: Grass	O1A: Grass - matted
C3: Mature Jack or Lodgepole Pine	C7: Ponderosa Pine-Douglas-Fir	<b>5 Unburnable</b>	
<b>2 Mixedwood</b>		NB1: Urban	NB2: Snow/Ice
M1: Boreal Mixedwood-Leafless	M2: Boreal Mixedwood-Green	NB8: Water	NB9: Bare Ground
M4: Dead Balsam Fir Mixedwood-Green	<b>3 Deciduous</b>		D1: Leafless Aspen
FWS Managed		Tetlin ANILCA	
Non-FWS Managed		Roads	

0 1 2 3 4 5 miles  
0 2 4 6 8 10 km

Produced by:  
Eastern Interior Refuges  
Fire Management  
Fairbanks, AK  
26 January 2012

NAD 83 UTM 7

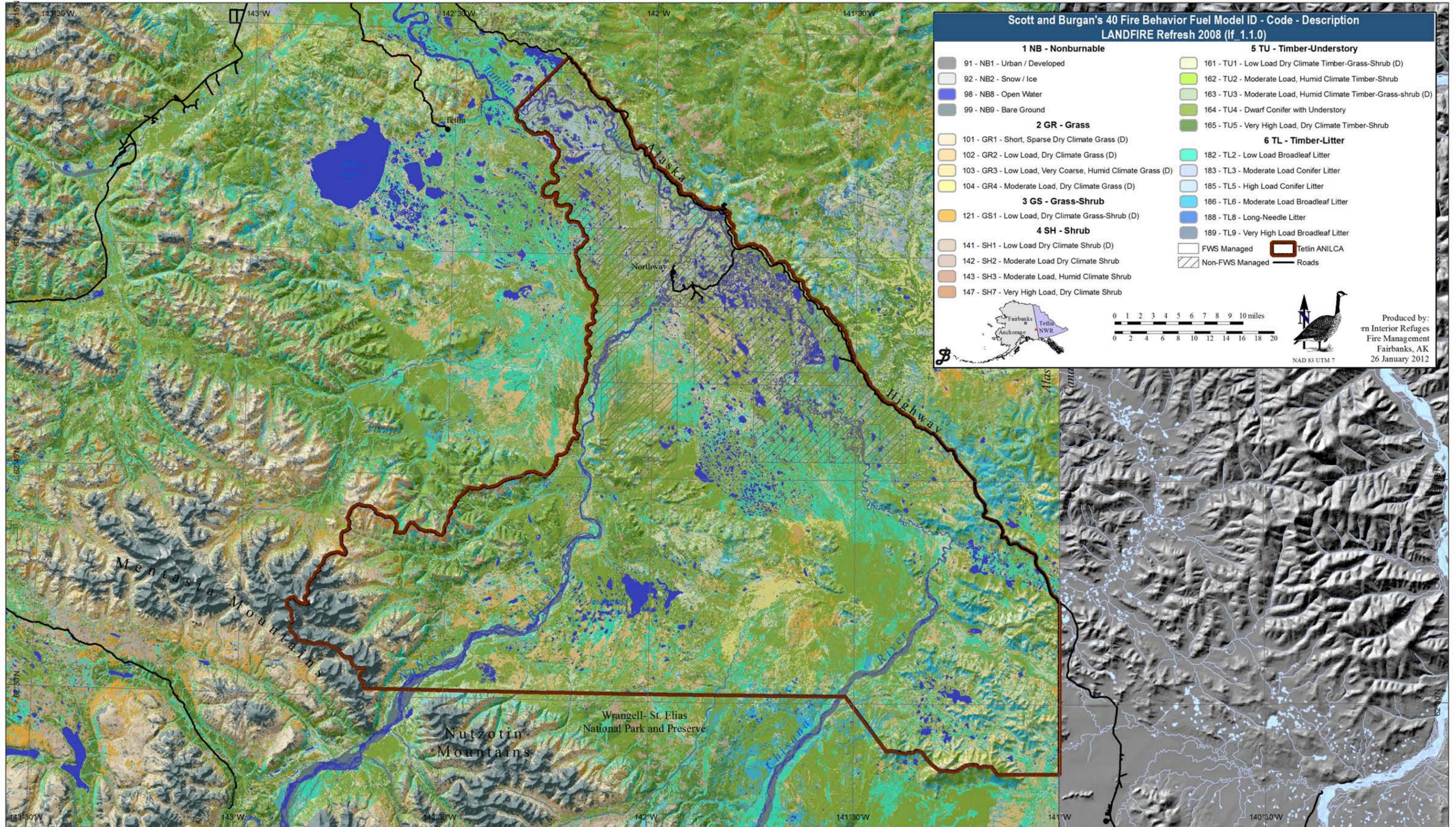




U.S. Fish & Wildlife Service

# Tetlin National Wildlife Refuge Alaska

## Fire Management Plan Map #10 Scott & Burgan's 40 Fire Behavior Fuel Models



**Scott and Burgan's 40 Fire Behavior Fuel Model ID - Code - Description**  
LANDFIRE Refresh 2008 (if 1.1.0)

1 NB - Nonburnable		5 TU - Timber-Understory												
91 - NB1 - Urban / Developed	92 - NB2 - Snow / Ice	98 - NB8 - Open Water	99 - NB9 - Bare Ground	161 - TU1 - Low Load Dry Climate Timber-Grass-Shrub (D)	162 - TU2 - Moderate Load, Humid Climate Timber-Shrub	163 - TU3 - Moderate Load, Humid Climate Timber-Grass-shrub (D)	164 - TU4 - Dwarf Conifer with Understory	165 - TU5 - Very High Load, Dry Climate Timber-Shrub						
2 GR - Grass				6 TL - Timber-Litter										
101 - GR1 - Short, Sparse Dry Climate Grass (D)	102 - GR2 - Low Load, Dry Climate Grass (D)	103 - GR3 - Low Load, Very Coarse, Humid Climate Grass (D)	104 - GR4 - Moderate Load, Dry Climate Grass (D)	121 - GS1 - Low Load, Dry Climate Grass-Shrub (D)	141 - SH1 - Low Load Dry Climate Shrub (D)	142 - SH2 - Moderate Load Dry Climate Shrub	143 - SH3 - Moderate Load, Humid Climate Shrub	147 - SH7 - Very High Load, Dry Climate Shrub	182 - TL2 - Low Load Broadleaf Litter	183 - TL3 - Moderate Load Conifer Litter	185 - TL5 - High Load Conifer Litter	186 - TL6 - Moderate Load Broadleaf Litter	188 - TL8 - Long-Needle Litter	189 - TL9 - Very High Load Broadleaf Litter

FWS Managed (white box)    Tetlin ANILCA (brown outline)  
 Non-FWS Managed (hatched box)    Roads (black line)

Produced by:  
 Interior Refuges  
 Fire Management  
 Fairbanks, AK  
 26 January 2012

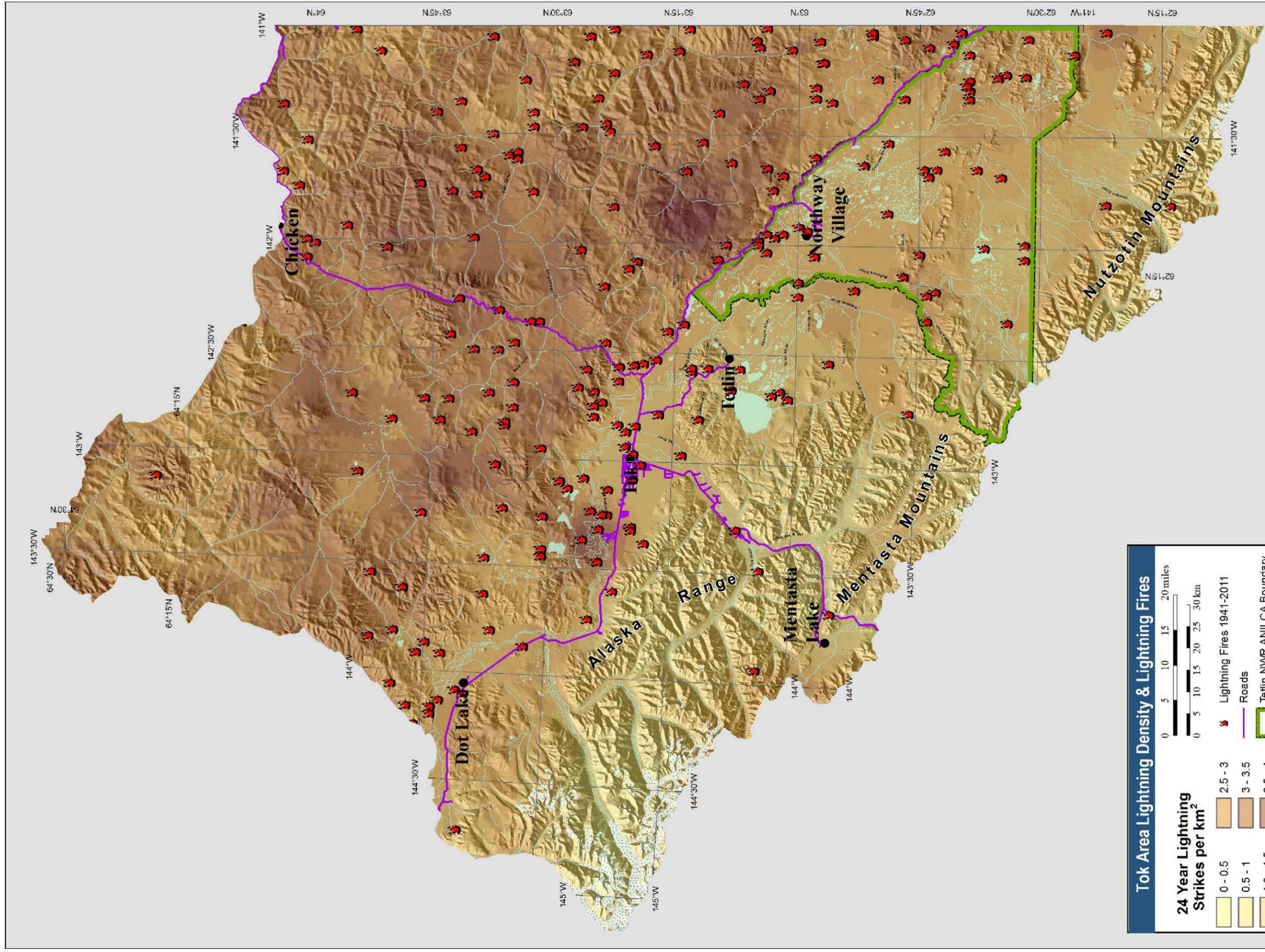
NAD 83 UTM 7





U.S. Fish & Wildlife Service  
**Tetlin National Wildlife Refuge**  
 Alaska

*Fire Management Plan Map #11*  
*Tok Area Lightning Density & Lightning Fires*

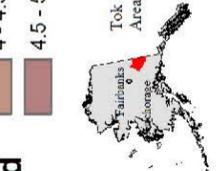


**Tok Area Lightning Density & Lightning Fires**

**24 Year Lightning Strikes per km<sup>2</sup>**

0 - 0.5	2.5 - 3
0.5 - 1	3 - 3.5
1.0 - 1.5	3.5 - 4
2 - 2.5	4 - 4.5
	4.5 - 5

- Lightning Fires 1941-2011
- Roads
- Tetlin NWR ANILCA Boundary



Produced by Eastern Interior Refuges  
 Fire Management  
 Fairbanks, AK

Current to: 31 December 2011



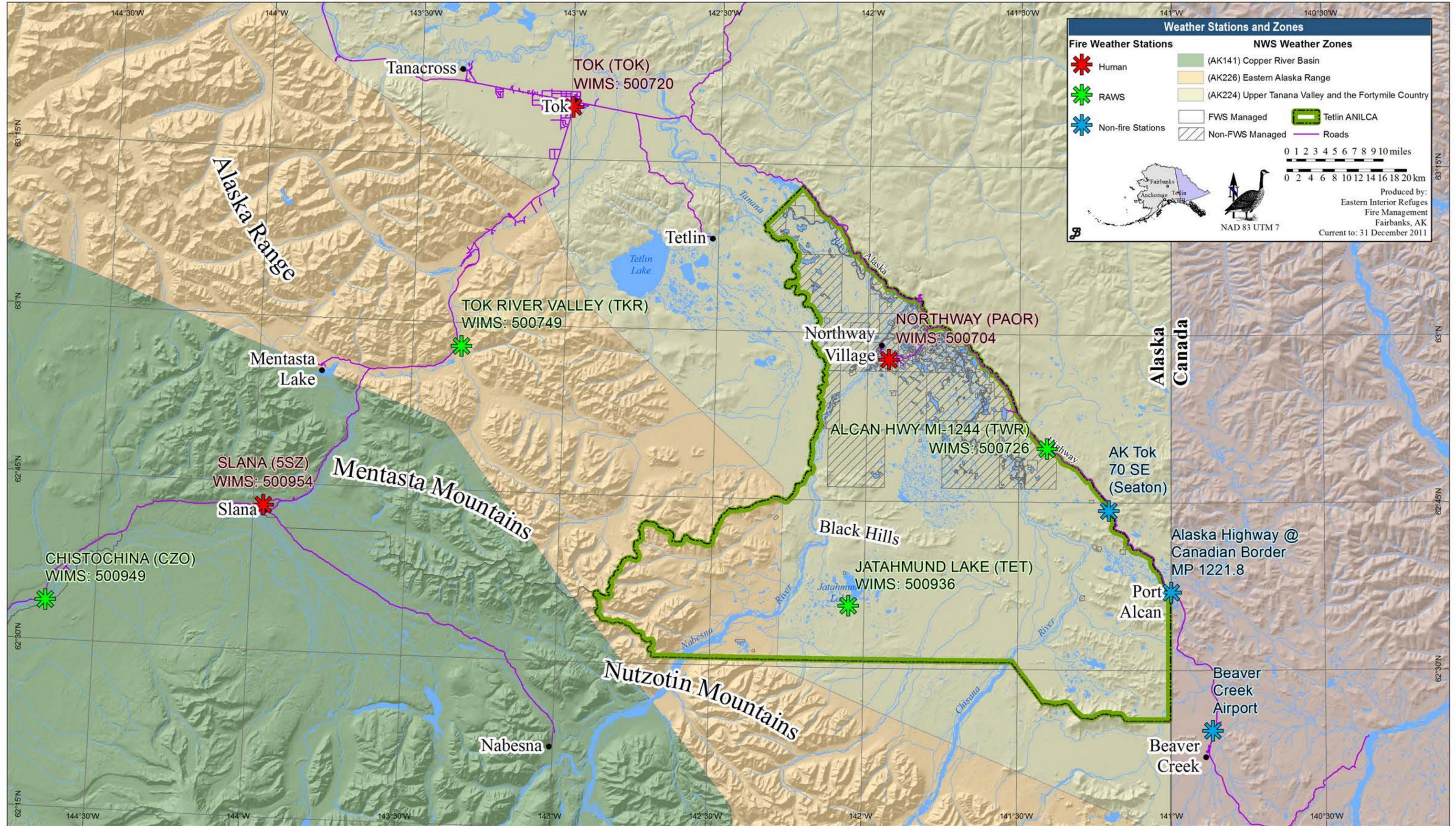




U.S. Fish & Wildlife Service

# Tetlin National Wildlife Refuge

Alaska



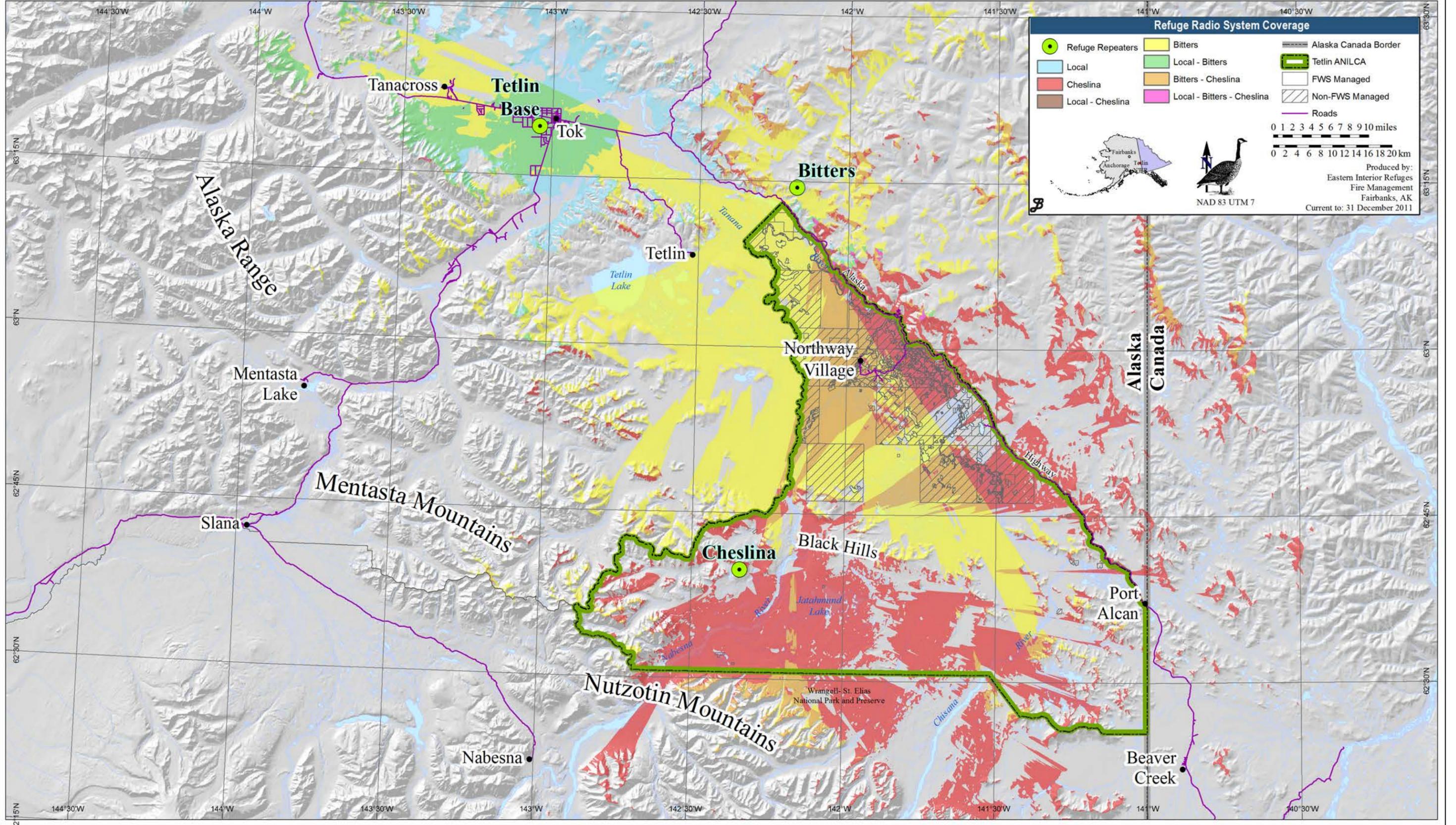




U.S. Fish & Wildlife Service

# Tetlin National Wildlife Refuge

Alaska



**Refuge Radio System Coverage**

	Refuge Repeaters		Bitters		Alaska Canada Border
	Local		Local - Bitters		Tetlin ANILCA
	Cheslina		Bitters - Cheslina		FWS Managed
	Local - Cheslina		Local - Bitters - Cheslina		Non-FWS Managed
					Roads

0 1 2 3 4 5 6 7 8 9 10 miles  
0 2 4 6 8 10 12 14 16 18 20 km

Produced by:  
Eastern Interior Refuges  
Fire Management  
Fairbanks, AK  
Current to: 31 December 2011

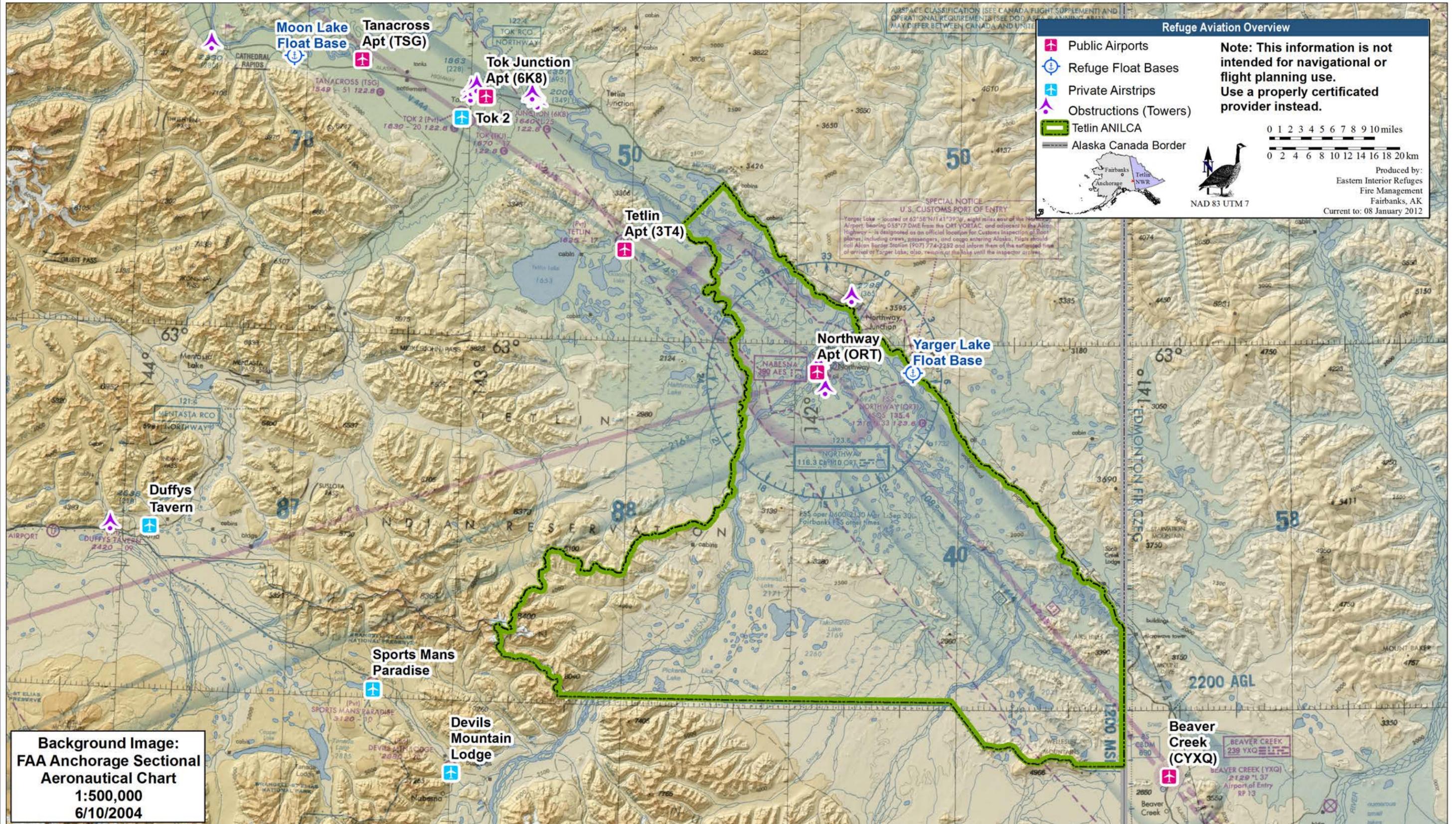
NAD 83 UTM 7





U.S. Fish & Wildlife Service

# Tetlin National Wildlife Refuge Alaska



**Refuge Aviation Overview**

- Public Airports
- Refuge Float Bases
- Private Airstrips
- Obstructions (Towers)
- Tetlin ANILCA
- Alaska Canada Border

**Note:** This information is not intended for navigational or flight planning use. Use a properly certificated provider instead.

0 1 2 3 4 5 6 7 8 9 10 miles  
0 2 4 6 8 10 12 14 16 18 20 km

Produced by:  
Eastern Interior Refuges  
Fire Management  
Fairbanks, AK  
Current to: 08 January 2012

NAD 83 UTM 7

Background Image:  
FAA Anchorage Sectional  
Aeronautical Chart  
1:500,000  
6/10/2004



*Appendix C. Eastern Interior Annual  
Dispatch/Preparedness Step-up Plan*

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*Appendix D. Eastern Interior Multi-year Treatment Plan*

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## *Appendix E. Minimum Impact Suppression Guidelines*

The following guidelines will be adhered to during fire operations on the Refuge:

### **Suppression Actions:**

#### **Fireline Construction:**

- Use natural barriers wherever possible.
- Use wetline where it will be effective.
- Construct sawline to minimum necessary width (trim ladder fuels near line for added effectiveness).
- Reduce total line length whenever possible by bridging fingers and burning out.
- Avoid flooding ash pits on steep slopes or within 100 feet of stream banks and lakeshores.
- Avoid trenching fireline wherever possible, especially in permafrost areas. If trenching is necessary do not exceed one foot trench width.
- The use of fireline explosives on refuge lands must be authorized by the Refuge Manager on a case by case basis.
- Consider using sprinkler systems and fire resistant wrap to protect cabins.
- Cultural resources will be stabilized and protected from further degradation if determined to be appropriate by agency archaeologists.

#### **Equipment Use:**

- The use of bulldozers, excavators, or other heavy equipment on refuge lands other than to mitigate an immediate threat to human life must be authorized by the Refuge Manager on a case by case basis.
- All-terrain Vehicle (ATV) and All-terrain Utility Vehicle (UTV) use on refuge lands other than to mitigate an immediate threat to human life must be authorized by the Refuge Manager on a case by case basis..

#### **Retardant Use:**

- Retardant use on refuge lands other than to mitigate an immediate threat to human life must be authorized by the Refuge Manager on a case by case basis.
- Avoid using retardant or foam within 300 feet of waterways.
- Avoid using retardant or foam where run-off into water source is likely.

#### **Helipot Construction:**

- Consider long-line use in lieu of helipot for gear delivery/retrieval.
- Choose impact resistant sites whenever possible.
- Construct helipot with irregular outlines whenever possible.
- Construct helipot to meet safety and utility requirements with the least environmental impact possible.

**Type 2 Helicopter: 90' safety zone**

**Type 3 Helicopter: 75' safety zone**

## **Camp Construction:**

- Choose impact resistant sites whenever possible.
- Construct latrine(s) for any camp to be used for multiple days.
- Construct latrines 200' minimum from water sources.
- Cut and roll back moss and duff from firepots. Keep layer intact for replacement.
- Minimize clearing.
- Avoid trenching campsites.

## **Repair Actions:**

### **Fireline repair**

- Rehabilitation efforts will be directed at mitigating suppression impacts.
- Burned area rehabilitation may be considered, but must be approved by the Refuge Manager.
- Flush cut stumps.
- Scatter brush along fireline. Avoid large piles inside or outside the line.
- Return moss to trenches.
- Construct water bars on steep slopes where moss layer has been removed.
- Remove all flagging, trash.

### **Helispot repair**

- Flush cut and cover stumps with brush outside of pad area.
- Scatter brush and disperse any large brush piles.
- Remove all flagging and trash.

### **Camp Repair**

- Restore campsites to as natural a condition as possible.
- Extinguish campfires. Only replace moss mat if campfire is dead out and cold.
- Scatter rocks, poles and firewood.
- Fill latrines and replace moss.
- Remove all equipment and gear.
- Burn all trash or haul it out. **Do not** bury trash.
- Police camp area and **check it** before crew departure.

## Annual Fish and Wildlife Fire Management Plan Review Checklist Process

---

The annual review of the Fire Management Plan (FMP) is a requirement of the Service which is documented in the *Fire Management Handbook*, Chapter 9 – section 4. The language in the Handbook states:

“To maintain currency, fire management plans must be reviewed each year using the nationally established annual review process. Plans must be revised when significant changes occur or substantial changes in management are proposed. Minor plan revisions may be accomplished through an amendment added to the plan and signed by the line officer and servicing fire management officer. Major scheduled revisions to fire management plans will follow the 15 year Comprehensive Conservation Plan revision cycle to provide consistency in objectives and management strategy formulation. Without a current FMP, prescribed fires cannot be conducted and response to unplanned ignitions can only consider suppression strategies. Pre-suppression and prevention activities can continue in the interim period as outlined in the expired plan.”

The review is essential to ensure that the FMP continues to contain relevant information for the management of the unit and that it conforms to current laws, objectives, procedures, and strategies. The review is intended to keep the FMP as current as possible and in line with changes that may occur in components of the FMP. Updating federal fire policy, terminology, agreements, wildland urban interface acres in close proximity to the refuges/units are examples of appropriate revisions to an FMP using this review and update format.

This review process requires the refuge/unit line officer and fire management officer responsible for fire management to review the FMP currently in place using the annual review checklist. During the review, they will discuss and update the sections as needed and complete an amendment containing the updates. Once this update/amendment is complete and signed off by the reviewing officials, the Fire Management Plan is deemed to once again be current and meets Service requirements.

The process will be more efficient if the fire management officer (FMO) does some pre-work on the checklist prior to meeting with the line officer. The regional and national fire planners will be filing changes to policy, terminology, etc. in a Sharepoint file they receive them and these changes, recommendations can be added.

---

Release Date: April 30, 2010

The Review Process Steps are as Follows:

1. Select the appropriate review form for the process – Short or Long.  
Note: For the first review of the FMP, it is suggested that the Long Form of the template be used so that a solid baseline of update information is completed and documented for future reviews.
2. The Fire Management Officer should look through the file in Sharepoint for suggested updates placed there by the regional and national planner.
3. FMO should incorporate all the update changes found in the Sharepoint into the document before meeting with the refuge/unit officer.
4. Set up a discussion between the refuge/unit FMO and line officer to determine other changes that may be needed to the remaining portions of the document.
5. Determine if the changes warrant a rewrite or just local approval.
6. If determined to not need a rewrite, the line office and the FMO must sign signature block to show approval of the review.
7. The FMO will list the changes addressed in the FMP on an amendment.
8. Staple the completed amendment and signature page to the fire management plan that was reviewed.
9. Have the Fire Management Officer fax the signed signature page to the regional fire planner (if desired).
10. The regional fire planner will insert the review completion date into the Sharepoint spreadsheet.

If there are any questions about this process, please call Becky Brooks at (208) 387-5345.

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Release Date: April 30, 2010

**FWS REVIEW CHECKLIST (SHORT FORM)**  
**FOR**  
**FISH AND WILDLIFE FIRE MANAGEMENT PLANS**  
*Based on the template of April 9, 2009*

Name of Plan Reviewed for Annual Review Process:		Review Date:
Refuge or Unit Name (Include Complex if applicable):		
Fire Staff Reviewer(s) Name and Phone Number:		Fire Staff Reviewer(s) Signature (for review approval):
Refuge Reviewer(s) Name and Phone Number:		Refuge Reviewer(s) Signature (for review approval):
Amendment Completed and Attached to Plan		Date:
Review information sent to Regional Office		Date
Review date entered in Database (Regional Office)		Date

The ‘Short Form’ of the Review Checklist was developed to be used the year(s) following the completion of the Long Form. The Long Form, with the required amendment, will provide baseline data to the reviewers. The significant headers from the 2009 Interagency Fire Management Plan Template make up the rows of the document and are intended to spark talking points between the FMP reviewers. The Long Form and Amendment should be utilized as reference documents during this discussion.

Please complete this Review Checklist as follows: A check-mark in the ‘No Update’ column means that this portion of your FMP has been reviewed and determined not to need an update; if, through discussion, it is determined that a row may require an update, refer to the previously filled out Long Form to see which sub-chapter elements should be included in the update comments. At that point, put a check-mark in the ‘Update Needed’ column and provide an explanation (and the sub-section number from the long form) of the changes in the ‘Notes/Comments’ section. This information will be included in an amendment that needs to be attached to the plan outlining the changes described for this review. Be sure to adequately describe the changes so they are easily understandable to the outside reader. Put an N/A in the ‘No Update’ column for lines that do not pertain to your refuge/unit to make it easier for future reviewers to complete the annual review process.

If the reviewers determine that the changes are substantial and the original intent of the document is compromised, then a revision of the document should be completed. The review discussion between the line officer and the fire staff may support that conclusion but the responsibility for making this decision rests with the unit line officer.

No Update or N/A	Update Needed	Section	Title – Content	Notes/Comments	Date
		<b>Chapter 1. Introduction</b>			
		1.1	Purpose of the FMP		
		1.2	General Description (of FMP area)		
		1.3	Significant values to Protect		
		<b>Chapter 2. Policy, Land Management Planning, and Partnerships</b>			
		2.1	Fire Policy		
		2.2	Land/Resource Management Planning		
		2.2.2	Environmental Compliance		
			• National Environmental Policy Act (NEPA)	What type?	
			• Endangered Species Act (ESA)	Date of consultation:	
		2.3	Partnerships (internal/external)		
		<b>Chapter 3. Fire Management Unit Characteristics</b>			
		3.1	Area -wide Management Considerations		
		3.1.1	CCP Goals, strategies, and actions		
		3.1.2	CCP Standards and Guidelines/Desired Conditions		
		3.1.3	FMU Common Characteristics		
		3.2	Fire Management Unit - Specific Descriptions		
		3.2.1	FMU Description(s)		
		3.2.2	FMU Values to Protect		
		3.2.3	FMU Fire Management Guidance		
		3.2.4	FMU Safety Considerations		
		3.2.5	FMU Wildfire Response Objectives		
		3.2.6	FMU Fuels Treatments and Methods		
		<b>Chapter 4. Wildland Fire Operational Guidance</b>			
		4.1	Management of Unplanned Ignitions		
		4.1.1	Preparedness		
		4.1.2	Incident Management		
		4.1.3	Emergency Stabilization (ES)		
		4.2	Burned Area Rehabilitation (BAR)		
		4.3	Management of Planned Fuels Treatments		
		4.3.1	Processes to Identify and Prioritize Fuels Treatments		
		4.3.2	Prescribed Fire Project Implementation		
		4.4	Prevention, Mitigation, and Education		
		<b>Chapter 5. Monitoring and Evaluation</b>			
		5.1	FMP Monitoring		
		5.2	Treatment Effects Monitoring		
		<b>References</b>			
		<b>Appendices</b>			

Additional reviewer comments:

**FWS REVIEW CHECKLIST (LONG FORM)**  
**FOR**  
**FISH AND WILDLIFE FIRE MANAGEMENT PLANS**  
*Based on the template of April 9, 2009*

Name of Plan Reviewed for Annual Update Process:		Review Date:
Refuge or Unit Name (Include Complex if applicable):		
Fire Staff Reviewer(s) Name and Phone Number:		Fire Staff Reviewer(s) Signature (for review approval):
Refuge Reviewer(s) Name and Phone Number:		Refuge Reviewer(s) Signature (for review approval):
Amendment Completed and attached to Plan		Date:
Review information sent to Regional Office		Date:
Review date entered in Database (Regional Office)		Date:

Please review the Fire Management Plan (FMP) and complete the columns as follows: A check-mark in the "No Update" column means that this portion of your FMP has been reviewed and determined not to need an update; if a row requires an update (answering yes to the question (s)), check the "Update Needed" column and provide an explanation of the changes in the "Notes/Comments" section. This information will be included in the amendment (including chapter, section and comments) to be attached to the plan annually following the review. Be sure to adequately describe the changes so they are easily understandable to the outside reader. Put an N/A in the "No Update" column for lines that do not pertain to your refuge/unit to make it easier for future reviewers to complete the annual review process.

If the reviewers determine that the changes are substantial and the original intent of the document is compromised, then a revision of the document should be completed. The review discussion between the line officer and the fire staff may support that conclusion but the responsibility for making this decision rests with the unit line officer.

If the reviewers determine that the changes are substantial and the original intent of the document is compromised, then a revision of the document should be completed. This responsibility for making this decision rests at the Unit Line Officer level.

No Update or N/A	Update Needed	Section	Title – Content	Notes/Comments	Date
<b>Chapter 1. Introduction</b>					
		<b>1.1</b>	<b>Purpose of the FMP</b>		
		<b>1.2</b>	<b>General description</b> of the FMP area (location/vicinity map, size, land ownership, etc.)		
			<ul style="list-style-type: none"> <li>Has your vicinity map changed due to new acres added or from complexing for FMP?</li> </ul>		
			<ul style="list-style-type: none"> <li>Total acreage changed? If it is the same management?</li> </ul>		
			<ul style="list-style-type: none"> <li>Are there significant changes in land ownership in lands surrounding unit and/or in-holdings? New subdivisions?</li> </ul>		
			<ul style="list-style-type: none"> <li>FWS units included in the FMP – have you recently complexed multiple units or added new units to a complex?</li> </ul>		
		<b>1.3</b>	<p>Are there any new <b>Significant values to Protect</b>? If so, add them in the spaces provided below.</p> <p>mission, special resource/ management designations (e.g., wilderness, cultural sites, T &amp; E species, etc.</p> <ul style="list-style-type: none"> <li></li> <li></li> </ul>		
<b>Chapter 2. Policy, Land Management Planning, and Partnerships</b>					
		<b>2.1</b>	<b>Fire Policy</b>		
		2.1.1	Federal Interagency Policy change?		
			<ul style="list-style-type: none"> <li>Terminology changes?</li> </ul>		
		2.1.3	DOI policy change? (e.g., Departmental manuals).		
		2.1.4	Service policy change?		
		2.1.5	Regional/unit-specific policy change?		
		<b>2.2</b>	<b>Land/Resource Management Planning</b>		
		<b>2.2.1</b>	<b>Planning Documents:</b>		
			<ul style="list-style-type: none"> <li>Does Habitat Management Plan (HMP) align with FMP at unit? Is it being revised? Does management wan HMP and FMP revisions to take place simultaneously?</li> </ul>		
			<ul style="list-style-type: none"> <li>Is the Comprehensive Conservation Plan (CCP) currently being developed? Revised?</li> </ul>	CCP date:	
			<ul style="list-style-type: none"> <li>Others: (list)</li> <li></li> </ul>		
		<b>2.2.2</b>	<b>Environmental Compliance</b> – are your compliance documents up to date in the following areas?		
			<ul style="list-style-type: none"> <li>National Environmental Policy Act (NEPA)</li> </ul>	What type?	
			<ul style="list-style-type: none"> <li>Endangered Species Act (ESA)</li> </ul>	Date of consultation:	
			<ul style="list-style-type: none"> <li>National Historic Preservation Act (NHPA)</li> </ul>		
			<ul style="list-style-type: none"> <li>Archaeological Resources Protection Act (ARPA)</li> </ul>		
			<ul style="list-style-type: none"> <li>Others: (list)</li> <li></li> </ul>		
		<b>2.3</b>	<b>Partnerships</b>		
		2.3.1	Internal Partnerships changes? (Use spaces below to add new partnerships)		
			<ul style="list-style-type: none"> <li></li> <li></li> </ul>		
			<ul style="list-style-type: none"> <li></li> </ul>		

No Update or N/A	Update Needed	Section	Title – Content	Notes/Comments	Date
		2.3.2	External Partnerships changes?		
			•		
			•		
<b>Chapter 3. Fire Management Unit Characteristics</b>					
		<b>3.1</b>	<b>FMP-wide Management Considerations</b>		
		3.1.1	Have the CCP Goals, strategies, and actions for FMP-wide fire management changed? If so, describe the changes in the comment box.		
		3.1.2	Have the Standards and guidelines/desired conditions from the CCP or other planning documents/handbooks changed? If so, describe the changes in the comment box.		
		3.1.3	Common Characteristics of the FMUs		
			•		
		<b>3.2</b>	<b>Fire Management Unit - Specific Descriptions</b>		
		3.2.1	Have the FMUs changed in your FMP? Do they need to be revised or more added/deleted? If so, fill out the information below.		
			Description of the FMU (add new information about FMU below)		
			• FMU name		
			• vicinity map		
			• adjacent ownership and jurisdiction		
			• fire management objectives		
			• vegetation types		
			• fuel models		
			• burnable acres		
			• Unique physical characteristics affecting fire management (topography, soils, access, fire effects, etc.)		
			• values to protect / uses that affect (or are affected by) fire management decisions		
		3.2.2	Values to Protect (use space below to add new)		
			•		
			•		
			•		
		3.2.3	Fire Management Guidance		
			Have any of the following changed? If so, add comments/changes in comment box or use space below to add new.		
			• Wildfire response objectives		
			• Potential size and scope of fuels treatments		
			• Approved fuels treatments and methods,		
			• Restrictions, limitations, constraints,		
			• Suppression Damage Repair, ES, and BAR considerations		
			•		
		3.2.4	FMU Safety Considerations (use space below to add new)		
			•		
			•		
			•		
			•		

No Update or N/A	Update Needed	Section	Title – Content	Notes/Comments	Date
		<b>Chapter 4. Wildland Fire Operational Guidance</b>			
		<b>4.1</b>	<b>Management of Unplanned Ignitions</b>		
		<b>4.1.1</b>	<b>Preparedness</b>		
			Have any of the following changed? If so, describe changes in the comment box.		
		4.1.1.1	Training and Qualifications		
		4.1.1.2	Refuge/Unit Delegation of Authority to Fire Staff		
		4.1.1.3	Readiness		
		4.1.1.4	Aviation Management		
		4.1.1.5	Fire Detection		
		4.1.1.6	Initial Report of Fire and Initial Attack dispatch		
		4.1.1.8	Mutual Aid and Cross Boundary Operations		
		<b>4.1.2</b>	<b>Incident Management</b>		
			Have any of the following changed? If so, describe changes in the comment box.		
		4.1.2.1	Dispatching beyond IA		
		4.1.2.2	Delegation of Authority to Incident Commander		
		4.1.2.3	Resource Allocation and Prioritization		
		4.1.2.4	Regulatory Compliance for Managing Unplanned Ignitions		
		4.1.2.5	Use of Decision Support Tools – (WFDSS etc.)		
		4.1.2.6	Wildfire Reporting Requirements		
		4.1.2.7	Suppression Damage Repair		
		<b>If no potential for ES and BAR exist on your unit, please skip sections 4.1.3 and 4.2</b>			
		<b>4.1.3</b>	<b>Emergency Stabilization (ES)</b>		
		4.1.3.1	ES Planning and Post-fire Assessments		
		4.1.3.2	ES Post-wildfire Issues and Values to Protect		
		4.1.3.3	ES Treatment Maintenance and Monitoring		
		4.1.3.4	ES Reporting Requirements		
		<b>4.2</b>	<b>Burned Area Rehabilitation (BAR)</b>		
		4.2.1	BAR Planning		
		4.2.2	BAR Issues and Values to Protect		
		4.2.3	BAR Regulatory Compliance		
		4.2.4	BAR Monitoring Protocols		
		4.2.5	BAR Contact Information		
		4.2.6	BAR Public Information and Public Concerns		
		4.2.7	BAR Reporting Requirements		
		<b>4.3</b>	<b>Management of Planned Fuels Treatments</b>		
		4.3.1	Processes to Identify and Prioritize Fuels Treatments		
		<b>4.3.2</b>	<b>Prescribed Fire Project Implementation</b>		
			Have any of the following changed? If so, describe changes in the comment box.		
		4.3.2.1	Prescribed Fire Planning		
		4.3.2.2	Prescribed Fire Operations		
		4.3.2.3	Prescribed Fire Public Notification		
		4.3.2.4	Multiple Prescribed Fires		
		4.3.2.5	Prescribed Fire on Private Lands		
		4.3.2.6	Prescribed Fire Conversions and Reviews		
		4.3.3	Planning, Preparing, Implementing Non-fire Fuels Treatments		
		4.3.4	Fuels Treatment Regulatory Compliance		
		4.3.5	Fuels Treatment Monitoring		
		4.3.6	Fuels Treatment Reporting Requirements		
		4.3.7	Fuels Committees/Local Coordinating groups		

No Update or N/A	Update Needed	Section	Title – Content	Notes/Comments	Date
		4.3.8	Funding Processes		
		4.3.9	Debris Burning (if applicable)		
		<b>4.4</b>	<b>Prevention, Mitigation, and Education</b>		
			Have any of the following changed? If so, describe changes in the comment box.		
		4.4.1	Wildfire Investigation and Trespass Policies		
		4.4.2	Prevention/Mitigation Activities		
		4.4.3	Education/Outreach Activities		
		<b>Chapter 5. Monitoring and Evaluation</b>			
		<b>5.1</b>	<b>FMP Monitoring</b>		
		5.1.2	FMP Terminology (update as needed)		
		<b>5.2</b>	<b>Treatment Effects Monitoring</b>		
			Have any of the following changed? If so, describe changes in the comment box.		
		5.2.1	Fire Effects Monitoring		
		5.2.2	Non-fire Treatment Effects Monitoring		
		5.2.3	Collaborative Monitoring with other Disciplines		
		5.2.4	Fuels Treatment Performance Information/Targets		
		<b>Chapter 6. References</b>			
			(Review Optional)		
		<b>Appendices</b>			
			( Dynamic process - updated annually - Review Optional)		

Additional reviewer comments:

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**Template Delegation of Authority for the Arctic, Kanuti, Tetlin, and Yukon Flats Fire Management Officer**

Peter Butteri, Fire Management Officer for the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges is delegated authority to act on our behalf for the following duties, actions and expectations:

1. Represent the US Fish and Wildlife Service in the local area Multiagency Coordinating Group in setting priorities and working to assist the Protecting Agencies in fire emergencies.
2. Provide direction, supervision and leadership to the Refuge Fire Management Program outlined in the respective Refuge Fire Management Plans and provide a liaison to the Protecting Agencies for all wildfire activities on the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges.
3. Coordinate with and provide timely and accurate reports to the Refuge Managers, Deputy Refuge Managers or Acting Refuge Managers, and Regional Fire Management Coordinator for all wildland fire management activities on the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges.
4. Responsible for coordination and oversight of the fire management budget for the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges to assure adherence to agency fiscal guidelines.
5. Coordinate prescribed fire and hazardous fuels management activities for the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges including requests and oversight of funding for Hazardous Fuels projects (F31, F32 accounts).
6. Request and oversee distribution of Severity and Emergency Preparedness Funding for Arctic, Kanuti, Tetlin, and Yukon Flats Refuge fire activities in collaboration with Protecting Agency FMO's.
7. Ensure all Arctic, Kanuti, Tetlin, and Yukon Flats Refuge wildfire incidents are managed in a safe and cost-effective manner in collaboration with Protecting Agency FMO's.
8. Provide for the management of inventories and property records for supplies and equipment purchased with fire program funds.
9. Oversee the recruitment and hiring of fire management personnel on the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges as required.
10. Ensure all personnel participating in prescribed fire and wildfire operations on the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges are fully qualified for assigned positions.
11. Responsible for representing the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges and/or the Region in assigned interagency wildland fire management program activities and

collaborative efforts such as AWFCG sub-committees and working teams.

12. Coordinate wildfire prevention and mitigation activities and provide appropriate program direction and guidance for the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges.
13. Hire emergency firefighters for prescribed fires conducted by the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges in accordance with Department of Interior "Pay Plan for Emergency Workers." Coordinate FWS hosted emergency hires with Protection Agency FMO's.
14. Manage the Incident Qualification Certification System (IQCS) and certify Incident Qualification Cards for the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges. Coordinate incident management resources status (ROSS) with dispatch centers.
15. Initiate and Certify NWCG Position Task Books for Arctic, Kanuti, Tetlin, and Yukon Flats Refuge personnel per NWCG and agency guidelines.
16. After initial implementation of the Wildland Fire Decision Support System (WFDSS) by the Protection Agency, continue the WFDSS documentation through completion for fires occurring on the Arctic, Kanuti, Tetlin, and Yukon Flats Refuges.
17. In the rare event a Refuge Manager and Deputy Refuge Manager **are absent**; the FMO may approve the WFDSS, and Periodic Fire Assessment.
18. In the absence of the FMO the above listed authorities may be delegated to AFMO, Brian Haugen.
19. This delegation will be reviewed and signed annually prior to fire season.

\_\_\_\_\_  
(Arctic NWR Refuge Manager)

\_\_\_\_\_  
Date

\_\_\_\_\_  
(Kanuti NWR Refuge Manager)

\_\_\_\_\_  
Date

\_\_\_\_\_  
(Tetlin NWR Refuge Manager)

\_\_\_\_\_  
Date

\_\_\_\_\_  
(Yukon Flats NWR Refuge Manager)

\_\_\_\_\_  
Date

*Appendix H. Incident Commander Delegation of Authority Template*

**Delegation of Authority  
Alaska Division of Forestry  
Tok Area**

As of **1800, May 20, 2010**, **IC Name** is delegated authority to manage the **Black Hills Fire #123**. Within the authority, regulations and policies of the Alaska Division of Forestry you are responsible for adhering to the guidelines and considerations established by this delegation and the WFDSS:

1. Provide for firefighter and public safety.
2. Manage the fire with as little environmental damage as possible.
3. Key cultural features requiring priority protection are:
4. Key resources considerations are:
5. Restrictions for suppression actions include:
6. Minimum tools for use are:
7. My agency Resource Advisor will be:
8. Keep fire south of
9. Manage the fire cost-effectively for the values at risk.
10. Provide training opportunities for the resources area personnel to strengthen our organizational capabilities.
11. Minimum disruption of residential access to private property, and visitor use consistent with public safety.

\_\_\_\_\_  
(Signature and Title of Agency Administrator)

\_\_\_\_\_  
(Date)

Amendment to Delegation of Authority

The Delegation of Authority dated **May 20, 2010**, issued to Incident Commander **IC Name** for the management of the **Black Hills Fire #123** is hereby amended as follows. This will be effective at **1800, May 20, 2010**.

12. Key cultural features requiring priority protection are:
13. Use of tracked vehicles authorized to protect Escalante Cabin.

\_\_\_\_\_  
(Signature and Title of Agency Administrator)

\_\_\_\_\_  
(Date)

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Appendix I. Request for SHPO Section 106 Review

**Request for SHPO Section 106 Review (36 CFR 800)**  
May also be used for review pursuant to Alaska Statute [A.S.] 41.36.070

Please use this form as a checklist and provide responses as an Appendix to this application. Incomplete forms may be returned. At this time, we are unable to accept this application electronically.

Please print, complete, and mail this form and accompanying material (typed) to:

STATE HISTORIC PRESERVATION OFFICE | OFFICE OF HISTORY AND ARCHAEOLOGY | DEPARTMENT OF NATURAL RESOURCES  
550 West 7<sup>th</sup> Avenue, Suite 1310, Anchorage, AK 99501

**Please note** that as stipulated in 36 CFR 800.2(c), other consulting parties such as the local government and Tribes are required to be notified of the undertaking. Information provided by other consulting parties may cause us to re-evaluate our comments and recommendations. Please note that our comment does not end the 30-day review period provided to other consulting parties.

**REQUIRED AGENCY INFORMATION**

It is the statutory obligation of the Federal agency to fulfill the requirements of section 106 (36 CFR 800.2(a)). The agency official remains legally responsible for all required findings and determinations (36 CFR 800.2(a)(3)).

- Federal or State involvement? (Check all that apply)  Funding  Jurisdiction  Permit, license, approval
- Federal or State Agency contact information (include name, title, and contact information for agency official)
- Signature of agency official
- Secondary Contact information (if different from above)

**I. GENERAL INFORMATION**

- Project Name
- Landowner
- Project Address / Location
- USGS Quad Map Name
- Meridian: Township: Range: Section:
- NAD 83 Latitude/Longitude: (Decimal Latitude) (Decimal Longitude)

**II. GROUND DISTURBING ACTIVITY**

Examples include, but are not limited to excavation, benching, grading, tree removal, hydroexcavation, utility installation, new construction, access roads, borrow areas, and staging/storage areas.

- DOES THIS PROJECT INVOLVE GROUND DISTURBANCE?  YES  NO
- Description of length, width, and depth of proposed ground disturbance
- Previous and current land use, condition, and disturbances
- Are there archaeological resources on the property?  YES  NO How was this determined?

**III. DESCRIPTION OF THE PROJECT (UNDERTAKING)**

- Detailed written description of the project
- Attach localized project map
- Attach photographs of the project area (Current, historic, and aerial photos are helpful)

#### IV. AREA OF POTENTIAL EFFECTS (APE)

The APE is the geographic area or areas within which an undertaking or project may cause direct or indirect changes in the character or use of historic properties. Every undertaking has an APE.

- Identify the APE on the USGS map and localized project map
  - Explain how the APE was developed and how it encompasses potential direct and indirect effects
- 

#### V. IDENTIFICATION OF HISTORIC PROPERTIES

Defined as prehistoric or historic sites, buildings, structures, objects, districts, landscapes, or properties of traditional religious and cultural importance to Tribes included in, or eligible for, the National Register of Historic Places (NRHP).

Record each cultural resource within the APE using the AHRIS Data Form (<http://dm.alaska.gov/parks/sha/ahrs/dataform.pdf>) and/or the AHRIS Building Form (<http://dm.alaska.gov/parks/sha/ahrs/buildingform.pdf>).

- Describe the steps taken (methodology) to identify cultural resources in the APE
- Describe, date, map, and photograph all cultural resources located in the APE.

Please select one or more of the following:

- Previously-unknown cultural resources present in the APE. Proceed to Section VI.
- Known or previously-reported cultural resources present in the APE. Proceed to Section VI.  
Using professional judgment, determine if a site reevaluation and updated DOE is necessary. Provide basis for decision.
- No cultural resources present in the APE. Proceed to Section VII. Note: finding of effect will be "No historic properties affected."

#### Alaska Heritage Resources Survey (AHRIS) REQUIREMENTS

AHRIS numbers are required for all cultural resources in the APE. Shape files should be submitted for each AHRIS site location as well as for surveyed areas. Alternatively, you may include a table containing survey and AHRIS site boundary metadata in the report. To obtain AHRIS numbers or for questions regarding AHRIS requirements and shapefile schema, contact our office at 907.269.8721 or visit: <http://dm.alaska.gov/parks/sha/ahrs/ahrs.htm>.

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#### VI. DETERMINATION OF ELIGIBILITY

A determination of eligibility (DOE) should be provided for each cultural resource in the APE. Only a qualified professional in an appropriate field of study should make these determinations. Please see "How to Apply the National Register Criteria for Evaluation" available at: <http://www.or.nps.gov/nr/publications/bulletins/nrb15/>. Provide the basis for each NRHP eligibility assessment using the following.

- Category of Historic Property (district, site, building, structure, object, other)
  - Historic Context specific to the property type(s)
  - Areas of Significance
  - NRHP Criteria for Evaluation (A, B, C or D and criteria considerations A-C)
  - Level of Significance: local, state or national
  - Seven Aspects of Integrity (location, design, setting, materials, workmanship, feeling and association)
- Cultural resources present within the APE but none is eligible for inclusion in the NRHP. Note: finding of effect will be "No historic properties affected."
  - Historic properties (36 CFR 800.16[d]) present within the APE. Note: the next step is to determine if the effect will be adverse. Apply Criteria of Adverse Effect at 36 CFR 800.5.
- 

#### VII. FINDING OF EFFECT

Please provide the basis for your finding.

- No historic properties affected [36 CFR 800.4(d)(1)].
  - No Adverse Effect [36 CFR 800.5(b)]. See examples of adverse effects at 36 CFR 800.5(a)(2).
  - Adverse Effect [36 CFR 800.5(d)(2)]. If an undertaking results in an adverse effect, further consultation must occur to resolve the adverse effect.
- Consulting parties:** Has this material been provided to other consulting parties (36 CFR 800.2(c)) such as the local government and Tribes? Please explain / describe the nature of this consultation. We request being involved in the consultation process with other consulting parties, as appropriate, if additional information is provided that is relevant to the consideration of historic properties.

Appendix J. Tetlin NWR Real Property Inventory



U.S. FISH & WILDLIFE SERVICE  
ALASKA REGION  
RPI ASSET LIST

1/19/2012

75630 Tetlin NWR		STATUS	CRV	API
<b>DOI CODE: 35230900 Bldg Environmental Ed Center</b>				
10059964	Deadman Lake Educational Pavillion	OPERATING	\$40,349.58	100
<b>DOI CODE: 35290800 Bldg Visitor Contact Station</b>				
10035679	Visitor Center - Log Cabin Building ( Old RPI Number 18)	OPERATING	\$1,645,162.34	100
<b>DOI CODE: 35300400 Bldg Hsng Apartment</b>				
10055479	Borealis Duplex (transferred from BLM)	OPERATING	\$991,780.00	55
<b>DOI CODE: 35300500 Bldg Hsng Cabin</b>				
10035677	Wellesley Lake - Administrative Cabin ( Old RPI Number 16)	OPERATING	\$107,316.16	100
10059198	Northway Bunk Cabin #1	OPERATING	\$44,192.00	80
10059200	Northway Bunk Cabin #3	OPERATING	\$44,192.00	80
10035685	Nabesna River - Administrative Cabin ( Old RPI Number 24)	OPERATING	\$64,389.70	100
10035676	Jatahmund Lake - Administrative Cabin ( Old RPI Number 15)	OPERATING	\$107,316.16	100
10035664	Northway - Bunkhouse ( Old RPI Number 1)	OPERATING	\$531,769.42	100
10059199	Northway Bunk Cabin #2	OPERATING	\$44,192.00	80
<b>DOI CODE: 35310000 Bldg Hsng Dorm Bunkhouse Barrack</b>				
10058190	Northway Bunkhouse, replaces 10035664	OPERATING	\$509,681.94	100
<b>DOI CODE: 35410300 Bldg Warehouse Equip Vehicle</b>				
10035696	Visitor Center - Storage Building and Fixed Bear-Proof Garbage Containers; Storage bldg contains tools and flammable storage locker ( Old RPI Number 35)	OPERATING	\$56,920.00	70
10035681	Visitor Center - Storage building, Connected to Restroom Building by Covered Walkway ( Old RPI Number 20)	OPERATING	\$40,156.07	70
<b>DOI CODE: 35410500 Bldg Warehouse Shed/Outbuilding</b>				
10057682	Storage building used for outboard motors located at refuge Hq	OPERATING	\$19,283.10	45
<b>DOI CODE: 35410700 Bldg Warehouse</b>				
10035665	Northway - Warehouse Storage ( Old RPI Number 2)	OPERATING	\$583,400.00	100
<b>DOI CODE: 35500200 Bldg Pump House Well House</b>				

		<b>STATUS</b>	<b>CRV</b>	<b>API</b>
10035680	Visitor Center - Log Cache, contains water well pressure tank and potable water station ( Old RPI Number 19)	OPERATING	\$233,360.00	90
<hr/>				
<b>DOI CODE: 35800000 Bldg All Other</b>				
10061543	Trapper Cabin #1 along the interpretive trail. Log cabin with sod roof. Built in the 1960s, below the VC.	OPERATING	\$78,412.50	45
10061544	Trapper Cabin #2 along the interpretive trail. Log cabin with sod roof. Built in the 1960s, below the VC. Trapper Cabin #1 along the interpretive trail. Log cabin with sod roof. Built in the 1960s,	OPERATING	\$78,412.50	45
<hr/>				
<b>DOI CODE: 35801000 Bldg Comfort Station</b>				
10061542	Deadman Lake Campground - Upper Outhouse	OPERATING	\$186,621.75	100
10035682	Visitor Center - Restrooms ( Old RPI Number 21)	OPERATING	\$356,262.28	100
10035610	Lakeview Campground - Vault Toilet, double, on concrete pad ( Old RPI Number 31)	OPERATING	\$186,209.82	90
10035666	Northway - Outhouse ( Old RPI Number 3)	OPERATING	\$38,843.78	40
<hr/>				
<b>DOI CODE: 40130200 Docks Stationary</b>				
10035619	Deadman Lake Campground - Boat Dock, 7ft width, Floating "Superdeck" type with aluminum handrail on one side( Old RPI Number 43)	OPERATING	\$761,305.00	100
<hr/>				
<b>DOI CODE: 40130500 Boat Launch</b>				
10035678	Desper Creek - Boat Ramp 15X30 ( Old RPI Number 17)	OPERATING	\$87,486.00	100
<hr/>				
<b>DOI CODE: 40161000 Culverts</b>				
10035645	Culverts, 7 Total: Deadman Lake Campground (4), Lakeview Campground (2), & Northway Bunkhouse (1) ( Old RPI Number 56)	OPERATING	\$21,345.00	100
<hr/>				
<b>DOI CODE: 40400300 Fuel Strg Tank Above Ground</b>				
10035660	Borealis Headquarters - 1000 Gallon Double-Walled Diesel Fuel Tank ( Old RPI Number 64)	OPERATING	\$26,975.81	90
10035695	Yarger Lake - avgas, Double-Walled Storage Tank, 1000 gallons, with tertiary containment, 150 Ft hose, electric dispensing system (solar panel and battery), perimeter 8FT high chainlink fence with bar	OPERATING	\$40,826.80	100
<hr/>				
<b>DOI CODE: 40660100 Parking Lot</b>				
10035616	Northway - Chisana River - Boat Ramp FHWA Rte 903, Gravel Parking Area, Gravel Loop Access Road, and Kiosk; from northway MP 0.5 ( Old RPI Number 40)	OPERATING	\$301,153.07	100

		<b>STATUS</b>	<b>CRV</b>	<b>API</b>
10035647	Deadman Lake Campground - Day Use Area, with 6 picnic tables, 4 fire rings, and gravel parking area, FHWA Rte XXX (at upper vault toilet and boat launch) ( Old RPI Number 57)	OPERATING	\$66,141.04	100
10035630	Northway (Bunkhouse/Warehouse) - Gravel Driveway and Parking ( Old RPI Number 48)	OPERATING	\$98,010.79	100
10035684	Visitor Center - Parking Lot, with gravel surface and log wheel stop perimeter; FHWA Rte 900, From Alaska MP 1229 ( Old RPI Number 23)	OPERATING	\$1,067,409.91	100
<b>DOI CODE: 40710100 Power Generating Facilities</b>				
10035683	Visitor Center - Generator Shed, Including 2 Diesel Generators, 5KW/16 KW ( Old RPI Number 22)	OPERATING	\$81,669.60	100
<b>DOI CODE: 40710200 Power Distribution Systems</b>				
10062578	Electrical System, 200 amp panel in the bunkhouse and 100 amp panel in the whs. Each cabin will have it's subpanel	OPERATING	\$38,272.62	100
<b>DOI CODE: 40710600 Water Wells</b>				
10059131	Northway Bunkhouse Water Well	OPERATING	\$29,256.00	80
<b>DOI CODE: 40720100 Telecommunication</b>				
10035627	Bitters Mountain, Radio Repeater Shelter and attached communication system equipment ( Old RPI Number 47)	OPERATING	\$284,600.00	100
10035625	Upper Cheslina, Radio Repeater Shelter and attached communication system equipment ( Old RPI Number 46)	OPERATING	\$284,600.00	100
<b>DOI CODE: 40750100 Campgrounds</b>				
10035613	Deadman Lake Campground - 16 Campsite Spurs, Each with Picnic Table and Fire Ring ( Old RPI Number 37)	OPERATING	\$691,296.94	100
10035612	Lakeview Campground - 8 Campsite Spurs, Each With Picnic Table and Fire Ring ( Old RPI Number 36)	OPERATING	\$231,243.47	100
<b>DOI CODE: 40750700 Kiosks</b>				
10035623	Visitor Center - 3-Panel Kiosk, 2-Panel Interpretive Sign, Flag Pole, and Entrance Sign ( Old RPI Number 45)	OPERATING	\$128,762.50	100
10035621	Interpretive Panels, Alaska Highway Pullouts ( Old RPI Number 44)	OPERATING	\$65,614.50	100
<b>DOI CODE: 40751100 Trails Unpaved</b>				
10035661	Island Lake - Scottie Creek Trail, 38,960' (7.0 mi): winter public use dirt/snow trail ( Old RPI Number 65)	OPERATING	\$1,666,126.67	55

		<b>STATUS</b>	<b>CRV</b>	<b>API</b>
10048150	Visitor Center - Interpretive foot trail - approx. 1,200' (0.2273 mi) ( Old RPI Number 73)	OPERATING	\$16,298.40	100
10035618	Hidden Lake Trail, 6400' (1.2121 mi) ( Old RPI Number 42)	OPERATING	\$357,234.50	100
10035642	Deadman Lake Campground - Taiga Trail, 1,320' (0.25 mi) ( Old RPI Number 54)	OPERATING	\$56,920.00	100
10035644	Airs Hill Trail, 58,080' (11.0 mi) of public use dirt trail ( Old RPI Number 55)	OPERATING	\$2,618,320.00	70
10037236	Border/Mirror Creek Trail, 35,000' (6.6288 mi) ( Old RPI Number 71)	OPERATING	\$871,416.00	80
<b>DOI CODE: 40760100 Roads Paved</b>				
10037238	Riverside Airstrip Trail Access Road; FHWA Rte 101, from Alaska MP 1281.7 to End ( Old RPI Number 72)	OPERATING	\$1,401,822.02	100
<b>DOI CODE: 40760200 Roads Gravel</b>				
10035611	Deadman Lake Campground - Entrance Road; FHWA Rte 010, from Alaska Highway Milepost 1249.4 to end ( Old RPI Number 35)	OPERATING	\$3,955,561.94	100
10035615	Lakeview Campground - Entrance Road, FHWA Rte 100, from SR2 to end ( Old RPI Number 39)	OPERATING	\$741,687.69	100
10035614	Seaton Roadhouse Interpretive and Recreation Site ( Old RPI Number 38)	OPERATING	\$3,610,173.22	90
<b>DOI CODE: 40800300 Gates</b>				
10035640	Vehicle Swing Gates, 8 Total: Visitor Center (2), Northway Bunkhouse (2), Deadman Lake Campground (1), Lakeview Campground (1), & Refuge Headquarters (2) ( Old RPI Number 53)	OPERATING	\$40,838.00	100
<b>DOI CODE: 40800500 Signs</b>				
10035657	Highway Signs ( Old RPI Number 62)	OPERATING	\$21,345.00	100
<b>DOI CODE: 40800900 Obs Decks Platforms Towers</b>				
10035659	Visitor Center - Wooden Observation Deck, Includes: Ramps, Dual Height Telescopes, and Benches ( Old RPI Number 63)	OPERATING	\$358,596.00	100
<b>TOTAL RPI ASSET COST for Tetlin NWR:</b>			<b>\$26,010,511.59</b>	

*Appendix K. Employee Fitness & Conditioning  
Agreement Template*

**Eastern Interior Fire Management Physical Fitness Agreement**

National policy authorizes physical fitness conditioning during duty time for firefighting personnel (Interagency Standards for Fire and Fire Aviation Operations 2012, 13-6).

FWS policy further defines the conditions under which this training will occur:

*Employees serving in wildland fire positions that require a fitness rating of arduous as a condition of employment are authorized one hour of duty time each workday for physical fitness conditioning. Employees not having a fitness rating of arduous as a condition of employment, but who are required by a Critical Performance element or other written agreement to maintain an arduous level, will be authorized three hours per week of duty time for physical fitness condition. All other wildland firefighting personnel holding qualifications requiring ratings of moderate or arduous may be authorized, by their supervisor, up to three hours per week of duty time for fitness conditioning. Prior to any duty time being allowed for physical fitness conditioning, employees and supervisors must agree, in writing, what physical conditioning activities the employee will engage in, and when and where they will occur. Activities outside of the agreement will not be authorized or allowed. A combination of activities designed to increase both physical strength and aerobic fitness, while minimizing the possibility of physical injury, should be utilized (FWS Fire Management Handbook 2012, 13-3).*

This agreement is in accordance with the above cited policies, and authorizes \_\_\_\_\_  
to engage in physical fitness conditioning activities while on duty for up to \_\_\_\_\_ hour(s) per \_\_\_\_\_.

All duty time physical fitness conditioning activities will be performed during the employee's regular tour of duty. Overtime or compensatory time will not be authorized.

Workout facilities and equipment are absent at FWS duty stations in Tok and Fairbanks. Therefore, employees are authorized to seek out other means for exercise including:

- Cooperator Facilities (AK-DOF, AFS)
- Commercial gym facilities
- On and Off-site outdoor locations
- Home workout equipment

Authorized Activities include:

- Stretching/Calisthenics
- Weight training
- Cycling
- Running/Walking/Hiking
- Nordic Skiing
- Fitness equipment exercises
- Swimming
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

**Team sports are not authorized.**

Employee Signature

Date

Supervisor Signature

Date

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## Appendix L. References

### 1. Authorities

The following statutes authorize and provide the means for managing wildland fires on FWS lands or threatening FWS lands and on adjacent lands:

- A. 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 his/her jurisdiction and to cooperate with other Federal agencies, States, or owners of timber.
- B. Economy Act of June 30, 1932** (47 Stat. 417; 31 U.S.C. 1535). Authorizes Federal agencies to enter into contracts and agreements for services with each other.
- C. Reciprocal Fire Protection Act of May 27, 1955 as amended by the Wildfire Suppression Assistance Act of 1989** (69 Stat. 66, 67; 42 U.S.C. 1856a)(102 Stat. 1615). 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 facilities in extinguishing fires when no agreement exists.
- D. National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 and the Refuge Recreation Act of 1962.**(80 Stat. 927)(16 U.S.C. 668dd-668ee)(16 U.S.C. 460k-460k4). Governs the administration and use of the National Wildlife Refuge System.
- E. Alaska Native Claims Settlement Act of December 18, 1971.** (88 Stat. 668; 43 U.S.C. 1601). Alaska Natives' lands are to continue to receive forest fire protection from the United States at no cost until they become economically self-sufficient.
- F. 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.
- G. Federal Fire Prevention and Control Act of October 29, 1974 et seq.** (88 Stat. 1535; 15 U.S.C. 2201) as amended. Authorizes reimbursement to State and local fire services for costs incurred in firefighting on Federal property.
- H. Federal Grants and Cooperative Act of 1977.** (Pub. L. 95-244, as amended by Pub. L. 97-258, September 13, 1982. 96 Stat. 1003; 31 U.S.C. 6301-6308). Eliminates unnecessary administrative requirements on recipients of Government awards by characterizing the relationship between executive agencies and contractors, States and local governments and other recipients in acquiring property and services in providing U.S. Government assistance.
- I. Alaska National Interest Lands Conservation Act of December 2, 1980.** (94 Stat. 2371, 43 U.S.C. 1602-1784). Designates certain public lands in Alaska as units of the National Park, National Wildlife Refuge, Wild and Scenic Rivers, National Wilderness Preservation, and National Forest systems resulting in general expansion of all systems. Any contracts or agreements with the jurisdictions for fire management services listed above that were previously executed will remain valid.

- J. Supplemental Appropriation Act of September 10, 1982.** (96 Stat. 837). Authorizes Secretary of the Interior and Secretary of Agriculture to enter into contracts with State and local government entities, including local fire districts, for procurement of services in pre-suppression, detection, and suppression of fires on any unit within their jurisdiction.
- K. Wildfire Suppression Assistance Act of 1989.** (Pub. L. 100-428, as amended by Pub. L. 101-11, April 7, 1989). 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 facilities in extinguishing fires when no agreement exists.

## *2. Other Policy References*

- A.** A Collaborative Approach for Reducing Wildfire Risks to Communities and the Environment: 10-Year Strategy Implementation Plan (December 2006)
- B.** Alaska State Statues 41.15.010 – AS 41.15.170
- C.** Bureau of Indian Affairs Act, as amended (67 STAT. 495:16 U.S.C.1b)
- D.** Cooperative Forestry Assistance Act of July 1, 1978, as amended (16 U.S.C. 2101) (FS)
- E.** Cooperative Funds Act of June 30, 1914, (16 U.S.C. 498) (FS)
- F.** Cooperative Funds and Deposits Act of Dec 12, 1975, (P.L. 94 148, 16 U.S.C. 565) (FS)
- G.** Department of the Interior and Related Agencies Appropriations Act, 1999, as included in P.L. 105-277, section 101(e);
- H.** Departmental Manual, 620 DM 1-3, Wildland Fire Management, General Policy and Procedures; Wildland Fire Management, General Policy and Procedures – Alaska; and Burned Area Emergency Stabilization and Rehabilitation.
- I.** Federal Land Policy and Management Act of Oct. 21, 1976, (P.L.94 579; 43 U.S.C.)(BLM)
- J.** Granger-Thye Act of April 24, 1950, (16 U.S.C., Sec 572) (FS)
- K.** Homeland Security Act of 2002 (H.R. 5005-8)
- L.** Homeland Security Presidential Directive-5 (HSPD-5)
- M.** Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide, September 2006
- N.** Interagency Standards for Fire and Fire Aviation Operations, also known as the “Red Book.”
- O.** National Fire Plan (September 2001) and Healthy Forest Initiative (August 2002)
- P.** National Indian Forest Resources Management Act (P.L. 101-630, Title III) (Interior Agencies)
- Q.** National Wildlife Refuge System Wildland Fire Management Strategic Plan (May 2006)
- R.** Region 7 Policy for Management of Permitted Cabins on National Wildlife Refuges in Alaska (RW-1)
- S.** Robert T. Stafford Disaster Relief and Emergency Assistance Act (P.L. 93-288) (Federal Agencies)

- T. Taylor Grazing Act of June 28, 1934, (48 Stat. 1269; 43 U.S.C. 315) (BLM, FS)
- U. United States Fish and Wildlife Service Fire Management Handbook
- V. United States Fish and Wildlife Service Manual sections 095 FW 3 Emergency Preparedness and Response -- Wildland Fire Management, 241 FW 7 Wildland Fire Safety, 232 FW 6 Training Standards for Wildland and Prescribed Fire Operations, 621 FW 1 Wildland Fire Policies and Responsibilities, 621 FW 2 Fire Management Planning, and 621 FW 3 Prescribed Fire.
- W. Watershed Restoration and Enhancement Act of 1998, P.L. 105-77;
- X. Wildland Fire Leadership Conference Call Notes, March 24, 2008 "Modifying Guidance for Implementation of Federal Wildland Fire Policy (AMR), published on the Internet at <http://www.forestsandrangelands.gov/leadership/meetings/index.shtml>

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