

U.S. FISH & WILDLIFE SERVICE

Fire Management Plan

*Innoko National Wildlife
Refuge*

April 2013



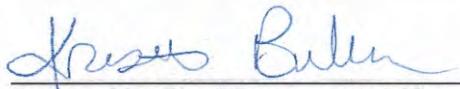
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Innoko National Wildlife Refuge

April 2013

Review and Approvals



Prepared by Fire Management Officer

4/15/13

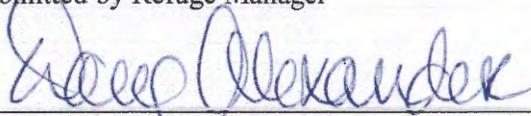
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Submitted by Refuge Manager

4/22/2013

Date



Reviewed by Regional Fire Management Coordinator

4/30/2013

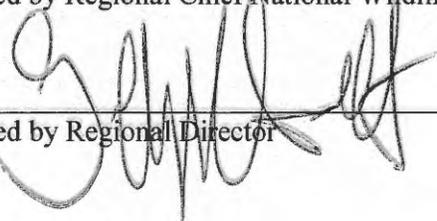
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Reviewed by Regional Chief National Wildlife Refuge System

5-24-2013

Date



Approved by Regional Director

5/25/13

Date



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Prepared by Fire Management Officer _____ Date _____

Submitted by Refuge Manager _____ Date _____

Reviewed by Regional Fire Management Coordinator _____ Date _____

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1.0 INTRODUCTION

1.1 Purpose of the Fire Management Plan

The Innoko National Wildlife Refuge (NWR) Fire Management Plan (FMP) defines a program of wildland fire management to achieve resource management objectives by implementing Departmental, Service, Regional, and Refuge policies, purposes, and objectives.

This plan is written to meet Department and Service requirements that every area with burnable vegetation must have an approved FMP (620 DM 1.4). This plan coincides with the 2008 Comprehensive Conservation Plan (CCP) for the Refuge. 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 CCP 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 (including surveillance). Preparedness and prevention activities can continue in the interim period as outlined in the FWS Fire Management Handbook.

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, which 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)

As described in the Service Manual 621 FW 1 (March 2012), the Refuge FMP provides the planning framework for Refuge fire management decision-making and identifies the approved course of action relating to fire as described in other plans. The FMP identifies action to be taken to preserve, protect and enhance natural and cultural resources with specific regard to wildland fire and provides the background and guidelines for management of wildfires and prescribed fires. It specifies the uses of fire that are consistent with and can enhance Refuge habitat and wildlife management objectives.

This update of a previously approved plan (September 2005) includes all the elements and guidelines of the previous plan. It follows the outline of the April 2009 interagency format and incorporates current policy and terminology relating to interagency and Service fire management programs.

This step-down plan from the CCP describes actions to prepare for and respond to unplanned ignitions, to plan and conduct prescribed fires, and to complete other fire management business. This plan is intended to integrate all wildland fire management activities within the context of the Innoko National Wildlife Refuge CCP and help achieve land and resource management goals and objectives identified in that document and in other step-down plans written and approved in the interim period.

1.2 General Description of the area in the Fire Management Plan

Innoko National Wildlife Refuge (NWR) lies in west central Alaska approximately 300 air miles northwest of Anchorage (see Figure 1). The Refuge consists of two units – the 3.8 million acre southern

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unit and the 750,000 acre northern unit (locally referred to as the Kaiyuh Flats). This plan only applies to the southern unit which also encompasses the 1.3 million acre Innoko Wilderness. The Innoko NWR was established in 1980 as a result of the Alaska National Interest Lands Conservation Act (ANILCA).

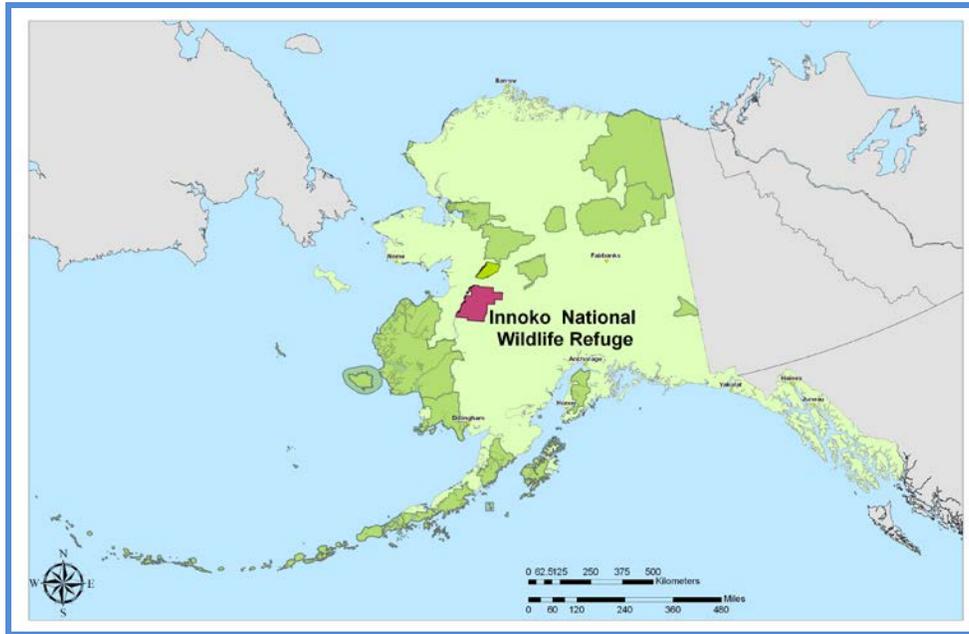


Figure 1 – Location of Innoko NWR (see also Map 1 in Appendix A).

The Refuge is bordered to the northwest by the Yukon River, to the southwest by Native Corporation Lands, and to the north, east, and southeast by State Lands (see Figure 2 below).

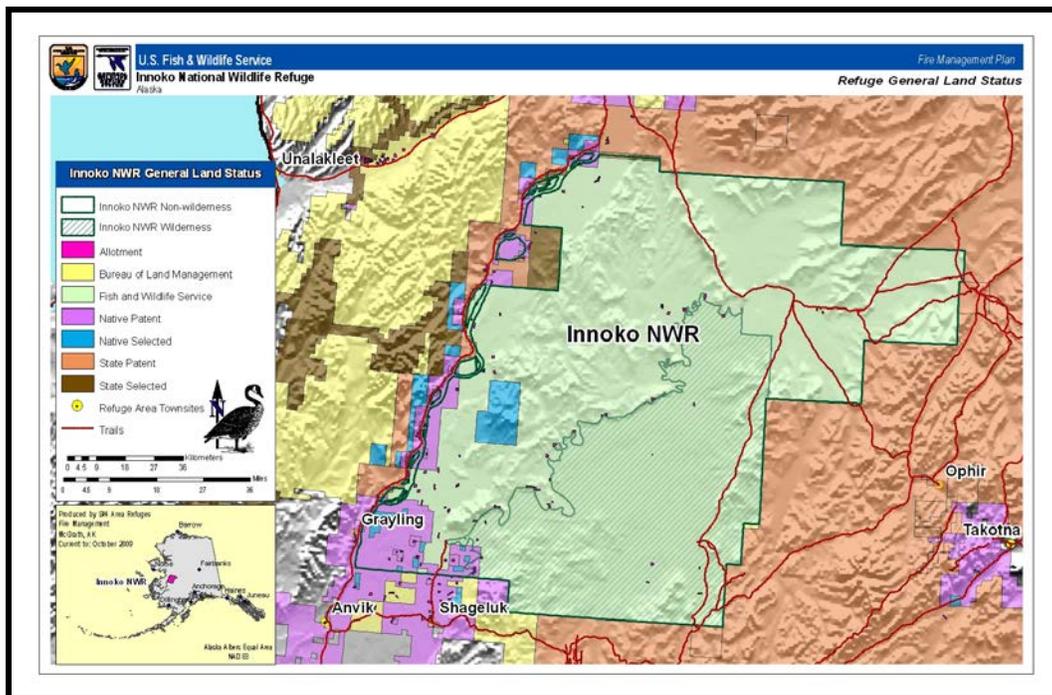


Figure 2 – Innoko Refuge General Land Status (see also Map 2 in Appendix A).

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Of those 3.8 million acres within the boundary, about 4% is under private title or claim leaving 3.6 million acres administered by the Service. There are numerous Native allotments and Native Corporation owned or claimed lands within the Refuge boundaries. The villages of Grayling, Anvik, and Shageluk are the nearest communities. The Refuge headquarters are located within the community of McGrath located fifty miles to the southeast. Approximately 36% of Refuge owned lands are designated as the Innoko Wilderness area. Table 1 below displays the acres delineated by general land owner within Innoko Refuge boundaries. This acreage may change as various selected lands are patented.

Table 1. Acres by land status located within the Innoko Refuge. *These values were provided by the Alaska FWS Regional Office Realty Division in February, 2012.

<i>General Land Status</i>	<i>Total Acres*</i>
<i>Innoko Refuge Non-Wilderness</i>	<i>2,324,689</i>
<i>Innoko Refuge Wilderness</i>	<i>1,315,564</i>
<i>Native Allotment</i>	<i>8,236</i>
<i>Regional Corporation</i>	<i>100,255</i>
<i>Village Corporation</i>	<i>59,496</i>
<i>Other Private</i>	<i>12</i>
<i>Other Federal</i>	<i>6</i>

The Innoko NWR encompasses a largely unaltered ecosystem dominated by numerous rivers flowing among diverse habitats, including muskeg, tundra, and dense boreal forest. The Refuge is a relatively flat plain with the highest point reaching just over 1,460 feet elevation. Water dominates the landscape. The Yukon River forms the western border of the refuge while the Innoko, Iditarod, Dishna and Yetna Rivers flow through it. The Innoko River forms the north and west boundaries of the Innoko Wilderness. These rivers tend to be slow-moving and silty with constantly meandering courses. Extensive wetlands with innumerable small lakes, streams and bogs occur much of the refuge, being particularly abundant in the southeast section. These wetland areas typically experience a yearly flooding and draw-down regime. The rest of the terrain is marked by hills, most of which are less than 1,000 feet in elevation and are part of the Interior Alaska boreal forest ecosystem.

1.3 Significant Values to Protect

Wildlife Habitat

Conservation of fish and wildlife populations and habitats in their natural diversity is the primary purpose for which the Innoko Refuge was established, and it is one of the more important waterfowl areas in interior Alaska. The refuge hosts hundreds of thousands of breeding, nesting, and molting waterfowl and shorebirds. The Refuge is also important rearing habitat for salmon and other species of fish. A large variety of raptors have been reported on the Refuge, as well as wolf, black bear, grizzly bear, caribou, moose and many furbearer species. The success of the moose population is largely attributed to the combination of water and fire regimes that create a wide variety of habitat.

Another purpose of the Refuge is to provide the opportunity for continued subsistence uses by local residents. Approximately 2,000 people live near the Refuge or on private land within the boundaries.

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Most people reside in villages, but some live on Native allotments or on homesteads. Many of these residents participate in some subsistence activities on the Refuge. Moose provide an important source of meat for local residents. Refuge lands have been important to subsistence hunters for generations.

Natural Processes

Habitat diversity and species productivity within the Refuge are the core resource values that the Refuge fire management program is designed to maintain. These values are largely dependent on the continued existence of a relatively natural fire regime. The Refuge is part of the fire dependent Interior Alaska boreal forest ecosystem. Fire, along with spring and summer flooding, is a major recycler of nutrients in the arctic and subarctic region so therefore is among the most important and dominant natural influences in determining the health and vigor of the ecosystem.

Gold Rush History and the Iditarod National Historic Trail

The Refuge has a rich Gold Rush history. The first gold rush began in 1907 to the upper Innoko area. A brief boom included growth of the communities of Dikeman and Dishkakat, both now abandoned. The Iditarod trail was constructed in 1910-11 as an overland winter trail from Seward to the gold fields at Nome, and was designated as a National Historic Trail in November 1978. A main portion of the historic Iditarod Trail, as well as side routes to historic gold mining areas, crosses refuge land.

The villages of Kaltag, Grayling, Anvik, Holy Cross, Shageluk, and the historic mining community of Iditarod are located near and/or have village corporation lands within the legislative boundaries of the Refuge. These communities (with the exception of Shageluk) have been identified as being at low risk from wildland fires occurring on the Refuge. Scattered cabins and a few cultural resource sites have been identified as values at risk from wildland fire (see Table 2).

Wilderness Values

The purpose of the Innoko Wilderness area is to secure an enduring resource of wilderness and preserve the wilderness character of the area in a way that will leave it unimpaired for future use and enjoyment.

1.3.1 Wildland Fire Considerations

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 are incident specific, and will be based on human health and safety, values at risk, and the costs of wildfire incident operations.

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, large fires may temporarily decrease productivity in certain areas. The effects of fires on established trails must also be considered.

The preservation of water quality is another identified Refuge purpose taken into consideration by this fire management plan. Water quality issues relating to fire are unlikely on the Innoko NWR, but may be addressed through Emergency Stabilization (ES) and Burned Area Rehabilitation see section 4.2)

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.

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Although smoke is a natural component of the local environment, and cannot be eliminated, the Refuge fire management program will seek to mitigate negative effects through fire management actions. Specific guidance can be found in the 2009 Alaska Enhanced Smoke Management Plan (Appendix K) and also through the “Smoke Effects Mitigation and Public Health Protection Procedures” located at: <http://fire.ak.blm.gov/administration/awfcg.php>.

There are resources within the Refuge boundary that warrant consideration regarding fire and/or protection from fire. They include administrative property on the Refuge, private property within the Refuge, ANSCA trust lands, and temporary commercial camps. The Refuge currently has no developed recreational or interpretive sites. Per the Regional Policy RW-1, dated August 2010, permitted cabins and their contents are not guaranteed fire protection.

Refuge values are listed in Table 2. Specific protection levels for the values managed by the Refuge will be documented by the FWS Area FMO via the Known Sites Database maintained by Alaska Fire Service (AFS) and can be found in Appendix Q. A map of these sites can be found in Appendix A (Map 4 - fire related values). Access to the Known Sites Database is controlled by AFS and is located at: <http://fire.ak.blm.gov/predsvcs/maps.php>.

Table 2. Innoko NWR Specific Refuge related Values; March 2012

Asset	Location	LAT / LONG	Comments
Rennie's Landing	NE Innoko River	63 36.65N 157 04.70W	Cabin w/outbldgs.
Holikachuk (some private)	SW Innoko River	62 54.59N 159 31.20W	Old townsite
Innoko Field Camp	N Innoko River	63 38.33N 158 01.84W	Summer residents
Walker Cabin	N Innoko River	63 36.20N 158 06.74W	FWS owned
Clarks	SE central	62 56.65N 157 58.14W	Old permit cabin
Peters	E central	63 05.55N 157 59.03W	Old permit cabin
Flemings	S boundary	62 44.70N 158 00.04W	Collapsed
Dikeman	SE near Clarks	62 57.04N 157 59.23W	Collapsed
Dishkaket	NE Innoko River	63 37.97N 157 28.74W	Collapsed
Simels	NE Innoko River	63 35.20N 157 13.53W	Collapsed
Innoko RAWS	west central	63 23.38N 158 49.81W	Weather station
Shermeier's Halfway Rdhs	SE along Iditarod Tr.	62 45.00N 157 49.49W	Collapsed
Deacons (private)	S Innoko River	63 04.12N 159 00.29W	Private inholding
Ivey (private)	central	63 11.21N 158 18.03W	Private inholding
Sucker Creek (private)	SW Sucker Crk	62 59.42N 159 31.06W	Private inholding

Currently there is not a comprehensive survey of cultural resources in the Refuge. Many associated sites are listed in literature concerning the Iditarod National Historic Trail. As new Refuge values are identified, they will be assigned a protection level and documented as stated above.

A FWS archeologist should be contacted for any planned ground disturbance near historic or cultural sites.

1.4 Effects of Climate on Biotic Composition

The climate in boreal and arctic Alaska is changing (Arctic Climate Impact Assessment 2005, Intergovernmental Panel on Climate Change 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 21st 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;
- 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, that we take to help reduce the impacts of climate change on fish, wildlife, and their habitats.

Implementation of the strategic plan will take time, and fire management decisions need to be made in the interim. All of Alaska's Refuges are mandated by ANILCA to conserve fish and wildlife populations and habitats in their natural diversity. This presents a challenge for fire managers who must consider Refuge and other legal mandates as well as safety obligations in the face of changing fire regimes.

In the absence of specific guidelines, the following will occur:

- Wildland fire management decisions will be based on guidance provided in Refuge Comprehensive Conservation Plans and associated step-down plans, ANILCA, 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.
- Participation in research efforts to better inform management decisions.

Drier conditions and longer summers are expected to result in increased wildland fire activity within the Refuge in coming years due to climate change. The Refuge expects to continue its policy to maintain fire-related ecological processes whenever possible.

2.0 POLICY, LAND MANAGEMENT PLANNING AND PARTNERSHIPS

2.1 Fire Policy

2.1.1 Federal Interagency Wildland Fire Policy

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)*:

- Firefighter and public safety is the first priority in every fire management activity.
- 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.
- Fire management plans, programs, and activities support land and resource management plans and their implementation.
- 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 either doing or not doing an activity.
- Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives,
- Fire management plans and activities are based upon the best available science.
- Fire management plans and activities incorporate public health and environmental quality considerations.
- Federal, State, tribal, local, interagency, and international coordination and cooperation are essential.
- 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:

- Wildland fire management agencies will use common standards for all aspects of their fire management programs to facilitate effective collaboration among cooperating agencies.
- 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.
- Responses to wildland fire will be coordinated across levels of government regardless of the jurisdiction at the ignition source.
- Fire management planning will be intergovernmental in scope and developed on a landscape scale.
- Wildland fire is a general term describing any non-structure fire that occurs in the wildland. Wildland fires are categorized into two distinct types:
 - Wildfires – Unplanned ignitions or escaped prescribed fires
 - Prescribed Fires - Planned ignitions.
- A wildland fire 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,

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weather, topography; varying social understanding and tolerance; and involvement of other governmental jurisdictions having different missions and objectives.

- Management response to a wildland fire on federal land is based on objectives established in the applicable Land/ Resource Management Plan and/or the Fire Management Plan.
- Initial action on human-caused wildfire will be to suppress the fire at the lowest cost with the fewest negative consequences with respect to firefighter and public safety.
- 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 project/incident objectives. Accomplishing the objectives safely and efficiently will not be sacrificed for the sole purpose of “cost-saving.” Appropriate oversight will ensure that expenditures are commensurate with values to be protected. Other factors besides those in the biophysical environment may influence decisions, including those from the social, political, and economic realms. (Interagency Standards for Fire and Fire Aviation Operation, Chapter 1).

2.1.2 National Fire Plan

This FMP meets the direction in the National Fire Plan because it emphasizes the following primary goals of the 10 Year Comprehensive Strategy and Cohesive Strategy for Protecting People and Sustaining Natural Resources:

- *Improving fire prevention and suppression,*
- *Reducing hazardous fuels,*
- *Restoring fire-adapted ecosystems, and*
- *Promoting community assistance.*

The use of Wildland fire supports the 10-Year Comprehensive Strategy goals of reducing hazardous fuels and restoring fire-adapted ecosystems. The 10-Year Strategy principles will be followed by 1) protecting communities, 2) collaborating with the Alaska Fire Service (AFS), Alaska Department of Natural Resources (DNR), and Alaska Department of Fish and Game (ADF&G) 3) establishing meaningful performance measures and 4) monitoring fires dependent on size and potential impacts.

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.*

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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 Interior (DOI) Fire Policy

This FMP incorporates and adheres to DOI policy stated in 620 DM 1 (and 620 DM2) by making full use of wildland fire as a natural process and a tool in the planning process, and by providing for the following:

- Wildfires, 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 Department programs. (620 DM 1.6 B)
- Bureaus shall cooperate in the development of interagency preparedness plans to ensure timely recognition of approaching critical wild fire situations, to establish processes for analyzing situations and establishing priorities, and for implementing management responses to these situations. (620 DM 1.6 E)
- Bureaus will enforce rules and regulations concerning the unauthorized ignition of wildfires, and aggressively pursue violations. (620 DM 1.7)
- Wildland 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).

This FMP implements the policy outlined in the following text from 620 DM 2.4 that sets out the lead role of the Bureau of Land Management Alaska Fire Service (BLM AFS) as the Wildland Fire Protecting Agency 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

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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 is to plan and make decisions that help accomplish the mission of the National Wildlife Refuge System. The mission is the conservation and management of fish, wildlife, plant resources and their habitats. Guidance for fire management is found in Service Manual 621 FW 1.

Any response to wildland fire (including wildfire and planned ignitions) occurring on Innoko Refuge 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 incorporates procedures and guidelines in the FWS *Fire Management Handbook (FWS FMH)* and the *Interagency Standards for Fire and Fire Aviation Operations (Red Book)* and affirms these key elements of FWS fire policy:

- Firefighter, employee, 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, wildfire management duties and operations.
- Trained and certified employees will participate in the wildfire management program as the situation requires, and non-certified employees will provide support as necessary.
- Fire management planning, preparedness, wildland 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.
- Wildfire is used to meet identified resource management objectives and benefits when appropriate.

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- Prescribed fire and other treatment types will be employed whenever they are 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.
- Management response to wildfire 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 unauthorized ignition of wildfires on FWS lands.

2.1.5 Alaska Region FWS Interagency Fire Management

2.1.5.1 Background on Fire Management Policy in Alaska Region (1939-2010)

The history of fire control within Interior Alaska dates back to 1939 when the Alaska 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. ANCSA [43 USC 1620(e)] provides for forest fire protection services from the United States at no cost to Native individuals or to Native Groups, Village and Regional Corporations organized under ANCSA, as long as there are no substantial revenues from such lands.

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,

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the AFS Manager works directly for the BLM State Director and serves as the BLM State Fire Management Officer. The BLM Field Offices¹ 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. 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.

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, hereafter referred to as the Master Agreement. This Master agreement with its exhibits has defined the roles and responsibilities of the jurisdictional and protection agencies as well as operating procedures (see Appendix G, more detail in section 2.3.3.2).

2.1.5.2 Alaska Interagency Wildland Fire Management Plan

The Alaska Interagency Wildland Fire Management Plan (AIWFMP 2010) 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 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.

¹ BLM Districts are now called Field Offices.

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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 is high, probability of significant fire growth is high and the probability of containment is low. A lower level of protection is considered when the fire danger decreases, potential for fire growth decreases and the probability of containment increases. 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 managed to maintain its ecological role while providing for the protection of human life and site-specific values. Most natural ignitions will be managed for the purpose of 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 Jurisdictional 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.

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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).

The AIWFMP objectives were developed to meet and support agencies’ goals and to provide implementation guidance for fire operations. The objectives are:

- 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.

Innoko NWR is located within the AFS Galena Zone protection area whose headquarters are located in the village of Galena during the summer months when fires typically occur.

2.1.5.3 FWS Alaska Regional 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)*
- *Region 7 Policy on Minimum Requirement Analyses for Approving Administrative Activities in Refuge Wilderness Areas (RW-29)*
- *Revised Region 7 Bear Awareness and Firearms Safety Training Policy (June 2008)*
- *Revised Region 7 Watercraft Safety and Training Policy (June 2003)*

2.2 Land / Resource Management Planning

2.2.1 Land Management Plans

This FMP steps down from the Innoko NWR Comprehensive Conservation Plan (USFWS 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 Environmental Compliance

NEPA requires that the environmental effects of proposed major federal actions be considered in the decision-making process. Refuge management activities were analyzed in the Refuge CCP through an Environmental Assessment (EA). After a public comment period, on September 22, 2008, the Regional Director signed a Finding of No Significant Impact (FONSI). This FMP is a step down plan based on that document and currently is in compliance with the Department of Interior's (DOI) wildland fire management policy, Departmental Manual (DM) 620 1-2 and the National Environmental Policy Act of 1969 (NEPA). The direction and intent of this FMP is based on the selected alternative developed through the CCP NEPA. Additional NEPA analysis may be completed as needs arise, and findings will either supplement or replace the CCP EA.

Individual, ground-disturbing fire management projects such as prescribed fires and fuel reduction activities require the completion of a NEPA compliance checklist. There are three levels of environmental analysis possible: Categorical Exclusion (CX), Environmental Assessment (EA) and Environmental Impact Statement (EIS). Refuge fire managers will consult with regional FWS environmental compliance experts to select the appropriate level of analysis for each proposed project. Prescribed fires conducted under this plan may temporarily reduce air quality in the immediate project vicinity. The Refuge will meet the Clean Air Act standards by adhering to the Alaska state Air Quality requirements during all prescribed fire activities. Details are in Chapter 4.

Categorical Exclusions

The Code of Federal Regulations (CFR's) (43 CFR 46.210) and DOI Manual (Part 516 DM 8.5), identify Categorical Exclusions (CX's) pursuant to 43 CFR 46.205 for fire and fuels management actions. Categorical Exclusions are classes of actions which do not individually or cumulatively have a significant effect on the human environment. Categorical Exclusions are not the equivalent of statutory exemptions. If exceptions to CX's apply (46 CFR 43.215), CX's cannot be used, two Departmental-wide CX's identified in the CFR's pertain specifically to fire management actions. The first CX (43 CFR 46.215(k)) deals with fuel reduction and the second (43 CFR 46.215(l)) relates to post-fire rehabilitation.

- 1) (43 CFR 46.215(k)): "Hazardous fuels reduction activities using prescribed fire not to exceed 4,500 acres, and mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing, not to exceed 1,000 acres. Such activities:
 - a. Shall be limited to areas:
 - i. in wildland-urban interface; and
 - ii. Condition Classes 2 or 3 in Fire Regime Groups I, II, or III, outside the wildland-urban interface;
 - b. Shall be identified through a collaborative framework as described in "A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan;"

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- c. Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans;
 - d. Shall not be conducted in wilderness areas or impair the suitability of wilderness study areas for preservation as wilderness;
 - e. Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and may include the sale of vegetative material if the primary purpose of the activity is hazardous fuels reduction.”
- (Refer to the Environmental Statement Memoranda Series for additional, required guidance.)
- 2) (43 CFR 46.215(l)): “Post-fire rehabilitation activities not to exceed 4,200 acres (such as tree planting, fence replacement, habitat restoration, heritage site restoration, repair of roads and trails, and repair of damage to minor facilities such as campgrounds) to repair or improve lands unlikely to recover to a management approved condition from wildland fire damage, or to repair or replace minor facilities damaged by fire. Such activities must comply with the following (Refer to Environmental Statement Series for additional, required guidance.):
- a. Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans;
 - b. Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and
 - c. Shall be completed within three years following a wildland fire.

In addition to the CX’s identified above, the DOI Manual Part 516 DM 8.5 identifies CX’s that are specific to the FWS. Identified below are categorical exclusions that may apply to fire management activities:

- 516 DM 8.5 A (2): “Personnel training, environmental interpretation, public safety efforts, and other educational activities, which do not involve new construction or major additions to existing facilities.”
- 516 DM 8.5 B (4): “The use of prescribed burning for habitat improvement purposes, when conducted in accordance with local and State ordinances and laws”.
- 516 DM 8.5 B (5): “Fire management activities, including prevention and restoration measures, when conducted in accordance with Departmental and Service procedures”.
- 516 DM 8.5 B (9): “Minor changes in existing master plans, comprehensive conservation plans, or operations, when no or minor effects are anticipated. Examples could include minor changes in the type and location of compatible public use activities and land management practices.”
- 516 DM 8.5 B(10): “The issuance of new or revised site, unit, or activity specific management plans for public use, land use, or other management activities when only minor changes are planned. Examples could include an amended public use plan or fire management plan.”

When using CX(s) for planned fire management activities (including prescribed fires, non-fire hazardous fuels treatments, and BAER/BAR), the refuge staff will follow guidance identified in Code of Federal Regulations, DOI Manual, agency policy (Fire Management Handbook), and regional guidance for the application and documentation of the appropriate environmental analysis and NEPA documentation.

Fire management activities authorized within the scope of this plan will also comply with all of the following Regulatory Acts:

- *Section 7 of the Endangered Species Act as amended in 1973 (ESA)*
- *National Historic Preservation Act of 1966 (NHPA)*
- *Archeological Resources Protection Act of 1979 (ARPA)*

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- *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*
- *Section 118 of the Clean Air Act (as amended in 1990)*

2.3 Fire Management Partnerships

2.3.1 Internal Partnerships

The Fire Management Officer (FMO) for the Refuge is a permanent full time shared position that also serves the Togiak and Yukon Delta NWRs and is also referred to as the FWS Area FMO. The FWS Area FMO is stationed in McGrath, AK and is supervised by the Innoko Refuge Deputy Manager. Funding for the position is sent directly to Innoko Refuge. There has been discussion about developing an Inter Refuge agreement to further define the roles and responsibilities of the FWS Area FMO. If this plan is developed, it will be added to this FMP as an appendix.

The FMO will take an active role in fire management activities on the Refuge in cooperation and coordination with the Refuge Manager (or designee), Refuge biologists, and other Refuge staff. The FMO may also be available for Regional and National fire assignments during periods of high fire occurrence. The availability of the FMO and any other fireline qualified Refuge employee is based on the National planning level, the State planning level, Refuge staffing and supervisory approval. Prescribed fires may require assistance from other Refuges or agencies.

The regional office in Anchorage has a fire management staff to assist the Refuge with fire ecology and fire research needs, fire planning, fire information, and fuels management. Regular contact is made with this staff and the Regional Fire Coordinator throughout the year to provide information on Refuge fire management activities and to obtain support to accomplish planned activities. The Regional Fire Coordinator reviews the Refuge FMP.

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 planned site-disturbing activities.

2.3.2 External Partnerships

2.3.2.1 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.

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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.

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

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

The *Alaska Master Agreement* (Appendix G) documents the commitment of its signatories to improve the efficiency of fire management activities in Alaska, including prevention, preparedness, communication and education, fuels treatment and hazard mitigation, fire planning, response strategies, tactics and alternatives, and suppression and post-fire rehabilitation and restoration, by facilitating the coordination and exchange of personnel, equipment, supplies, services, and funds. It also facilitates improved coordination regarding other incidents covered under the National Response Framework (NRF).

Signatories include:

- The State of Alaska, Department of Natural Resources (AKDNR)
- The United States Department of Agriculture Forest Service, Region 10 (USFS)
- The United States Department of the Interior (DOI), National Park Service, Alaska Region (NPS)
- The United States DOI, Fish and Wildlife Service, Alaska Region (Region 7 - FWS)
- The United States DOI, Bureau of Indian Affairs, Alaska Regional Office (BIA)
- The United States DOI, Bureau of Land Management, Alaska (BLM)
- The United States DOI, Bureau of Land Management, Alaska Fire Service (AFS)

Alaska Statewide Annual Operating Plan (Alaska AOP)

The *Alaska AOP*, exhibit C of the Master 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 the following: State Forester, AFS Manager, USFS Regional Forester, FWS, NPS, BLM and BIA Regional Director.

Innoko National Wildlife Refuge falls within the scope of the *Alaska Master Agreement* and *Alaska AOP*. The Alaska Fire Service, Galena Zone provides protection services. Additional support services and some tactical resources such as air tankers and smokejumpers are available from AFS in Fairbanks.

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Consultation and coordination with AFS Galena Zone is essential for all fire management activities on the Refuge. Meetings are held each spring to discuss upcoming fire management activities. At that time memorandums of understanding and cooperative agreements in effect will be addressed; Refuge equipment and fireline qualified personnel will be identified; local procedures regarding management responses to unplanned ignitions will be discussed (contact lists updated); and both agencies will familiarize themselves with each other's concerns and issues.

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 specifies direction for the response to a wildland fire that is based on 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 Innoko Refuge. The *AIWFMP* is incorporated by reference into the *Alaska AOP*, with specifics are outlined in Section 2.1.5.

Signatories include:

- The State of Alaska, Department of Natural Resources (AKDNR)
- The State of Alaska, Department of Environmental Conservation (AKDEC)
- The State of Alaska, Department of Fish and Game (AKDF&G)
- The United States DOI, National Park Service, Alaska Region (NPS)
- The United States DOI, Fish and Wildlife Service, (Alaska, Region 7) (FWS)
- The United States DOI, Bureau of Indian Affairs, Alaska Regional Office (BIA)
- The United States DOI, Bureau of Land Management, Alaska (BLM)
- The United States Department of Agriculture Forest Service, Region 10 (USFS)
- The Association of Village Council Presidents (AVCP)
- Tanana Chiefs Conference, Inc. (TCC)
- Chugachmiut, Inc.
- Anchorage Fire Department

The AFS, AKDF&G, BIA, TCC, AKDNR, AVCP, and the communities of Holy Cross, Anvik, Grayling, Shageluk, and McGrath were consulted during the drafting of this plan. The plan was developed in collaboration with Refuge staff and other AK FWS fire staff. Interagency coordination is critical for successful implementation of the Refuge fire program since fires have ecosystem-wide effects that affect neighboring land owners and managers. The Refuge works closely with its neighbors in the selection of fire management options and for input/concerns regarding fire management strategies.

3.0 FIRE MANAGEMENT UNIT CHARACTERISTICS

A Fire Management Unit (FMU) is a land management area definable by objectives, management constraints, topographic features, access, values to protect, political boundaries, fuel types, major fire regime groups, etc. that set it apart from the characteristics of an adjacent FMU. The Innoko FMUs are based on an analysis of values to protect, the natural role of fire, wilderness management direction, and overall Refuge management objectives.

Under this FMP, the Refuge is divided into (1) a Wilderness FMU made up of the Innoko Wilderness and (2) the Non-wilderness FMU, the remainder of the Refuge. Areas within each FMU are further subdivided into AIWFMP fire management options. Figure 3 shows the location of FMU boundaries and the current AIWFMP fire management options for the Refuge and adjacent lands. The Refuge Manager determines the FMU location for lands under their authority (in consultation with the FWS Area FMO and other staff as appropriate) and has the flexibility to change the fire management options on those lands as needed due to changes in land use, protection needs, laws, mandates or policies (see section 3.1).

Table 3. Innoko NWR Fire Management Units (Service lands only)

<i>Fire Management Unit Name</i>	<i>Total Acres</i>
Innoko Non-Wilderness FMU	2,324,689
Innoko Wilderness FMU	1,315,564

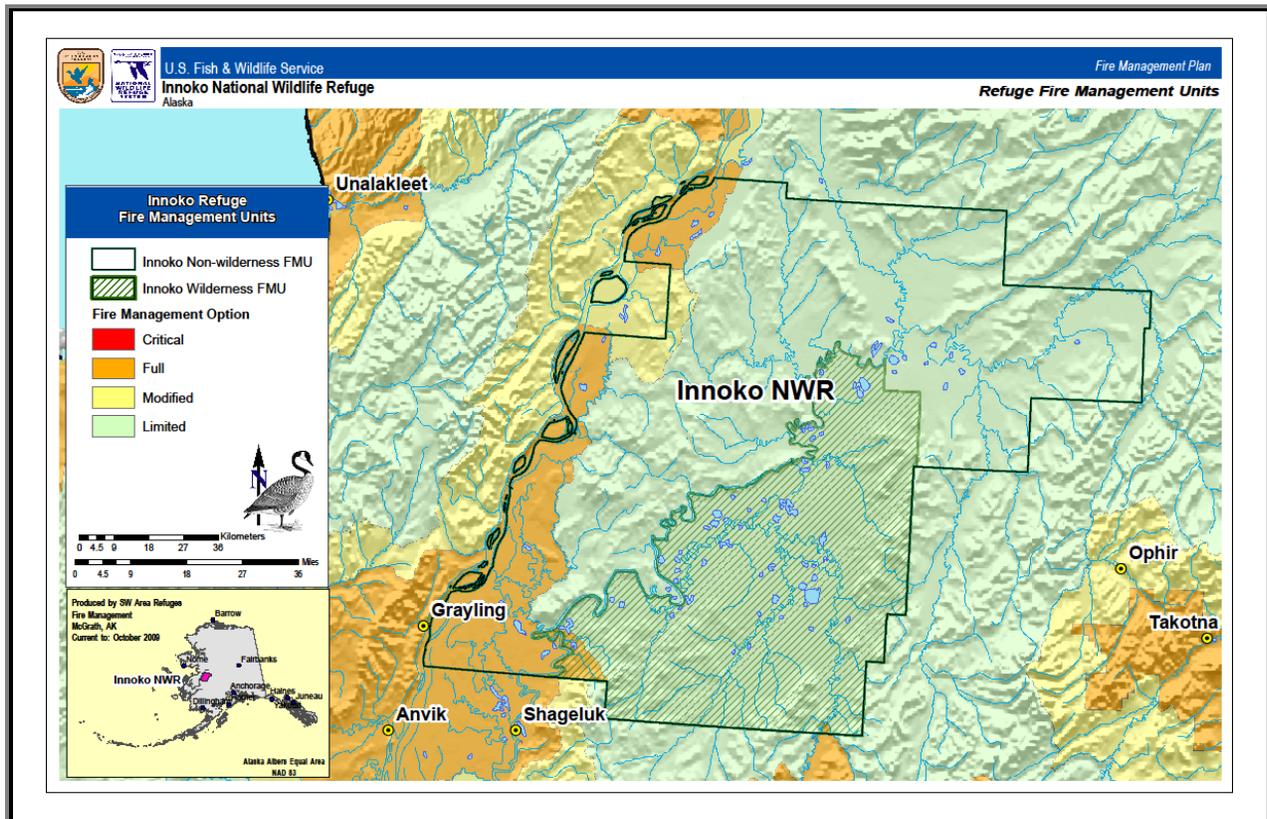


Figure 3 - Innoko NWR Fire Management Units (see also Map 3 in Appendix A).

3.1 Area Wide Management Considerations

The management of wildland fire for the benefit of Refuge ecosystems should be the guiding principle while taking measures to protect human life, property and/or areas of special concern. A management response will be made for all wildfires; fires may be managed for multiple objectives, which may change as conditions on the fire change. The circumstances under which a fire occurs, and the likely consequences on public and firefighter safety, natural and cultural resources, and values to be protected dictate the type of response it receives.

The Refuge Manager is responsible for reviewing and updating management option and known site designations on Innoko NWR annually. This usually is completed in consultation with the FWS Area FMO. Federal permits, leases, sales contracts and other documents that allow for private use of federal contain information regarding wildland fire protection levels and management option designation as stipulations. Those designations are applicable to the lands and personal property located on those lands; the issuing Jurisdictional agency designates the management option category for those lands.

Note: neither the CCP, nor this plan describe management of state or private lands since those lands are outside of Refuge jurisdiction. However, the locations of State/Private Lands within Refuge boundaries are important to the management of adjacent Refuge lands.

3.1.1 Fire Management Goals, Strategies, and Guidance from CCPs/Similar Plans

The 2008 Innoko Comprehensive Conservation Plan (CCP) provides broad policy guidance and establishes management directions for the Refuge. It defines long-term goals towards which Refuge management activities are directed, 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 CCP describes fire management as the *full range of activities necessary to conserve, protect, and enhance habitat and to maintain desired ecological conditions for the benefit of fish and wildlife. Fire management activities include preparedness, emergency suppression operations, use of wildland fire, fire prevention, education, monitoring, research, prescribed fire, hazardous fuel reduction, and mechanical treatments* (pg 2-42).

3.1.1.1 Fire Related Goals and Objectives from the CCP

The Refuge CCP includes eight general goals, ranging in topic from wildlife to facilities, and 115 associated objectives. One purpose of this FMP is to scale down broad CCP objectives pertaining to fire to specific strategies that can be applied on the ground. Another purpose is to document progress towards meeting objectives and, when appropriate, to remove them from the list when work has been completed or when situations change such that the objective is no longer relevant.

Sixteen objectives from the CCP were identified as being specifically or indirectly related to fire and are excerpted in Table 4 below (see also Appendix X). *Some objectives are more appropriately addressed in the Refuge's biological Inventory and Monitoring Plan than in the FMP; roles and responsibilities will be determined pending conversations between the fire and biological staffs.* Progress has been made on some these objectives since the CCP was published in 2008, while others may have become obsolete during that time. Appendix X contains 1.) a discussion of CCP objectives related to fire that will be addressed in the Inventory and Monitoring Plan. 2.) progress towards objectives (2008 – 2013); and 3.) an updated list of FMP objectives that the Refuge plans to address within the next five years, including strategies for meeting them. New wildland fire objectives not included in the CCP will be developed as needed and will relate back to goals documented in the CCP. These will be added to Appendix X.

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Table 4. Fire Management Goals and Objectives from the 2008 Innoko National Wildlife CCP (2 pages)

CCP Goal	CCP Objective	Objective Category	Description	Program Responsibility/Status
Wildlife	31 (CCP pg 2-9)	Cooperative Efforts	Within five years of funding, evaluate distributions of furbearer populations in relation to fire severity. A range of post-fire seral stages provides different habitat requisites for different furbearers. Wildfire timing and severity affect the rate of vegetative succession and post-fire re-colonization of many species. Utilize remote sensing with land cover mapping efforts and recent knowledge of furbearer distributions to improve our understanding of the short- and long-term response of furbearers to fire (see objective 48).	Biology and Fire. <i>Dependent on completion of initial furbearer abundance and winter distribution surveys.</i>
	33 (CCP pg 2-10)	Cooperative Efforts	On approval of funding, initiate long-term studies of how small mammals and vegetation are affected by fire. Document changes to forest succession from differing fire intensities. Little is known about how small mammals respond over time to a range of fire severity within various vegetation types (see objective 48).	Biology and Fire. <i>Dependent on completion of initial furbearer abundance and winter distribution surveys.</i>
Habitat	42 (CCP pg 2-12)	Planning	Throughout the life of this plan, evaluate weather data from permanent RAWS station area compared to other areas of the Refuge by use of a portable RAWS. Compare data and collect localized weather information for use in other studies.	Fire. FWS R7 Fire Planner assist. Partner with AICC Predictive Services.
	43 (CCP pg 2-12)	Planning	Continue implementing the Refuge's Fire Management Plan in accordance with DOI, National Fire Plan, and Agency policy.	Fire. <i>Policy has changed since the CCP was completed that includes 1.) FMP must be reviewed annually 2.) FMP revisions follow the CCP revision schedule.</i>
	44 (CCP pg 2-12)	Planning	At five-year intervals assess and report fire occurrence, cause, behavior, and fire effects trends using the best available technology to provide fire managers the information necessary to revise the Refuge's FMP and evaluate fire management decision criteria. Include short/long term monitoring of caribou lichen fire-impacted areas.	Fire. FWS R7 Fire Ecologist assist. <i>Policy has changed since the CCP was completed that includes 1.) FMP must be reviewed annually 2.) FMP revisions follow the CCP revision schedule.</i>
	47 (CCP pg 2-13)	Mapping	Develop fire progression maps for future fires as opportunities allow for use to validate/refine fire spread models, improve predictions, and assist in fire severity remote sensing interpretation and refine fire behavior predictions when linked with weather and fuels data.	Fire/GIS.
	48 (CCP pg 2-13)	Mapping	Within one year of a fire's occurrence, develop a fire severity map (if data available) to provide baseline for habitat and wildlife research.	Fire/GIS. Biology, FWS R7 Fire Ecologist assist.

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Habitat (cont.)	49 (CCP pg 2-13)	Mapping	Within three years of funding, create an updated land cover map using satellite imagery or other advanced methods. The last mapping effort in 1991 does not include changes due to wildfire. Medium resolution imagery (i.e. 30 x 30 meter pixels) is adequate for wildfire monitoring and habitat changes.	Fire/GIS. Biology, FWS R7 Fire Ecologist assist.
	50 (CCP pg 2-14)	Mapping	Within one year of completion of updated land cover map (see objective 49), develop data crosswalks to fire fuels classification systems such as NFDRS, LANDFIRE, and FRCC. Fire fuel datasets provide base inputs for fire behavior and fire effects predictive modeling tools to better manage wildland and prescribed fires.	Fire/GIS. Biology, FWS R7 Fire Ecologist assist.
	54 (CCP pg 2-15)	Inventory and Monitoring	Within two years of funding, develop inventory and monitoring strategies to assess the effects of fire on caribou and moose habitat. This information will assist management of fire with these populations.	Fire, Biology.
	58 (CCP pg 2-16)	Inventory and Monitoring	Continue to document fire history patterns (as a key determinant of ecosystem change) on the Refuge using historic records/field studies and participating in research on Alaska Fire Regimes. This informs decisions on managing for natural fire regimes.	Fire. Biology, FWS R7 Fire Ecologist assist.
	59 (CCP pg 2-16)	Inventory and Monitoring	Within two years of funding, begin annual measurements of berry production (important for wildlife and subsistence activities) and assess productivity trends in relation to fire severity.	Fire, Biology.
	62 (CCP pg 2-17)	Inventory and Monitoring	Throughout the life of this plan, monitor landscape changes of both vegetation and physical features after fires using satellite imagery to assess the long-term effects and effectiveness of various fire management decisions.	Fire. Biology, FWS R7 Fire Ecologist assist.
Wilderness	83 (CCP pg 2-21)	Preserve values of designated wilderness	Allow naturally occurring fires to burn and avoid or minimize evidence of human actions whenever possible within the Refuge designated wilderness.	Fire.
Outreach and Environmental Education	87 (CCP pg 2-22)	Provide outreach and education	Participate when possible in local community events, festivals, and programs that will facilitate education and interpretation of Refuge goals, especially related to wildland fire management (see also FMP section 4.4.3).	Fire. <i>FWS R7 provides "Role of Fire" for K-12 teachers. Fire staff participates in Annual Science Camp (fire courses), provides fire information brochures for public use, and FireWise education.</i>
Cultural Resources	100 (CCP pg 2-24)	Conserve cultural and archeological resources	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. This information will be communicated to the BLM Alaska Fire Service.	Fire. <i>Starting in 2010, Refuge structures were identified, mapped, and documented as "Known Sites" and is available at Refuge headquarters (both hardcopy and electronic) This was also provided to AFS for inclusion in the statewide "known-sites" database and is updated annually.</i>

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3.1.1.2 Management Categories (and Guidance) from the CCP pertaining to fire.

The CCP documents which management category is applied to specific areas of the Refuge. A *management category* is used to define the level of human activity appropriate to a specific area of the Refuge. It is a set of Refuge management directions applied to an area in light of its resources and existing and potential uses to facilitate management and the accomplishment of Refuge purposes and goals. There are five potential management categories for Alaska refuges: Intensive, Moderate, Minimal, Wild and Scenic Rivers, and Wilderness. Only two of these categories are used on Innoko Refuge - Wilderness, which applies to the Innoko Wilderness Area, and Minimal, which applies to the remainder of the Refuge. Table 5 (from the CCP pg 2-62 and 2-63) displays fire management activities that are or may be allowed in each management category on the Refuge.

Table 5. Fire Management Activities by CCP Management Category (see sections 2.3, 2.4, and 2.5, of the CCP for a full description of activities and management categories.¹⁾

Activity	Wilderness Management	Minimal Management
Habitat Management (see section 2.4.10.1) <i>Mechanical Treatment</i> Activities such as cutting, crushing or mowing of vegetation; water control structures; fencing; artificial nest structures	Not allowed; with exceptions consistent with section 2.3.5; see also section 2.4.19 ³	Not allowed; with exceptions consistent with section 2.3.3 ⁴
<i>Manual Treatment</i> Use of hand tools to remove, reduce, or modify hazardous plant fuels, exotic plant species, or to modify habitats (e.g., remove beaver dams)	May be allowed; see section 2.4.19 ³	May be allowed
Fire Management—Prescribed Fires Fire ignited by management actions to meet specific management objectives (see section 2.4.10.2)	May be allowed; see section 2.3.5 ³	May be allowed
Fire Management—Wildland Fire Use² The planned use of naturally occurring fires to meet management objectives (see section 2.4.10.2)	May be allowed ³	May be allowed
Fire Management—Fire Suppression Management actions intended to protect identified resources from a fire, extinguish a fire, or alter a fire’s direction of spread (see section 2.4.10.2)	Allowed	Allowed

¹Allowed: activity allowed under existing NEPA analysis, appropriate use findings, refuge compatibility determinations, and applicable laws and regulations of the Service, other Federal agencies, and the State of Alaska. May be Allowed: allowance subject to site-specific NEPA analysis, an appropriate use finding, a specific refuge compatibility determination, and compliance with all applicable laws as noted above.

²The term “wildland fire use” has been discontinued since the CCP was developed; most similar terminology currently used is “wildland fire use for resource benefit.”

³Subject to minimum requirements analysis.⁴Section 2.3.3 allows mechanized and motorized equipment use when overall impacts are temporary or where its use furthers management goals.

Special Management

Special management lands are managed within one of the CCP management categories described above, but have additional requirements because of their status.

- Management of Selected Lands - The Service retains management responsibility for lands selected but not yet conveyed to Native village and regional corporations or to the State of Alaska. Management of these lands will be the same as for adjacent Refuge lands.

3.1.2 Fire Management Guidance and Standards from Other Sources

Section 2.1.5 explains specific Alaska Region FWS Interagency Fire Management. The following directly pertain to Innoko Refuge:

- FWS is the Jurisdictional Agency for Innoko NWR lands. The Protecting Agency responsible for providing protection services for the Innoko NWR and surrounding lands is the Bureau of Land Management, Alaska Fire Service, Galena Zone.
- The Refuge Manager retains overall responsibility for fire management activities on the Refuge. “Nothing herein relieves agency administrators of the responsibility and accountability for activities occurring on their respective land.” (620 DM 2.4A)
- The Refuge Fire Management Officer will take an active role in fire management activities on the Refuge in cooperation and coordination with services provided by the Protecting Agency.
- The Refuge Manager (or designee) may authorize the Protecting Agency to a non-standard response to a selected fire management option if prudent and justifiable. These decisions may be based on anticipated fire behavior and acreage likely to be burned, existing and anticipated smoke problems, probability of success, proximity to non-Service lands, and the experience and judgment of Service and Protecting Agency personnel. The decision and the rationale for this request and the action taken will be documented following current DOI and FWS guidelines.

3.1.3 Common Characteristics of Fire Management Units

3.1.3.1 Climate, Fire Season, and Fire Regime

The Refuge has a continental sub-arctic climate characterized by low annual precipitation, low humidity, low cloudiness, and large seasonal extremes in both temperature and daylight. The summer sun provides almost continuous radiation (20 hours daylight during the summer solstice) and heats valleys that are protected from coastal winds and clouds by surrounding hills. During the winter, the valleys become cold sinks and temperatures are among the coldest on the continent. Temperatures can range from -62° F during winter months, to 93° F in the summer (at Holy Cross). December and January are the coldest months, while June, July, and August are the warmest. The frost-free period is approximately 105 days. Ice is typically present in the lakes from early October to late May. Precipitation averages 18 inches annually, including an average of 90 inches of snow.

A normal fire season pattern is described below, but not every year is normal. Large fires require dry fuels, ignitions, and wind. Some fire seasons have a lot of lightning, but this is accompanied by rain. Some are extremely dry, but with few sources of ignition. The Refuge is large enough that separate areas may have different activity levels due to vast differences in rainfall and lightning.

Fire activity typically begins in late May, when snow cover disappears, and flooding starts to subside. Fires during this time usually are low intensity because of high relative humidity (RH) at night, moderate daytime temperatures, and high soil and duff moistures. Black spruce (*Picea mariana*) can be moisture stressed earlier in the year, promoting crown fires, and birch and aspen also can sustain higher fire

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intensities before green-up. Additionally, spring fires can smolder and flare up later when fuels have a chance to dry. The majority of the Refuge is inaccessible except by air or boat so human caused ignitions are rare on the Refuge, but may occur in spring or fall during hunting or fishing activities (see Figure 4).

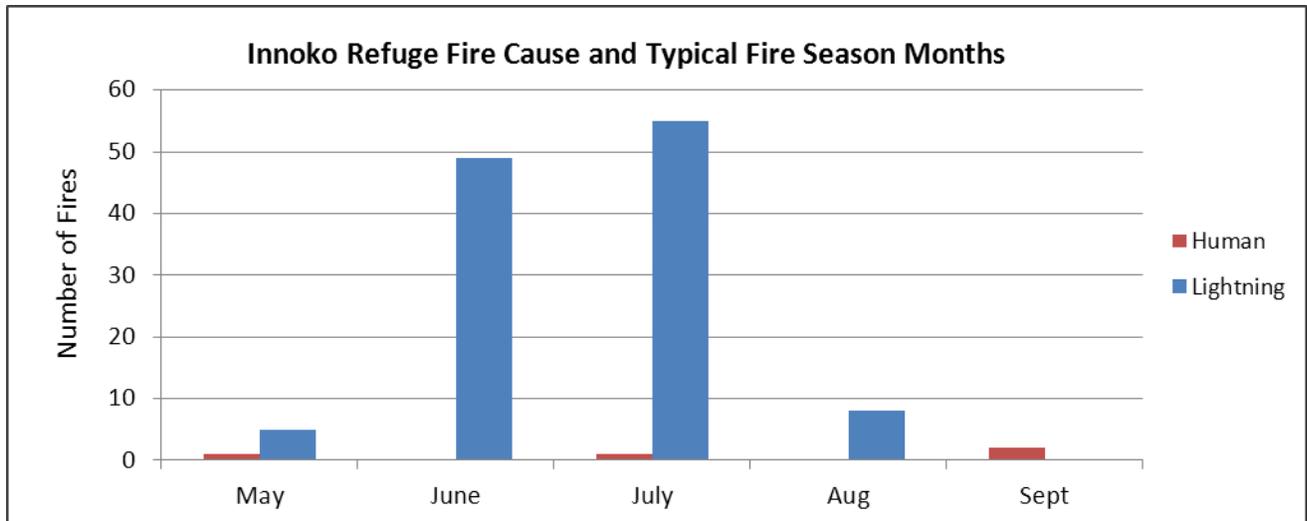


Figure 4 – Innoko Refuge fire cause by month during typical fire season based on average number of fires from 1956 through 2012.

Ninety-five percent of Interior Alaska wildfires are caused by lightning. The active lightning season for the Refuge is late June through mid-July so the height of fire season follows this same pattern. Depending on the air mass, storms may be either mostly wet or dry. Wet storms may produce a lot of lightning, but start few fires. Dry storms with hot, dry, and windy weather may allow for large fire growth, especially when combined with long days of solar heating typically found in these latitudes. Wet weather and/or little lightning in this and the following period result in few ignitions and little acreage.

Some fires start in early August, but this tends to be the wettest month, and new lightning starts are rare after the middle of the month. Late season fires normally burn with lower intensity because of increased humidity at night and shorter solar heating timeframes.

The fire regime consists of Regimes III (35-100+ year frequency and mixed severity) and IV (35-100+ year frequency and high severity). The condition class is a Condition Class 1 (within the natural range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and, other associated disturbances).

3.1.3.2 Topography, Geology, Soils, and Water

Innoko Refuge is primarily a large lowland area between the Yukon River to the west, and Kuskokwim Mountains to the south and east. The Kaiyuh Mountains are located just east of the Yukon and run parallel to it (CCP pg. 3-13). Between the two mountain ranges lie the Innoko River and associated lowlands. The Refuge is located within the Yukon-Koyukuk basin and is of volcanic origin.

The Refuge soils are relatively uniform with poorly drained peat or loamy silt. Discontinuous permafrost is found throughout the area, except along major drainages, and is relatively shallow (10-25 inches).

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The source of water for the refuge comes from the headwaters of the Innoko River. The waters of the Innoko and its tributaries are naturally silty and turbid. In the spring ice jams often cause the rivers to flood out into the lowlands. The lowlands consist of a vast array of lakes, sloughs, and oxbows.

Use of retardant or gelling agents is authorized to prevent a fire from destroying life, property, Critical Habitat, and historic resources. The use of retardant or gelling agents requires approval from the Refuge Manager or Delegate, and every effort must be made to avoid all water sources.

3.1.3.3 Cultural Resources

There are currently 41 known archeological/historic sites on the Refuge. These include the location of five Holikachuk villages and the Ingalik village near the mouth of Holikachuk Slough. At least thirty sites are associated with the Gold Rush Era and Iditarod National Historic Trail (and connecting trails), including abandoned communities, roadhouses, and camps. The Iditarod Trail Management Plan identifies sites within Refuge boundaries for management activity (see section 1.3.1, Table 2) If a new site is found, the Regional Office Archaeologist will be notified immediately. In the event a wildfire threatens an archeological/historic site, the archeologist will be contacted as a resource advisor for site protection activities.

3.1.3.4 Wildlife

Innoko Refuge is home to a variety of wildlife, and a variety of habitats. The Refuge provides important wetlands and lowlands for migratory waterfowl to nest, molt, and forage. The wetlands seldom are impacted by fire in the spring and fall, when nesting and molting occur. Fire can benefit numerous species of wildlife. Waterfowl and other avian species find forage in the form of annual plants or berries, often in areas where a disturbance such as fire has occurred. Raptors tend to respond favorably to post wildfire areas due to the reduced cover for their prey and a potential increase in small mammal populations post-fire. Maier et al (2005) found that in early winter, moose in the central portion of interior Alaska preferred areas that had been burned 11-30 years prior. Conversely, caribou winter forage consists largely of lichens that are found in tundra and open spruce habitats and are easily killed by fire and take a long time to regenerate. . The Beaver Mountain Caribou herd has been seen on the Refuge but little is known about its seasonal use areas (CCP 3-67). Areas of caribou forage (lichen) are rare on the Refuge but protection of these may be considered if wildfire is found to have an effect on the quality of the habitat. More information can be found under Appendix X, Goals and Objectives.

At this time, there are no known federally listed threatened or endangered species on the Refuge. Other species that occur on the Refuge including the peregrine falcon, olive-sided flycatcher, gray-checked thrush, wood frog, Townsend's warbler, and the blackpoll warbler are mentioned in the State of Alaska Wildlife Action Plan as conservation targets. This document can be found at: http://www.adfg.alaska.gov/static/species/wildlife_action_plan/appendix7.pdf.

3.1.3.5 Vegetation

The vegetation of the Refuge is typical of the transition zone between the boreal forest of Interior Alaska and the shrubland and tundra types common in western and northern Alaska. Black spruce muskegs or bogs develop on the poorly drained soils and north-facing slopes with understory vegetation consisting of feather mosses, sphagnum mosses, and lichens. Tussocks, shrub willows, and ericaceous shrubs may also be present. White spruce (*Picea glauca*) occurs along rivers where soils are warmer and better drained. Mid-successional stage forest communities are dominated by broadleaf hardwood species or mixed stands

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of spruce and hardwoods. Dense willow (*Salix* spp.) and alder (*Alnus* spp.) stands are common along the rivers and sloughs. Numerous fires have set vast areas back to earlier seral stages consisting of aspen (*Populus tremuloides*), paper birch (*Betula neoalaskana*) and willow. In addition to burns, these deciduous forests are found in riparian areas, lake margins, and on well-drained slopes or ridges. The most conspicuous characteristic of the vegetation is the complex interspersed of different vegetation types.

No threatened or endangered plants or sensitive biological communities have been identified in the Refuge. There are at least 5 species of nonnative plants within the Refuge – all documented at the administrative field camp or along the Innoko River. While not native, they generally do not spread rapidly and pose less risk to native habitats than invasive species with higher Alaska invasiveness rankings. More information on Alaska invasiveness rankings can be found at: <http://aknhp.uaa.alaska.edu/botany/akepic/non-native-plant-species-biographies/>.

There are several sources of landcover information for the Refuge. The earliest was derived from 1981 Landsat 3 imagery (Talbot and Markon 1988). Ducks Unlimited, in cooperation with the BLM and FWS developed landcover maps of the Innoko and Northern Innoko Refuges in 2002 using 1991 Landsat 5 TM imagery (BLM et al. 2002). The resulting classification report included landcover acreages for FWS lands outside of the Refuge, including the Northern Innoko unit and portions of the Yukon Delta NWR, and was missing a section in the eastern part of the Refuge. In 2012, Boggs et al. mosaicked existing landcover maps, including the Ducks Unlimited maps, to develop a seamless map of northern, western, and interior Alaska. For Innoko Refuge, much of the imagery from the composite map was from the Ducks Unlimited effort (see Table 6 on the following page for specific landcover classes). Appendix A contains a map of the vegetation listed in Table 6 (see map 8 *Innoko NWR Landcover 2013*) as well as a less detailed general vegetation map (see Map 6 *General Vegetation Types*).

LANDFIRE is a national mapping effort designed for fire management applications that includes existing vegetation and fuels layers, among others. LANDFIRE data layers traverse jurisdictional land boundaries and provide the public free data products for numerous applications, including wildland fire management and landscape conservation. LANDFIRE fuel (vegetation) layers were produced to support decision making (WFDSS) and unit fuels analysis for Fire Program Analysis (FPA) but are being used for multiple purposes; such as natural resource management, and analytical assessments.

The current version of LANDFIRE (2008 Refresh) includes disturbances up to 2008; a new version that will include disturbances through 2010 will be released in 2013. Geospatial data that can be viewed and downloaded from the LANDFIRE website (<http://www.landfire.gov>) depict the nation's major ecosystems, wildlife habitat, vegetation or canopy characteristics, landscape features, and wildland fire behavior, effects, and regimes. Landfire also takes into account the 30+ significant fires that have occurred on the Refuge since the Landsat 3 imagery was obtained and provides updated post-fire landcover classes. Although LANDFIRE continually refines its mapping products, data accuracy in Alaska, especially for the existing vegetation layer, is poor in some cases and should be used with caution.

As new mapping products are available, they will be included with this plan.

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Table 6. Landcover classes and acreage on Innoko NWR (Boggs et al. 2012)¹

Landcover Type	Acres	Percent of Total
Alder-Low Willow (Open-Closed)	232.18	0.01
Bareground (<20% vegetation)	341.38	0.01
Bareground (Rock-Gravel; <20% vegetation)	2,148.15	0.06
Clearwater	88,763.00	2.33
Cloud	1,057.06	0.03
Deciduous Forest (Closed)	207,711.99	5.44
Deciduous Forest (Open)	94,007.61	2.46
Dwarf Shrub	153,157.96	4.01
Dwarf Shrub-Lichen	12,696.76	0.33
Fire Scar	45,708.78	1.20
Fire Scar (Burned Shrub Tundra)	4,102.59	0.11
Fire Scar (Regenerating)	1.11	0.00
Forb (Mesic)	64.27	0.00
Forb (Wet)	9,130.50	0.24
Graminoid (Mesic)	7,703.90	0.20
Graminoid (Wet)	93,452.95	2.45
Herbaceous (Dry)	17,832.17	0.47
Herbaceous (Mesic) >20%, Bareground >50%	418.11	0.01
Herbaceous-Moss (Wet)	307,451.05	8.06
Lichen	13,168.91	0.35
Low <i>Betula nana</i> -Low Willow	436,986.46	11.45
Low Shrub-Lichen	2,567.15	0.07
Low Shrub-Tussock Tundra	92,861.15	2.43
Pondlily	10,466.99	0.27
Tall Shrub	118,752.39	3.11
Terrain Shadow	127.66	0.00
Turbid Water	13,991.79	0.37
Tussock Tundra	17,856.42	0.47
Tussock Tundra/Lichen	14,593.16	0.38
White Spruce or Black Spruce (Open)	377,927.51	9.90
White Spruce or Black Spruce (Woodland)	346,097.77	9.07
White Spruce or Black Spruce/Lichen (Open)	801,021.82	20.99
White Spruce or Black Spruce/Lichen (Woodland)	138,356.20	3.63
White Spruce or Black Spruce-Deciduous Forest (Closed)	193,877.44	5.08
White Spruce or Black Spruce-Deciduous Forest (Open)	191,663.24	5.02
Total	3,816,297.67	100.00

¹ Data derived from mosaicked map of northern, western, and interior Alaska; imagery for the Innoko NWR primarily from 1991 Landsat 5.

3.1.3.6 Cultural, Social, and Economic Considerations

Cultural, social, and economic considerations are more fully described in the Environmental Assessment associated with the Refuge CCP (2008). The Refuge provides an area in which local residents conduct subsistence activities, an area for locals and others to ply commercial visitor services, and a wild remote area for recreationists. All recreation and subsistence uses depend on healthy habitat and wildlife populations.

The Refuge is mandated by ANILCA to provide for subsistence uses by local residents, and those uses have precedence over other consumptive public use. Subsistence uses are important not only for providing food, clothing, tools, and housing, but are important culturally and socially as well. The residents of the communities adjacent to the Refuge depend on the Refuge's resources.

The Refuge has social importance beyond its value for subsistence and recreational activities. Although the area's remoteness and isolation result in relatively low levels of public use, those characteristics are what make it attractive to many people.

Fish and wildlife that have spawned, hatched, and/or which spend part of their life on the Refuge are also important to commercial, subsistence, and recreational users elsewhere. Fish, waterfowl, migratory non-game birds, moose, and caribou are important to people throughout the Yukon River and Kuskokwim regions, in the Lower 48, and in Russia, Mexico, and Central and South America. Economic exploitation of the Refuge is limited by law and by the nature of the area. Mostly trapping, fishing, hunting, and limited commercial hunts take place on the Refuge.

3.1.3.7 Ecological role of fire

Fire is an integral part of the ecosystem and has caused plants and animals to adapt to fire over eons. Both black and white spruce depend on intense ground fire to clear organic layers and expose a fertile seedbed. The release of seeds from black spruce semi-serotinous cones is enhanced by exposure to the intense heat of some wildland fires. At the landscape level, the most obvious impact by fire is the creation and maintenance of a mosaic of different plant communities in a variety of seral stages, sometimes referred to as habitat patches.

More fundamentally, fire plays a key role in the regulation of the permafrost table throughout all Interior Alaska ecosystems. Without fire, organic matter accumulates, the permafrost table rises and the ecosystem productivity declines. Vegetation communities become less diverse thus creating monocultures of wildlife habitats. Fire rejuvenates these ecosystems. It removes some of the insulating organic matter and elicits a warming of the soil and an increased active layer depth. Nutrients are added as a result of combustion and by increased decomposition rates.

Across much of Alaska, large fires are a frequent occurrence. This is generally due to inaccessibility but is also due to a conscientious effort by Alaska Wildland Fire Coordinating Group (AWFCG) members to manage wildfires for multiple objectives (including resource benefit) and reduce the high costs associated with suppressing remote fires.

3.1.3.8 Wildland fire history, fire behavior and effects

There is evidence of wildland fire throughout much of the Innoko Refuge that is not a wetland. Data from the Alaska Large Fire Database (<http://www.frames.gov/rcs/10000/10465.html>) and the FWS fire reporting system was used for the Refuge Fire history. Most fire suppression efforts are focused on

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human-caused fires near developed areas. In the absence of suppression, the final fire sizes are determined by a number of factors including time of year, weather, and fuels (see section 3.1.3.1). From 1956 to 2012, 121 wildland fires burned a total of 3,379,526 acres. Fire history records show the Refuge experienced wildfire on over 100,000 acres at least one year per decade. Record temperatures and drought conditions in 2005 allowed eight lightning-caused fires to burn over 321,500 acres, making this the third largest amount of annual area burned in the Refuge known fire history. In 1997, over 678,000 acres burned, but the largest fires on record occurred during the late 1950s, where over 1.4 million acres burned. With this fire history, it can be said that the annual averages for number of acres burned is 62,584 with an average of 2.5 fires per year. *Note: these data are different from the CCP pg 3-39 due to updated information.*

Figure 5 below displays the location of all known large fires by decade since 1940 (see also Map 5 in Appendix A – *Fire History*). Approximately 89% of the refuge burned during the last half century (some areas burned more than once), which roughly equates to a 60-year fire return interval. Prescribed fire has not played a significant role historically.

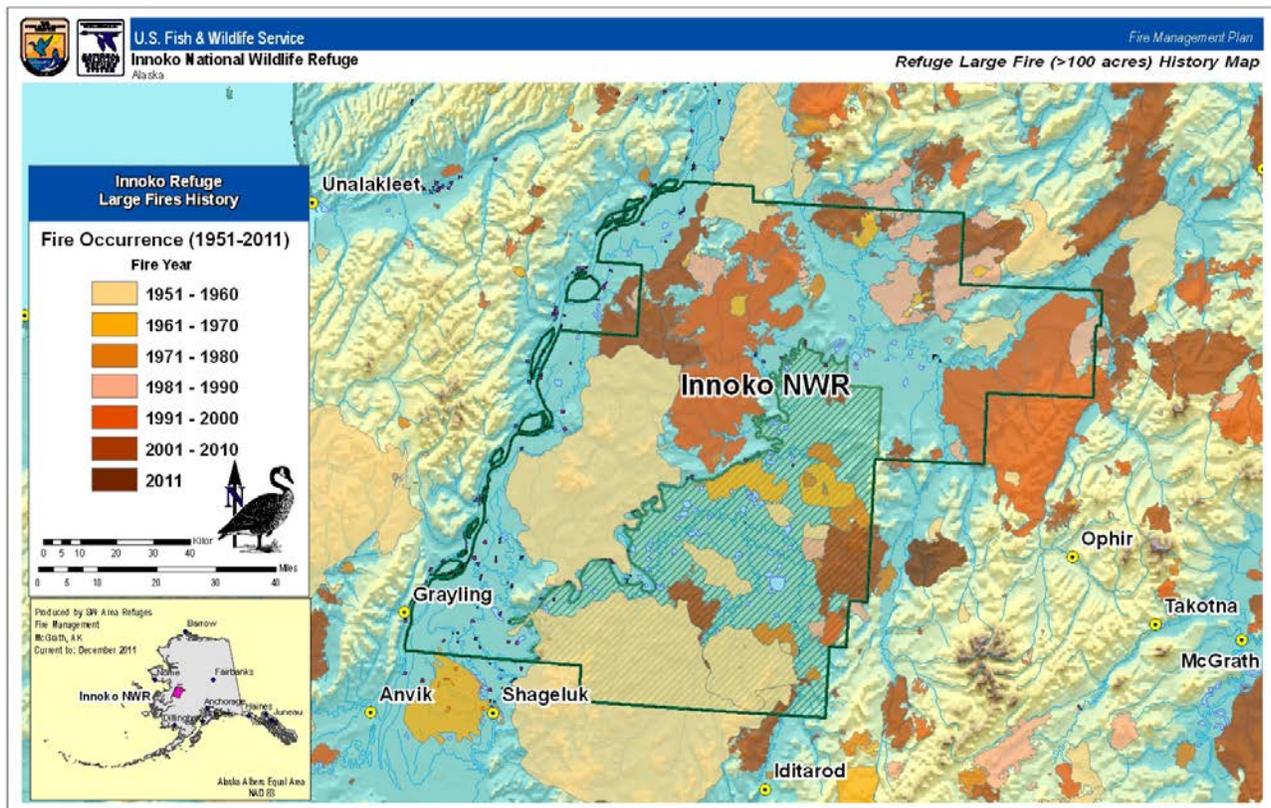


Figure 5 - Large Fires on Innoko NWR (1950-2011).

Fire Behavior

Fire behavior can range from a creeping fire to a very active crowning fire. Most fires will exhibit a range of fire behavior during their duration as various environmental factors such as wind, slope, aspect, relative humidity, fine fuel moisture, fuel type, fuel continuity, and period since last rain change during the course of the fire. The various shapes of fires in Figure 5 above indicate the influence of these factors as they change. Ignition usually occurs when there has been little or no rain and on days with low relative humidity, high temperatures, and lightning.

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Fire behavior is strongly tied to fuel moisture levels, especially in the duff and moss layers. Moss is relatively quick to change in response to humidity, while rain affects both the moss and duff moisture. Number of sequential days without rain significant enough to penetrate the forest canopy has been found highly correlated with area burned (Flannigan and Harrington 1988). As time since precipitation increases, moisture is lost, increasing susceptibility to ignition and availability of fuel. Prolonged dry periods result in progressive drying deeper into the duff layer, as well as drying in live fuels (Johnson 1992, Pyne 1984). Depth of burn is extremely important in determining resistance to fire control efforts and fire effects on vegetation (Schimmel and Granstrom 1996). Once a drought is in effect and dries out the organic mat, it may require over six inches of rain to thoroughly saturate the entire mat again.

Fires in the boreal black spruce and white spruce ecosystems are large and frequent due to the dry continental climate, the flammable nature of the forest, and the continuity of fuels extending from ground level to the forest crown (Heinselman 1981; Viereck 1983). Feathermoss or grass understories form large, horizontally continuous, and well-aerated fuelbeds. Van Wagner (1983) lists five main types of fires: smoldering fires in deep organic layers, surface fires burning against (and into) the wind, surface head fires (burning with the wind), crown fires (advancing as a single front from surface to top of canopy), and high-intensity spotting fires. Crown fire development depends on crown foliage density and its height above ground, leaf moisture content, surface fire intensity, and rate of spread after crowning. The spread of most fires of any size is accelerated by torching of groups of trees and spotting. During "extreme" burning conditions the flaming front may be more than a mile wide, fires may run several miles during a day, flame lengths may reach a hundred feet, and spot fires may occur hundreds of yards ahead of the main fire. Suppression options will be severely limited by the fire, and direct attack is rarely possible (BLM 1995, Alexander and Cole 1994).

Fuel Models

Van Wagner (1983) divides fuels into four types: subsurface organic layers, surface fuels, down dead trees and branches, and standing live and dead vegetation. Deep organic layers are made up of partly decomposed plant parts, and although some may burn during the flaming front passage, much consumption occurs in a smoldering fire. If deeper layers are dry, fires can be sustained there during rainy periods that wet the surface. Although a portion of this layer may burn during the flaming front passage, much of it burns later in a smoldering fire. Surface fuels largely determine whether a fire will spread or not, and they are composed of dead foliage, litter, mosses and lichens, and fine shrubs. Down woody fuels may be heavy and contribute to crowning and flare-ups. Live foliage is highly flammable in some species, and crown fire behavior depends on the presence of ladder fuels, the amount of foliage present and its density, moisture content, and content of flammable waxes, oils, and/or resins.

In Alaska, the following fuels/weather indicators are used to predict fire danger: the Fine Fuels Moisture Code (FFMC), the Duff Moisture Code (DMC), and the Drought Code (DC). The FFMC represents the moisture content of litter, cured fine fuels, and surface fuels (1-2 cm depth). These are sensitive to changes in wind, precipitation, relative humidity, and temperature. The FFMC is an indicator of potential for fire ignition. The DMC represents the moisture content of the loosely compacted upper duff layer (5-10 cm depth) and is sensitive to precipitation, relative humidity, and temperature. The DMC is used as an indicator of a fire's potential resistance to control efforts. The DC represents the compacted duff layer (10-20 cm depth) and is sensitive to precipitation and temperature. The DC is used as an indicator of a fire's potential resistance to extinguishment efforts (see section 4.1.1 for more info).

Vegetation classes on the Refuge have been correlated with fuel models from the Northern Forest Fire Laboratory (NFFL; Anderson 1982) and the Canadian Forest Fire Danger Rating System (CFFDRS, Stocks et al. 1989). These can be used to predict not only rate of spread and flame length, but also likelihood of ignition, crown involvement, crown fire effect on rate of spread, fuel consumption, and fire

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shape and growth rate (see Table 7). The CFFDRS system is currently used in Alaska which utilizes the FFMC, DMC, and DC values as inputs to predict the Initial Spread Index (ISI), Build up Index (BUI) and resultant Fire Weather Index (FWI) More information on this system is located on the AICC website at: <http://fire.ak.blm.gov/predsvcs/fuelfire.php> and can be found in section 4.1.1 under Preparedness.

Table 7. Fuel types for fire behavior prediction and fire danger rating including all lands in the Refuge.

Cover Type	CFFDRS Model	NFFL Model	Approximate % Total Land Cover
Spruce-lichen Woodland	C-1	10 for white spruce 9 for black spruce/shrub 9 adj for black spruce	3%
Boreal Spruce Forest	C-2	9 (adj for ROS) 5 for Flame Length	35%
Boreal Mixed Spruce/Hardwood Forest	M-1 leafless M-2 green fuels	8 (few spruce) or 9 (moderate spruce) or (can set amount of spruce)	22%
Low Shrub/Tall Shrub Lichen Tundra Herbaceous, Grasses	O-1 (O-1a + O1b)	1 for low bogs, short grass 2 (grass w/ ericaceous shrubs) or 3 for tussocks, tall grass 5 for birch/willow/alder shrub	37%

The Refuge’s CFFDRS fuel model layers for the main existing vegetation types are portrayed in Figure 6 (see also Map 7 in Appendix A – *CFFDRS Fuel Models*).

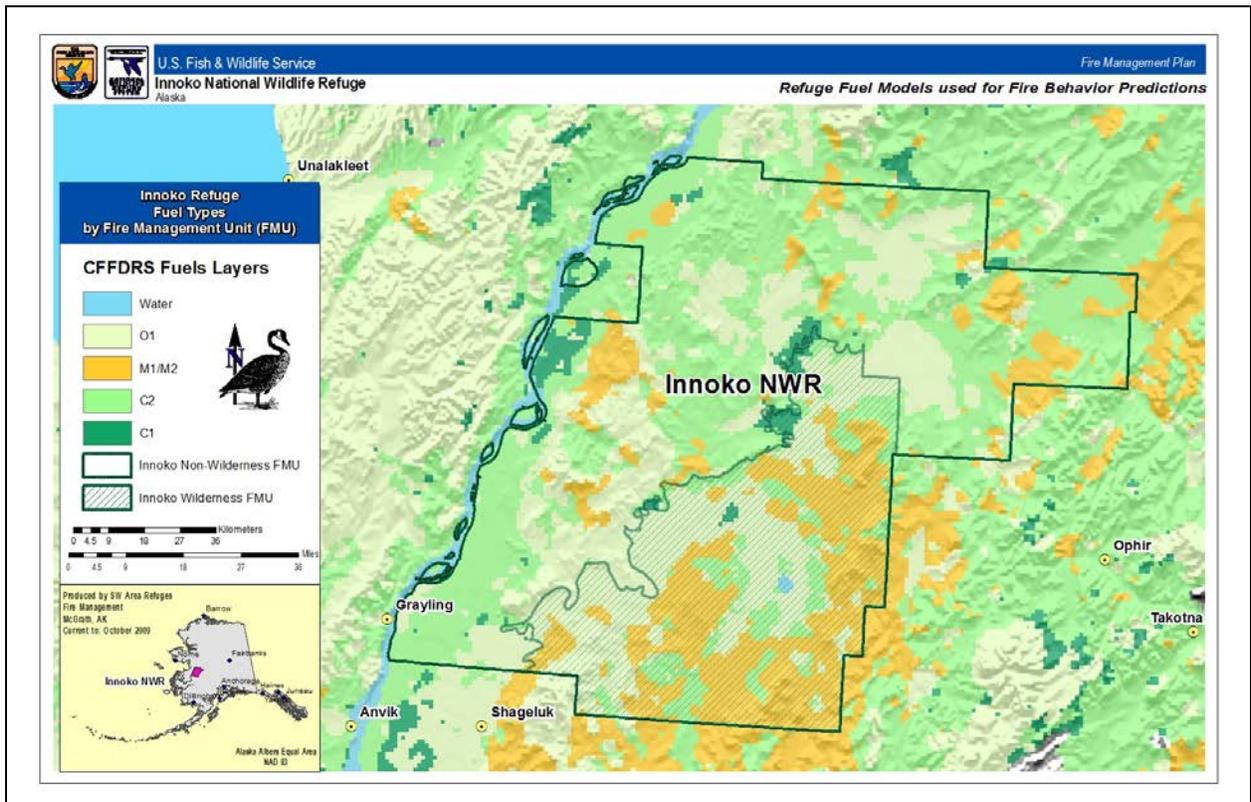


Figure 6 – CFFDRS Fuel Model Layers on Innoko Refuge. Map includes FMU designations. *Data acquired from Alaska Fire Service; AK 1 km vegetation data cross walked to CFFDRS fuels.*

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The CFFDRS fuel type descriptors and fire behavior likely to be encountered in each fuel type are discussed below (from BLM 1995, USDI 1982, and Fuel Model Guide to Alaska 2008).

C-1/ Spruce-lichen Woodland:

Spruce-lichen Woodland can be dominated by either black or white spruce. Stunted white spruce stands resemble and are sometimes mistaken for black spruce stands. The ground cover in these stands dries rapidly, can be quite flammable, and is composed primarily of feather mosses, lichens, dwarf birch (*Betula nana*), Labrador tea (*Ledum palustre*), and low-bush cranberry (*Vaccinium vitis-idaea*).

White spruce usually grow on warm, frost free, well-drained sites along river corridors and on south facing slopes. White spruce can grow up to 130 feet tall and three feet in diameter. Paper birch and balsam poplar are often mixed in with the spruce. Spruce stands may be open and park-like or have a dense shrub layer. White spruce fires are generally slow spreading and burn with lower intensities than in black spruce. Smoldering fires in the root systems are common. Increased canopy cover and shading tempers the response of fine fuels to changes in relative humidity. Ladder fuels are not common except in young dense stands. Crowning is rare.

Fires in open black spruce are carried by surface fuels and generally burn with a high intensity and low rate of spread. Ignition of the tree crowns (torching) will occur just behind the flaming fire front if flame lengths are high enough to ignite the lowest branches. Because this type of vegetation usually grows on poor sites, the trees are commonly moisture or nutrient stressed. This condition, coupled with the fact that surface fuels respond quickly to changes in relative humidity, causes this fuel type to be flammable through a longer part of the fire season than any other fuel type. Areas where fire has only partially burned surface fuels are susceptible to re-burns. After 30-40 years, these sites have accumulated sufficient amounts of continuous fuels to be able to sustain large fires again. Spotting by aerial firebrands from torching trees is common, which increases the overall rate of fire spread. Instability of the atmosphere, surface winds and fuel moisture of receptor fuels are critical factors influencing the amount and distance of spotting.

This fuel type is patchy in Innoko Refuge, generally occurring in sections at the base of mountainous terrain. Small stands can also be found along the Innoko River, and other relatively small areas scattered throughout the Refuge.

C-2/Boreal Spruce Forest

Boreal Spruce Forests account for over a third of the Refuge vegetation. The majority of forest is dominated by black spruce, which is found in cooler wet lowland sites and north facing slopes. White spruce and paper birch may also be present. Tall shrubs within the boreal forest consist of clumps of alder, resin birch (*Betula glandulosa*), and willow. A carpet of feather or sphagnum mosses are common as the understory. Tussocks, dwarf shrubs, and ericaceous shrubs may also be present.

Fires in Boreal Spruce Forest types tend to burn similar to the C-1 fuel type, but with a higher intensity and greater chance for continuous crown fire involvement. These fires are large and frequent due to the flammable nature of the forest and the continuity of fuels extending from ground level to the forest crown (Heinselman 1981; Viereck 1983). Even though these fires are of sufficient intensity to damage or kill both the understory and overstory, they often do not burn with consistent intensity so create mosaics of variant burn severity. Fires that burn into the deep duff layer can hold over for long periods of time, including over winter, regardless of high relative humidity and moderate rainfall amounts.

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M-1 +M -2/ Boreal Mixed Spruce/Hardwood Forest

Aspen is most abundant on warm, well-drained sites, which often change to white spruce stands over time. Paper birch is adapted to cooler, wetter sites, especially moist flat lands, or east and west aspects; such sites commonly become dominated by black spruce over time. Young hardwood stands are often dense with little understory. In mixed spruce-hardwood forests, fire intensity generally increases with more spruce in the stand. Pure hardwood stands are often natural fuel breaks; because surface fuel loading is light (mostly compacted leaf litter or thorny shrubs) and fuel and soil moisture relatively high, typical fires are slow spreading and relatively low intensity. Running crown fires in spruce stands will normally drop to the forest floor when they encounter a hardwood stand.

In wet sites or where surface fuels are sparse, fire will not carry in this fuel type. When fires do burn, the rate of spread and fire intensity depend on the size classes and amount of fuel present. The presence of grasses and sedges greatly increases rate of spread. Ericaceous shrubs (such as resin birch, crowberry (*Empetrum nigrum*), low-bush cranberry and Labrador tea) contain combustible chemicals that increase fire intensity. Significant amounts of dead woody material can contribute to high fire intensities.

Under very dry conditions, mixed hardwood stands may burn with fairly high intensity and carry a crown fire. M-1 is used during the shoulder seasons to model fire behavior during leafless conditions. Smoldering fire in root systems and dead logs is common.

This fuel type is relatively common on Innoko Refuge, mostly occurring within the wilderness boundary, along historic trail routes and the larger rivers, and in scattered patches on the more mountainous areas. Older post-fire stands also contain this mixed forest type.

O-1/ Tundra, shrub, grasses

A major habitat type within the Refuge is moist tundra bogs with low-growing shrubs, herbs, grasses, and sedges that grow primarily in poorly drained sites, or areas of seasonal flooding. Shrub habitats and sedge tussock-mixed shrub tundra are characterized by light flashy fuels whose moisture content responds quickly to modest changes in relative humidity. These fires tend to burn quickly and intensely, skipping over and around standing water between the tussock and pockets of sphagnum mosses. Wind contributes to high rates of spread and spotting. These fires go out quickly with small amounts of moisture (CCP pg 3-32). Tussocks, which are pillars of grass or sedges that vary in height from 3 inches to four feet, increase control difficulties.

Tundra can include both low and tall shrub. Some types of tundra rarely burn because moist conditions and sparse fuels create slow rates of spread and low intensities. These types include low shrub, mesic graminoid/herbaceous, wet sedge, and dwarf shrub tundra. These areas may carry fire after they have cured.

Over a third of the Refuge includes this fuel type. Tussock tundra occurs in the area of the Chick Mountain Fire (2005) as well as scattered areas along the eastern Refuge boundary. Early successional stage plant communities in disturbed or burned areas fall into this category as well as vast areas of tall shrubs that are resultant from fires that occurred over 50 years ago (see Figure 5 for large fire polygons).

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Fire Effects

Maintaining the natural role of ecosystem processes such as fire is important to fulfilling the primary purpose for which the Refuge was set aside; to conserve fish and wildlife populations and habitat in their natural diversity. Additionally, managing naturally ignited fires in wilderness meets the intent of the Wilderness Act by not interfering with this major ecosystem process or the wilderness ecosystem's response to such natural events (610 FW 2.16.B). Wildland fire is a natural feature of the ecology of the boreal forest. Effects of wildfires to plant and animal communities can be viewed at the local (site specific) level or at the landscape level (watersheds, etc.). The types of effects on Refuge lands vary depending on the level examined, however it is known that wildland fire may affect soil, permafrost, vegetation, fish, wildlife, water, and air resources (refer to previous 3.1.3 sections for specific effects).

At the landscape level, the greatest impact by fire is the creation and/or maintenance of a mosaic of different types, sizes, and ages of plant communities sometimes referred to as habitat patches (CCP pg 3-30). These patches are created by the variation in intensity and burn severity commonly found on large fires (100+ acres) on the Refuge. Foote (1983) identifies six seral stages of secondary succession in spruce forests following fire disturbance: newly burned, moss-herb, tall shrub-sapling, dense tree, hardwood or mixed spruce, and spruce (CCP pg 3-30). A disturbance, such as wildfire, can shift these successional stages. Lichens associated with tundra and open spruce habitats tend to take 30 to 100 years to re-establish following loss from wildfires (CCP pg 3-33).

Fire suppression activities can have longer lasting negative impacts than the fire does. Heavy equipment can cause soil erosion, stream siltation, subsidence, and gully formation. These activities may also destroy above ground and sub-surface cultural resources. Additionally, fire exclusion may alter natural processes on parts of the Refuge, slowing nutrient cycling, reducing productivity, and altering wildlife habitat.

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.

3.1.3.9 Constraints on Specific Strategies (Management Requirements)

The following restrictions have been or may be imposed by the Refuges for incidents:

- A voluntary restriction to maintain a minimum altitude of 2000 feet above ground level for all aircraft except for take-off and landing or in the immediate fire vicinity
- Restrictions may be placed on aircraft flying over certain waterfowl, waterfowl staging areas and/or raptor nesting areas depending upon time of year and number of flyovers required.
- The use of retardant or foam must first be approved by the Refuge Manager or designee. If approved, avoid making retardant or foam drops in, across, or directly adjacent to the stream bed and sloughs that feed into them. Retardant aircraft used for water drops must be flushed to remove residual retardant before use on Refuge lands.
- Avoid black/grizzly bear encounters by emphasizing preventive measures
 - Keep a clean camp and exhaust all attempts to drive the bear away before destroying it.
 - Whoever takes a bear in defense of life and property must comply with all State regulations and immediately report the incident to the Refuge Manager.
 - A Service bear incident report will be completed and filed.

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- Refuge employees receive bear safety training and firearms training and are annually certified to carry the shotgun. Refuge personnel may provide bear guard services as needed.
- Incident facility site selection
 - Locate base and spike camps, helispots and other facilities in natural clearings if possible.
 - Minimize construction of helispots.
 - Cut any opening created for facilities with an irregular pattern.
 - Prior to use, cover the vegetation layer in “high-use” cooking and eating areas with road-construction type filter cloth/other suitable fabric to prevent compaction and destruction.
 - Locate latrines at least 200 feet from lakes, ponds and streams.
 - Keep areas clean to avoid attracting animals.
 - Locate camps away from known historic or archaeological sites.
 - Artifacts will not be collected
 - Incident Commanders will notify the Refuge promptly if any artifacts are found
- Incident facility site rehabilitation
 - Use minimal disturbance-preventive rehabilitation
 - Dismantle and remove all tent and shelter frame materials
 - Spread local materials used for construction (logs and poles) throughout the site
 - Completely fill all fire and latrine pits
 - Remove all trash from campsites and fireline. Burnable trash may be burned on site.
 - Rehabilitation must be approved by Refuge Manager before demobilization.
- Fireline repair and stabilization
 - Consult with Resource Advisors (Service or Interagency) whenever possible
 - Locate constructed lines dug to mineral soil or permafrost to limit erosion when possible and meander obliquely to the slope fall line rather than run straight down fall lines. Leave a buffer of vegetation immediately adjacent to water bodies.
 - Prior to release of fireline resources, repair damage and take appropriate measures to control erosion on all constructed lines. Build water bars as needed and replace organic material into lines with exposed mineral soil or permafrost.
 - Use saw lines sparingly
 - Only where essential for holding and accessing hot perimeter
 - Only where essential for holding indirect attack line during firing operations
 - Direct attack black lining is possible on many fires without building saw lines
- If an incident facility is needed on a Native allotment within the Refuge, it is the Protecting Agency’s responsibility to collaborate with the Bureau of Indian Affairs (BIA), compacted Tribe or land owner.

3.1.4.0 Public and firefighter safety concerns or issues

Safety of the public and fire management personnel takes precedence.

Public safety is a critical concern of all aspects of the refuge fire management program. Notification of the public is an initial step whenever fire suppression or prescribed fire activities are expected to occur. Public notifications will be conducted by local radio announcement, emails, phone calls, on-site visits, and/or posting fire information bulletins in the local area. When a wildfire occurs in an area where public use is likely, the areas will be checked for public users. If any are found, they will be contacted and advised of the fire hazard/danger. If a wildfire occurs near private property, the owner will be advised if possible. The Refuge staff will cooperate closely with the Alaska Fire Service and Alaska State Troopers in communicating and coordinating public notification and other emergency actions.

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Personal Protective Equipment (PPE)

Incident Commanders, Burn Bosses, and other fire line supervisors will ensure firefighters employ proper safety practices on incidents, including applicable use of personal protective equipment.

Communications Safety

Radio communication may be limited to line of sight due to the vast landscape repeaters in the area need to reach. Service repeaters serve as communication from the Innoko Field Camp or aircraft back to the office headquarters only. Satellite phone usage is strongly advised for wildland or prescribed fire operations for communicating with any party not located on the incident or project.

Wildland Urban Interface (WUI) Safety

WUI safety concerns need to be considered, including Public Safety, Hazardous Materials, Traffic (Air, Water), and other infrastructure adjacent to Refuge boundaries. The Refuge Field camp is usually staffed during the summer. FWS field going personnel are provided with a wildfire safety briefing each year by the Fire Management Officer that includes how to report wildfires and what to do if a fire is located near the field camp.

Remoteness

The Refuge has multiple remote areas that would be difficult to support logistically for any fire management activity. Transportation is primarily by aircraft, and aviation safety can easily be compromised by proximity to fuel, changing weather conditions, and smoke impacts. If watercraft is used for transportation individuals are required to utilize appropriate boating safety equipment (per US Coast Guard regulations) during all fire management operations.

3.2 Fire Management Units – Specific Descriptions

A map of the Refuge Fire Management Units (FMU's) showing the Fire Management Options is shown in Figure 3 (section 3.0). Larger maps of the FMU's including values at risk are displayed under Appendix A. Each of the FMU's is described in detail below.

3.2.1 Innoko Wilderness Fire Management Unit

3.2.1.1 Innoko Wilderness FMU Description

The Innoko Wilderness is located in the southeastern third of the Refuge (see figure 3). This area is mostly bounded on the west by the Innoko River and extends south and east to the Refuge boundary. Innoko Wilderness has a rich fire history, with some fire perimeters encompassing over 90,000 acres. The majority of the area is low wetlands surrounding the Yetna and Iditarod Rivers with rolling hills (Kuskokwim Mountains) along the eastern, southern and western boundaries. Fuels are primarily moist tundra bogs and lowland shrubs with black spruce bogs and tussock tundra on higher ground. Boreal mixed spruce dominates the hills and areas of higher ground. The Innoko River separates this FMU from the Non-wilderness FMU.

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There are a few Native allotments within the Wilderness area, primarily along the rivers and adjacent to lakes. The village of Shageluk lies approximately 11 miles south of the Wilderness boundary. The Wilderness area provides opportunities for local residents to engage in traditional subsistence activities such as hunting, fishing, berry picking, wood gathering, and trapping. Access to the area is limited, but rivers are used as travel corridors, and the Iditarod National Historic Trail traverses the unit for winter travel.

The Wilderness Act of 1964 prohibits the use of motor vehicles, motorboats, motorized equipment, the landing of aircraft, and other forms of mechanical transport in designated Wilderness areas. However, ANILCA provides exceptions to these prohibited uses, allowing public access to the area using snowmachines, airplanes, motorboats, and non-motorized surface transportation methods for traditional activities and for travel to and from villages and homesites, as well as other methods traditionally used for subsistence purposes.

The Wilderness Act provides exceptions to the prohibited uses that are applicable to fire management activities. Section 4(c) allows the use of normally prohibited uses in wilderness “as necessary to meet the minimum requirement for the administration of the area for the purposes of [the Wilderness Act].” Section 4(d)(1) provides an exception to the prohibited uses to the extent that “such measures may be taken as may be necessary in the control of fire, insects and diseases, subject to such conditions as the Secretary deems desirable.”

3.2.1.2 Innoko Wilderness FMU Values to Protect

- Wilderness character
- Maintaining fire as a natural ecological process
- Historic and Archeological resources
- Native allotments
- Special values as listed under section 1.3

3.2.1.3 Innoko Wilderness FMU Management Guidance

All areas of the FMU:

- Guidance for managing wildfire in wilderness areas is found in Service policy at 610 FW 2.21-2.24.
- Maintain the natural environment with very little evidence of human-caused change by allowing a full range of fire effects across the landscape and not interfere with the ecosystem’s response to these effects.
- When management action is needed, use low impact methods that preserve wilderness character. For example, avoid ground disturbing activities whenever possible.
- Retardants or gelling agents will not be used except when approved by the Refuge Manager. Aerial water can be utilized if the delivery apparatus is flushed with water prior to use.
- Actions such as hazardous fuels / habitat treatments may be conducted but must be found to be the minimum requirement for administering the area as wilderness and necessary to accomplish the purposes of the Refuge.
- Area will be managed under the Wilderness Management Category (see Section 3.1.1.2).
- Monitor for and record fire occurrence.
- Natural recovery from the adverse effects of unplanned ignitions is preferred. However, if natural

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recovery is unlikely, stabilization or recovery efforts may be needed to prevent further degradation of cultural and natural resources within a burned area and to mitigate the effects of erosion or invasion of undesirable species (see sections 4.1 and 4.2).

- 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.
- In many cases refuge land management objectives will be met by managing fire, maintaining its disturbance role in the ecosystem. Fires in Limited protection and those in Full and Modified protection that escape initial attack will be managed primarily to limit their incursion on neighboring properties.

Areas designated as Full Protection (and Modified designations before conversion date) A small area in the SE corner of the Refuge Wilderness is designated as Full Protection. Wildfires within this option area will trigger a suppression response, with the intent of minimizing the number of acres burned. However, evaluation of options for managing fires for multiple objectives will remain the strategy of choice if the fire exceeds the initial response. Protect state, private, and native lands adjacent to and within the Wilderness.

- Camps, helispots, and constructed fire lines must be approved by Refuge manager.
- To the extent possible, use minimum impact suppression tactics. Construct fire lines to minimize erosion and follow the natural contours wherever possible. Use indirect attack to the maximum extent possible. A fire line repair plan, as approved by the Refuge Manager, must be completed before the final demobilization occurs.
- Helicopter landings for initial attack fire suppression must comply with operational guidance in the AIWFMP.

Areas designated as Limited Protection (and Modified designations after conversion date): Most of the Wilderness FMU has this designation. Allow fire as a natural process on the Refuge while providing for protection of life and property and other resources.

- Within the Limited option area, wildfire detection will trigger a monitor only response unless the Refuge Manager (or designee) specifies otherwise.

3.2.1.4 Innoko Wilderness FMU Safety Considerations

- Difficulty of movement in marshes/wetlands/tussocks.
- Consider closures during fire operations.
- Area is remote and travel is by air or boat during fire season.
- Communications in the area are limited to satellite phone only.
- Environmental considerations, including weather and bears.

3.2.2 Innoko Non-Wilderness Fire Management Unit

3.2.2.1 Innoko Non-Wilderness FMU Description

The Innoko Non-Wilderness FMU includes all Refuge lands outside of the Wilderness northwest of the Innoko River and southeast of the Yukon Rivers (see figure 3). This unit also includes some islands in the Yukon River as well as a few parcels west of the Yukon River near Steamboat Slough. The Kaiyuh Mountains, located approximately 12 miles inland from the Yukon River, dominate this unit. The eastern most part includes a small portion of the Wapoo Hills, and lowlands surround the Magitchlie and Mud Rivers to the north. The villages of Shageluk, Anvik, and Grayling lie near the Southern boundary. The Innoko River separates this FMU from the Wilderness FMU.

Fuels in this FMU are typical of that found in the transition zone between the boreal forest and tundra. The Yukon River floodplain is a riparian woodland consisting predominantly of willow, alder, and cottonwood with patches of mixed spruce and hardwoods interspersed throughout. The better drained soils of the Kaiyuh and Wapoo mountains support more spruce and mixed hardwood forests. Lowlands in this unit are similar to the floodplains found in the Wilderness and consist of moist tundra bogs with low shrub. Mature mixed white spruce stands can be found along all the larger river systems. Large areas of closed black spruce forest occur in this FMU.

There are private allotments within many of these areas, primarily along the rivers and lakes. Most allotments are accessible by boat with some having limited access by air or winter trails. Large areas of land within the southwestern corner are Native village or corporation owned. Overall access to the FMU is limited, but rivers are used as travel corridors, and winter travel can occur by snow machine or dogsled.

3.2.2.2 Innoko Non-Wilderness FMU Values to Protect

- Maintaining fire as a natural ecological process
- Adjacent communities and private property.
- Native allotments and Corporation lands.
- Historic and archeological resources.
- Special values as listed under section 1.3.

3.2.2.3 Innoko Non-Wilderness FMU Management Guidance

All areas of the FMU:

- Manage fire as a natural process and protect values in a manner that minimizes the adverse effects of fire and/or fire suppression activities. The Refuge Manager must approve heavy equipment (dozers). Ground disturbing activities are to be avoided whenever possible.
- When management action is needed, use low impact or indirect suppression methods whenever possible.
- Helicopter landings for initial attack fire suppression must comply with operational guidance in the AIWFMP.
- Retardant or gelling agents will not be used without the permission of the Refuge Manager (or designee). Aerial water may be utilized if the delivery apparatus is flushed prior to use.

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- Access is limited to aircraft, foot and boat. Off-road vehicles (air boats, air cushion vehicles, and motorized wheeled vehicles) may be allowed with Refuge manager approval.
- Area will be managed under Minimal Management (see section 3.1.1.2).
- Hazardous fuels treatments for the protection of values at risk may be performed with approval by the Refuge Manager.
- Actions such as prescribed fires or invasive species control may be conducted with approval by the Refuge Manager.
- Monitor for and record fire occurrence.
- Natural recovery from the adverse effects of unplanned ignitions is preferred. However, if natural recovery is unlikely, stabilization or recovery efforts may be needed to prevent further degradation of cultural and natural resources within a burned area and to mitigate the effects of erosion or invasion of undesirable species (see sections 4.1.3.2 and 4.2.2).
- 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.
- In many cases refuge land management objectives will be met by managing fire, maintaining its disturbance role in the ecosystem. Fires in Limited protection and those in Full and Modified protection that escape initial attack will be managed to limit their incursion on neighboring properties, but may be managed on Refuge lands when prudent. .

Areas designated as Full or Critical Protection (and Modified designations before conversion date):

Mostly located along the Yukon River on the FMUs western boundary including tracts of native selected and/or conveyed lands.

- Wildfires within this option area will trigger a suppression response, with the intent of minimizing risk to values and number of acres burned. . Managing fires for multiple objectives, however, will remain the strategy of choice.
- Protect state, private, and native lands adjacent to and within Refuge boundaries.
- Camps, helispots, and mechanically constructed fire lines must be approved by the Refuge manager.
- To the extent possible, use minimum impact suppression tactics. Construct fire lines to minimize erosion and follow the natural contours wherever possible. Use indirect attack to the maximum extent possible. A fireline repair plan, as approved by the Refuge Manager, must be completed before the final demobilization occurs.
- Helicopter landings for initial attack fire suppression must comply with operational guidance in the AIWFMP.
- ***Modified designation:*** Contain fires to prevent from entering adjacent Full Protection areas but not to minimize acres.

Areas designated as Limited Protection (and Modified designations after conversion date): Most of the central and eastern portion of the FMU.

- Manage fire as a natural process and protect values in a manner that minimizes the adverse effects of fire and/or fire suppression activities. Within the Limited option area, wildfire detection will trigger a monitor only response unless the Refuge Manager (or designee) specifies otherwise.

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3.2.2.4 Innoko Non-Wilderness FMU Safety Considerations

- Difficulty of movement in marshes/wetlands.
- Consider public closures during fire operations.
- Area is remote and travel is limited to air and boat in most areas.
- Communications in the area are limited to satellite phone only.
- Environmental considerations including weather, bears, and air quality on village and aviation activities.

4.0 WILDLAND FIRE OPERATIONAL GUIDANCE

By this reference, the policy and procedure guidance in the corresponding chapters of the current edition of the Interagency Standards for Fire and Fire Aviation Operations, (aka the Red Book) is incorporated into this plan, and must be followed. This book as well all FWS Fire Handbook, Departmental Manual and agency specific directions are the guidance for all fire operations.

4.1 Management of Wildfires:

As noted earlier, guidelines for determining the standard wildland fire response are provided in the AIWFMP (see section 2.1.5.2) and initial action on fires is largely pre-planned with "wildland fire management option" designations described in the AIWFMP. Protection responses can range from aggressive initial attack to surveillance/monitoring to indirect containment or any combination of the former. The level of suppression action will depend upon the fire management option pre-identified for the FMU, available resources, time of year, fuel type and conditions, cost, terrain and other factors related to the management of a fire. Such factors include consideration of risks to public and firefighter safety, threats to the values to protect, costs of various mitigation strategies and tactics, and potential resource benefits. (Refer to FMU section(s) for specifics.). Non-standard responses (other than pre-planned fire management option designation) to wildland fires will remain an option at the request of the Refuge Manager.

Managers will use a decision support process (currently WFDSS) to guide and document wildfire management decisions. The Jurisdictional and Protecting Agencies will work together to develop strategic options to manage the fire when it: (1) escapes initial attack, (2) threatens to escape from a limited fire management option into a higher management option, (3) warrants suppression actions but did not receive action due to resource shortages, (4) is beyond the capabilities of initial attack forces, or (5) fire and/or resource management objectives are not being met and a significant change in strategy/action is required (refer to 4.1.2.5 for decision support specifics).

The FMP and a delegation of authority can provide a general strategy to an Incident Commander (IC; see section 4.1.1.7), who has discretion to select and implement appropriate tactics within the limits described for the FMU(s). All resources, including mutual aid resources, will report to the IC and receive an assignment prior to tactical deployment.

Structural fire suppression is the responsibility of local governments. We may assist with exterior structural protection activities under formal Fire Protection Agreements that specify mutual responsibilities, including funding (Red Book 01-3).

4.1.1 Preparedness

Review of fire management options should be coordinated with the Protecting Agency and be completed between September 30th and March 1st annually. All changes should be recorded on the map atlas (housed at Alaska Fire Service) by April 1st. Fire management option boundary changes are not encouraged during the fire season. However, if a change of the selected management option is requested and can be accommodated by all affected land managers/owners and the suppression organization it may be accepted and recorded on the map atlas.

Each year prior to the active fire season, the FWS Area FMO will discuss the upcoming fire season strategy with the Protecting Agency FMO and Refuge Manager (or Deputy). The FMO (or other designated duty officer) will be available to the Protecting Agency by phone or radio during the active fire season.

The Innoko NWR and other fire management agencies in Alaska use the Canadian Forest Fire Danger Rating System (CFFDRS) for evaluating potential fire danger, rather than the National Fire Danger Rating System (see also section 3.1.3.8). This system's key indices include:

Fine Fuel Moisture Code (FFMC): moisture content of litter and fine dead fuels; the approximate equivalent of 1-hour time lag fuel moisture; however the values do not represent percent fuel moisture.

Duff Moisture Code (DMC): moisture content of the upper duff; the approximate equivalent of 10- and 100-hour time lag fuels combined and an indicator of resistance to control. The values do not represent percent fuel moisture.

Drought Code (DC): moisture of the duff 4-8 inches down; the approximate equivalent of 1000-hour time lag fuel moisture and a measure of mop-up difficulty; however the values do not represent percent fuel moisture.

Initial Spread Index (ISI): a rating of fire spread immediately after ignition; the rough equivalent of Spread Index (used in the National Fire Danger Rating System).

Build Up Index (BUI): a representation of fuel available for consumption; the rough equivalent of Energy Release Component (used in the National Fire Danger Rating System).

The Refuge will adhere to regional and national preparedness levels. A Refuge preparedness plan, which guides fire management actions based on local fire danger, is attached as Appendix D. It addresses fire danger using the CFFDRS system. It will be reviewed annually and updated as needed as historic weather data is accumulated and contact information changes. As new information concerning key breakpoints for CFFDRS indices in SW Alaska is known, it will be updated in the Preparedness Plan.

4.1.1.1 Training and Qualifications

Standards for fire position training and experience, annual refresher training, physical fitness testing, and medical examinations will follow the guidelines of the Red Book, the National Wildfire Coordinating Group (NWCG), the Service, and the Region (for agency-specific positions). The Refuge Manager and/or Deputy Refuge Manager and the FWS Area FMO will assess the training/staffing needs of the Refuge annually. Training and physical fitness testing for fire-qualified Refuge employees are coordinated by the FMO.

All fire training, qualifications and experience records will be maintained by the FWS Area FMO in the Incident Qualifications and Certification System (IQCS). The FMO will be responsible for issuing the

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current IQCS card, “redcard”. The FWS SW Area FMO is responsible to ensure personnel issued redcards meet current NWCG, Red Book, and USFWS standards for the positions listed.

The FWS Area FMO should meet Interagency Fire Program Management (IFPM) standards for a moderate complexity fire program to assist with wildland fire decision-making, to plan fuels treatments, and to conduct moderate complexity prescribed fires. Training may include fire behavior prediction, smoke management, and aviation safety, and will meet current Departmental, Service, and NWCG requirements. The Alaska Fire Service provides fire detection/protection services on the Refuge and trains its staff to meet NWCG and AWFCG standards.

4.1.1.2 Delegation of Authority to the Fire Management Officer (FMO)

Delegations of authority to the FWS Area FMO will be included in Appendix C. These may include specific duties related to program management, management of wildfires, or prescribed fire programs. There are plans to complete an inter-refuge agreement that outlines the roles and responsibilities of the FWS Area FMO for each refuge under his/her jurisdiction. When completed, this plan will be added as an appendix.

4.1.1.3 Readiness

All current fireline qualified personnel will be expected to be available for fire assignments within Alaska and the Lower 48 depending upon Refuge staffing needs, State and Federal Preparedness Levels and supervisory approval. Appropriate personal protective equipment and other safety and firefighting equipment will be issued as needed. It is up to the FMO to ensure annual readiness reviews are conducted and documented. Program readiness reviews will be performed by the regional fire staff on a rotating basis with other Region 7 Refuges.

The FWS Area FMO will attend meetings scheduled with the Alaska Department of Forestry, the Alaska Fire Service, or representatives of other agencies to discuss wildland fire management business as needed or requested. The FMO may participate in Refuge wildland fire assignments, and is also available for regional and national callout during high fire occurrence periods. The FMO will determine if conditions require an adjustment in local staffing to ensure adequate coverage during periods of high fire danger (in coordination with the Protecting Agency).

The Refuge maintains a cache of basic equipment for wildfire suppression and prescribed fire use at the Innoko Field Camp and in McGrath (Appendix L), to provide basic “initial protection” of the Field Camp. The fire cache will be inventoried annually and maintained to a fire ready condition by June 10th of each year. The Refuge staff will discuss fire protection strategies annually prior to the onset of Field Camp operations. The Refuge staff will brief all summer volunteers on evacuation protocol should a fire occur at or near the camp. Only fireline qualified personnel will engage in fire suppression activities should a wildland fire occur. Additional fire equipment is available from the AFS Galena Zone

Data from a permanent RAWS site on the Refuge is available to inform decisions associated with response to wildfires, planning and implementing prescribed fires or making long-term weather predictions. The Innoko Flats RAWS is located at LAT 63° 23.22' LONG 158° 49.49'. The Bureau of Land Management maintains the site annually. Due to the vast and variable landscape of the Refuge, there are concerns that this one data collection site will not accurately reflect all areas. To address this issue, the Innoko office maintains a portable RAWS, or one may be requested through the Alaska Interagency Fire Cache with a valid resource order.

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Communications by radio for Refuge staff during field activities are often ineffective unless transmitting/receiving at the Innoko Field Camp (frequencies listed in Appendix S). Satellite phones are carried by field crews. Fire operations on the Refuge will need to evaluate the need for temporary repeaters during a fire incident and utilize Protecting Agency frequencies. The FWS Area FMO maintains a satellite phone for field use.

The FWS Area FMO is responsible for the annual fire budget for the SW Area Refuges. Requests for special fire funding for projects, training, and equipment will be completed by the FMO.

4.1.1.4 Aviation Management

All fire-related aviation operations will follow applicable guidelines of the DOI National Business Center Office of Aviation Services (OAS) and will have qualified personnel assigned based on the missions to accomplish. Any detection or reconnaissance flights by the Refuges will be coordinated with the Protecting Agency. Flight following will be coordinated by the Protection Agency and will follow Refuge policy.

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 Protecting Agency. Air crew and passengers will be appropriately briefed prior to performing fire related missions. Refuge personnel performing fire-related aviation missions in cooperator aircraft will additionally comply with cooperator policy and procedures when they are more stringent than DOI policy. More information concerning ordering/use of OAS certified aircraft on incidents can be found in the Alaska Interagency Mobilization Guide <http://fire.ak.blm.gov/content/aicc/aimg/aimg.pdf> (AIMG).

4.1.1.5 Fire Detection

Detection activities on the Refuge are considered part of the protection services and are provided by the BLM/AFS. Visual fire detection is provided by fixed wing aircraft and a lightning detection system is in place that displays ground strikes and aids in planning detection flights. Detection flights are scheduled based on area lightning detections and fire danger rating, and are often combined with reconnaissance of ongoing fires. The USDA Forest Service also provides Fire Detection Map (MODIS) products for Alaska through their Remote Sensing Applications Center. A link to the most current imagery can be found on the AICC webpage at: <http://fire.ak.blm.gov/predsvcs/maps.php>

Refuge aircraft are often in the field during fire season and can provide supplemental, incidental detection. New fires detected by the Refuge will be reported to the Protecting Agency as soon as possible. Private or commercial aircraft are a common mode of transportation in the area during the summer and frequently report fires or flare-ups for ongoing fires. When Refuge lands are affected by wildland fire, Refuge personnel will attempt to actively participate with the reconnaissance flights. This will be coordinated closely between the Refuge FMO and the Protecting Agency.

4.1.1.6 Initial Report of Fire and Initial Attack (Response)

Upon discovery, the Protecting Agency 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. Notification procedures are addressed in the AIWFMP and AOP found at <http://fire.ak.blm.gov/content/aicc/asma/Exhibit%20C%20AOP.pdf> and can be

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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 WFDSS entry by the Protecting Agency is required as part of the notification process. A Fire Notification form may also be used when the Jurisdictional Agency does not have WFDSS access.

The AFS Galena Zone Dispatch is responsible for initial attack dispatching on all Refuge fires. The Galena field office Dispatch Center season and hours will be extended as needed and an after-hours contact protocol will be included in the FWS SW Area Preparedness Plan (Appendix D). Galena Zone personnel located at AFS will be responsible for dispatching outside of the Galena Zone's field office operating season.

Preferred *initial response* actions for wildfires are described for each fire management option and summarized in Table 8 below (more information can be found in section 2.1.5). The designation of a management option pre-selects the initial strategies for the response to a wildland fire. All actions are dependent on the availability of resources and other factors - weather and current and expected fire behavior.

Table 8. Management Option Designation and Initial Response to Wildland Fire*

Fire Management Option	Appropriate Initial Response	Suppression Objectives
Critical	Aggressive initial attack--usually direct attack	1. Protect inhabited property and designated developments. 2. Usually continue control tactics until fire is declared out.
Full	Aggressive initial attack--usually direct attack	1. Protect designated sites and values. 2. During initial attack- contain fire to minimize acreage burned.
Modified, before conversion to Limited	Initial attack--use of indirect attack to contain the fire is encouraged	1. Contain fire to prevent spread into Full and Critical management option areas. 2. Protect designated sites.
Modified, after conversion to Limited	Surveillance	1. Prevent fire from spreading into Full and Critical management option areas. 2. Protect designated sites.
Limited	Surveillance	1. Prevent fire from spreading into areas with Full and Critical management option designations. 2. Protect designated sites.

*Common to all fire management objectives is the top priority of protection of human life and secondarily the protection of property and natural/cultural resources.

The AIWFMP states that "non-standard responses" may be made for initial response to any fires in any of the wildland fire management option areas (AIWFMP 2010, p. 29). The Refuge Manager (or designee), Protecting Agency FMO, or initial attack Incident Commander may select a more aggressive response because of firefighter or public safety concerns, or a lesser response due to lack of resources, threat to areas with higher management option designation, anticipated failure of strategy, unusual conditions in a geographic area, or other compelling reasons. The decision and rationale for non-standard responses requests and actions taken will be documented in WFDSS and communicated to the Refuge in a timely manner.

Upon notification of a new fire, the FWS Area FMO will consult with the Refuge Manager (or designee) regarding special concerns and specific direction. Currently the Wildland Fire Decision Support System

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(WFDSS) will be used to document the course of action chosen and the decisions made by the Refuge Manager (refer to 4.1.2.5 for decision support specifics).

If surveillance is performed by refuge staff, coordination before, during, and after the mission should be completed with the Galena Zone FMO or designee to identify specific needs from the surveillance, and to ensure open dialog exists while Refuge staff are at the fire. The FWS Area FMO will provide a copy of the report to AFS Galena dispatch as soon as possible following the surveillance.

4.1.1.7 Incident Commander (IC) Responsibilities (for all incident types)

Operational control of a Refuge wildfire is the responsibility of AFS. The AFS FMO will assign a qualified IC and provide supervision and support including oversight, direction and logistical support. When a fire is not staffed, the AFS FMO (or designee) will retain operational control and will be the de facto IC. AFS will be responsible for fulfilling daily interagency incident reporting requirements as directed in the Alaska Interagency Mobilization Guide (found at <http://fire.ak.blm.gov/logdisp/aimg.php>) and will complete the final fire report which will be provided to the USFWS.

The IC is a single individual responsible to the AFS FMO for all incident activities, including the development of incident management strategies and tactics, and the ordering, deployment, and release of resources. The IC responsibilities are to:

- Provide a size-up to dispatch as soon as possible upon arrival on scene.
- Assess potential fire incident objective(s) and contact the unit manager with recommendations.
- Use guidance in this FMP and/or a Delegation of Authority, implement selected response and manage an organization to implement effective strategies and tactics.
- Determine resource needs and order additional as needed through local dispatch.
- Ensure that all resources assigned to the incident 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 place the order for the 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 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, a qualified wildland fire investigator will be ordered. The point of origin must be protected.

4.1.1.8 Mutual Aid and/or Cross Boundary Operations

Due to the proximity of the Refuge to McGrath, AFS may request mutual aid from the SW Area DOF for detection flights and reports during periods of high fire occurrence.

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.

4.1.2 Incident Management

4.1.2.1 Extended Attack

The IC will notify the AFS FMO whenever it appears a fire will escape initial attack efforts or when fire complexity will exceed the capabilities of command or operational forces. If a wildland fire is not contained with initial action forces, a documented decision analysis and support process will be initiated to determine or validate the course of action and associated costs. When additional resources are needed, they will be ordered through the AFS Galena Zone Dispatch which will mobilize any additional resources, including higher level ICs and Incident Management Teams.

The AFS FMO will notify the FWS Area FMO or Duty Officer who will inform and provide technical assistance to the Refuge Manager through the decision making process:

- Assisting the Refuge Manager to complete a WFDSS decision.
- Provide risk and fire behavior analysis as needed.
- Assisting the Refuge Manager to complete a Delegation of Authority for Type 3 and higher complexity incidents.

As appropriate or needed, representatives from the Bureau of Indian Affairs, the Zho-Tse Village Corporation (Shageluk), the Heeyea Lingde Village Corporation (Grayling), Doyon Regional Corporation, Bureau of Land Management, Alaska State Lands, and/or the local Alaska Department of Fish and Game staff will be consulted for input/concerns regarding specific fire management strategies.

The Refuge will work collaboratively with the Protecting Agency and any other affected Jurisdictional agencies to develop the complexity analysis and provide strategic goals and constraints to ensure land and resource management objectives are met and documented. The Incident complexity analysis will be based on Red Book criteria. The NWCG has adopted the Organization Needs Assessment as a replacement for the Type 1, 2, and 3 Complexity Analysis within WFDSS. A copy of the Assessment can be found in Appendix I. The transfer of authority for suppression actions is done through the execution of a written delegation of authority to the Incident Commander, and provides specific guidance and constraints.

For large or complex fires requiring a Type I or Type II Overhead Team, Refuge staff will take an active role in providing direction to AFS and the Incident Management Team (IMT). Refuge staff (primarily the FWS Area FMO) will help prepare the decision support documents. The Refuge Manager will approve the course of action and incident objectives. Refuge staff will also have input into the Limited Delegation of Authority, which transfers authority for fire management activities to the Incident Management Team and provides specific guidance and constraints on the suppression effort. The WFDSS will be re-validated utilizing a periodic assessment completed by the Refuge Manager (or designee) and any other Jurisdictional Agency Manager involved in the Fire. It is highly encouraged that the Agency Administrator and Jurisdictional FMO conduct Zone Dispatch and Large Fire site visits annually. Type I and Type II incidents occurring on the Refuge may have an Agency Administrator's Representative or Resource Advisor designated by the Refuge Manager to provide and maintain a conduit of communication between the Incident Management Team (IMT) and the Refuge Manager, as well as between the local Protecting Agency and the Refuge Manager. The FWS Area FMO will usually function as the line officer's representative, but in the case of multiple incidents, other staff may also be assigned. Refuge staff will articulate Refuge resource management concerns and agency strategic direction, not tactical direction.

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All Type I and Type II fires that occur on the Refuge will have a debriefing scheduled prior to demobilization of the overhead team. The Refuge Manager, FWS Area FMO, and the Protecting Agency will attend the fire critiques. Other individuals may be requested to attend depending upon the complexity of the incident. Critiques on other fires may be scheduled if problems or events occur which warrant scheduling a critique.

4.1.2.2 Delegation of Authority to Incident Commander (IC)

The Master Agreement will serve as the Delegation of Authority from the Refuge Manager to AFS to implement initial response activities in accordance with the AIWFMP. A Delegation of Authority will be provided to any Type 3 or higher level IC. See the current Red Book for supporting guidelines which include Agency Administrators Briefing to IMT, and a Sample Delegation of Authority from Agency Administrator to Incident Management Team (IMT).

Delegations of Authority will be jointly developed and signed by the Jurisdictional and Protecting Agencies and will document procedures and criteria that specify direction, authority, and financial management guidelines to Incident Commanders.

4.1.2.3 Resource Allocation and Prioritization

Guidance for resource allocation are identified in the Alaska Interagency Annual Operating Plan/Alaska Mobilization Guide, and local Protecting Agency Dispatch. Under Alaska Preparedness Levels 1-3, the Protecting Agencies' fire operation leads set resource allocation priorities. During Alaska Preparedness level 4-5 resource allocation priorities are completed by the Alaska Multi-agency Coordination Group (AMAC) with input from the Protecting Agency operation leads. The FWS Regional Fire Management Coordinator (RFMC) is the FWS representative on the AMAC. Concerns regarding resource allocation on Refuge fires should be directed towards the RFMC.

4.1.2.4 Regulatory Compliance for Managing Wildfires (unplanned ignitions)

National Environmental Policy Act (NEPA) - analysis is not conducted on wildfires because they are unplanned events. Suppression activities are Categorically Excluded from NEPA (516 DM 8.5(5)).

Endangered Species Act (ESA) - Wildfire may impact endangered species and destroy critical habitat and this is considered a disaster or an act of God in the sense of 50 CFR 402.05. Emergency consultation may be conducted on the response to a wildfire.

Wilderness Act - The Wilderness Act provides exceptions to the prohibited uses that are applicable to fire management activities. Section 4(c) allows the use of normally prohibited uses in wilderness "as necessary to meet the minimum requirement for the administration of the area for the purposes of [the Wilderness Act]." Section 4(d)(1) provides an exception to the prohibited uses to the extent that "such measures may be taken as may be necessary in the control of fire, insects and diseases, subject to such conditions as the Secretary deems desirable."

Clean Air Act - Impacts to non-attainment areas may limit management options for unplanned ignitions or require aggressive suppression actions during period of air quality alerts. Otherwise, Clean Air Act regulations generally apply to planned events such as prescribed fires rather than unplanned ones.

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Smoke assessments are the responsibility of both AFS and Innoko 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. 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.

4.1.2.5 Use of Decision Support Tools

Decisions for extended response, non-standard responses and escaped prescribed fires will be documented using WFDSS and will support the objectives listed in the Refuge Fire Management Plan. AFS will initiate the WFDSS process by entering the required information into the Incident Information tab within the WFDSS program. AFS will then transfer the “ownership” as defined within WFDSS to the Refuge WFDSS contact; both AFS and the Refuge will work collaboratively to complete an organizational needs assessment and the documentation as required. For all incidents:

- Public and firefighter safety issues will continue to be the primary consideration.
- AFS and the Refuge will jointly complete a complexity analysis (or Organizational Needs Assessment) to determine the management level of the incident.
- AFS will authorize/provide oversight for all incident resources regardless of 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.
 - 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 AFS as the lead.
- WFDSS documents that go to decision due to being a non-standard response or extended attack beyond the initial response require approval by the Agency Administrator.

AFS will develop and implement incident tactics based on verbal approval from the FWS Area FMO or Refuge Manager while WFDSS approvals are being finalized. Approval authority for WFDSS decisions are listed in Table 9. These amounts are subject to change so it is necessary to consult the Redbook for updated amounts. AFS will notify the Refuge when costs are approaching approval thresholds. BLM approvals are primarily for the associated costs, not the WFDSS document.

Table 9. WFDSS Approval Requirements – FY 2013

Cost Estimate	FWS Approval	BLM Approval
\$0 - \$2M	Refuge Manager	AFS FMO
\$2M – \$5M	Region 7 Director	AFS FMO
\$5M-\$10M	FWS Director	AFS Director

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Currently WFDSS will be used to inform and document line officer decisions for all wildland fire incidents. The Agency Administrator will be briefed on the current fire situation and will validate if the initial pre-planned response is meeting the strategic objectives for that incident. If the pre-planned response is not meeting the strategic objectives or if there are site specific incident objectives that must be met, a new course of action and incident objectives will be developed and documented in WFDSS. On-line fire behavior tools within the WFDSS system (FSPro, STFB) can be used to inform the decisions that the Agency Administrator must make. Once this decision is published, a periodic assessment schedule will be set to re-validate that the chosen course of action is still meeting strategic objectives. Whenever a course of action is no longer meeting strategic objectives, a new course of action and decision will be required. This sequence continues for the duration of the incident. WFDSS reports maybe generated to document the progression of the incident and the decisions made during its course. The electronic WFDSS documents are maintained under Federal Records Management Policies as permanent records.

If the pre-planned response is followed, a further course of action may not be necessary, however if the fire exceeds the initial attack resource and goes into an extended attack or /or is expected to burn for multiple days, a decision is required of the Agency Administrator. Although these fires may stay in the pre-planned response throughout the entire duration of the incident they still require a decision in WFDSS. The FWS Area FMO will provide timely updates on the fire status to the Agency Administrator so they may complete the periodic assessment in WFDSS.

A large portion of the Refuge is designated as limited fire management option. Fire in these areas will be integrated as a naturally occurring process. Fires in all fire management options may be managed for multiple objectives and used to protect, maintain, and enhance natural resources whenever long-term weather and fuel conditions are favorable. Fire behavior modeling programs such as FARSITE and FSPro can help inform the long-term prognosis for fires being managed for multiple objectives.

4.1.2.6 Wildfire Reporting Requirements

In addition to the national standard (found in the Red Book), Alaska requires an ICS- 209 form be submitted for all fires that have a commitment of 17 or more personnel for more than one burning period (overnight). AFS is responsible for completing ICS 209s as they are the primary source of Alaska fire activity information for national fire managers. Alaska ICS-209's should be submitted by 10:00 p.m. (2200 hrs.) Alaska Daylight Time (ADT).

Fire reports are to be completed and entered into the FWS Fire Management Information System (FMIS).The FWS Area FMO will complete an FMIS entry for the following types of fires within 10 days of a fire being declared out:

- All fires on FWS lands (Fire Reports are required to be completed by the Protecting Agency and submitted to the R7 Regional Fire Staff)
- All wildland fires on which Refuge Fire staff takes action (on or off Refuge)
- All escaped prescribed fires
- All false alarms responded to on FWS by Protecting Agency or Refuge staff

Fires that achieve resource management objectives will also be documented in the National Fire Plan Operations & Reporting System (NFPORS) by the FWS Area FMO or designee. The FMO will ensure that a complete project record will be compiled and retained for each wildland fire on the Refuge. Each record may contain the following items:

- Decision support documentation
- Project maps (including progression + severity maps)
- Monitoring summaries
- Photographs/photo points if available

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- Funding codes used and cost
- Overall project summary including the narrative, daily log, periodic assessments, contacts, decision records, orders and what and how objectives were met (Fire Report completed by Protecting Agency). MANDATORY

Reviews and investigations are used by wildland fire and aviation managers to assess and improve the effectiveness and safety of organizational operations. Brief descriptions of various reviews and associated procedures and requirements, including those for serious wildland fire accidents, entrapments, and fire trespass are listed in the corresponding Red Book Chapter.

An annual Fire Management Accomplishments Report is prepared by the FWS Area FMO to keep the Regional Fire Management Coordinator apprised of all Refuge fire management activities.

4.1.2.7 Suppression Damage Repair

Repairing the impacts of suppression activities is the responsibility of the Incident Commander and funded by the wildfire account. This work should be completed by the incident resources prior to final demobilization whenever practical. However, some actions may need to be conducted by the local unit when conditions are appropriate but need to be completed before the fire code (funding) is closed out (usually within 1 year). It is the responsibility of the Refuge Manager/Agency Administrator (or designee) to ensure 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 firelines to refill them to level; add water bars as needed, and/or apply Alaska specific tactics such as lying brush over firelines in permafrost areas.
- Fell and buck up hazardous trees and snags,
- Flush cut all stumps as close to ground level as practicable,
- Roll back and compact sod overturned by plowing (with a grader or by hand) to preserve native grass root stock. This is also important in peat to reduce thawing of permafrost.

4.1.3 Emergency Stabilization (ES)

Natural recovery is the preferred choice for recovery following unplanned ignitions. However, when natural recovery is not likely, emergency stabilization (ES) treatments may be needed to prevent unacceptable degradation of cultural and natural resources, to minimize threats to life and property resulting from the effects of a wildfire, or to repair/replace/construct physical improvements necessary to prevent degradation of land or resources. See Chapter 11 of the Red Book for current procedures and guidelines for ES as well as an Approval Authorities Table.

ES uses emergency appropriations and activities must be completed within one year of fire containment. Because of the emergency classification, the ES plan must be completed within 7 calendar days of wildfire containment and approved within 6 business days of receipt by the approving office. Responsibility for ES plan preparation, compatibility with Service/Refuge management goals and objectives, and NEPA/regulatory compliance lies with the Refuge Manager. The Refuge Manager is also responsible for ES Plan implementation. Plans must be developed at the Refuge level, approved at the Regional level, and submitted to the National Fire Program Office in Boise for review by an inter-Departmental review group. 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.

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Treatments must be implemented within one year of wildfire containment, although ES funding can be used for up to three years following containment in order to monitor treatment effectiveness or to replace/repair ES 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 and cannot be used to continue seeding, plantings, or invasive plant treatments.

Alaska's first experience with ES was after the 2004 fire season when an interagency team was assembled to develop a plan. Individual refuges in Alaska developed refuge-specific plans following the 2005 fire season, including Innoko, Kanuti, and Yukon Flats. Reports from these efforts may be consulted for Alaska-specific guidance, although national guidance on allowed activities has changed since 2005 (see also section 4.1.3.1). Field inspections will likely be necessary to assess values at risk as a result of the fire. The Refuge 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.

Information, guidance, and templates for ES activities can be found at:

- DOI Emergency Stabilization and Burned Area Rehabilitation website: <http://fire.r9.fws.gov/ifcc/esr/home.htm>
- The Red Book, Chapter 11: <http://www.nifc.gov/PUBLICATIONS/redbook/2012/Chapter11.pdf>
- Interagency Burned Area Emergency Response Guidebook (2006): http://www.fws.gov/fire/ifcc/esr/Policy/es_handbook_2-7-06.pdf
- DOI Wildland Fire Management Policy, Part 620 Chapter 3, Burned Area Emergency Stabilization and Rehabilitation: <http://elips.doi.gov/elips/DocView.aspx?id=1860&searchid=d4e2e93d-8cea-4305-9a57-2d2731f10c85&dbid=0>
- Policy guidance: http://www.fws.gov/fire/ifcc/rehab/policy_guidance.html

As stated above, a Burned Area Emergency Response (BAER) - ES plan was completed for Innoko Refuge 2005 fires to assess cultural resource impacts (including the historic Iditarod Trail) and invasive species (Refuge files INN_07-01 & 07-02 2007 Kovach). According to the final report, no cultural resources or parts of the historic trail were impacted, and no invasive species were located.

4.1.3.1 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 trails are likely to be impacted by severe or large fires. The historic Iditarod Trail is one such value, as are the specific Refuge related values listed in Table 2.

ES actions potentially needed on Innoko Refuge, as identified in 620 DM 3, include:

- 3.7 M (2) placing structures to slow soil and water movement,
- 3.7 M (10) direct treatment of invasive plants,
- 3.7 M (12) monitoring of treatments and activities for up to three years.

The non-native plants currently identified on the Refuge are generally not noxious, and are not expected to spread rapidly post disturbance, but other invasive plants are spreading throughout the state and could become established on the Refuge. 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. As of 2011, Canadair CL2-15 tanks (and other aerial water delivery apparatus) are required to be washed prior to scooping water in Alaska to prevent the spread of aquatic invasive species.

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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. 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 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 or may be a part of the historic landscape (Iditarod Historic Trail). Hazard trees can obstruct trails, making travel difficult or impossible. While ES funds can be used to remove hazard trees, stabilize slopes immediately above and below the trail, and create water bars, it is not allowed to use ES funds to improve a trail to a standard above its pre-fire condition.

4.1.3.2 ES Reporting Requirements

ES annual and final accomplishment reports are required for accountability. The final report documents all ES activities and costs and will be archived in the Refuge project files with electronic copies sent to the RFMC and Branch of Fire Management in Boise, Idaho. The Regional Fire Management staff will provide assistance as needed. Accomplishment reports including treatment and activity information are also required in the National Fire Plan Operations and Reporting System (NFORS).

4.2 Burned Area Rehabilitation (BAR)

4.2.1 BAR Planning

A BAR plan is a document that specifies treatments required to implement post-fire rehabilitation policies. This plan may be programmatic (prepared in advance) and applicable to clearly defined types of incidents and situations, or prepared by an interdisciplinary team of specialists during or immediately following the containment of a wildfire. Information and a BAR plan template are at the DOI - ESR website at: <http://fire.r9.fws.gov/ifcc/esr/home.htm>. Based on prior ES assessments, it is unlikely that BAR would be required on the Refuge.

4.2.3 BAR Regulatory Compliance

Two Categorical Exclusions (CXs) may apply to BAR. The first is a DOI CX (43 CFR Section 46.210), and the second is a FWS CX (516 DM 8.5(5)). See section 2.2.2 for more information.

When utilizing the FWS CX, 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 CX, consult with the Regional Office regarding its use.

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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 the State Historic Preservation Officer (SHPO).

4.2.4 BAR Monitoring Protocols

Monitoring protocols will be included or referenced in the BAR plan. They will follow DOI policy and will use standard protocols developed for similar bio-physical regimes.

4.2.5 BAR Contact Information

Refuge Biologists, the FWS Area FMO, and GIS specialist 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.

4.2.6 BAR Reporting Requirements

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. Annual accomplishments are also summarized and reported in the NFPORS treatment/activity form. NFPORS accomplishment updates are to be completed by the 23rd of every month and at the end of the fiscal year until the project is shown as completed.

4.3 Management of Fuels Treatments

By this reference, guidelines and procedures of the current Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide, and corresponding chapters of the FWS Fire Management Handbook and the Red Book are incorporated into this FMP and must be followed.

Refuge planning of fuels treatments is developed through the strategic placement of projects, based on risk from wildfire, or desired vegetation change for habitat treatments. The overarching goal of fuels management is to allow fire to play its natural role in the ecosystem. Maintaining the largely natural and intact fire regime on the Refuge into the future may be dependent upon the strategic placement of, and effectiveness of hazardous fuels treatments.

Fuels treatments may be implemented by mechanical, chemical, or manual methods in accordance with the Innoko NWR CCP (see section 3.1.1.2) and be carried out under written and approved plans. Completed plans will be reviewed by the FWS Area FMO or designee and approved by the Refuge Manager. The FMO ensures that personnel assigned to these projects have the necessary training and qualifications.

Fuels treatment projects on Innoko Refuge will be guided by the following:

- Evaluating Refuge mission with the need for fuel treatments and treatment location.
- Identifying known sites and maintaining the known sites database.

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- Evaluation of treatment priorities by ranking high risk sites.
- Development of treatment plans for priority sites hazardous fuels treatments.
- CWPP's developed by communities adjacent to the Refuge that identify areas of risk from fires moving off the Refuge and onto private lands.
- Habitat treatments utilizing the fuels treatment suite of vegetation manipulation techniques are proposed for those areas deemed beneficial for various species of wildlife. Any habitat treatments for the Refuge will require new site specific or area analysis and will need to relate directly to the goals and objectives identified in the Revised CCP.

Hazard Reduction

Hazard fuels reduction and prescribed fires help reduce risk from wildland fire and make suppression operations easier by reducing the continuity and amount of fuels. Priority for hazard reduction efforts is highest based on risk ranking. In general, projects that reduce crown fire initiation risk in black spruce are preferred. Hazard fuel reduction may include, but is not limited to:

1. Break up continuous stands of vegetation that contribute to large wildland fires.
2. Reduce and remove hazardous fuels, especially dead and decadent vegetation or that exhibits extreme fire behavior.
3. Create defensible space adjacent to specific values at risk by clearing flammable materials.

All treatments should use natural barriers where possible and avoid identified sensitive features. Collaborative planning may result in treatment placement on both Refuge and private or state lands.

Resource Management

Vegetation management techniques, including the full range of fuels treatment methods may be used for resource management objectives when there is an identified need. Selection of strategies for habitat management and manipulation is based on the cost effectiveness of achieving the resource management objective(s) identified in the Refuge CCP. Habitat treatments should occur where altered fire return intervals are occurring or vegetation manipulation using hazardous fuels treatment techniques are desired. Currently there are no identified projects to utilize fuels treatments for resource management.

4.3.1 Processes to Identify and Prioritize Hazardous Fuels Treatments

Hazardous fuels treatments are based upon the risk to values from wildfire. Hazardous fuels projects will focus on the highest risk areas. The Refuge Manager will meet annually with the FWS Area FMO to prioritize/update fuels projects (based on guidelines listed in section 4.3). The 5 year program of work for hazardous fuels treatments for the Refuge can be found in Appendix T. If National funding improves and the need arises for a more in-depth Hazardous Fuels Treatment Plan, it will be added to Appendix T. The Hazardous Fuels Prioritization and Allocation System (HFPAS) is the current DOI system used to prioritize funding for projects nationwide.

4.3.1.1 Planning, Preparing and Implementing Non-Fire Hazardous Fuels Treatments

Refuge sponsored fuels and vegetation projects may include mechanical treatments (may be followed by prescribed fire). Emphasis is on small scale treatments in the immediate vicinity of values at risk, or larger scale fuel breaks. Some of these values are located off Refuge. Refuge fuels treatments may be planned and implemented on an interagency basis for projects located on State and private lands. Projects

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may be funded with Refuge force account labor, contracts, or agreements with the BIA, BLM, State of Alaska, Native Corporations, Village Councils, and/or other private entities.

The Refuge Manager may authorize the use of power saws, hand tools or similar devices to mitigate hazard fuel buildup, mimic natural fire effects or recreate historical landscape/conditions in areas where prescribed fire would pose an unreasonable threat to life, property or resources. Each mechanical fuel reduction action must follow a written plan prepared or reviewed by the Fire Management Officer and approved by the Refuge Manager. This plan will evaluate possible options and long-term effects along with costs. The most common project on the Refuge is thinning, followed by hand-piling (and ignition of the resultant slash piles, see section 4.3.2)

4.3.2 Prescribed Fire Project Implementation

Prescribed fire implementation will follow the standards set forth in the FWS Fire Management Handbook, the Red Book, and the Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide (Prescribed Fire Guide), available at www.nifc.gov/fire_policy/rx/rxfireguide.pdf.

Prescribed fire may be utilized as a management tool in any of the FMUs for the purposes of hazard reduction or resource management following guidelines listed in section 4.3. Hazard reduction projects will be conducted for the protection of Refuge facilities or for the benefit of local residents by helping protect their lives and property from wildfire. The most common prescribed fire conducted on Innoko Refuge is the ignition of slash piles created from hazardous fuels projects (see section 4.3.1.1).

Prescribed fires may be ignited during Regional or National Preparedness Levels 4 or 5 if they meet requirements specified in the Regional and National Interagency Mobilization Guides. Daily fire situation reports issued by AFS list the day's preparedness level.

4.3.2.1 Prescribed Fire Planning

Each prescribed fire project will require a detailed and comprehensive prescribed fire plan, including objectives for the burn and monitoring to determine if objectives are met. Prescribed fire projects are considered a discretionary fire management activity so would trigger the completion of a Minimum Requirement Analyses if planned within the Innoko Wilderness boundary.

Prescribed fire plans begin with consultation between the FWS Area FMO or designee and the Refuge Biologist and other staff based on risk and need. The completed plan will undergo the technical review process coordinated by the FMO before submittal to the Regional Fire Management Coordinator for approval. Final approval of prescribed fire plans is made by the Refuge Manager. The Refuge Manager will approve individual prescribed fire implementation using the Agency Administrator approval checklist.

Copies of approved prescribed fire plans will be provided to AFS and other involved agencies or party (I.E. Alaska Department of Fish and Game). Execution and supervision of prescribed fire plans are the responsibility of the FMO. Local resources (e.g. village EFF crews) may be utilized to supplement Refuge resources.

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

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Desired Effects for prescribed fire

General desired effects for prescribed fire on plant communities are presented below. Burn patterns that include unburned areas and enhance the mosaic effect are generally preferred. Site-specific objectives for individual prescribed fires may be significantly different from those listed.

- a. Meadows: burn with low intensity to remove dead thatch and leave root systems intact.
- b. Shrub lands: burn with low to moderate intensity to remove dead downed fuels and litter and promote regeneration of shrub species.
- c. Broadleaf and Mixed Forest: burn with low to moderate intensity to consume dead downed fuels and litter and allow regeneration of deciduous species that are preferred by many wildlife species that are of interest to subsistence users.

The following phenological parameters may affect treatment project timing.

- *Prior to green-up*: In the black spruce and low shrub/grass fuel types, an early prescribed fire (April to mid-May) may be feasible when ground fuels are still relatively moist or on exposed sites where the snow has melted earlier than adjacent areas.
- *Green-up through foliage maturation*: Prescribed fire activities between early June and mid-July will be scheduled with caution. This is the peak of the fire season. Fires can quickly become difficult to control because of undesirable weather and fuel conditions. Pre-green-up fires should not be managed during this period due to the remaining length of the fire season. This could be mitigated by developing a seasonal analysis based on the current and anticipated weather patterns.
- *Maturation of foliage*: A very feasible time to conduct prescribed fires in the black spruce fuel types is from mid-July to early September depending upon weather conditions and drought trends. The risk of problems occurring is reduced when the end-of-the-season weather event is imminent. This is often the best time to burn shrubland and broadleaf forest sites if the summer has been somewhat dry.

Duff moisture levels that facilitate consumption of no greater than 25-33% of the active layer are desirable. Overall the duration of exposure should be relatively short. Smoldering fires are to be avoided, because duration of exposure to the flaming front affects the degree to which root systems are destroyed.

4.3.2.2 Prescribed Fire Operations

During the project, the Burn Boss will report acres treated to AICC each evening so that the information may be included in the 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 Dispatch operations (if required) 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 Alaska Fire Service or other prescribed fire staff.

The Burn Boss will follow all the guidelines and procedures of the Prescribed Fire Plan and will be assigned to each project by the FWS Area FMO. Cooperators, contractors, and casual hires (AD or EFF) may be used to implement prescribed fires. Casual hires 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 FWS standards. The Burn Boss will ensure all personnel have and maintain the qualifications necessary to implement prescribed fires.

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The Refuge Manager, Burn Boss, and FWS Area FMO must closely monitor weather and fuel conditions and share information to take advantage of conditions needed to schedule and implement the project.

4.3.2.3 Prescribed Fire Public Notification

The public will be informed in advance of prescribed fire projects through news releases in the local media. Prescribed fire plans must include procedures and timeframes for appropriate notification of cooperators, other agencies, neighbors, media, and members of the public likely to be impacted by a prescribed fire. Special notification should be made for neighbors with known physical ailments that could be adversely affected by smoke.

4.3.2.4 Multiple Prescribed Fire Projects

A burn boss may not manage multiple prescribed fires in non-adjacent prescribed fire blocks where ignition or active holding is being implemented. A qualified Prescribed Fire Manager may oversee multiple projects if each has a designated Burn Boss.

4.3.2.5 Prescribed Fire on 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 prescribed fire. The Service has guidelines which may allow this when circumstances apply that benefit the Service and when agreements with landowners are in place. The Regional Fire Management Coordinator can advise on appropriate procedures. *NOTE: Refuge employees involved with prescribed fires off federal lands will have a memo in their personnel file from the Refuge Manager detailing that the scope of their employment includes implementing prescribed fire on non-federal lands.*

4.3.2.6 Prescribed Fire Conversions and Reviews

When a Refuge prescribed fire is declared a wildfire, the Protecting Agency FMO will assume operational control with the cooperation of the Burn Boss and prescribed fire resources. An IC will be identified by the Protecting Agency FMO prior to ignition. This may be the burn boss or other individual. The wildfire number will be assigned and all wildfire management costs will be charged to that number. The same analysis and WFDSS (or other) decision support documentation that applies to all wildfires is required. The acreage burned after the fire was declared a wildfire is reported as wildfire acreage in the final fire report. 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*.

The contingency section of each prescribed fire plan will clearly define what contingency actions constitute a significant departure from what was planned or expected and where conversion to a wildland fire is appropriate. Policy authorizes the prescribed fire burn boss to take limited holding action(s) on prescribed fire outside of the planned perimeter if stated in the prescribed fire plan.

A prescribed fire will be declared a wildfire by the Burn Boss when they determine that contingency actions have failed or are likely to fail and cannot be mitigated by the end of the next burning period by

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on-site holding forces and listed contingency resources. A prescribed fire may be converted to a wildfire for reasons other than escape. On these incidents, a planned incident management response will be prepared, implemented, and documented using the WFDSS process. The Refuge Manager will be notified as soon as possible of an escaped prescribed fire.

When a prescribed fire is declared a wildfire, notification will be made to the AFS Galena Zone (356-5623 – before the Galena Office is staffed or 656-1222 – after the Galena Office is staffed), the Alaska Interagency Command Center (356-5678), and the Regional Fire Management Coordinator (786-3497).

4.3.3 Fuels Treatment Regulatory Compliance

NEPA Compliance

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 1.16), but if necessary the project may require an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). Refer to section 2.2.2 for additional guidance.

Clean Air Act Compliance

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

Prior to each prescribed fire of greater than 40 acres, the FWS Area FMO will submit the burn plan to DEC (State of Alaska Department of Environmental Conservation, Division of Air and Water Quality, 555 Cordova Street, Anchorage, AK 99501-(FAX) 907-269-7508). Appropriate DEC forms will be completed.

Individual prescribed fire plans will specify conditions required for burning that will minimize impacts to air quality from prescribed fire, including compliance with the requirements of State and local air quality regulatory agencies. The following parameters will be followed unless ADEC requires more specific conditions to open burning permits.

- *Materials burned are limited to natural vegetation.*
- *To the extent possible, provide for optimum burning efficiency.*
- *Prior notification must be given to the Alaska Department of Environmental Conservation, Alaska State Troopers, and the Alaska Fire Service.*
- *The open burn permit is granted on either an individual or annual calendar year basis and must be re-applied for subsequent to each approval period. A report must be submitted at the end of each approval period to DEC specifying dates and acreage of all prescribed burns that occurred during that period on the Refuge.*

Emission calculations may be completed using one of the emission models available at:

<http://frames.nbii.gov/portal/server.pt?open=512&objID=205&PageID=0&cached=true&mode=2>
(e.g. CONSUME, EPM - Emission Production Model, NPSPUFF, SASSEM or FOFEM plus hand calculations) as needed.

4.3.4 Fuels Treatment Monitoring

Fuels treatment projects will include a post- implementation monitoring plan to help determine if the treatments met the desired objectives/outcomes as specified in the plan. It is intended that monitoring will begin as soon as the project is initiated, so as to be able to adjust techniques as early during the implementation phase as possible. Fuels treatment activities are project specific so may include monitoring of site characteristics that relate to fuel loading, vegetation change, residual vegetation density, or the anticipated amount of fuel reduction.

Designing each project specific monitoring plan will be coordinated with the FWS regional fire ecologist and fuels specialist to ensure quality methods are used and a consistent approach is followed state-wide.

For prescribed fires, the Burn Boss will review current and forecast local weather prior to burn day. On burn day, a spot weather forecast from the local National Weather Service will be requested that will include time periods to complete ignition, holding, and immediate mop-up needs. When possible, weather variables are typically monitored prior to test fire and during the ignition phase at intervals specified in the prescribed fire plan. This is intended to document that the fire is within prescription.

Post-treatment assessment will include documentation of fuels reduction and vegetative change including whether the treatment met the specific measureable resource objectives identified in the treatment plan (i.e. stimulate sprouting in 75% of willows present, limit mortality to <5% of spruce, etc.) Treatment effects monitoring is also discussed in Section 5.2.

4.3.5 Fuels Treatment Reporting Requirements

Completed treatments will be reported in FMIS and NFPORS within 5 days of completion.

Prescribed Fire Reports

The Burn Boss will complete an Individual Fire Report (DI-1202) with the FMO who will file this within 10 days of the fire being declared out. The report will document conditions and fire behavior during the prescribed fire to assess how well actual fire characteristics fit those predicted, unanticipated difficulties encountered during implementation, and assessing how well the fire accomplished the intended objectives. For prescribed fires that have fire effects objectives requiring longer term studies, the evaluation and reporting schedule should also be specified. Specific fire effects objectives will require specific means of measuring results and should be delineated in the prescribed fire plan (see section 5.2.1 for additional information).

A summary of all prescribed fire activity for the fiscal year will be completed by October 31 of each year and submitted to the Regional Fire Management Coordinator and AFS by November 1.

Treatment Reporting for Agreements or Contracts

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.

4.3.6 Fuels Committees and other Collaborative Groups

Hazardous fuels reduction planning for the Refuge will consider CWPPs for local communities, and will be coordinated on an interagency level when possible. Fuel treatment projects may be discussed and coordinated with AFS and other entities that are identified during project development.

4.3.7 Fuels Treatment Funding Processes

Fuels funding requests are developed by the FWS Area FMO after treatments are proposed and identified by the Refuge Manager. Requests are entered into NFPORS within required timeframes. Accountability for fuels funds lies with the Refuge Manager, with oversight by the FMO. The Hazardous Fuels Prioritization and Allocation System (HFPAS) is used for prioritizing and allocating hazardous fuels funding beginning with the 2012 budget.

4.3.8 Debris Burning

Debris burns may be implemented under State laws and regulations, and are not required to comply with prescribed fire requirements. If there is the slightest potential for spread into refuge lands, a prescribed fire plan is recommended. 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 the day of the burn to confirm restrictions, suspensions, and closures are not in effect.

4.4 Prevention, Mitigation, Education and Public Information Programs

4.4.1 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.

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Wildland fire trespass refers to the occurrence of wildfire 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 provides detailed information regarding investigation and trespass procedures.

4.4.2 Prevention/Mitigation Program

Prevention Program Goals are to:

- Reduce the likelihood of human-caused fires, and naturally-ignited wildland fire ignitions that result in unacceptable loss. Investigate human-caused fires at the earliest possible time.
- Minimize loss and reduce overall fire protection costs by developing programs such as fuels reduction/modification while considering resource management objectives.
- Integrate and coordinate prevention through an interagency approach among all Federal, State, Borough, and municipal agencies/entities.

4.4.2.1 Wildfire Occurrence

Since 1957, only three of the recorded 85 fires that have occurred on Innoko National Wildlife Refuge was human-caused. Human-caused fire starts in roadless areas of Alaska are generally along rivers and other waterway access areas. Additional information concerning fire occurrence as well as a fire map can be found under section 3.1.3.7.

4.4.2.2 Prevention Activities

Prevention activities will focus on increasing youth and young adult awareness of the effects of human-caused fires and the benefits of natural fire. Prevention efforts will also focus on outreach to the public during the fire season (airing prevention messages on local radio stations as needed). The objective of fire prevention activities is to prevent human-caused wildfires and encourage homeowners to implement mitigation measures around private property. In order to accomplish this, the FWS Area FMO will:

- Make employees aware of ways to prevent unwanted ignitions, especially during the field season.
- Be trained in FireWise Community Action Plan implementation and actively share that knowledge with the public at every suitable opportunity.
- Work collaboratively with other Refuge programs to effectively deliver fire management interpretive programs at Refuge Headquarters, area schools, and in adjacent villages.
- Seek opportunities for fuels mitigation projects to reduce the risk of fire moving onto and off of Refuge lands and potentially posing a threat to surrounding communities or other values at risk.
- Coordinate the distribution information to the press, staff, and public.

4.4.2.3 Mitigation Activities

The FWS Area FMO will accomplish the prevention goals identified above through the following efforts:

- Make staff aware of prevention efforts and be able to explain it to other interested parties and individuals contacting the Refuge.
- Brochures concerning fire prevention will be made available at each Refuge for public education.
- Coordinating with the Project Leader during periods of high or extreme fire danger for Refuge closures to smoking, open fires, and Refuge access. Notices will be posted at appropriate entrances, trails and through local radio and news releases.

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- Reducing hazardous fuel accumulations around the Innoko Field Camp and possibly other values at risk. An annual assessment of hazardous fuels will be performed for the Field Camp.

Depending upon resource availability and collaboration with other agencies, the Refuge may provide assistance to any local community requesting help in dealing with hazardous fuels assessments and/or treatments or any other fire related issue(s). Actions would focus on reducing hazardous fuels, both in the village and adjacent to the community, assist in securing funding for fuels projects, help develop local infrastructure capacity to do fuels work, and support FireWise concepts such as promoting FireWise education and information in these communities. Specifically, efforts will be made to conduct FireWise workshops in communities adjacent to the Refuge such as Shageluk, McGrath, Grayling, and Anvik.

Mitigation efforts will also focus on reducing fire risk to cultural resources, Administrative sites, historical resources, native allotments and other Refuge values. As these areas become known, they will be identified on a spreadsheet and their locations and desired level of protection will be given to AFS for inclusion in the statewide Known Sites database. Larger areas (such as Refuge lands adjacent to communities) have been identified and the fire management option changed to one that provides the desired level of Protection.

4.4.2.4 Prevention Analysis

As per the Fire Management Handbook, each field office is responsible for performing a prevention analysis. The completed prevention analysis determines the scope, contents and need of the fire prevention plan. The same planning cycle used in developing the Fire Management Plan or for the most recent 5 years is used for developing the prevention analysis. This analysis serves as a justification for increasing, decreasing, and modifying existing prevention activities and helps determine if a prevention plan is required/or needed. The problems identified in the prevention analysis are addressed in a prevention plan along with recommended solutions. This analysis will be completed as time and resource availability allow.

4.4.3 Education/Outreach Activities

The local attitude towards fire varies considerably. The early fire management concept of suppressing all fires has influenced the local public view that fire is not ecologically beneficial. Firefighting is still one of the main sources of income for residents of remote Alaska villages. It will take time and effort to persuade the local public of the ecological benefits of wildland and prescribed fire.

The goal of fire outreach activities is to enhance knowledge and understanding about the important aspects of wildland fire management, including: the natural role of fire in the environment, wildfire prevention and mitigation, suppression, prescribed fire, hazardous fuels management, monitoring, and research. All Refuge staff play an important role in dispensing information on the refuge fire management program and educating the public. Information and education are critical to increasing support for prescribed fires as well as beneficial natural ignitions (see also section 3.1.1 and Appendix X).

The FWS Area FMO will conduct the following outreach activities:

- Utilize meetings with residents of local villages as a good opportunity to find out about individual preferences and understanding of wildland fire management.
- Work collaboratively with other staff to deliver fire management interpretive programs.
- Keep Refuge staff informed concerning wildland fire updates and provide current material that can be disseminated concerning wildland fire safety, burn barrel use, etc.

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- Participate in the Annual Science Camp to reach youth interested in natural resource management, specifically furthering the understanding of fire ecology and fire management.
- Pursue other avenues to bring fire ecology education into the Iditarod Area School District.
- When opportunities arise, provide information concerning the nationally sanctioned FireWise program (www.firewise.org).
- Encourage use of the “Role of Fire” curriculum. The Region’s “Role of Fire” (available at <http://alaska.fws.gov/nwr/visitor/fire/curriculum.htm>) describes the role wildland fire plays on the Refuges, is an excellent reference for K-12 teachers, and is available to any school teacher in Alaska. It is important to work with the local school systems providing teachers with reference materials and fire curricula. Communicating information on the role of fire in the northern boreal forest is a high priority for the Region and the Refuge.

4.4.3.1 Community Grant Programs and Assistance

Currently there are no Community Assistance Activities planned for the Refuge. Local Rural Fire Assistance programs are available through Alaska State Forestry. Ready Reserve funding has diminished over the past few years making acquiring of this funding not feasible due to the low occurrence of wildfire on the Refuge.

4.4.3.2 Cooperative Meetings

Each year prior to fire season, the FWS Area FMO will meet with the Protecting Agency FMO and their staff concerning Preparedness for the upcoming season. More information concerning preparedness can be found under section 4.1.1. The FWS Area FMO will work cooperatively with the Protecting Agency and other Federal, State, Native, Municipal, and private entities for Fire Management Activities within and adjacent to the Refuge, and meetings will be assembled as needed throughout the year.

4.4.4 Public Information

Informing the public is an important part of fire suppression, fire prevention, and the FWS mission. During wildfires occurring on Service lands, the Refuge Manager is responsible for providing fire information to the press and the public. The FWS Area FMO (or other staff) may be delegated this responsibility.

The following actions may be used to inform the public as part of the Refuge fire prevention and Protection program:

- Press releases
- Interviews with local media
- Signs and interpretive materials
- Attendance at local volunteer fire department meeting
- Personal contact with bystanders

During the typical fire season, the Alaska Fire Service provides an excellent conduit for fire information, including a specific fire information line during periods of high fire activity. This information can be accessed at <http://fire.ak.blm.gov/>. In the event of a large wildfire or numerous small wildfires on the Refuge, the FMO will coordinate Public Information.

5.0 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. Through monitoring and evaluation methods, we seek to better understand the relationships between fire and other Refuge resources. Monitoring also helps us improve our 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.
- Treatment Effectiveness Monitoring - focused on the ecological effects that result from fire management 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, AIWFMP; compatibility with Refuge plans; support of the applicable National Wildlife Refuge promises, and national and region policies of the Fish and Wildlife Service.

To maintain currency, the FMP must be reviewed each year using the nationally established annual review process. The FMP 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 Refuge 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 (FWS FMH 2010). The AFS Galena Zone (Protecting Agency) should be given the opportunity to review major revisions to the FMP:

Refuge Fire Management Option Updates

Refuge fire management option maps are reviewed annually. Any changes in response levels or boundaries are submitted to AWFCG by March 15 of each year to allow for incorporation into the Alaska Fire Service's atlas and the map atlas held in the Alaska Interagency Coordination Center for the upcoming fire season.

Refuge Fire Preparedness Plan

The Refuge Preparedness Plan will be reviewed annually, and updated as necessary. Currently this plan is for the AK SW Area and includes Innoko and Yukon Delta National Wildlife Refuges.

Refuge 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.

5.1.2 FMP Terminology

Terms in the FMP are defined in the National Wildfire Coordinating Group glossary, located at <http://www.nwccg.gov/pms/pms.htm>. Additional local terms are listed in Exhibit A of the Alaska Statewide Master Agreement: <http://fire.ak.blm.gov/content/aicc/asma/Exhibit%20A%20Glossary.pdf>. Additional local terms are listed in the AIWFMP glossary: <http://fire.ak.blm.gov/content/admin/awfcg/C.%20Documents/Alaska%20Interagency%20Fire%20Management%20Plan/Alaska%20Interagency%20Wildland%20Fire%20Management%20Plan%202010.pdf>.

ACRONYMNS:

ADEC = Alaska Department of Environmental Conservation
ADF&G = Alaska Department of Fish and Game
AIWFMP = Alaska Interagency Wildland Fire Management Plan
AFS = Alaska Fire Service
AMAC = Alaska Multi-Agency Coordination (Group)
ANCSA = Alaska Native Claims Settlement Act
ANILCA = Alaska National Interest Land Conservation Act
AWFCG = Alaska Wildland Fire Coordinating Group
BIA = Bureau of Indian Affairs
BLM = Bureau of Land Management
BTU = British thermal unit
BUI = buildup index
CBI = Composite Burn Index
CCP = comprehensive conservation plan
CDI = Canadian drought index
CFFDRS = Canadian Forest Fire Danger Rating System
DC = drought code
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
FFMC = fine fuel moisture code
FMO = fire management officer
FMP = fire management plan
FMU = fire management unit
FRCC = fire regime and condition class
HFPAS = Hazardous Fuels Prioritization and Allocation System
IMT = Incident Management Team
IQCS = Incident Qualifications and Certification System
MAC = multi-agency coordination
MIST = minimum impact suppression tactics
NEPA = National Environmental Protection Act
NFFL = Northern Forest Fire Laboratory
NFDRS = National Fire Danger Rating System

Fire Management Plan *Innoko National Wildlife Refuge*

NFPORS = National Fire Plan Operations & Reporting System

NWR = National Wildlife Refuge

OAS = Office of Aviation Services

Refuge = Innoko National Wildlife Refuge

RFMC = Regional Fire Management Coordinator

RH = relative humidity

Service = U. S. Fish and Wildlife Service

TES = threatened, endangered and sensitive (species)

WFDSS = Wildland Fire Decision Support System

5.2 Treatment Effectiveness Monitoring

Monitoring and evaluation are activities that must be accomplished during any wildland fire, prescribed fire, or non-fire fuels project on the Refuge to ensure the activity is within prescription, and to ascertain whether habitat/resource management objectives are/have been met. Post-implementation monitoring will examine both short and long-term effects on vegetation. The Fire Management Officer and Refuge staff are responsible for the accomplishment and documentation of monitoring objectives.

5.2.1 Fire Effects Monitoring

The general *goals* of fire effects monitoring may include the following:

- To understand the relationship of fire to the Refuge resources.
- To determine the natural variability of fires on the refuge, including occurrence, extent and severity.
- To better understand fire effects in different vegetation/fuel types to develop predictive capabilities for modeling fire distribution, spread, and behavior.
- To evaluate the possible need for rehabilitation following wildfires.
- To monitor the effectiveness of treatments to insure that objectives have been met or document unexpected results.

The main Refuge *objectives* are to document fire effects trends for more effective decision-making as well as assess the long-term effects and effectiveness of various fire management decisions. Post-fire monitoring may also occur in response to a specific event and may be completed under the auspices of a BAER or BAR plan, as described in sections 4.1 and 4.2. (refer to section 3.1.1 and Appendix X for additional information concerning goals and objectives)

Specific fire effects monitoring on the Refuge may include the following *activities*:

Wildland fires: As described in Section 4.1, wildland fire management activities can range from surveillance/ monitoring of Limited fires to the use of ground-disturbing suppression techniques to control unwanted fires. Monitoring for any wildfire response involves two phases. Phase 1 monitors the fire while it is active and, for wildfires, is conducted by the Protecting Agency per guidance in the AIWFMP (see section 4.1). Phase 2 monitors the post-fire ecological effects.

Fire Management Plan *Innoko National Wildlife Refuge*

During Phase 1, the cause, location, size, fuel model, fire behavior, CFFDRS weather index, potential threats, tactics, constraints, public and firefighter safety are documented. The purpose of monitoring active fires is to determine if the fire meets planning and resource objectives that have been set forth in the WFDSS or other decision document. Effective monitoring provides a basis from which to make decisions regarding risk, threats, and potential resource benefits.

Phase 1 monitoring will be documented long-term in WFDSS or other decision documents, Final Fire Reports, and in the ICS-209 system for some staffed fires.

Phase 2 monitoring can examine both short and long-term effects of fire on vegetation, abiotic attributes, and wildlife depending on Refuge objectives. Post-fire monitoring may also occur in response to a specific event and may be completed under the auspices of an Emergency Stabilization or Burned Area Rehabilitation plan, as described in sections 4.1.3 and 4.2 of this document. Methods will vary with objectives.

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 or <http://www.frames.gov/partner-sites/afsc/partner-groups/frdac/frdac-activities/>.
- 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

Prescribed Fires: Prescribed fire may be used as a tool to meet specific habitat or fuels reduction objectives. Each treatment requires a detailed plan, as described in section 4.3, which includes methods for effectiveness monitoring. In addition to monitoring during and after the fire, surveys are generally required to document pre-treatment conditions. Monitoring methods will depend on treatment objectives; the above sources for post-fire monitoring provide guidance when developing the monitoring plan.

All activities involving fire must be monitored to ensure compliance with the Alaska Enhanced Smoke Management Plan.

5.2.2 Non-fire Fuel Treatment Effects Monitoring

Monitoring protocols will be included in each project plan for non-fire fuel treatments. These are typically mechanical treatment activities designed to reduce the level of hazardous fuels or to alter vegetation structure and composition to meet Refuge resource objectives. The plan implementation monitoring goals for non-fire fuel applications are:

- To ensure non-fire fuel applications follow prescriptions and do not move out of compliance with Refuge goals and objectives.
- To determine if treatment was adequate to meet objectives outlined in the specific plan.

Fuel treatment activities are project specific and will include monitoring of site characteristics that relate to fuel loading, vegetation change, residual vegetation density, and the anticipated amount of fuel reduction. Fuel treatment activities will constantly be monitoring during the implementation phase as outlined in the project's monitoring specifications. Post-treatment assessment will include documentation

of fuel reduction and vegetative change to determine whether the treatment has met objectives. The level of post treatment fire effects monitoring may be similar to that of fire effects; however the treatment monitoring plan should specify the level and elements that will be monitored.

5.2.3 Collaborative Monitoring with other Disciplines

Interagency studies and research are encouraged on all fuels treatments planned and wildland fires that may occur on the Refuge, as long as they do not adversely impact on-site fire management operations or management objectives. Monitoring schedules for prescribed fires are dependent upon observed and predicted fire behavior and weather. On-site monitors may be assigned to specific prescribed fires. *For invasive plant issues and monitoring and control actions, refer to the CCP.*

5.2.4 Fuels Treatment Performance Targets

Fuels treatment performance targets can be found in Appendix T. Units that are not treated during one year due to funding, environmental, or staffing reasons may be re-scheduled, which could result in increases or decreases in total treatment acres in a given year.

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6.2 Authority and Policy References

The following statutes authorize and provide the means to manage wildland fires on Service lands or those that threaten 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 System Administration Act of 1966, as amended by the National Wildlife System Improvement Act of 1997 and the NCTC 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 NCTC System.

E. 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.

Fire Management Plan *Innoko National Wildlife Refuge*

F. 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.

G. Federal Grants and Cooperative Act of 1977. (Pub. L. 95-244, as amended by Pub. L. 97-258, September 13, 1982. 96 Stat. 1003; 31 U.S.C. 6301-6308). 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.

H. 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.

I. 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.

J. 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.

K. 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.

6.3 Other Policy References

1. 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
2. United States Fish and Wildlife Service Manual sections 621 FW 1 Fire Management Program.
3. United States Fish and Wildlife Service Fire Management Handbook.
4. Interagency Standards for Fire and Fire Aviation Operations, also known as the “Red Book”.
5. Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide, July 2008.
6. National Wildlife Refuge System Wildland Fire Management Strategic Plan (May 2006).
7. A Collaborative Approach for Reducing Wildfire Risks to Communities and the Environment: 10-Year Strategy Implementation Plan (December 2006).

Fire Management Plan *Innoko National Wildlife Refuge*

8. National Fire Plan (September 2001), Healthy Forest Initiative (August 2002), Updated Federal Fire Policy Implementation Plan (March 2009).
9. Interagency Fire Management Plan Template Guidance (April 2009), and FWS Guidance for the 2009 Interagency Fire Management Plan Template (Sept 2010).
10. Region 7 Policy for Management of Permitted Cabins on National Wildlife Refuges in Alaska (August 2010).
11. Region 7 Policy on Minimum Requirement Analyses for Approving Administrative Activities in Refuge Wilderness Areas (August 2010).
12. Review and Update of the 1995 Federal Wildland Fire Management Policy (January 2001).
13. Federal Wildland Fire Management Policy and Program Review, Final Report (December 1995).

Appendix A – Maps

Map 1: Innoko NWR Location Map

Map 2: Innoko NWR General Land Status

Map 3: Innoko NWR Fire Management Options/Fire Management Units

Map 4: Innoko NWR Fire Related Values at Risk

Map 5: Innoko NWR Fire History 1951-2011

Map 6: Innoko NWR General Vegetation Types

Map 7: Innoko NWR Vegetation Cover for Fire Behavior Predictions (CFFDRS)

Map 8: Innoko NWR Landcover 2013



U.S. Fish & Wildlife Service

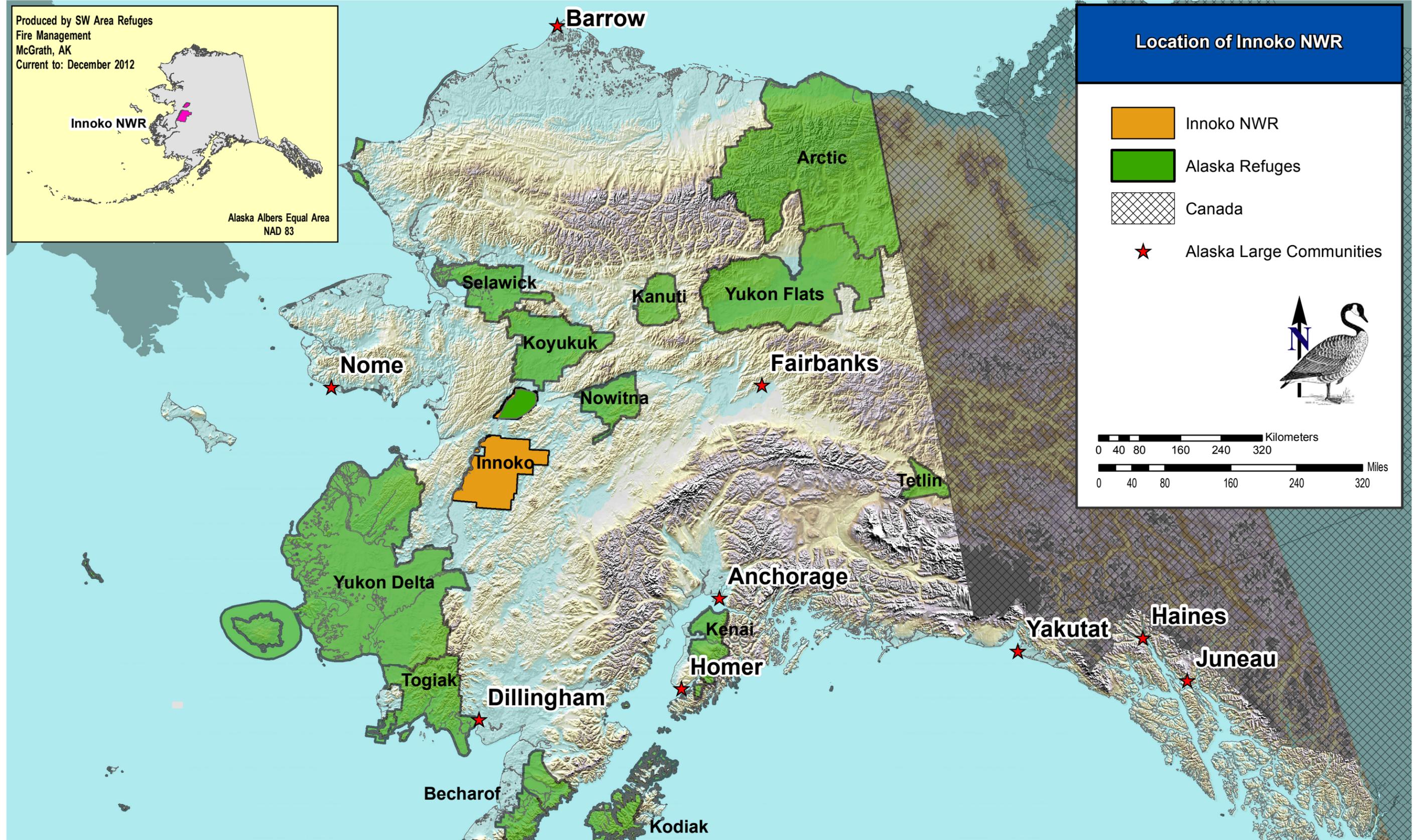
Innoko National Wildlife Refuge

Alaska

Fire Management Plan

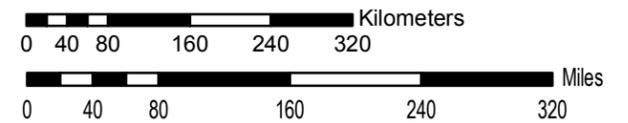
Innoko National Wildlife Refuge Location Map

Produced by SW Area Refuges
Fire Management
McGrath, AK
Current to: December 2012



Location of Innoko NWR

-  Innoko NWR
-  Alaska Refuges
-  Canada
-  Alaska Large Communities





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Innoko National Wildlife Refuge

Alaska

Fire Management Plan

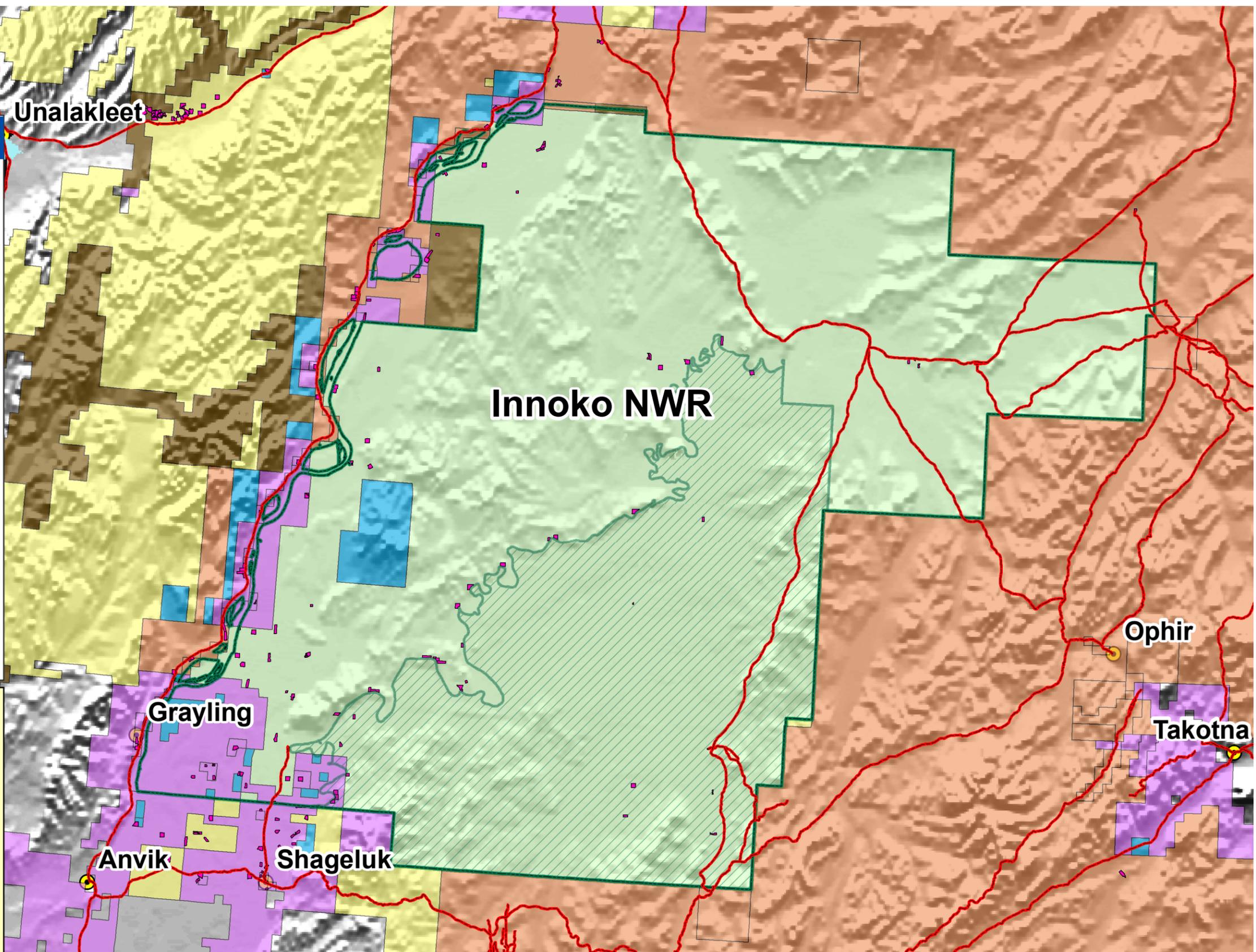
Refuge General Land Status

Innoko NWR General Land Status

-  Innoko NWR Non-wilderness
-  Innoko NWR Wilderness
-  Allotment
-  Bureau of Land Management
-  Fish and Wildlife Service
-  Native Patent
-  Native Selected
-  State Patent
-  State Selected
-  Refuge Area Townsites
-  Trails



Produced by SW Area Refuges
 Fire Management
 McGrath, AK
 Current to: October 2009





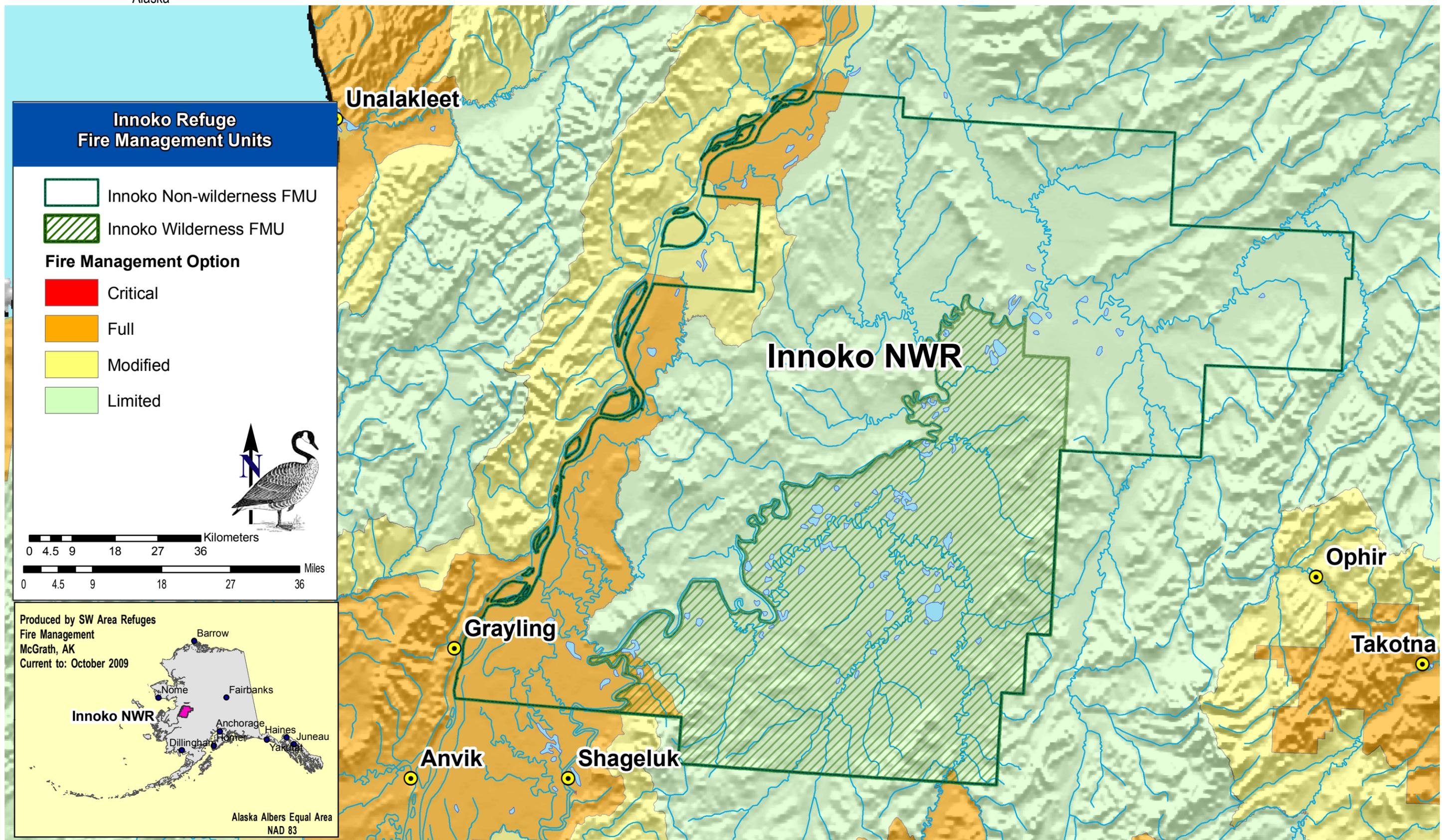
U.S. Fish & Wildlife Service

Innoko National Wildlife Refuge

Alaska

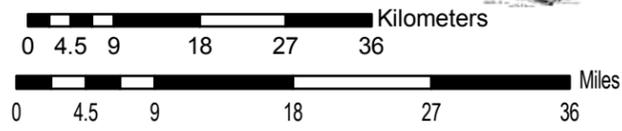
Fire Management Plan

Refuge Fire Management Units



**Innoko Refuge
Fire Management Units**

-  Innoko Non-wilderness FMU
 -  Innoko Wilderness FMU
- Fire Management Option**
-  Critical
 -  Full
 -  Modified
 -  Limited





Innoko Refuge Fire Related Values at Risk and Fire Management Units (FMUs)

- Innoko Non-Wilderness FMU
- Innoko Wilderness FMU

Known Sites 2012

Fire Mgmt Options

- Critical
- Full
- Modified
- Limited



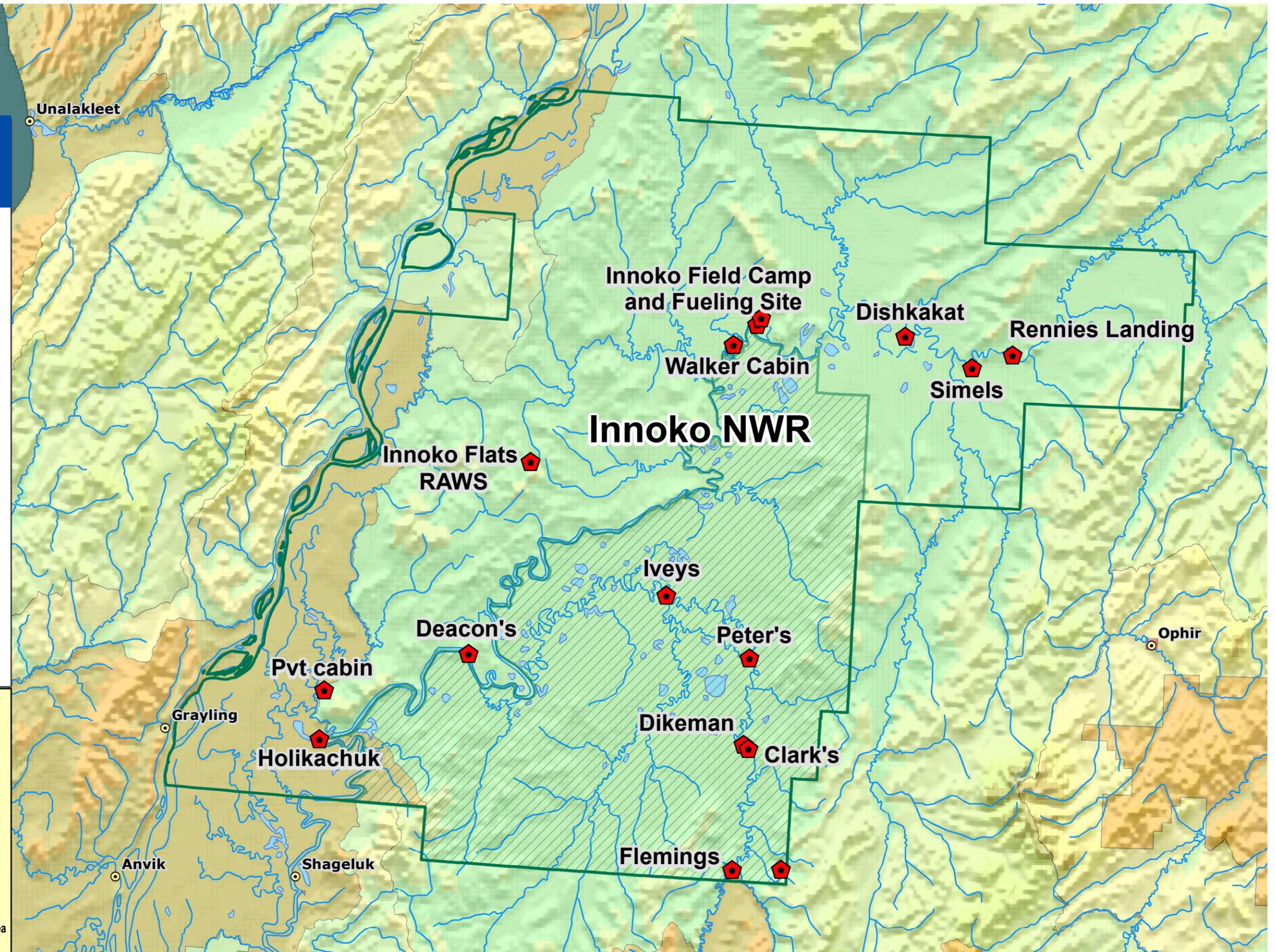
0 4.5 9 18 27 36 Kilometers

0 4.5 9 18 27 36 Miles

Produced by SW Area Refuges
Fire Management
McGrath, AK
Current to: December 2012



Alaska Albers Equal Area
NAD 83





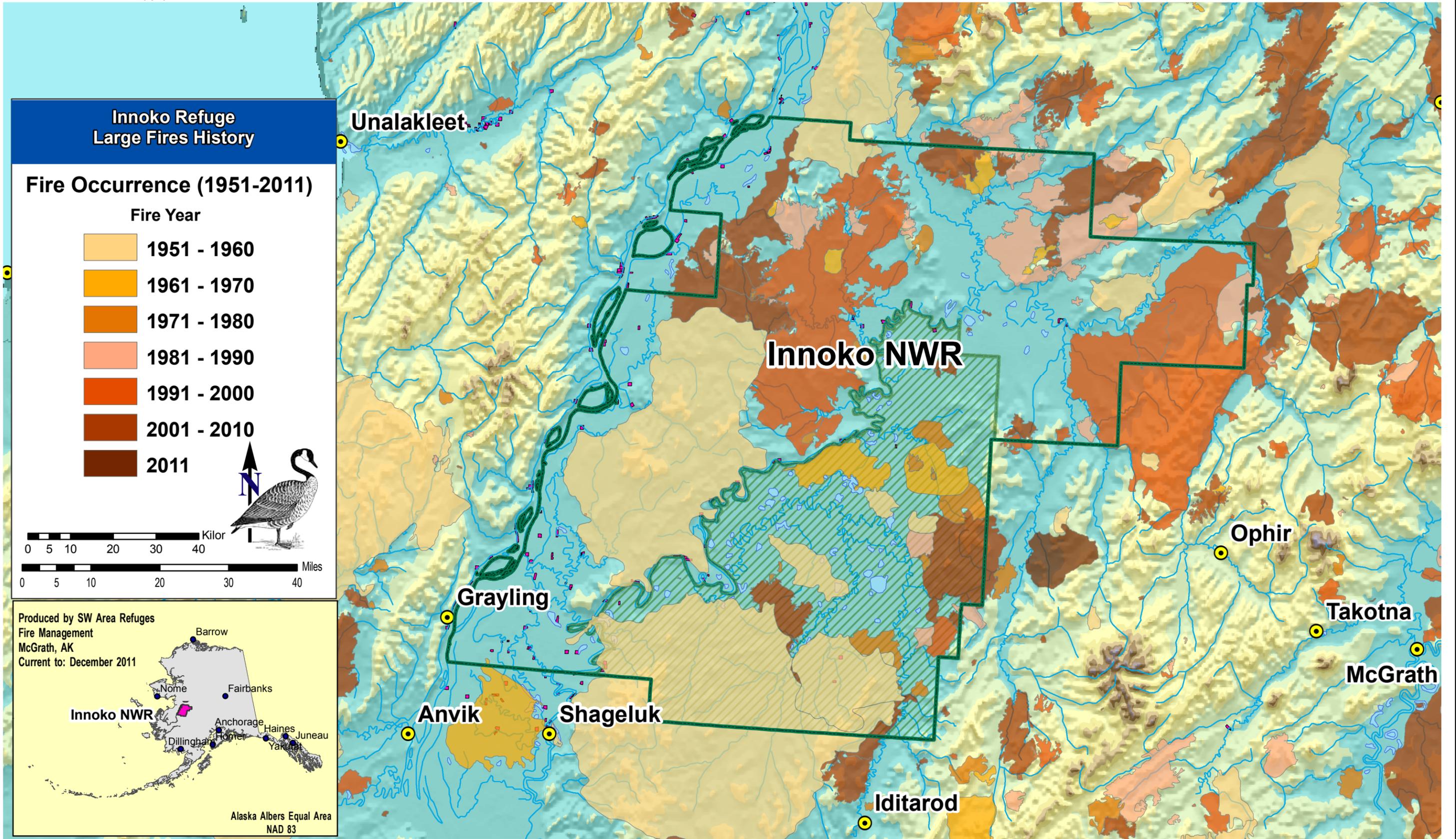
U.S. Fish & Wildlife Service

Innoko National Wildlife Refuge

Alaska

Fire Management Plan

Refuge Large Fire (>100 acres) History Map



Innoko Refuge Large Fires History

Fire Occurrence (1951-2011)

Fire Year

- 1951 - 1960
- 1961 - 1970
- 1971 - 1980
- 1981 - 1990
- 1991 - 2000
- 2001 - 2010
- 2011

0 5 10 20 30 40 Kilor

0 5 10 20 30 40 Miles



Produced by SW Area Refuges
Fire Management
McGrath, AK
Current to: December 2011



Innoko NWR

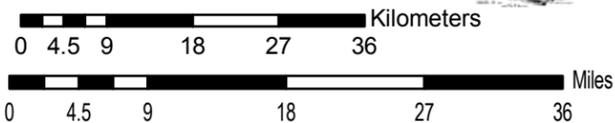
Alaska Albers Equal Area
NAD 83



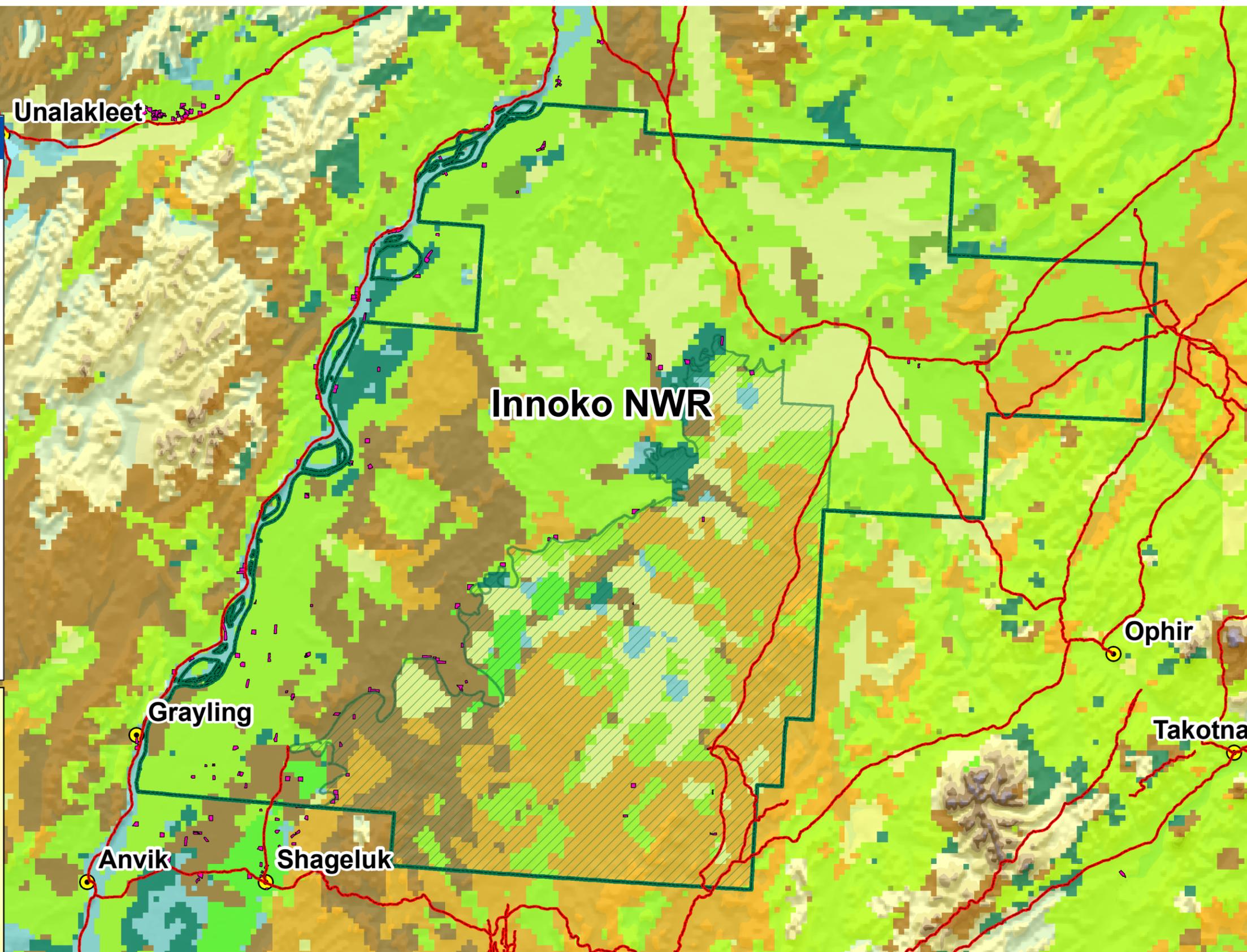
Innoko NWR Vegetation Types

Description

-  Low Shrub/Lichen Tundra
-  Open Spruce & Closed Mixed Forest Mosaic
-  Open Spruce Forest/Shrub/Bog Mosaic
-  Spruce & Broadleaf Forest
-  Spruce Woodland/Shrub
-  Tall Shrub
-  Wet Sedge Tundra
-  Innoko NWR Non-wilderness
-  Innoko NWR Wilderness
-  Allotment
-  Refuge Area Townsites
-  Trails



Produced by SW Area Refuges
 Fire Management
 McGrath, AK
 Current to: October 2009





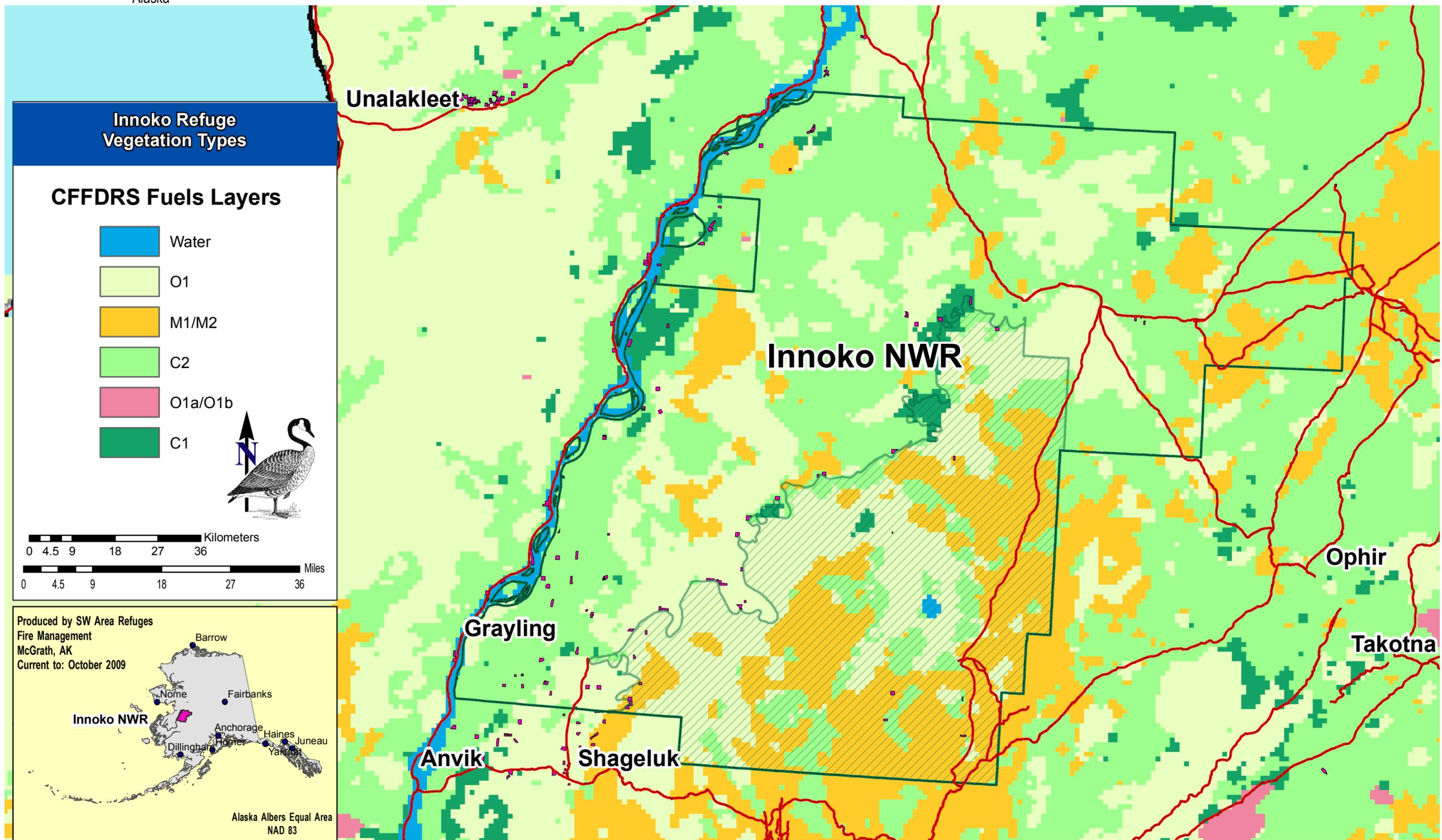
U.S. Fish & Wildlife Service

Innoko National Wildlife Refuge

Alaska

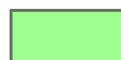
Fire Management Plan

Refuge Vegetation Cover for Fire Behavior Predictions



Innoko Refuge Vegetation Types

CFFDRS Fuels Layers

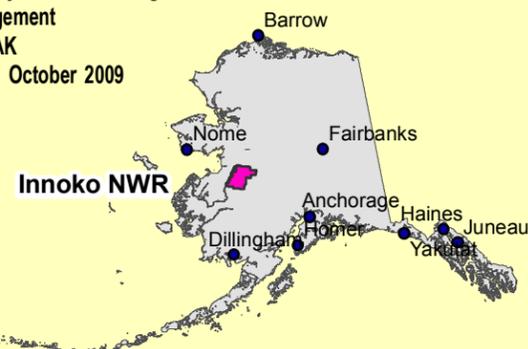
-  Water
-  O1
-  M1/M2
-  C2
-  O1a/O1b
-  C1



0 4.5 9 18 27 36 Kilometers

0 4.5 9 18 27 36 Miles

Produced by SW Area Refuges
Fire Management
McGrath, AK
Current to: October 2009



Alaska Albers Equal Area
NAD 83

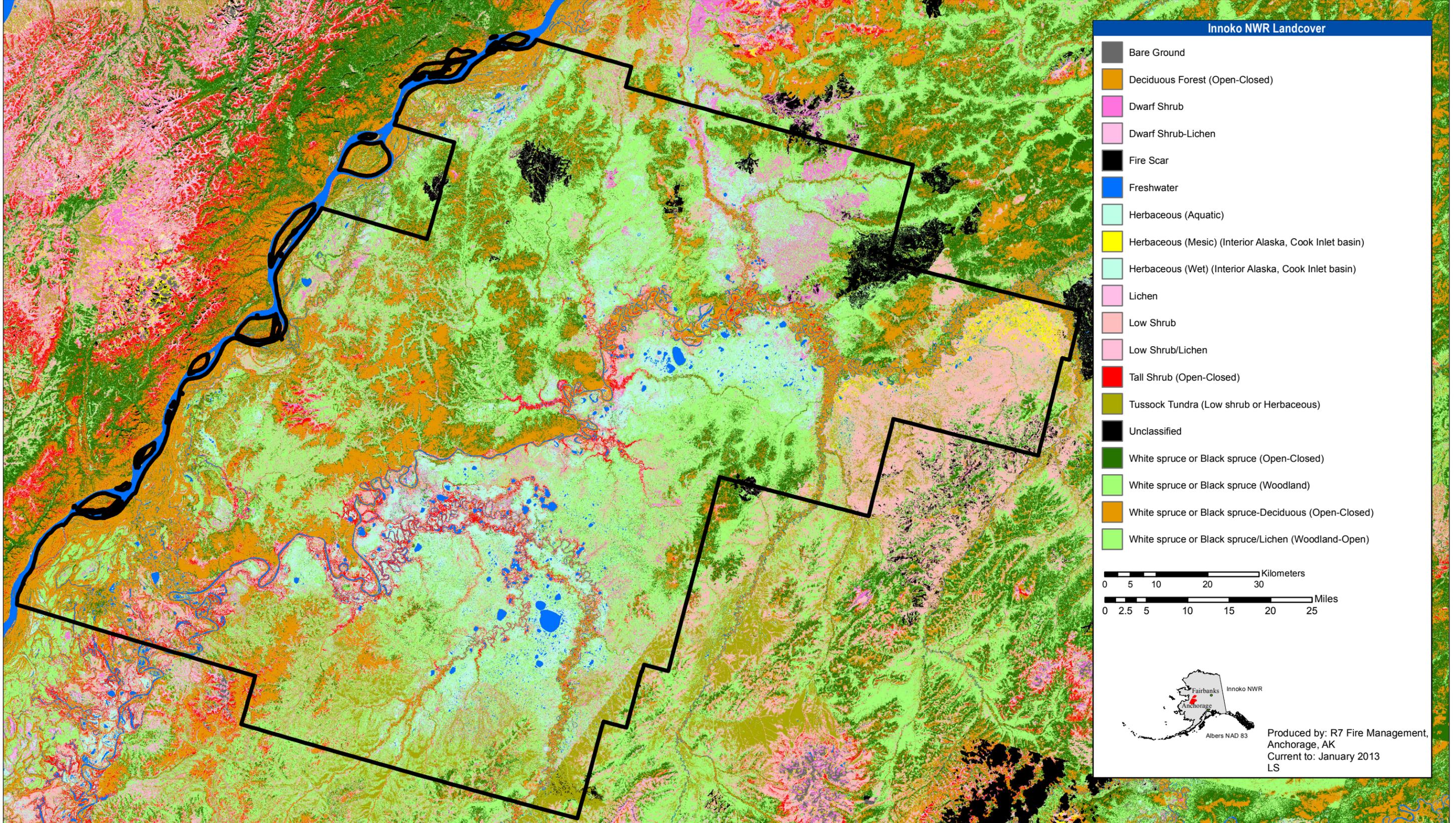


U.S. Fish & Wildlife Service

Innoko National Wildlife Refuge
Alaska

Fire Management Plan

Refuge Landcover



Innoko NWR Landcover

- Bare Ground
- Deciduous Forest (Open-Closed)
- Dwarf Shrub
- Dwarf Shrub-Lichen
- Fire Scar
- Freshwater
- Herbaceous (Aquatic)
- Herbaceous (Mesic) (Interior Alaska, Cook Inlet basin)
- Herbaceous (Wet) (Interior Alaska, Cook Inlet basin)
- Lichen
- Low Shrub
- Low Shrub/Lichen
- Tall Shrub (Open-Closed)
- Tussock Tundra (Low shrub or Herbaceous)
- Unclassified
- White spruce or Black spruce (Open-Closed)
- White spruce or Black spruce (Woodland)
- White spruce or Black spruce-Deciduous (Open-Closed)
- White spruce or Black spruce/Lichen (Woodland-Open)

0 5 10 20 30 Kilometers
0 2.5 5 10 15 20 25 Miles

 Fairbanks Innoko NWR
Anchorage
Albers NAD 83

Produced by: R7 Fire Management,
Anchorage, AK
Current to: January 2013
LS

Appendix B – Annual FMP Review Process

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.

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/line 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.

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
		Chapter 1. Introduction			
		1.1	Purpose of the FMP		
		1.2	General Description (of FMP area)		
		1.3	Significant values to Protect		
		Chapter 2. Policy, Land Management Planning, and Partnerships			
		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)		
		Chapter 3. Fire Management Unit Characteristics			
		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		
		Chapter 4. Wildland Fire Operational Guidance			
		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		
		Chapter 5. Monitoring and Evaluation			
		5.1	FMP Monitoring		
		5.2	Treatment Effects Monitoring		
		References			
		Appendices			

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
		Chapter 1. Introduction			
		1.1	Purpose of the FMP		
		1.2	General description of the FMP area (location/vicinity map, size, land ownership, etc.)		
			<ul style="list-style-type: none"> Has your vicinity map changed due to new acres added or from complexing for FMP? 		
			<ul style="list-style-type: none"> Total acreage changed? If it is the same management? 		
			<ul style="list-style-type: none"> Are there significant changes in land ownership in lands surrounding unit and/or in-holdings? New subdivisions? 		
			<ul style="list-style-type: none"> FWS units included in the FMP – have you recently complexed multiple units or added new units to a complex? 		
		1.3	<p>Are there any new Significant values to Protect? If so, add them in the spaces provided below.</p> <p>mission, special resource/ management designations (e.g., wilderness, cultural sites, T & E species, etc.</p> <ul style="list-style-type: none"> 		
		Chapter 2. Policy, Land Management Planning, and Partnerships			
		2.1	Fire Policy		
		2.1.1	Federal Interagency Policy change?		
			<ul style="list-style-type: none"> Terminology changes? 		
		2.1.3	DOI policy change? (e.g., Departmental manuals).		
		2.1.4	Service policy change?		
		2.1.5	Regional/unit-specific policy change?		
		2.2	Land/Resource Management Planning		
		2.2.1	Planning Documents:		
			<ul style="list-style-type: none"> 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? 		
			<ul style="list-style-type: none"> Is the Comprehensive Conservation Plan (CCP) currently being developed? Revised? 	CCP date:	
			<ul style="list-style-type: none"> Others: (list) 		
		2.2.2	Environmental Compliance – are your compliance documents up to date in the following areas?		
			<ul style="list-style-type: none"> National Environmental Policy Act (NEPA) 	What type?	
			<ul style="list-style-type: none"> Endangered Species Act (ESA) 	Date of consultation:	
			<ul style="list-style-type: none"> National Historic Preservation Act (NHPA) 		
			<ul style="list-style-type: none"> Archaeological Resources Protection Act (ARPA) 		
			<ul style="list-style-type: none"> Others: (list) 		
		2.3	Partnerships		
		2.3.1	Internal Partnerships changes? (Use spaces below to add new partnerships)		
			<ul style="list-style-type: none"> 		
			<ul style="list-style-type: none"> 		

No Update or N/A	Update Needed	Section	Title – Content	Notes/Comments	Date
		2.3.2	External Partnerships changes? • •		
Chapter 3. Fire Management Unit Characteristics					
		3.1	FMP-wide Management Considerations		
		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 <u>Standards and guidelines/desired conditions</u> from the CCP or other planning documents/handbooks changed? If so, describe the changes in the comment box.		
		3.1.3	<u>Common Characteristics</u> of the FMUs •		
		3.2	Fire Management Unit - Specific Descriptions		
		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. <u>Description of the FMU</u> (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	<u>Values to Protect</u> (use space below to add new) • • •		
		3.2.3	<u>Fire Management Guidance</u> 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) • • • •		

Appendix C – FMO Delegation of Authority

Appendix D – SW Area Refuges Preparedness Plan

Appendix E – Seasonal Readiness Activities

FMP Review & Updates
Fire Management Option Review
Known Sites Review
Acquire summer Field Camp locations
Preparedness Plan Review
FMO Delegation Review
Fireline Safety Refreshers
Medical Exams
Fitness Testing
Village Meetings (as needed)
Schedule outreach activities (science camp, etc.)
Pre-season Hazard identification & Analysis
Equipment Inventory/Preparation/ Inspection (as needed)
Monitor fire activity and indices (as needed)
NFPORS project ID – 4 years out (as needed)
Project Planning & NEPA (as needed)
RAWS maintenance & calibration
Snow free and indices start-up - WIMS
Training scheduling

Appendix F – Alaska Statewide Annual Operating Plan

This document can be found at: <http://fire.ak.blm.gov/>

The direct document link is:

<http://fire.ak.blm.gov/content/aicc/asma/Exhibit%20C%20AOP.pdf>

Appendix G – Alaska Statewide Master Agreement

This document can be found at: <http://fire.ak.blm.gov/>

The following links to the whole document including exhibits:

http://fire.ak.blm.gov/content/aicc/asma/Master_Agreement%20with%20exhibits.pdf

Appendix H – Alaska Interagency Wildland Fire Management Plan

This document can be found at: <http://fire.ak.blm.gov/>

The following links to the document:

<http://fire.ak.blm.gov/administration/awfcg.php?folder=Alaska%20Interagency%20Wildland%20Fire%20Management%20Plan&content=d:\content\admin\awfcg\C.%20Documents>

**Appendix I – Revised Complexity Analysis/
Organizational Needs Assessment**



NATIONAL WILDFIRE COORDINATING GROUP

National Interagency Fire Center
3833 S. Development Avenue
Boise, Idaho 83705

MEMORANDUM

Reference: NWCG#042-2010

To: NWCG Committee Chairs
Geographic Area Coordinating Group (GACG) Chairs
National IC/AC Council Chair

From: NWCG Chair *William Raage*

Date: December 6, 2010

Subject: Implementation of Revised Complexity Analysis/Organizational Needs
Assessment for 2011

Over recent years, a Wildland Fire Situation Analysis (WFSA) complexity analysis tool has been used by Agency Administrators as a means for analyzing incident complexity and providing guidance for the type of incident management organization needed. During recent fire seasons, it has become apparent that the existing Complexity Analysis is not serving fire managers in the best possible way. The current analysis is not fully responsive to changes in fire complexity prevalent in today's environment. Additionally, the WFSA has been replaced by the Wildland Fire Decision Support System (WFDSS), but there is no current capability in WFDSS for managers to analyze incident complexity and evaluate organizational needs.

The subject of revising this analysis process has been raised to the NWCG Executive Board and after some discussion, it was agreed to pursue a new process. A Task Team was convened and directed to review this issue and provide recommendations whether a new complexity analysis/organizational needs assessment tool is needed and, if so, how it should be designed.

The Task Team provided the following key recommendations to NWCG based on discussions with Incident Commanders, State and Federal Agency Administrators, and Fire Program Managers:

- There is a need for a new Complexity Analysis/Organization Needs Assessment Tool.

NWCG#042-2010
Implementation of Revised
Complexity Analysis/Organizational
Needs Assessment for 2011

- Given the changes in implementation of the Federal Fire Policy and an increase in large fires being managed by Type 3 IMTs, the Risk and Complexity tools should be applicable for Type 3 fires.
- The “YES/NO” checklist for Type 1/2/3 fires is inadequate. A more thorough assessment should be created in a format similar to the Wildland Fire Relative Risk Assessment. (Reference the Wildland Fire Use Implementation Procedures Reference Guide, May 2005).
- Relative Risk is estimated on all fires and can serve as the foundation for this assessment, but should also include External Influences (Socio-political), Land Ownership, Firefighting Resources Committed, Existing Skills on Host Unit, and Safety Management.
- Specific fire complexity is not the desired outcome. Guidance for the type of management organization to implement proposed actions is the outcome.

Following this Task Team report, a draft Organizational Needs Assessment was developed and field tested at a variety of units and locations in 2010. Feedback from this test was reviewed and incorporated as appropriate. The revised version has been reviewed by the NWCG Executive Board and accepted as a replacement for the existing Complexity Analysis for 2011. The Organizational Needs Assessment will provide managers information pertaining to type 1, 2, and 3 organizations while types 4 and 5 will continue to be addressed through the Incident Complexity Analysis for Type 4 and 5. Wildland fire management agencies will incorporate use of these processes commensurate with their needs.

The new Organizational Needs Assessment:

- will have information about its use and a link to an electronic website included in agency references for fire and aviation standards (“Red Book” and “Blue Book”),
- will be incorporated into WFDSS as soon as development permits, and
- will be available as a stand-alone power point and text document for use outside of WFDSS, as needed.

As implementation proceeds, agencies can consolidate feedback and lessons learned and provide this information back to NWCG. The process may evolve and continue to develop as this feedback occurs and as the NWCG Incident Management Team Succession Planning Project is finalized and implemented. Attached are the revised Organizational Needs Assessment with guidelines for use and a power point file version that can be completed electronically.

Attachment A: Organizational Needs Assessment – Process and Directions for Use
Attachment B: PowerPoint – Wildland Fire Relative Risk Assessment

cc: NWCG Executive Board

Appendix J – Alaska Interagency Mobilization Guide

This document can be found at: <http://fire.ak.blm.gov/>

The direct document link is:

<http://fire.ak.blm.gov/content/aicc/aimg/aimg.pdf>

Appendix K – 2009 Alaska Enhanced Smoke Management Plan

The most recent open burning document can be found at:

<http://www.dec.state.ak.us/air/anpms/SIP/SIPDocs/rhsip&intertransip&openburn11doc/OPEN%20BURN%20SIP%20ADOPTED%20FEB%2011,%202011.pdf>

Additionally, the 2009 document including 2010 amendments can be found at:

<https://dec.alaska.gov/air/anpms/rh/rhdoc/Appendix%20III.K.8.pdf>

Appendix L – Refuge Fire Equipment Inventory

A. Field Camp Inventory

1. Pumps

- a. Mark III Serial No. 4856364 S/N A-12475 (with Mark III kit, ROTAX tool kit, primer hose, spanner wrench, and 2 five gallon fuel cans)
- b. ACME Motori Serial No. 496807; pump R/N 726502
- c. Waterous Power Bee Mod. # 82029 Engine Serial No. 9272 w/ spanner wrench

2. Mark III Pump Kit

- a. 1 - 10 foot length 1 ½” synthetic hose
- b. 1 – fuel line
- c. 1 – 1 ½” NP x 1” NPSH reducer
- d. 1 – 1 ½” NH double male adapter
- e. 1 – 1 ½” NH double female adapter
- f. 2 – 1 ½” (red) Lexan nozzles
- g. 1 – pkg. ear plugs
- h. 1 – pr. goggles
- i. 2 – 1 ½” in-line tees w/ 1 ½” to 1” reducer and 2 foot of garden hose
- j. 1 – 1” twin tip (fog/stream) nozzle
- k. 1 – hand primer pump
- l. 2 – grease guns
- m. 1 – pull cord
- n. 1 – 6” Crescent wrench
- o. 1 – 13mm box/open end wrench
- p. 1 – ½” socket drive
- q. 1 – spark plug socket
- r. 1 – combination Phillips/flat screwdriver
- s. 1 – slip joint pliers
- t. 1 – spanner wrench
- u. 2 – red tags

3. Hose

- a. 21 rolls – 1”x100’ NPSH Yellow Hotline
- b. 16 rolls – 1 ½”x100’ NH Yellow Hotline
- c. 5 rolls – 1”x100’ NPSH WAJAX Synthetic/Rubber lined
- d. 7 rolls – 1”x100’ NPSH STAYFLO
- e. 1 roll – 1 ½”x50’ NH Yellow Hotline
- f. 1 roll – 1 ½”x100’ NH STAYFLO
- g. 3 roll – 1”x100’ Synthetic-Lined Fire Hose
- h. 1 – 2”x10’ suction hose with screen
- i. 1 – 1 ½”x10’ suction hose with screen
- j. 1 – 1 ½”x10’ suction hose without screen

4. Fittings

- a. 17 – 1 ½” NH x 1” NPSH reducer
- b. 3 – 2” NPSH x 1 ½” NH reducer
- c. 1 – 2”NP x 1 ½” NP galvanized pipe reducer
- d. 1 – 2” NPSH to 1 ½” to 1” to ¾” to 5/8” black plastic reducer

- e. 1 – 1 ½” NH female x 1 ½” NPSH male adapter
- f. 2 – 1”NPSH x 1” NH adapters
- g. 1 – 2”NPSH male with hose sleeve
- h. 2 – 1 ½” plastic hose sleeve
- i. 18 – 1” rubber gaskets
- j. 19 – 1 ½” rubber gaskets
- k. 18 – 2” rubber gaskets

5. Nozzles

- a. 15 – 1” (red) Lexan Nozzles
- b. 2 – 1” “Dragon Slayer” Heli Foam Guns
- c. 2 – 1 ½” “Dragon Slayer” Heli Foam Guns
- d. 2 – brass “red Lexan type” nozzles
- e. 1 – 1” twin tip (fog/stream) nozzle
- f. 1 – “Blizzard Wizard” Foam Mixer
- g. 3 – Forester Nozzles 1” NPSH

6. Valves

- a. 5 – 1 ½” Wyes
- b. 1 – 1 ½” ball valve with D-handle
- c. 2 – 1 ½”Foot Valves

7. Hand Tools

- a. 6 – shovels (4 sheaths)
- b. 3 – “mop type” swatters
- c. 7 – flexible head swatters
- d. 9 – Pulaski (4 sheaths)
- e. 2 – Combi Tools

8. Men’s Nomex Pants

- a. 3 – pr. 32x34
- b. 1 – pr. 34x30
- c. 5 – pr. 34x34
- d. 4 – pr. 36x34
- e. 2 – pr. 36x30

9. Women’s Nomex Pants

- a. 1 – pr. size 10

10. Nomex shirts

- a. 7 – Large
- b. 4 – Extra Large

11. Personal Protective Equipment

- a. 10 – fire shelters with cases
- b. 5 – pr. rubber rimmed goggles
- c. 1 – pr. safety glasses

12. Miscellaneous Equipment

- a. 3 – drip torches
- b. 20 – 1 ½” NH rain birds

- c. 7 – spanner wrenches
- d. 2 – 2” suction hose screens
- e. 1 – Personal Gear Pack
- f. 1 – Tent Bag
- g. 1 – Complete Field Pack
- h. 1 – Firefighter’s helmet
- i. 1 – Box of Food Rations
- j. 4 – Firefighter’s Headlamps
- k. 1 – Firefighter’s Sleeping Bag
- l. 3 – Backpack Pump

B. Office Fire Cache Inventory

TBA

Appendix M – FWS Medical Standards Plan

Appendix N – Contact List

The most current contact list for Innoko Refuge staff can be found at:

<http://region7.fws.gov/directory/nwr/innoko/directory.htm>

Local Government:

Anvik City Council	(907) 663-6322
Grayling IRA Council	(907) 453-5142
Holy Cross Tribal Office	(907) 476-7169
Kaltag Tribal Council Office	(907) 534-2224
Shageluk Village Council	(907) 473-8239
Sleetmute Traditional Council	(907) 449-4225

Native Organizations:

Doyon, Limited	(907) 459-2000
Gana-A' Yoo, Ltd.	(888) 656-1606
	(907) 451-9599
Tanana Chiefs Conference	(907) 452-8251

Appendix O – Region 7 Policy on MRA for Wilderness



IN REPLY REFER TO:
NWRS710-131

United States Department of the Interior

FISH AND WILDLIFE SERVICE

1011 E. Tudor Road
Anchorage, Alaska 99503-6199



AUG 20 2010

Memorandum

To: All Regional and Field Office Units

From: Regional Director, Region 7

Subject: Regional Policy on Minimum Requirement Analyses for Approving Administrative Activities in Refuge Wilderness Areas (RW-29)

During 2008, the Service completed development of a new national wilderness stewardship policy (610 FW 1-5) that replaced the former policy in the Refuge Manual. The national policy requires that we conduct a Minimum Requirements Analysis as part of the approval process for all administrative activities proposed to be conducted in refuge wilderness areas. The attached regional policy for approving administrative activities is to be followed in order to meet this requirement and assure consistent management of Alaska refuge wilderness areas. This guidance supersedes the previous policy memorandum issued by the Regional Chief, NWRS, dated October 4, 2006, and will remain in effect until such time as it may be revised or replaced by new regional or national policy.

This policy has been given the identifier RW-29 so that it can be included in the *Region 7 Policy Manual*.

Thank you for your cooperation in meeting our stewardship responsibilities and preserving our vital wilderness resource. Please contact Brian Anderson, Regional Wilderness Coordinator, at (907) 786-3379 if you have questions or need additional information.

Attachment

TAKE PRIDE
IN AMERICA 

**PREPARING MINIMUM REQUIREMENTS ANALYSES
FOR APPROVING ADMINISTRATIVE ACTIVITIES
IN WILDERNESS AREAS ON
NATIONAL WILDLIFE REFUGES IN ALASKA**

In Alaska, we hold in trust approximately 18.6 million acres of Congressionally designated wilderness, in 21 wilderness areas within 10 refuges. Region 7 wilderness areas comprise 90 percent of the total wilderness acreage under Service stewardship nationwide. In addition to managing these lands for specific refuge establishing purposes, and the mission of the National Wildlife Refuge System, wilderness areas are also administered for purposes of the Wilderness Act of 1964, primarily to preserve their wilderness character.

During 2008, the Service completed development of a new national wilderness stewardship policy (610 FW 1-5) that replaced the former policy in the Refuge Manual. Chapter 5 of the national policy describes the special provisions of the Alaska National Interest Lands Conservation Act (ANILCA) that affect our management of wilderness areas in Alaska. Regarding the need for a Minimum Requirements Analysis (MRA), the national policy states, in part: "We conduct MRAs in accordance with 610 FW 1.18 - 1.21 for all proposed refuge management activities in Alaska wilderness whether or not the actions involve a generally prohibited use" (610 FW 5.4). We must be consistent in our process for approving administrative activities in wilderness, including application of the minimum requirements exception.

Section 4(c) of the Wilderness Act provides for an administrative exception to the following prohibited uses: temporary roads, motor vehicles, motorboats, motorized equipment, landing of aircraft, other forms of mechanical transport, and structures and installations. This exception allows these uses by the managing agency (not the public) "only as necessary to meet the minimum requirements for administration of the area for the purpose of [the Wilderness Act], . . ." The purpose of the Act, it should be remembered, is to preserve the area's wilderness character, and should not be confused with the public purposes or uses listed in Section 4(b). Administrative activities that support one or more of the public purposes (recreational, scenic, scientific, educational, conservation, and historical use) may be considered, but only those activities which preserve the wilderness character of the area to the greatest extent will be approved. The minimum requirements exception cannot be used to approve permanent roads or to allow any prohibited use by the public in wilderness areas. Commercial enterprises are not allowed, although commercial visitor services may be performed "to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas" [Section 4(d)(6)].

A MRA is defined as a decision making process, documented in writing, that is used to determine if a proposed administrative activity conducted in wilderness is necessary to administer the area as wilderness and is necessary to accomplish the purposes of the

refuge, including Wilderness Act purposes, and if so, how to minimize resultant impacts. As part of the MRA process, we will identify the "minimum tool," which is the least intrusive tool, equipment, device, force, regulation, or practice determined to be necessary to achieve a refuge management activity objective in wilderness (610 FW 1.5).

MRAs are prepared in conjunction with the appropriate NEPA documentation (i.e., categorical exclusion, environmental assessment, finding of no significant impact, environmental impact statement, record of decision). Information gathered for the MRA is used to document the purpose and need for a proposed project and to develop and describe the proposed action and alternatives (610 FW 1.21). It is crucially important that the minimum requirements concept be applied at the earliest stages of project planning.

Administrative activities requiring a MRA are actions conducted or authorized by the Service that might potentially affect wilderness resources, or visitor experience. Examples of administrative activities requiring a MRA including the following:

- climate and seismic monitoring installations
- resource inventory and monitoring
- scientific research
- invasive species control
- habitat manipulation
- fish and wildlife population control
- law enforcement patrols, and public use monitoring
- construction and maintenance of trails, signs, shelters, and cabins
- discretionary fire management activities

A MRA is not required for emergencies involving the health and safety of persons within the area, or for the control of wildfire according to an approved fire management plan. However, the minimum requirements concept should be incorporated into emergency management plans.

Because of their authority to manage fish and wildlife within the state, activities conducted in refuge wilderness by the Alaska Department of Fish and Game are administrative activities that are subject to the same minimum requirements policies and standards that apply to the Service.

When conducting a MRA, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience. If a compromise of wilderness resources or character is unavoidable, only those actions that employ the minimum tool, as defined above, will be acceptable.

Section 1110 (a) of ANILCA provides additional exceptions to uses otherwise prohibited by the Wilderness Act, specifically the public use of snowmachines, motorboats, airplanes, and nonmotorized surface transportation methods for traditional activities. While the administrative use of these methods of access should not be a foregone

conclusion, their use requires a different level of analysis than would be necessary for helicopters or off-highway vehicles. In any case, we must exercise restraint in their use to help preserve wilderness character and to serve as a positive example for the public.

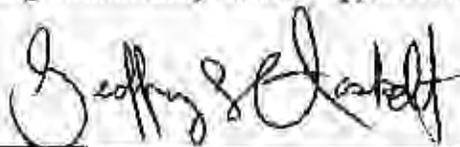
Prior to initiating a MRA, the appropriate staff must complete the training available on-line through the Arthur Carhart National Wilderness Training Center (<http://carhart.wilderness.net/>). MRAs are prepared by refuge staff with necessary input (i.e., project description and alternatives) from involved partners. Refuge partners may be allowed to draft a MRA for the refuge only with the understanding that the Service is ultimately responsible for the analysis and findings. To help ensure consistent application of the minimum requirements exception, you are encouraged to consult with the regional wilderness coordinator during preparation of a MRA.

The method for documenting a MRA will be the interagency *Minimum Requirement Decision Guide* (MRDG) developed by the Arthur Carhart National Wilderness Training Center, and available through the regional wilderness coordinator, or online at www.wilderness.net. The MRDG is a tool designed to guide the user through a two-step process to help decide if a proposed activity is necessary in a wilderness area, and if so, determine the minimum tool to accomplish the activity. An Alaska supplement to the MRDG has been posted on the above website as a source for identifying the Wilderness Act exceptions contained in ANILCA.

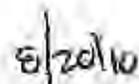
A completed MRA will consist of the signed MRDG worksheets, accompanied by a memorandum (see attached outline) to the files which summarizes the proposed project, makes a determination of whether the action is necessary in wilderness, and if so, identifies the minimum tool authorized to complete the project.

A MRA is signed by the refuge manager if he/she has completed a national wilderness stewardship training course (National Conservation Training Center course No. CAR3101), or by the next higher line authority who has received the appropriate training. Refuge managers who have not received the training will forward draft MRAs to the regional wilderness coordinator for review, comment, and concurrence prior to submitting for approval. A copy of all signed MRAs are to be provided to the regional wilderness coordinator for tracking and filing. See 618 FW 1.6 for more information on roles and responsibilities.

As a means to alleviate the administrative burden of this MRA requirement, routine and recurring administrative activities (e.g., law enforcement patrols) should be addressed programmatically. For example, a MRA that is included in a planning document would be valid for the life of the plan. Those activities which cannot be approved programmatically must be approved individually once every two years.



Regional Director



Date



IS REPLACED BY

United States Department of the Interior

FISH AND WILDLIFE SERVICE

1011 E. Tudor Road
Anchorage, Alaska 99503-6199

RW-29



SAMPLE MEMORANDUM FOR MINIMUM REQUIREMENTS ANALYSIS

Date:

To: [file name]

From: Refuge Manager, [refuge name] National Wildlife Refuge

Subject: Minimum Requirements Analysis (MRA) for the [project name] in the [area name] Wilderness Area

I have completed the MRA for the [project name]. **[Briefly describe the problems or opportunities to be addressed, the proposed action and goals, and identify project partners]**

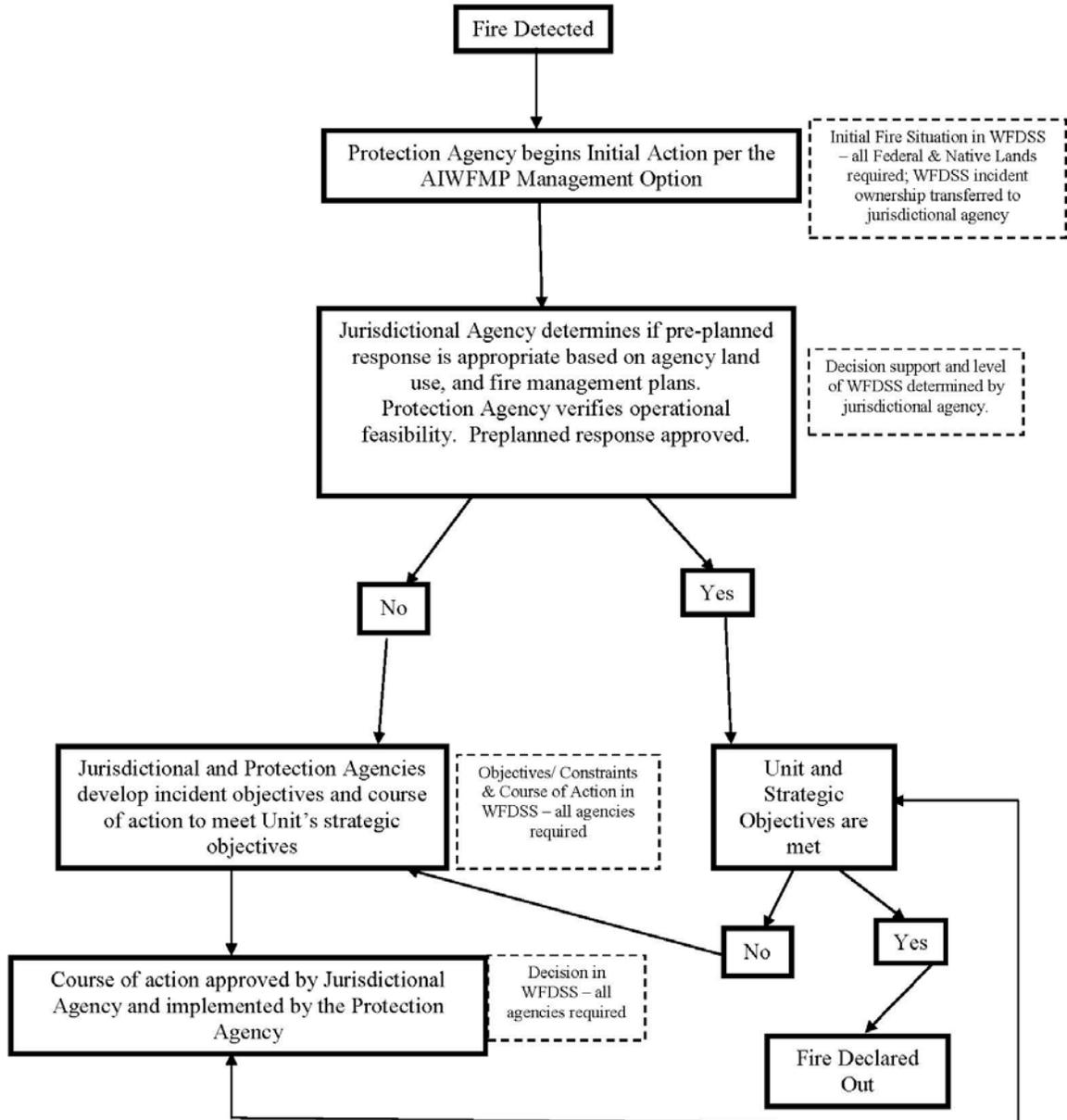
For the reasons stated in the attached *Minimum Requirements Decision Guide*, I have determined that this action is necessary to administer the [area name] Wilderness area as wilderness and to accomplish the purposes of the refuge, including Wilderness Act purposes. I find that the use of the following otherwise prohibited uses constitute the minimum requirements (i.e., the "minimum tool") for administration of the area in accordance with Section 4 (c) of the Wilderness Act: **[list all approved Section 4 (c) prohibited uses and appropriate restrictions]**

Attachment



Appendix P – AIWFMP Operational Decision Chart

Operational Decision Chart for All Management Options



Appendix Q – Known Sites (Values at Risk) List

Innoko NWR Known Sites List

Site/Structure name	Lat	Long	Site number	Fire Protection	Wilderness
Rennie's Landing (AHRs: OPH-00052)	63 36.65	-157 04.7	FWS_R7_INN_01	Full	No
Holikachuk (some private)	62 54.59	-159 31.20	FWS_R7_INN_02	Full	No
Field Camp (occupied in summer)	63 38.33	-158 01.84	FWS_R7_INN_03	Critical	No
Walker Cabin	63 36.20	-158 06.74	FWS_R7_INN_04	Non-sensitive	No
Clarks (permit 75605-87-3)	62 56.65	-157 58.14	FWS_R7_INN_05	Non-sensitive	Yes
Peters (permit 75605-51122)	63 05.55	-157 59.03	FWS_R7_INN_06	Non-sensitive	Yes
Flemings	62 44.7	-158 0.04	FWS_R7_INN_07	Non-sensitive	Yes
Dikeman	62 57.04	-157 59.23	FWS_R7_INN_11	Non-sensitive	Yes
Dishkaket	63 37.97	-157 28.74	FWS_R7_INN_12	Non-sensitive	No
Simels	63 35.2	-157 13.53	FWS_R7_INN_13	Non-sensitive	No
Innoko RAWS	63 23.38	-158 49.81	FWS_R7_INN_14	Full	No
Shermeier's Halfway Roadhouse	62 45.0	-157 49.49	FWS_R7_INN_15	Non-sensitive	Yes
Deacons (allotment)	63 04.12	-159 00.29	FWS_R7_INN_08	Full – BIA mgmt.*	No
Ivey (allotment)	63 11.21	-158 18.03	FWS_R7_INN_09	Full – BIA mgmt.*	Yes
Sucker Creek (allotment)	62 59.42	-159 31.06	FWS_R7_INN_10	Full – BIA mgmt.*	No

**These sites are on native allotments located within Refuge boundaries. BIA is the management contact for fire protection status of these. The default value for all native allotments is full protection for Refuge purposes.*

Appendix R – FWS Region 7 Cabin Policy



PHOTO REFERENCE TO:
NWR5710-130

United States Department of the Interior

FISH AND WILDLIFE SERVICE

1011 E. Tudor Road
Anchorage, Alaska 99503-6199



AUG 20 2010

Memorandum

To: All Regional and Field Office Units

From: Regional Director, Region 7

Subject: Regional Policy for Management of Permitted Cabins on National Wildlife Refuges in Alaska (RW-1)

We have revised the regional cabin management policy, which has not been updated since 1989. The previous cabin policy became the basis for the current cabin regulations (50 CFR 36.33) published in 1994. However, not all pertinent topics were included in the regulations, and additional policy guidance is needed for managing special use permits for the private use of cabins on refuge lands in Alaska. While the attached policy is intended to be comprehensive, it frequently references the regulations, and refuge managers will need to become familiar with both sets of guidance.

Please insert the attached RW-1 policy revision into your copy of the *Region 7 Policy Manual*, and contact Brian Anderson, Refuge Permits Coordinator, at (907) 786-3379 if you have questions or need additional information.

Attachment

TAKE PRIDE
IN AMERICA 

**REGION 7 POLICY FOR MANAGEMENT OF PERMITTED CABINS
ON NATIONAL WILDLIFE REFUGES IN ALASKA**

1. INTRODUCTION

- a. Scope
- b. Definitions
- c. Background

2. ASSOCIATED POLICY AND REQUIREMENTS

- a. Appropriate Refuge Use Policy
- b. Compatibility Policy
- c. Subsistence Evaluation Requirement

3. CABIN CATEGORIES

- a. Recreational Cabin
- b. Subsistence Cabin
- c. Trapping Cabin used by a Non-Rural Resident
- d. Commercial Cabin
- e. Other cabin types

4. FEES

- a. Administrative Fee
- b. Reserved Site Use Fee

5. CABIN PERMIT ADMINISTRATION

- a. Cabin Permit Decisions and Appeals
- b. Permit Duration and Renewal
- c. Cabin Ownership
- d. Sale of Personal Property/Interest
- e. Abandoned and Trespass Cabins

6. SPECIAL PROVISIONS

- a. Construction Specifications
- b. Other Related Structures
- c. Incidental Uses
- d. Department of the Interior Employees
- e. Fire Protection
- f. Land Acquisition

1. INTRODUCTION

a. Scope

This policy provides additional guidance for management of cabins permitted on National Wildlife Refuges in Alaska, consistent with regulations at 50 CFR 36.33 implementing the Alaska National Interest Lands Conservation Act (ANILCA) sections 304 and 1303. This policy also provides clarification for guidance regarding fees associated with cabin permits found in regional policies RW-7 (1990) and RW-7(a) (1993). This policy does not affect the management of public use or administrative cabins on refuge lands.

b. Definitions

- *cabin* shall mean a small, usually single story, three or more-sided structure that is permanently and completely enclosed with a roof and walls. The roof and walls are not fabric, cannot be easily disassembled, and are not removed seasonally [50 CFR 36.33 (a)].

- *commercial cabin* shall mean any cabin which is used in association with a commercial operation including but not limited to commercial fishing activities and recreational guiding services [50 CFR 36.33 (a)].

- *existing cabin* shall mean any cabin situated on Federal lands before December 2, 1980. A cabin legally situated on lands that subsequently become refuge will also be considered an "existing" cabin providing the applicant meets the appropriate application deadlines [50 CFR 36.33 (a)].

- *family* shall include the spouse (including what is known as a common-law relationship), children by birth or adoption, and other blood relatives within the second degree of kindred [50 CFR 36.33 (a)].

- *immediate family* shall include the spouse and children, either by birth or adoption, of the claimant residing in the cabin or structure [50 CFR 36.33 (a)].

- *new cabin* shall mean any permitted cabin constructed on refuge lands after December 2, 1980. This may also include a cabin whose claimant failed to meet the application deadline for existing cabins but is otherwise a permitted cabin [50 CFR 36.33 (a)].

- *other related structures* shall mean those structures or devices essential to the activities for which the cabin special use permit is issued. This includes but is not limited to outdoor toilets, food caches, storage sheds, and fish drying racks [50 CFR 36.33 (a)].

- *private recreational use* shall mean a use associated with leisure activities, not including bona fide subsistence uses or authorized commercial uses [50 CFR 36.33 (a)].

- *resident* means any person who has his or her primary, permanent home for the previous 12 months within Alaska and whenever absent from the primary, permanent home, had the intention of returning to it [continued] (50 CFR 100.4).

- *rural* means any community or area of Alaska determined by the [Federal Subsistence] Board to qualify as such under the process described in 50 CFR 100.15 (50 CFR 100.4).

- *subsistence uses* means the customary and traditional uses of wild, renewable resources for direct personal or family consumptions as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; and for customary trade (50 CFR 100.4).

c. Background

Cabins have long been associated with the traditional and customary use of land by Alaska's rural residents, and have also been used to support the commercial guiding and shore fishing industries. Recognizing this, Congress included in ANILCA provisions that address the use of cabins for specific purposes on national wildlife refuges in Alaska. Section 304(d) requires that the Service permit the use of refuge lands, including cabins, for the exercise of valid commercial fishing rights. Section 1303 (b) allows refuges to permit the use of cabins for traditional and customary uses, where these activities have been found to be compatible with the purposes for which the refuge was established.

No cabin may be constructed or occupied for private use on refuge lands except pursuant to a valid special use permit [50 CFR 36.33 (b)(1)]. Existing cabins which are compatible with refuge purposes may be allowed to continue for traditional and customary uses [50 CFR 36.33 (c)]. When found to be compatible, and where the applicant lacks a reasonable off refuge site, a permit for a new cabin may be issued in accordance with this policy, but will generally be given only to local residents to pursue a legitimate subsistence activity [50 CFR 36.33 (d)(1)].

2. ASSOCIATED POLICY AND REQUIREMENTS

a. Appropriate Refuge Use Policy

To the extent that several provisions of ANILCA allow for the continuation of cabins used for traditional and customary purposes on refuges in Alaska, the Service policy for determining appropriate refuge uses (603 FW 1) is not applied when evaluating special use permit applications for cabins.

b. Compatibility Policy

Except as otherwise provided in law, a permit for the construction, use and/or occupancy of a cabin will only be issued when the proposed cabin and other related structures have been individually determined to be compatible with refuge purposes, including Wilderness Act purposes for designated wilderness lands. Compatibility determinations will consider the individual and any cumulative impacts of proposed new cabins. A refuge-wide compatibility determination may not be used as part of the approval process for cabin permit applications or renewals.

In accordance with the Service compatibility policy (603 FW 2), compatibility determinations will be reevaluated when warranted by changing conditions or new information, but no longer than every ten years to coincide with a scheduled cabin permit renewal.

c. Subsistence Evaluation Requirement

In deciding whether to issue a permit for the use and occupancy of a cabin, refuge managers must consider the effects of the proposed cabin on subsistence uses and needs in accordance with section 811 of ANILCA.

3. CABIN CATEGORIES

a. Recreational Cabin

The private recreational use of a cabin on refuge lands may not be permitted [50 CFR 36.33 (b)(4)]. See the policy regarding *Incidental Uses* under Special Provisions.

b. Subsistence Cabin

Permits for a cabin for subsistence uses may be issued only to qualified Alaska rural residents. At the time of cabin permit renewal, the refuge manager must verify that that permit holder remains qualified. Subsistence uses of a cabin shall be consistent with the regulations governing such uses of national wildlife refuges in Alaska at 50 CFR 36 Subpart B.

c. Trapping Cabin Used by a Non-Rural Resident

Where trapping has been an ongoing activity on the refuge supported by the use of cabins, new trapping cabin permits may be issued to non-rural residents, after an individual determination of compatibility.

d. Commercial Cabin

Except as otherwise allowed by law, new cabins used for commercial purposes may be permitted only when determined to be compatible with refuge purposes, and when the new cabin is necessary to provide for the continuation of an ongoing activity or use.

otherwise permitted on the refuge. No new commercial cabins will be permitted in designated wilderness areas [50 CFR 36.33 (e)(3)].

Section 304 (d) of ANILCA authorizes the use of refuge lands for the exercise of valid commercial fishing rights, including the use of cabins and other related structures [50 CFR 36.32 (b)]. Although this provision constitutes an exception to the compatibility requirement, the use is subject to "reasonable regulation." In addition, a refuge is not required to permit such uses that would represent a significant expansion of commercial fishing activities beyond the level occurring in 1979, and which are inconsistent with refuge purposes. Specifically, a determination of compatibility would be required to authorize the use of a cabin associated with commercial fishing activities determined to be beyond the level occurring in 1979.

Additional commercial use of an existing commercial cabin may be authorized. For example, an existing cabin permitted for commercial fishing may also be permitted for guiding. However, the use of new commercial cabins will be limited to the use authorized in the original permit [50 CFR 36.33 (e)(1)].

e. Other Cabin Types

Examples of other types of cabins subject to a special use permit include existing cabin home sites, and cabins used by the Alaska Department of Fish and Game for conducting fish and wildlife management activities

4. FEES

a. Administrative Fee

A non-refundable \$100 administrative fee is charged for commercial cabin permits, and permits for trapping cabins used by non-rural residents. The administrative fee is not charged for subsistence use or for other types of cabin permits. When applicable, the administrative fee is charged when a cabin permit is first issued, and each time the permit is renewed.

b. Reserved Land Site Fee

The National Wildlife Refuge System Administrative Act (16 U.S.C. 668dd - 668ee) requires that holders of permits for reserved land sites, such as cabins, pay the fair market value of the use. However, because of the unique conditions in Alaska, and based on past practices, this requirement has been waived for certain cabin uses as described below.

A reserved land site (rental) fee is required for all commercial cabins. Permits issued to non-rural residents (i.e., not subsistence qualified) for the use of trapping cabins are also subject to reserved land site fees, with the following exception: Permits for non-subsistence trapping cabins that were originally issued prior to the date of this policy will not be subject to a reserved land site fee as long as the original permittee continues to

renew the permit. Permits for cabins used solely for subsistence uses are not subject to reserved land site fees.

The reserved land site fee will be in the amount specified on the current approved U.S. Fish and Wildlife Service Annual Fee Schedule (Division of Realty) and is charged when a commercial cabin is originally permitted, and each year thereafter. This annual rental fee is in addition to the administrative fee, and any applicable client use day fees. Reserved land site fees are required as long as the cabin permit remains in force, regardless of whether the permittee actually occupies the cabin during a given fee period.

5. CABIN PERMIT ADMINISTRATION

a. Cabin Permit Decisions and Appeals

The *Cabin Permit Application Decision Guide* (Exhibit 1) provides a step-by-step guide to assist refuge managers in evaluating applications for the construction and/or use of cabins on refuge lands.

Cabin permit decisions are subject to appeal in accordance with regulations at 50 CFR 36.41 (i). Refuge managers must follow the specific procedures found in these regulations when making any adverse permit decision.

b. Permit Duration and Renewal

Cabin permits are issued for a period of five (5) years, are not transferable, and are renewable at the request of the permittee as long as the permittee continues to comply with permit terms and conditions, demonstrates a qualifying need for the cabin, and uses the cabin for the specific authorized purpose. For non-commercial cabins, upon the death of the original permittee, a qualifying immediate family member is entitled to renew the permit for use of the cabin. To qualify, an immediate family member must have been listed on the original permit as having resided in the cabin. The permit will be renewed or reissued until the death of the last qualifying immediate family member of the original permittee, unless the permit has been revoked or the cabin abandoned [50 CFR 36.33 (c)(2)(viii) and (d)(3)].

A commercial cabin permit may not be renewed by an immediate family member upon the death of the original permittee [50 CFR 36.33 (c)(2)(viii)].

c. Cabin Ownership

Existing cabins permitted under the regulations at 50 CFR 36.33 (c) are the personal property of the permittee, and can be removed by the permittee or the permittee's heirs upon non-renewal or revocation of the permit [50 CFR 36.33 (c)(1)]. In the event that an existing cabin is rebuilt or replaced (and the original specifications are maintained), ownership remains with the permittee. However, major additions to an existing cabin may only be permitted under the regulations for a new cabin at 50 CFR 36.33 (d).

whereby the entire cabin would become the property of the United States. A major addition is defined as any expansion of the original cabin living area.

The ownership of a permitted cabin includes any other related structures that may be authorized by the permit. The authorized construction of other related structures would not be considered a major addition for the purpose of determining ownership.

New cabins permitted under regulations at 50 CFR 36.33 (d) are the property of the United States.

d. Sale of Personal Property/Interest

Cabin permits are not transferable. For existing cabins, the owner may sell his/her interest in the cabin to another person; however, the buyer does not automatically qualify for a permit and must apply for a new one [50 CFR 36.33 (c)(1)]. Prior to a sale, prospective buyers are encouraged to discuss with the refuge manager the likelihood of receiving a cabin permit.

New cabins are the property of the United States, and interest therein may not be sold [50 CFR 36.33 (d)(2)(v)].

Regardless of whether a commercial cabin is the personal property of a permittee, or owned by the government, the privilege of using the cabin cannot be sold to a new party who has acquired the associated commercial fishing or guiding rights. The new party must apply for a new permit [50 CFR 36.33 (e)(2)]. The cabin permit is separate from the permit authorizing the commercial activity [50 CFR 36.33 (e)(5)].

e. Abandoned or Trespass Cabins

A cabin on the refuge may be considered abandoned or in trespass if the cabin remains unclaimed in accordance with regulations at 50 CFR 36.33 (b)(2) or 50 CFR 36.33 (c)(3), or if a permittee fails to renew a cabin permit within a reasonable amount of time. Refuge managers must exercise due diligence in attempting to notify permittees of an impending permit expiration, and the requirements for renewal. Cabins determined to be abandoned or in trespass may be disposed of in accordance with regulations at 50 CFR 36.33 (b)(2).

6. SPECIAL PROVISIONS

a. Construction Specifications

All new, or rebuilt cabins will be constructed of materials that blend with, or are compatible with, the immediate surrounding landscape. The refuge manager must approve the types of materials used.

The size of new cabins and other related structures will be limited to that which is necessary to conduct the activity. For commercial fishing cabins, the size of the cabins and the type and size of other related structures will be determined by what is considered to be minimally necessary to carry out the activity in compliance with section 304 (d)(2) of ANILCA.

Cabin locations will be determined by the refuge manager and the permittee. Considerations will be given to resource values, visibility, pollution controls, access, and impacts on refuge resources. If possible, new cabins will not be located directly on the banks of rivers, and will be set back from the shoreline of a water body by a minimum of 100 feet, leaving at least a 50-foot buffer of standing vegetation. The refuge manager must verify the location of all cabins on the refuge, and maintain an accurate map and location coordinates for each cabin.

b. Other Related Structures

Cabin permits may authorize the construction of specific other related structures, following a determination that such structures are compatible and are essential to the activities for which the cabin permit was issued.

c. Incidental Uses

An incidental use of a cabin is defined as an activity conducted incidental to the use authorized by the special use permit, and which is otherwise allowed on the refuge without a permit. Incidental uses may include subsistence uses or recreational activities. No incidental commercial use of any cabin is allowed. Incidental uses may only occur during the period of cabin occupancy authorized by the permit. Special use permits for cabins will not specifically authorize any incidental uses. Refuge managers must monitor the use of cabins under permit to verify that the cabin is being used primarily for the authorized purposes.

d. Department of the Interior Employees

Regulations at 5 CFR 3501.103(c) prohibit employees of the Department of the Interior from acquiring or retaining any rights in federal lands granted by the Department, which includes a refuge special use permit for the use and occupancy of a cabin. However, refuge managers may process an application for a cabin permit from an employee of the Department who has obtained an appropriate waiver in accordance with the regulations at 5 CFR 3501.103(e).

e. Fire Protection

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 constructed after the date of this policy may be issued without authorizing Fire Wise standards because of other resource considerations. 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.

f. Land Acquisition

During negotiations associated with the potential acquisition of private lands on which a cabin is located, the seller may not be offered the possibility of receiving a special use permit to use the cabin after the sale has been completed. A cabin obtained through a land acquisition from a private seller may be disposed of in accordance with regulations at 50 CFR 36.33 (b)(2), except that the cabin may not be permitted to the seller or members of the seller's family, for private use. For a period of five years following a sale closing, permits will also not be issued to a seller, or members of the seller's family, to construct a cabin on the acquired lands. This provision does not affect the opportunity to acquire land with a cabin subject to a life estate.


Regional Director

8/20/10
Date

Appendix S – Radio Frequencies Innoko NWR Field Operations

Printout: king dph template.dph (Continued)

Group 5 Channel Settings:

	Label	RX Freq(M)	CG	NAC	TX Freq(M)	CG	NAC	Sq.	TrkGrp	Scn	BW	LP	Sec Key	Lock	OTAR
Ch 1	LOCAL DG	167.15000(D)	100.0	\$3E8	167.15000(D)	100.0	\$3E8	Select 1	1	-	N	-	Clr 1	-	-
Ch 2	LOCAL AN	167.15000(A)	100.0	\$3E8	167.15000(A)	100.0	\$3E8	Select 1	1	-	N	-	Clr 1	-	-
Ch 3	BEAVER DG	172.61250(D)	103.5	\$40B	166.31250(D)	103.5	\$40B	Select 1	1	S	N	-	Clr 1	-	-
Ch 4	BEAVER AN	172.61250(A)	103.5	\$40B	166.31250(A)	103.5	\$40B	Select 1	1	-	N	-	Clr 1	-	-
Ch 5	EAST DG	172.45000(D)	110.9	\$455	163.57500(D)	110.9	\$455	Select 1	1	-	N	-	Clr 1	-	-
Ch 6	EAST AN	172.45000(A)	110.9	\$455	163.57500(A)	110.9	\$455	Select 1	1	-	N	-	Clr 1	-	-
Ch 7	WEST DG	169.67500(D)	131.8	\$526	164.55000(D)	131.8	\$526	Select 1	1	-	N	-	Clr 1	-	-
Ch 8	WEST AN	169.67500(A)	131.8	\$526	164.55000(A)	131.8	\$526	Select 1	1	-	N	-	Clr 1	-	-
Ch 9	BLM SILVER	168.01250(A)	000.0	\$293	168.01250(A)	000.0	\$293	Select 1	1	-	N	-	Clr 1	-	-
Ch 10	SPARE	Inactive(M)	000.0	\$293	Inactive(M)	000.0	\$293	Select 1	1	-	N	-	Clr 1	-	-
Ch 11	SPARE	Inactive(M)	000.0	\$293	Inactive(M)	000.0	\$293	Select 1	1	-	N	-	Clr 1	-	-
Ch 12	A/G TAC	166.63750(A)	000.0	\$293	166.63750(A)	000.0	\$293	Select 1	1	-	N	-	Clr 1	-	-
Ch 13	TAC1	159.37500(A)	000.0	\$293	159.37500(A)	000.0	\$293	Select 1	1	-	N	-	Clr 1	-	-
Ch 14	TAC2	166.77500(A)	000.0	\$293	166.77500(A)	000.0	\$293	Select 1	1	-	N	-	Clr 1	-	-
Ch 15	NIMMS	168.55000(A)	000.0	\$293	168.55000(A)	000.0	\$293	Select 1	1	-	N	-	Clr 1	-	-
Ch 16	GUARD	168.62500(A)	000.0	\$293	168.62500(A)	110.9	\$293	Select 1	1	-	N	-	Clr 1	-	-

Group 5 Settings:

Group Password 159357
 Group Label MCGRATH MCG
 ANI ID 000000
 Display Mode Alpha/Numeric
 Back Light Mode Keypress & Display Change
 Back Light Duration 3 Seconds
 Priority 1 Priority 1 use MAIN channel
 Priority 2 Priority 2 OFF
 TX on Priority 1 No
 User Channel Guard Disabled
 User Channel Guard Channel OFF
 User Channel Guard ENCODE Only No
 Scan Hold Time 1.5 Seconds
 TX Timeout Timer 180 Seconds
 Battery Saver Allow Battery Saver
 Busy Channel Mode Indicate
 ANI/DTMF Mode DTMF Only
 Priority 1 Channel Selection User Select
 Scan List Selection User Select
 Incoming Clone Reject
 Group Scan List No
 OTAR Channel during Scan Channel 1

Appendix T – Innoko NWR Planned Fuels Treatments

I. Introduction

As stated in section 4.3 of the FMP: Refuge planning of fuels treatments is developed through the strategic placement of projects, based on risk from wildfire, or desired vegetation change for habitat treatments. The overarching goal of fuels management is to allow fire to play its natural role in the ecosystem. Maintaining the largely natural and intact fire regime on the Refuge into the future may be dependent upon the strategic placement of, and effectiveness of hazardous fuels treatments.

Fuels treatment projects on Innoko Refuge are guided by the following:

- Evaluating Refuge mission with the need for fuel treatments and treatment location.
- Identifying known sites and maintaining the known sites database.
- Evaluation of treatment priorities by ranking high risk sites.
- Development of treatment plans for priority sites hazardous fuels treatments.
- CWPP's developed by communities adjacent to the Refuge that identify areas of risk from fires moving off the Refuge and onto private lands.
- Habitat treatments utilizing the fuels treatment suite of vegetation manipulation techniques are proposed for those areas deemed beneficial for various species of wildlife. Any habitat treatments for the Refuge will require new site specific or area analysis and will need to relate directly to the goals and objectives identified in the Revised CCP.

Hazardous fuels treatments are based upon the risk to values from wildfire. Hazardous fuels projects will focus on the highest risk areas. The Refuge Manager meets annually with the FWS Area FMO to prioritize/update fuels projects (based on guidelines listed in FMP section 4.3). This appendix contains considerations that were used as well as a multiple year table of planned treatments.

II. Considerations Used for Hazardous Fuels Treatment Planning

A. Wildland Urban Interface Risk Assessment

All communities (defined as communities by the State of Alaska) were assessed for risk from wildland fire in a collaborative effort among federal, state, local and Native entities in 2001. The following criteria were used in the community assessments: ground fire encroachment threat; crown fire encroachment threat; fire behavior potential; values at risk; and infrastructure. These ratings were combined to determine an overall wildland fire risk rating of low, moderate, or high for each community. *As more detailed assessments are accomplished the overall wildland fire risk may change.*

Six communities in or near the Innoko National Wildlife Refuge have been identified as being potentially impacted by wildland fire occurrence on the Refuge. These communities and risk ratings are as follows:

Community	Population	Ground Fire Encroachment Threat	Crown Fire Encroachment Threat	Fire Behavior Potential	Values at Risk	Infra-structure	Overall Wildfire Risk
Anvik	91	Yes	No	Moderate	Moderate	High	Low
Grayling	187	Yes	No	Moderate	Moderate	High	Low
Holy Cross	259	Yes	No	Moderate	Moderate	High	Low
Iditarod*	0	Yes	No	Moderate	Low	High	Low
Kaltag	251	Yes	No	Moderate	Moderate	High	Low
Shageluk	128	Yes	Yes	Moderate	Moderate	High	Moderate

*Note that the community of Iditarod does not have any residents. Iditarod is however a significant historical mining town.

The size of the treatment unit around a community depends on the findings of the risk assessment and the mitigation required to significantly diminish this risk. Development of a Community Wildland Fire Protection Plan can help the community to clarify and refine priorities for mitigation efforts as well as improve their chances for federal funding to assist with implementation (see FMP section 4.3).

B. Conserve Cultural and Archeological Resources of the Refuge

Goal 7 from the CCP is: *to conserve cultural and archeological resources of the Refuge* (CCP pg 2-23). One of the objectives of this goal is to inventory the values at risk from wildfire and/or fire management activities and utilize this inventory to ensure that important structures are protected if possible (see Appendix X for more information on Goals and Objectives). An assessment of Refuge known structures (referred to as known sites) was started in 2010 and is updated annually (refer to Appendix Q for a current list of known sites). Only those sites listed as “Full or Critical Protection” would warrant hazardous fuels mitigation.

An in-depth assessment of cultural sites has not yet been completed, but literature pertaining to the Historic Iditarod Trail contains information on some of these sites. Typically, one or two acres of hazard fuel treatment are required per structure or cultural resource site, but that would be specifically determined in a fuels treatment plan.

C. Private Lands Within and Adjacent to the Refuge Boundary

Most Native allotments receive full wildland fire protection. These allotments are surrounded by Service lands. Risk assessments and treatment options for Native allotments would be developed in conjunction with the allotment owners, the Bureau of Indian Affairs and/or the local compacting Tribal entity. Most Native allotments are isolated, remote parcels and very few have full-time occupied dwellings, therefore the risk for wildland fire entering an allotment is higher than may be for a community. The cost to fully implement allotment fuels treatment projects could potentially be shared by the Bureau of Indian Affairs. If the treatment was on Service lands, the cost to the Service would be much higher.

III. Multiple Year Treatment Plan (2010-2016)

NOTE: This plan is subject to change annually due to project funding. Starting in 2013, fuels treatment funding has been dramatically reduced Service wide.

Innokko NWR Multi-Year Fuels Treatment Planning					
Year	Project Name	Treatment Type	Acres Planned	NEPA	Completed + FY
2010	Innokko Field Camp HFR	Thinning	20	completed 2010	18 acres 2010
	"	Hand Piling	20		8 acres 2010
2011	Innokko Field Camp HFR	Pile Burning	20	completed 2010	20 acres 2010
	"	Mowing - Maint	10		5 acres 2010
	"	Thinning - Maint	5		5 acres 2010
	"	Hand Piling	5		5 acres 2010
2012	Innokko Field Camp HFR	Mowing - Maint	10	completed 2010	4 acres 2011
2013	Innokko Field Camp HFR	Pile Burning	5	completed 2010	5 acres 2013
	"	Mowing - Maint	5		
2014	Innokko Field Camp HFR	Mowing - Maint	5	completed 2010	
	"	Thinning	5		
	"	Hand Piling	5		
	Shageluk WUI HFR	Thinning	10	N/A	
		Hand Piling	10		
	McGrath WUI HFR	Thinning	2		
2015	Innokko Field Camp HFR	Mowing - Maint	5	completed 2010	
	"	Thinning	5		
	"	Hand Piling	5		
	"	Pile Burning	5		
	Shageluk WUI HFR	Thinning	10	N/A	
		Hand Piling	10		
		Pile Burning	10		
	McGrath WUI HFR	Thinning	2		
2016	Innokko Field Camp HFR	Mowing - Maint	5	completed 2010	
	"	Thinning	5		
	"	Hand Piling	5		
	"	Pile Burning	5		
	Shageluk WUI HFR	Thinning	10	N/A	
		Hand Piling	10		
		Pile Burning	10		
	McGrath WUI HFR	Thinning	2		

Appendix X – Goals and Objectives

I. Introduction

Goals and objectives are the core of a management plan. They identify and focus management priorities, provide a context for resolving issues, guide specific projects, provide rationale for decisions, and offer a defensible link among management actions, Refuge purposes, Service policy, and the NWRS mission (USFWS 2004). Without clear goals and objectives, it can be extremely difficult to develop a course of action, let alone stay the course.

The following definitions are from the USFWS handbook for writing Refuge management goals and objectives (2004). A goal is a descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose, but does not define measurable units. An objective is a concise statement of what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible for the work. They derive from goals and provide the basis for determining strategies, monitoring Refuge accomplishments, and evaluating the success of strategies.

As a step down plan of the Refuge Comprehensive Conservation Plan (CCP), the purpose of the Fire Management Plan (FMP), as defined by policy (602 FW 4), is to provide specific strategies and implementation schedules for meeting the general goals and objectives identified in the CCP. CCPs are designed to provide guidance on all aspects of Refuge management for 15 years. Although they state goals and objectives related to programs such as biological inventories and monitoring, visitor services, and fire management, CCPs are not designed to provide sufficient guidance on how to implement these programs throughout the year, requiring development of step-down plans. Also, a step-down plan allows for annual updates and is thus more of a “living document” than a CCP. Over time, CCP objectives may need to be revised to reflect current conditions or removed from consideration as they are addressed or if new information renders them obsolete. Progress towards meeting objectives and documenting other changes to objectives will be included as an annual update to this appendix of the FMP.

II. Objectives related to fire from the Innoko NWR CCP to be addressed in the Refuge Inventory and Monitoring Plan.

Many of the habitats on Innoko NWR are fire prone if not fire dependent; thus, fire affects numerous facets of plant and wildlife biology and is a component of several wildlife and habitat objectives in the CCP. Some of these objectives involve the effects of fire on fish and wildlife populations and habitat use, which require biological skills not necessarily found among fire management staff. The biological program will therefore address the following CCP objectives in the Inventory and Monitoring step-down plan rather than in this FMP. However, it is important for Refuge fire staff to be intimately involved in projects related to these objectives, lending expertise whenever possible, as results may influence fire management decisions on the Refuge.

- A. ***GOAL 1: WILDLIFE*** – *Improve knowledge of fish and wildlife species on the Refuge to maintain healthy populations in their natural diversity (CCP pg. 2-2)*

1). CCP Objective: Within five years of funding, evaluate distributions of furbearer populations, including but not limited to wolf, wolverine, lynx, marten, mink, and weasel, in relation to fire severity. This objective is dependent on Objective 7 (*involves surveys to estimate abundance and winter distribution of wolves, wolverine, lynx, and marten*) (CCP pg. 2-9).

CCP Rationale: Furbearers are one of the reasons cited by Congress for the creation of Innoko Refuge. Furbearers are a significant component of the Refuge's natural diversity; and they have subsistence, cultural, and economic value to local residents. In the boreal forest, a range of post-fire seral stages provides different habitat requisites for different furbearers. Wildfire timing and severity affect the rate of vegetative succession and post-fire recolonization of many species. Utilizing a variety of remote sensing technologies, managers can estimate the severity of wildfires at the landscape scale. This effort would combine these remote sensing technologies with previous and newer land cover mapping efforts and recent knowledge of furbearer distributions to improve our understanding of the short- and long-term response of furbearers to fire.

FMP Comments: This objective is dependent on another objective to estimate the number and distribution of furbearers on the Refuge. Should this objective be accomplished, fire staff (Refuge and/or Regional Office, as appropriate) will work with biologists to provide insight/information on current methods of estimating burn severity. Fire staff will also assist with field efforts to estimate burn severity as needed.

2). CCP Objective: On approval of funding, initiate long-term studies of how small mammals (including species diversity, distribution, and relative abundance) and vegetation are affected by fire. Document changes to forest succession from differing fire intensities during the life of this Plan or until results indicate small mammal populations have stabilized (CCP pg. 2-10).

Rationale: Periodic fire is one of the primary natural forces that form the mosaic of habitats present on Innoko Refuge. Vegetation regrowth after fire often affects forage availability and the distribution of animals. The amount, species, and quality of vegetative regrowth after fire depend on several factors. Fire severity can affect the rate of vegetative succession and post-fire regrowth. Small mammals are an important prey item for many mammalian and avian predators. Although fire has been shown to be beneficial for some species of small mammals, little is known about how small mammals respond over time to a range of fire severity within various vegetation types.

FMP Comments: This objective primarily involves population estimates of small mammals and measurement of habitat parameters important to them. As with objective 1 above, fire personnel will assist with characterization of burn severity (not fire intensity as stated in the objective). Fire staff will also provide information and field assistance for post-fire vegetation monitoring as requested.

B. **GOAL 2: HABITAT** – *Perpetuate ecosystem processes that shape habitats within the natural range of variability* (CCP pg. 2-11).

1). CCP Objective: Within two years of funding, develop inventory and monitoring strategies to assess the effects of fire on caribou and moose habitat quality, and incorporate these strategies into the I&M Plan (CCP pg. 2-15).

Rationale: Both moose and caribou are locally important to subsistence users, and it is important to quantify and monitor the availability of quality habitat for both species. It is also generally agreed that both moose and caribou habitat and population dynamics are affected to some extent by fire. The character of these relationships, however, remains unclear, for caribou in particular. The amount, species, and quality of forage regrowth after fire depend on several factors. The composition of the pre-fire community, time of year of the fire, fire intensity, size of the fire, and burn patterns are all important to monitor. This information will assist the Refuge, agencies, and boards responsible for management of moose and caribou populations, and for management of fire.

FMP Comments: This objective involves population estimates of moose (currently being implemented) and caribou on the Refuge as well as direct measurement of quality habitat important to them in pre and post-fire areas. Fire personnel will assist with characterization of burn severity as well as monitor fire size and general burn patterns (as stated in table 4 under section 3.1.1.1 of the FMP). Fire staff will provide information and field assistance for post-fire vegetation monitoring as requested.

2). CCP Objective: Within two years of funding, begin annual measurements of the production of berries that are important as forage for wildlife species on the upland habitats and for subsistence activities, and assess trends in production in relation to fire severity and climate data (*CCP pg. 2-16*).

Rationale: Wild berries are an important component of annual subsistence activities and Native culture. Berries have also been shown to be seasonally important to many migratory birds, some furbearers, small mammals, and bears. Fire severity can affect the rate of vegetative succession and post-fire establishment of berry producing plants. This study will provide a better understanding of the relationships among fire severity, weather, and the distribution, abundance, and annual fruit production following fire.

FMP Comments: This objective is dependent on another objective to measure berry production on the Refuge. Should this objective be accomplished, fire staff (Refuge and/or Regional Office, as appropriate) will work with biologists to provide insight/information on burn severity as well as how it relates to climate change. Fire staff will also assist with field efforts to estimate burn severity and post-fire vegetation monitoring as needed.

III. CCP Goals and Objectives Progress/Management Strategies

This section includes progress made on objectives, if any, in the time between CCP and FMP development and management strategies where applicable. Future progress towards meeting objectives and revisions to objectives and strategies will be addressed in annual updates to this appendix. Additional fire management objectives will likely arise during the lifespan of the CCP; these will be included in section IV.

A. GOAL 2 : HABITAT – *Perpetuate ecosystem processes that shape habitats within the natural range of variability (CCP pg. 2-11).*

- 1) **CCP Objective:** Throughout the life of this Plan, endeavor to move the mobile Remote Automated Weather Station (RAWS) facility to other portions of the Refuge. Evaluate the weather data and determine how representative the permanent RAWS facility is to other regions of the Refuge and whether additional permanent stations would significantly improve the system's predictive capability (*CCP pg. 2-12*).

Rationale: There is concern that the existing weather station may not represent actual conditions in the southern or eastern portions of the Refuge. By moving the Refuge's one portable RAWS facility to other parts of the Refuge for an entire summer season, managers would have the ability to evaluate how representative data from the Innoko Flats RAWS facility is to the entire Refuge for dealing with potential wildfires. This would also provide managers with critical local weather information that could be included in habitat, wildlife, and climate studies on the Refuge.

Progress on objective since CCP was published: FMO considered placing the portable RAWS at the AFS fire cache to reduce annual costs of upkeep (recommended by RO fire staff). Decision was made to keep the RAWS in McGrath due to needs for climate data in the SW Area. Moving the RAWS around the Refuge is cost prohibitive, logistically difficult, and protection from animals unlikely. Additionally, the value gained from 3-4 months of weather observations annually (moving the RAWS) does not outweigh these factors. Collection of weather data near on-going fires and also at the Innoko Field Camp has a greater value, and is more logistically feasible.

Management Strategies and Prescriptions:

- Deploy portable RAWS at Innoko Field Camp annually between June 1st and September 15th.
- Data collected will include: air temp, RH%, wind speed/direction, and solar radiation.
- Data obtained from this station will automatically download daily into ROMAN. Any missed data will be recovered from the station after it is retrieved from the field.
- Calculate CFFDRS fire weather indices from RAWS data using protocols found on the AICC webpage.
- Compare raw and calculated data to data from the permanent RAWS station.
- Include data from permanent and portable RAWS stations as an update to this appendix by March 15th of each year
- In the annual FMP update, include a narrative documenting how well the permanent RAWS station data related to data from the portable RAWS, whether permanent RAWS station data can be used to predict fire behavior or spread at the site of the portable RAWS, and if the RAWS was moved to support on-going wildland fires. Include weather data pertaining to those fires if feasible.

- 2) **CCP Objective:** Continue implementing the Refuge's Fire Management Plan (*CCP pg. 2-12*).

Rationale: According to the Department of the Interior Manual 620 and National Fire Plan policy (2001), agency and Refuge approved fire management plans are required to continue managing all fire operations on Refuge lands. It is required by policy (minimum) that every five years, the Refuge Fire Management Plan be revised to reflect any changes on an agency and interagency perspective.

Revised Objective: Implement the 2013 Fire Management Plan as directed in the plan.

Revision Rationale: Policy has changed since the CCP was developed. Major FMP revisions now follow the CCP revision process. Lesser revisions will be addressed through annual updates as needed.

Progress on objective since CCP was published: FMO reviews and updates the FMP annually utilizing national guidelines and following the strategies listed below.

Management Strategies and Prescriptions:

- Follow guidance listed under section 5.1.1 of the FMP.
- Assess objectives in this appendix annually and revise or add additional objectives as needed. Report on progress.
- Follow guidance for fire management option changes found in the AIWFMP.
- Include anything else that needs to be reviewed/updated/addressed annually.

- 3) **CCP Objective:** At five-year intervals following the Plan's approval, assess and report fire occurrence, fire causes, fire behavior, fire intensity, and fire effects trends and interagency issues (using the best available technology and data) to provide fire managers the information necessary to revise the Refuge's Fire Management Plan (*CCP pg. 2-12*).

Rationale: As stated previously (*see objective 2*), the policy standard for revision is a five-year interval according to the National Fire Plan (2001). Additionally, fire effects monitoring will be necessary to evaluate Refuge and fire management decision criteria for a five-year evaluation of the existing Refuge Fire Management Plan. The fire effects monitoring will include short- and long-term monitoring criteria for caribou lichen through the fire-impacted areas to guide future management decisions.

Revised Objective: Annually assess and report fire occurrence, fire causes, fire behavior, fire intensity, and fire effects trends and interagency issues (using the best available technology and data) to provide fire managers the information necessary to update the current Fire Management Plan.

Revision Rationale: Policy has changed since the CCP was developed. Major FMP revisions now follow the CCP revision process. Lesser revisions will be addressed through annual updates as needed.

Progress on objective since CCP was published: Only 2 fires have occurred since the CCP was signed; the 2009 Innoko River Fire (37 acres), and the 2010 Two-mile Creek Fire (983 acres on FWS lands). Both have fire report files located at the Refuge headquarters, and include narratives that can be reviewed. Fire information can also be acquired from the AICC website. No fire effects work has been completed, largely due to logistical and funding issues.

Management Strategies and Prescriptions:

- Completion of this is dependent on updated data concerning lichen caribou locations (see mapping efforts under objective 6 to follow).

- Opportunities exist for future fire effects monitoring using remote sensing techniques. Refer to FMP section 5.2.1 for fire effects monitoring specifics.
- Fire behavior/intensity is documented in fire reports from the Protection Agency.
- Annual reports are completed and include fire occurrence and cause (see FMP section 4.1.2.6).
- FMO will participate in fire research workshops/webinars as offered from the Alaska Fire Consortium and other research venues.
- Interagency issues are addressed during fire occurrence with the Protection Agency, as well as during the AK Fall Fire Review. The FMO will actively participate in these meetings whenever feasible (see FMP sections 4.1.1.3 and 2.3.2.2).

- 4) **CCP Objective:** Develop fire progression maps for future Refuge fires as opportunities allow throughout the life of this plan (*CCP pg. 2-13*)

Rationale: Progression maps can be used to validate and refine fire spread models, improve future predictions of spread, and assist in the interpretation of fire severity remote sensing. Linking fire progression data with weather and fuel data will allow managers to refine fire behavior predictions for the Refuge.

Progress on objective since CCP was published: Only 2 fires have occurred since the CCP was signed; the 2009 Innoko River Fire (37 acres), and the 2010 Two-mile Creek Fire (983 acres on FWS lands). Both have fire report files located at the Refuge Headquarters. Fire information can also be acquired from the AICC website.

Management Strategies and Prescriptions:

- Request progression maps for each fire from the Protection Agency.
- Refuge fire staff will personally visit and map fires when possible.
- Develop capacity within the Refuge fire staff for fire behavior modeling and GIS.
- Monitor weather data and compare with observed fire progression.
- Continue to refine fuel model data for the Refuge (see objective 6 below).
- Keep complete fire files at the Refuge headquarters for review by management.

- 5) **CCP Objective:** Within one year of a fire's occurrence on the Refuge, develop a fire severity map if sufficient data are available (*CCP pg. 2-13*).

Rationale: Recent work on Innoko and other interior Alaska Refuges has shown promise in using remote sensing technologies to estimate severity of wildfires across the landscape. Accurate severity estimates, combined with updated land cover data, provide a solid baseline for numerous future habitat and wildlife research within burned areas, and allow managers to make better estimates of potential habitat changes.

Revised Objective: Assist with efforts to develop and/or assist with efforts to develop improved burn severity maps as requested.

Revised Rationale: Since the CCP was developed, questions have arisen about the accuracy of burn severity maps using the Differenced Normalized Burn Ratio (dNBR) method in Alaska. Also, the Monitoring Trends in Burn Severity (MTBS) program uses the dNBR method to develop burn severity maps for fires greater than 1,000 acres in the west,

generally within a year of the fire (<http://www.mtbs.gov>). Due to the efforts of MTBS, the Refuge is not responsible for developing burn severity maps. However, there may be future efforts to assess performance of dNBR maps or to test new methods. The Refuge will work with the Regional Fire Ecologist to the extent possible to assist with such efforts. Acquisition of accurate burn severity maps tie in with other Refuge CCP objectives related to wildlife habitat and fire.

Progress on objective since CCP was published: Only 2 fires have occurred since the CCP was signed; the 2009 Innoko River Fire (37 acres), and the 2010 Two-mile Creek Fire (983 acres on FWS lands). No fire severity remote sensing was requested for these fires (one was too small @ <1,000 acres and the other was primarily located on State lands). Post-fire validation of burn severity mapping was completed for fires in 2004 and 2006. The Regional Fire Ecologist is currently working on the final report.

Management Strategies and Prescriptions:

- Remote sensing maps will be ordered and/or reviewed post-fire for all Refuge fires larger than 1,000 acres by the FMO (MTBS automatically maps).
 - Complete fire files will be kept at the Refuge headquarters for review by management.
 - FMO will evaluate MTBS data for previous fires (1984 to 2003) on the Refuge using this new feature within WFDSS or by other means.
 - FMO and Refuge biologists will review final report for 2004 and 2006 burn severity map validation and utilize this information for local calibration of burn severity mapping products if appropriate (see rationale discussion above).
 - Refuge staff will pursue additional review of the 2004 and 2006 plot data if deemed appropriate by the report or in coordination with the Regional Fire Ecologist.
 - This calibration information will be used to update national LANDFIRE data.
- 6) **CCP Objective:** Within three years of funding, create an updated land cover map of vegetation and wetland communities using satellite imagery and Multi-Resolution Land Characteristics (MRLC) or other advanced methods (*CCP pg. 2-13*).

Rationale: Fire and flooding are the primary sources of changes to the landscape within Innoko Refuge. There have been two previous land cover mapping efforts for the Refuge—each using different classification schemes, thereby complicating our ability to monitor changes across the landscape. The last land cover map was derived using satellite imagery collected in 1991; this map did not cover the entire Refuge and is now vastly outdated due to the numerous wildfires that have occurred since then. Medium resolution satellite imagery (i.e., 30 x 30 meter pixels) is adequate for monitoring habitat changes at the landscape scale; updated land cover data are basic for wildlife monitoring, wildfire modeling, recreation planning, and biological research. The Refuge needs both the current distribution of habitats and a cost-effective way to monitor changes in those habitats.

Revised Objective: The Refuge will rely on LANDFIRE, or other regional mapping efforts for an updated land cover map of vegetation and wetland communities.

Revised Rationale: Same as above except that it is more reasonable to rely on region-wide mapping efforts due to budget limitations and lack of GIS expertise at the Refuge.

Progress on objective since CCP was published: Two mapping efforts have occurred since 2008; one is the AKNHP map which is referenced in 3.1.3.5, and the other is high resolution Lidar imagery requested from the USGS. The second imagery is located at Refuge headquarters near the GIS computer (on CDs) but needs to be geo-referenced.

Management Strategies and Prescriptions:

- Increase GIS capacity at the Refuge through on-line ESRI courses.
- Ensure data updates are provided to LANDFIRE during annual data calls.
- Fire staff will assist to the extent possible with other mapping efforts concerning the Refuge.
- Pursue creating usable data from the USGS high-resolution imagery CDs.

- 7) **CCP Objective:** Within one year of completion of the updated land cover map, develop data crosswalks to fire fuels classification systems, including but not limited to the National Fire Danger Rating System (NFDRS), Landscape Fire and Resource Management Tools (LANDFIRE), Fire Regime/Condition Class (FRCC), and the National Fire Fuel Laboratory (NFFL) system (*CCP pg. 2-14*).

Rationale: A current land cover map would provide a foundation for numerous data products—one of which is fire fuels. Fire fuel datasets will provide base inputs for short- and long-term fire behavior modeling using existing predictive software. These fire behavior models are used to develop prescribed fire plans, Wildland Fire Situation Analyses (WFSAs) and Wildland Fire Implementation Plans (WFIPs). Completion of fuels mapping will allow Refuge fire managers and incident management teams to use proven fire behavior and fire effects predictive modeling tools to better manage wildland and prescribed fires and make better decisions.

Revised Objective: Same as above except that land cover mapping efforts will be from region wide efforts rather than Refuge specific and the CFFDRS rather than NFDRS system is used in Alaska.

Revised Rationale: Same as above except that WFIPs are no longer utilized.

Progress on objective since CCP was published: Two mapping efforts have occurred since 2008; one is the AKNHP map which is referenced in 3.1.3.5, and the other is high resolution Lidar imagery requested from the USGS. The second imagery is located at Refuge headquarters near the GIS computer (on CDs) but needs to be geo-referenced.

Management Strategies and Prescriptions:

- This objective is dependent on Objective 6 above.
- Coordinate with Regional Fire Ecologist to crosswalk data.
- Utilize information from the final report for 2004 and 2006 burn severity map validation project for local calibration of burn severity mapping products.
- Participate with annual data calls, workshops, etc. for land cover updates.
- Develop expertise within the fire program concerning CFFDRS, LANDFIRE, FRCC, and NFFL as well as fire behavior modeling.

- 8) **CCP Objective:** Continue to document fire history patterns on the Refuge and participate in research on Alaskan fire regimes during the life of this Plan (*CCP pg. 2-16*).

Rationale: Fire and flooding are the primary causes of habitat disturbance and subsequent vegetation regrowth on the Refuge and is therefore a key determinant of how the ecosystem changes. Our current knowledge of fire history patterns is insufficient to manage for natural fire regimes or adapt to potential habitat or population changes caused by climate change. Refuge staff will continue to document fire history patterns on the Refuge using historic records and appropriate field studies and will continue to participate in localized or regional fire ecology research during the life of this Plan.

Progress on objective since CCP was published: Only 2 fires have occurred since the CCP was signed; the 2009 Innoko River Fire (37 acres), and the 2010 Two-mile Creek Fire (983 acres on FWS lands). Both have fire report files located at the Refuge Headquarters. Fire history can also be acquired from the AICC website. FMO actively participates in research workshops/webinars offered by the Alaska Fire Consortium and other research venues.

Management Strategies and Prescriptions:

- Fire staff will monitor fire history trends annually and report these to Agency Administrator.
- FMO will monitor weather data and document with observed fire occurrence.
- Complete fire files will be kept at the Refuge headquarters for review by management.
- Refuge fire staff will coordinate with the Regional Fire Ecologist concerning potential research on AK fire regimes.
- FMO will continue to participate in Fire Research workshops/webinars as offered from the Alaska Fire Consortium and other research venues.

- 9) **CCP Objective:** Throughout the life of this Plan (if adequate funding is available), monitor landscape changes of both vegetation and physical features at five-year intervals or after a significant disturbance (*CCP pg. 2-17*).

Rationale: The Refuge will monitor landscape-level changes in vegetation (e.g., fire, insect outbreak) and physical features (e.g., rivers, wetlands) using tools such as medium- and high-resolution satellite imagery. This technology provides an extremely cost-effective and reasonably accurate method for assessing vegetation and wildlife habitat change over time, updating Refuge land cover maps, and assessing the long-term effects and effectiveness of various fire management decisions.

Progress on objective since CCP was published: Two mapping efforts have occurred since 2008; one is the AKNHP map which is referenced in 3.1.3.5, and the other is high resolution Lidar imagery requested from the USGS. The second imagery is located at Refuge headquarters near the GIS computer (on CDs) but needs to be geo-referenced. Vegetation data inventories have been completed each year since 2010 for a wood bison project (may be used to validate satellite data) on part of the Refuge. MTBS collected post-fire imagery for fires greater than 1,000 acres (see objective 5 above).

Management Strategies and Prescriptions:

- Monitoring guidance can be found in the FMP section 5.2.
- Fire staff will follow management strategies as listed in objectives 1-8 above.
- Refuge staff will compare the mapping data listed above to previous data, especially in areas of fire occurrence, in a timely manner.
- FMO will monitor weather data and document with observed fire occurrence.
- Coordinate with Refuge biologists and FWS Regional Office Specialists for interpretation of mapped imagery and on-the-ground validation/calibration using vegetation data collected during field inventories and MTBS data.

B. GOAL 5: WILDERNESS - Preserve the wilderness character of the Innoko NWR Wilderness area (CCP pg. 2-21).

- 1) **CCP Objective:** Allow naturally occurring fires to burn within the wilderness whenever possible. If suppression steps must be taken, use “Light Hands On the Land” (Minimum Impact Suppression Tactics or MIST) firefighting techniques (CCP pg. 2-21).

Rationale: Fire is one of the two naturally occurring forces that greatly affect the Innoko Refuge landscape. Fire has occurred in these environments for eons and should be allowed to continue to shape the landscape. Fire suppression tends to leave scars on the landscape that would affect the natural appearance of the designated wilderness, and precautions should be taken to avoid or minimize any evidence of human actions.

Progress on objective since CCP was published: Only one fire occurred in the Wilderness since the CCP was signed; the 2009 Innoko River Fire (37 acres). Initial response to this fire followed guidelines set forth in the AIWFMP for the limited fire management option, and the fire was managed as a natural process (see section 3.2.2.3).

Management Strategies and Prescriptions:

- Guidance can be found in section 3.2.2.3 of the FMP.

C. GOAL 7: CULTURAL RESOURCES – Conserve cultural and archeological resources of the Refuge (CCP pg. 2-23).

- 1) **CCP Objective:** 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 (CCP pg. 2-24).

Rationale: This inventory will be used to update the Refuge’s Fire Management Plan annually to ensure that important historic structures and private inholdings are protected, if possible, and that sensitive cultural resources are considered in fire planning. This is especially important for on-the-ground suppression so that adverse effects to cultural resources are avoided whenever possible. Interagency communication will be a priority after any revisions to the Refuge Fire Management Plan to ensure that on-the-ground suppression actions are adhered to on Service lands. The communication of the Innoko Refuge Fire Management Plan revisions will be directed to the Bureau of Land Management (BLM) Alaska Fire Service on an annual basis.

Progress on objective since CCP was published: Mapping and aerial photography was completed for many of the known sites on the Refuge in 2010 (FMO and biologist). From this information, site protection forms and maps were created, as well as a GIS layer and spreadsheet with locations and fire management protection level (see section 1.3). The Alaska Fire Service was provided with this information on their standardized “known sites” template spreadsheet. They also were provided aerial photos, individual maps, and site protection forms for each. These values can currently be accessed through the password protected “known sites database” on the AICC webpage.

Management Strategies and Prescriptions:

- Refer to section 1.3 (significant values to protect) and section 3.1.3.3 (Cultural Resources) and map 4 in Appendix A (Innoko NWR Fire Related Values at Risk).
- Completion of this objective is dependent upon a complete cultural resource survey coordinated by the Regional FWS Archeologist.
- Folders documenting each site will remain available for reference at the Refuge headquarters.
- Annually, FMO will pursue avenues to identify additional sites, document their location, and work with the Agency Administrator on designation of a protection status. This information will be provided to AFS as required in the AIWFMP.
- Refer to the FMP Appendix T for hazardous fuels reduction projects planned for known site protection.

D. GOAL 6: OUTREACH AND ENVIRONMENTAL EDUCATION – Provide outreach, environmental education programs to develop and/or increase a sense of stewardship for wildlife, cultural resources, and the environment.

- 1) **CCP Objective:** In McGrath, Takotna, Nikolai, Holy Cross, Anvik, Grayling, and Shageluk, participate when possible in community events, festivals, and programs that will facilitate education and interpretation of Service and Refuge goals and build awareness of the Refuge and its resources.

Rationale: These communities are closest to the Refuge and provide the greatest amount of local visitation, both subsistence and non-consumptive. It is important that users in these communities feel comfortable working with and obtaining information from Refuge staff.

Progress on objective since CCP was published: FMO has participated in events such as the Native Traditions week, Science Camp, community “breakfast clubs” and other meetings, as well as the “Give 8 Outdoors” program.

Management Strategies and Prescriptions:

- Within the year following plan implementation, begin a wildland fire management interpretation program on the local radio station (KSKO). Times and dates are TBD.
- FMO will continue to participate in the Give 8 Outdoors and Native Traditions week program as requested/available.
- Refer to FMP section 4.4.3 for additional information.

IV. Additional Objectives

This section includes objectives that pertain to the CCP goals but were not included in the CCP. Also included are new objectives that may arise during the lifespan of the CCP; these will be added annually during the FMP review process.

A. **GOAL 2 : HABITAT** – *Perpetuate ecosystem processes that shape habitats within the natural range of variability (CCP pg. 2-11).*

1. **Objective:** In cooperation with Alaska State Forestry, monitor duff and live fuel moisture moistures bi-weekly throughout the typical fire season (June-August) each year near the Refuge Headquarters in McGrath. This information will be provided as acquired to Refuge staff and the greater wildland fire community.

Rationale: Measuring fuel moisture will help to document natural ranges of variability in vegetation, as well as contribute to statewide monitoring efforts. Although Refuge lands are the focus, an ecosystem approach requires that a larger scale be used for long-term monitoring efforts (McGrath is in the general vicinity of the Refuge by Alaska terms). This effort will also assist the Refuge in documenting landscape-scale effects of global climate change such as potential changes in wetland (vegetation) drying. This information can be used for fire behavior modeling, fire danger rating, and as a correlative factor in fire effects and burn severity.

Progress on objective since CCP was published: None. This is a new objective.

Management Strategies and Prescriptions:

- Training on procedures for fuel moisture sampling will be conducted by the Regional Fire Ecologist in late May or early June 2013. Additional guidance can be found at: <http://www.frames.gov/partner-sites/afsc/partner-groups/frdac/frdac-activities/>
- Following the training, duff and live fuel moisture samples will be collected twice monthly by the Refuge in cooperation with staff from McGrath State Forestry.
- Samples will be processed utilizing the Refuge fuel moisture equipment such as the DMM600 and/or drying oven. Additional equipment will be acquired as needed.
- Values will be recorded in the National Fuel Moisture Database found at: <http://www.wfas.net/index.php/national-fuel-moisture-database-moisture-drought-103>
- The FMO will document trends in fuel moistures, and make these available to Refuge staff as requested.