FIRE MANAGEMENT PLAN

WRANGELL-ST. ELIAS NATIONAL PARK and PRESERVE

Alaska

Final 6/1/2010

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I. INTRODUCTION

The following Fire Management Plan (FMP) is a specific action plan for the implementation of agency-wide and park-specific policies. As stated in Director's Order 18 (DO-18), the National Park Service specifies that "Each park with vegetation capable of burning will prepare a fire management plan to guide a fire management program that is responsive to the park's natural and cultural resource objectives and to safety considerations for park visitors, employees, and developed facilities." Accordingly, this plan is intended to facilitate the achievement of the goals and objectives identified in the General Management Plan (1986) and Resource Management Plan (1997) for Wrangell-St. Elias National Park and Preserve (WRST). The Wrangell-St. Elias General Management Plan (GMP) states, "Naturally caused fires will continue to influence the Park/Preserve's natural systems." More specifically, within the Park/Preserve's Resource Management Plan (RMP) Project Statement WRST N-503.00 mandates the development and implementation of strategies and actions designed to "allow fire to play its natural role in the maintenance of the Park/Preserve ecosystem" and to "protect archeological and historical sites, private property, NPS facilities, and human life". Since 1983, guidance for fire management activities within the Park/Preserve has come from a series of state-wide interagency plans developed cooperatively by the National Park Service, the Bureau of Land Management, the Alaska Department of Natural Resources, the Alaska Department of Fish and Game, the U.S. Forest Service, the U.S. Fish and Wildlife Service, the Bureau of Indian Affairs, and Native Regional and Village Corporations. This Fire Management Plan, in turn, comprises a park-specific action plan; as such, it will be used in conjunction with the current Alaska Interagency Wildland Fire Management Plan (AIWFMP) to direct all personnel engaged in fire management actions within the Park/Preserve toward the fulfillment of the goals and objectives specified by the Park/Preserve's RMP.

Authority for the implementation of this Fire Management Plan originates with the Organic Act of the National Park System, August 25, 1916. This Act states that the primary goal of the National Park Service is to preserve and protect the natural and cultural resources found on lands under its management in such a manner as will leave them unimpaired for future generations. Current service-wide fire management policy is specifically expressed in Director's Order 18 (DO-18) and the attendant Reference Manual (RM-18). The Fire Management Plan for Wrangell-St. Elias National Park and Preserve complies fully with these directives.

The WRST Fire Management Plan will also implement fire management policies and help achieve resource management and fire management goals defined in: (1) *Federal Wildland Fire Management Policy and Program Review* (2001), (2) *Managing Impacts of Wildfires on Communities and the Environment and Protecting and Sustaining Resources in Fire Adapted Ecosystems- A Cohesive Strategy* (USDOI / USDA) and (3) *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-year Comprehensive Strategy Implementation Plan.*

The actions described within this plan also meet the requirements of the National Environmental Planning Act (NEPA), the National Historical Preservation Act (NHPA), and the Alaska

National Interest Lands Conservation Act (ANILCA). Compliance with these acts will be demonstrated as follows:

- The WRST Fire Management Plan is accompanied by an Environmental Assessment (Appendix C.1), a substantive discussion of the effects upon the Park/Preserve's natural and cultural resources of several alternative actions, including the preferred course of action which are explained throughout the FMP.

- The Environmental Assessment, in turn, is accompanied by an ANILCA 810(a) Summary Evaluation and Findings document (Appendix C.2), an assessment of the impacts of the proposed actions upon subsistence activities within the Park/Preserve.

- The Fire Management Plan, Environmental Assessment, and 810(a) Summary Evaluation and Findings report will be submitted to National Park Service staff members at Wrangell-St. Elias National Park and Preserve and to the Alaska Regional Support Office for review of operational soundness and compliance with federal policy.

- The Fire Management Plan, Environmental Assessment, and ANILCA 810(a) Summary Evaluation and Findings report will be submitted for review to local municipalities, local native corporations, and to all state and federal agencies holding or administering lands adjacent to or in the proximity of the Park/Preserve.

- The State Historic Preservation Officer (SHPO) will review the Fire Management Plan and Environmental Assessment for compliance with the National Historical Preservation Act; in addition the SHPO will review all individual prescribed fire burn plans prior to their approval by the Superintendent.

- Notice of Availability of the FMP and accompanying Environmental Assessment and 810(a) Summary will be made locally, with public comments accepted by the NPS for a period of sixty days thereafter.

II. NPS POLICY AND RELATION TO OTHER PLANS

A. NPS Policy

In 1995, an interagency review of the risks and expenses associated with wildland fire management culminated in the Final Report of the Federal Wildland Fire Management Policy and Program Review. This review contained several principles, policy changes, and recommendations that were accepted and endorsed by the Secretary of the Interior. In response to these changes and recommendations, the director of the National Park Service (NPS) issued *Director's Order #18: Wildland Fire Management* (DO-18) in 1998. The provisions of DO-18 supersede all previous requirements and statements of policy with regard to wildland fire management.

Foremost, DO-18 recognizes the need of the NPS to foster a healthy and natural fire ecology within individual parks, through the development of fire management programs designed around resource management objectives. Central to this is the development of individual fire

management plans (FMPs) for each park unit, in order to tailor the FMP to park resource management objectives while still following the national guidelines. To this end, each unit of the NPS is directed to prepare a fire management plan that supports cultural and natural resource management objectives while emphasizing safety for park visitors, employees, and developed facilities.

Wildland fire is a general term describing any non structure fire that occurs in the wildland. All fires burning in natural or landscaped vegetation will be considered wildland fires. Following both DO-18 and the AIWFMP, wildland fires may be managed for the accomplishment of resource management objectives.

Wildfires are unplanned ignitions of a wildland fire or escaped prescribed. All Wildfires will be effectively managed through application of the appropriate strategic and tactical management options. Those options will be selected after comprehensive consideration of firefighter and public safety, the resource values to be protected and costs.

Prescribed Fire are wildland fire originating from a planned ignition to meet specific objectives identified in a written, approved, prescribed fire plan for which NEPA requirements (where applicable) have been met prior to ignition.

Planned Ignition –the intentional initiation of a wildland fire by hand-held, mechanical or aerial device where the distance and timing between ignition lines or points and the sequence of igniting them is determined by environmental conditions (weather, fuel, topography), firing technique, and other factors which influence fire behavior and fire effects. Prescribed fire activities will include effective communication on prescribed fire activity in the park and local community and the monitoring programs that provide information on whether specific objectives are being met. In conformance with the preserve's fire management plan, a systematic decision –making process will be used to determine the most appropriate management strategies for wildland fire that are no longer meeting resource management objectives.

B. DOI Alaska Policy

In 1998 the Department of the Interior issued Departmental Manual 620 Chapter 2 which provides policy and guidance regarding wildland fire suppression and organization in Alaska. DM 620 Chapter 2 states, "BLM will maintain and operate the Department of the Interior wildland fire suppression organization in Alaska". This policy document provides for the existence of Alaska Fire Service, and the Statewide Master Agreement entered into between the BLM-Alaska Fire Service, State of Alaska, the DOI agencies, and Native land managers. This statewide master agreement is available on the web at http://fire.ak.blm.gov/logdisp/asma.php and includes the Annual Operating Plan. The Master Agreement provides for cooperative wildland fire suppression between the BLM and State of Alaska and other fire suppression organizations. In Wrangell St. Elias National Park and Preserve the Master Agreement gives protection authority to the State of Alaska through the Valdez Copper River Area office, and the Tok Area office. However DM620 part 2 also states, "Nothing herein relieves agency administrators in the Interior bureaus of the management responsibility and accountability for activities occurring on their respective lands." And, "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."

C. Establishment and Purpose of WRST

Portions of the present Park/Preserve were originally contained within Wrangell-St. Elias National Monument, established in 1978. Congress created Wrangell-St. Elias National Park and Preserve in 1980 through the passing of the Alaska National Interest Lands Conservation Act (ANILCA). ANILCA established several new Alaskan Park and Preserve areas and contains a comprehensive statement of purpose for each of them. Section 201(a) of ANILCA specifically states that Wrangell-St. Elias National Park and Preserve will be managed for the following purposes:

> "to maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes and streams, valleys, and coastal landscapes in their natural state; [and] to protect habitat for, and populations of, fish and wildlife including but not limited to caribou, brown/grizzly bears, Dall sheep, moose, wolves, trumpeter swans and other waterfowl, and marine mammals…."

Sections 101 (a), (b), and (c) of ANILCA charges all national park units in Alaska with the preservation of historic and archeological sites.

D. WRST General Management Policy and Resource Management Plans

The current WRST Resource Management Plan comprises an action plan for the implementation of the Park/Preserve's GMP and as such provides resource-oriented guidelines for the development of a fire management program for Wrangell-St. Elias National Park and Preserve. Within the RMP, Project Statement WRST N503.00 identifies the following fire management objectives:

- protection of life and physical developments;
- maintenance or restoration of fire as a naturally occurring factor in the ecosystem,
- economy and efficiency in fire suppression and control actions,
- protection of cultural/historic sites and sensitive habitats from total loss due to fire or disturbance during suppression activities.

The accomplishment of the management objectives described above will occasionally demand that wildland fire management activities take temporary priority over other concerns at Wrangell-St. Elias. Large or complex wildland fire incidents may demand the involvement of most or all Park/Preserve personnel, in some cases for extended periods of time.

III.WILDLAND FIRE MANAGEMENT STRATEGIES

A. General Management Considerations

In Alaska, primary responsibility for wildland fire suppression is divided between the Alaska Department of Natural Resources (DNR), the US Forest Service (USFS), and the Bureau of Land Management Alaska Fire Service (BLM-AFS). The Alaska DNR's Division of Forestry (DOF) carries the primary responsibility for suppression actions on lands within Wrangell-St. Elias National Park and Preserve. Although the Division of Forestry has primary responsibility for suppression, 620 DM 2.4 states that "nothing herein relieves agency administrators in the Interior bureaus of the management responsibility and accountability of activities occurring on their respective lands." Section 2.4 goes on to state that "each bureau will continue to use its delegated authority for applications 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."

The NPS, as well as the US Fish and Wildlife Service, the Bureau of Indian Affairs, and Native Corporations and Native Villages participate in wildland fire management training and provide suppression resources during periods of increased fire activity in the Park/Preserve, Alaska and the contiguous United States. Although the use of NPS personnel for initial attack and structure protection is not common, qualified NPS personnel may provide initial attack if they are the closest resources or other initial attack resources are not available. The use of these personnel will be coordinated with the DNR Fire Management Officer (FMO).

Beginning in 1980 the NPS cooperated with the BLM, the Alaska DNR, the Alaska Department of Fish and Game, the US Forest Service, the US Fish and Wildlife Service, the Bureau of Indian Affairs, and Native Regional and Village Corporations to initiate a state-wide series of area-specific fire management plans. Three of these documents, the Alaska Interagency Fire Management Plan for the Fortymile Planning Area (1983), the Alaska Interagency Fire Management Plan for the Copper Basin Planning Area (1983), and the Alaska Interagency Fire Management Plan for the Southeast Planning Area (1988), provided direction for fire management activities within WRST through 1998. At that point a variety of documents, including 13 local planning area FMPs, were consolidated and approved as the **Alaska Interagency Wildland Fire Management Plan** (AIWFMP), which in turn became the key reference for fire management at WRST. Copies of these plans can be found at the Wrangell-St. Elias National Park and Preserve headquarters in Copper Center, Alaska.

This Fire Management Plan integrates the policies set forth in both DO-18 and the AIWFMP. Specifically, it is a detailed program of action to implement the fire management policies and objectives of the National Park Service. Additionally, this FMP will help to meet the objectives set forth in the WRST General Management Plan and the WRST Resource Management Plan.

B. Fire Management Goals at WRST

Whenever safely possible, Wrangell-St. Elias National Park and Preserve will utilize the role of fire in the natural environment in the fulfillment of NPS natural resource management directives. Accordingly, park management will direct all fire management activities toward the accomplishment of the following goals:

- The protection of human life, property, and irreplaceable natural and cultural resources.
- The preservation of the natural fire ecology of the Wrangell-St. Elias region.
- The use of selected wildland fires for the accomplishment of resource management objectives and for the reduction of hazardous fuels.
- The use of mechanical hazard fuel reduction for the accomplishment of protection of property and irreplaceable natural and cultural resources.
- The minimization of adverse effects of fire and/or fire-suppression activities.
- The coordination and scientific management of wildland fire on the basis of the best natural resource management program goals and objectives.
- The education of employees and public about the scope and effect of wildland fire management.
- The management of wildland fire incidents in accordance with accepted interagency standards and the achievement of maximum efficiency through interagency coordination and cooperation.
- The development of on-site protection capabilities at the Park and Preserve through the training of WRST personnel and acquisition of wildland firefighting equipment.
- Provision of fire situation, fire behavior and fire effects information to the Park Superintendent and to appropriate Division of Forestry (DOF) personnel.

1. Response to Wildland Fire

The NPS policy DO-18 specifies the various fire management options available for use by the fire management program.

Fire, as a critical natural process, will be integrated into land, Resource Management Plans and activities on a landscape scale, across bureau boundaries. Response to wildland fires is based upon ecological, social and legal consequences of the fire. The circumstances under which a fire occurs, and the likely consequences on the firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate response to the fire.

Wildland fire is defined as any ignition or fire occurring in WRST that was not planned and ignited by management. Following both DO-18 and the AIWFMP, wildland fires may be managed for the accomplishment of resource management objectives.

Wildland fire will be used to protect, maintain, and enhance natural and cultural resources and, as nearly as possible, be allowed to function its natural ecological role. Use of fire will be based on approved Fire Management plans and will follow specific prescriptions contained in operational plans.

Response to wildland fire will include the full range of options presented in the AIWFMP. This means that sections of the same incident may be allowed to burn to meet ecological considerations while suppression actions may be taken on sections where fire managers have determined there is a need. The classic example is a fire which begins in **Limited** Protection FMU where the fire is meeting ecological considerations, but there are structures which require protection. Fire managers may deploy smokejumpers or other suppression resources to protect the specific values while allowing the rest of the fire to burn inhibited. In selecting suppression strategies, the Incident Commander and/or the DNR FMO and/or the Agency Administrator must consider firefighter and public safety, cost effectiveness, and impact of suppression activities, as well as protection of resources and values to be protected. Accordingly, suppression strategies may range from aggressive initial attack to surveillance and/or indirect containment.

2. Fuels Management

In wildland fire management, fuel is defined as live or dead organic matter. The two primary management options for fuel reduction are described below. Table 1 is a five year plan of fuels activities for the Park and Preserve.

Table 1: Five Year Fuels Treatments Plan

WUI or HF	Fiscal Year	Treatment Name	Treat Type	NEPA	Target Acres
WUI	FY10	HQ cut & pile	Mechanical	Within FMP NEPA	18
HF	FY10	Cabins cut & pile	Mechanical	Within FMP NEPA	4
HF	FY11	Carl Creek RX NEPA	Other	Requires Supplemental NEPA	
WUI	FY11	HQ Pile Burn	Fire	Within FMP NEPA	18
HF	FY11	Cabin Pile Burn	Fire	Within FMP NEPA	4
WUI	FY11	HQ cut & pile	Mechanical	Within FMP NEPA	18
HF	FY11	Cabin Cut & Pile	Mechanical	Within FMP NEPA	4
HF	FY11	Carl RX Black Line	Fire	Requires Supplemental NEPA	100
WUI	FY12	University Boundary Cut & Pile	Mechanical	Within FMP NEPA	10
HF	FY12	Cabin Cut & Pile	Mechanical	Within FMP NEPA	4
WUI	FY12	HQ Pile Burn	Fire	Within FMP NEPA	18
HF	FY12	Cabin Pile Burn	Fire	Within FMP NEPA	4
HF	FY12	Carl Creek RX Interior	Fire	Requires Supplemental NEPA	100
HF	FY13	Cabin Cut & Pile	Mechanical	Within FMP NEPA	4
WUI	FY13	University Boundary Cut & Pile	Mechanical	Within FMP NEPA	10
HF	FY13	Cabin Pile Burn	Fire	Within FMP NEPA	4
WUI	FY13	University Boundary Pile Burn	Fire	Within FMP NEPA	10
HF	FY13	Carl Creek RX Interior	Fire	Requires Supplemental NEPA	100
HF	FY14	Cabin Cut & Pile	Mechanical	Within FMP NEPA	4
WUI	FY14	University Boundary Cut & Pile	Mechanical	Within FMP NEPA	10
HF	FY14	Cabin Pile Burn	Fire	Within FMP NEPA	4
WUI	FY14	University Boundary Pile Burn	Fire	Within FMP NEPA	4
HF	FY14	Carl Creek RX Interior	Fire	Requires Supplemental NEPA	100

a. Prescribed Fire

Prescribed Fire is defined as the planned implementation of fire within a predetermined area and under predetermined conditions, for the accomplishment of resource management objectives and/or hazard fuel reduction. Each implementation of prescribed fire must follow a Prescribed Fire Plan prepared by the WRST FMO and approved by the Superintendent. Prescribed fire may be implemented for the accomplishment of certain resource management goals. Because of the relatively undisturbed nature of the WRST ecology, the Park and Preserve does not anticipate implementing landscape-scale burning for the purpose of restoring or preserving the area's indigenous ecosystems. WRST may, however, use prescribed fire for the purposes of restoring historical conditions at selected sites or for reducing hazard fuel loads in the vicinity of valued resources. These uses would facilitate the accomplishment of goals identified in WRST's

Resource Management Plan, particularly the stabilization and restoration of historical sites and structures associated with the gold rush.

Currently the Carl Creek prescribed fire is in the planning stages. This is a burn to asses the effect of fire on the graminoid herbaceous and low shrub ecosystem in the Carl Creek drainage east of Chisana. There have been anecdotal reports of shrub encroachment in this area over the last thirty years by a concessionaire that uses the area for stock forage. Other prescribed fire that may be implemented in the park would be debris removal pile burning in response to mechanical fuels reduction projects.

b. Mechanical Fuel Reduction

Mechanical Fuel Reduction is defined as the use of power saws, cross-cut saws, mowers, hand tools, or similar devices to mitigate hazard fuel buildup or recreate historical landscape conditions in areas where fire would pose an unreasonable threat to property or resources. Each mechanical fuel reduction action at WRST must follow a written plan prepared by the WRST FMO (or delegate) and be approved by the Superintendent.

Table 2: DO-18 Fire Management Options

Management Option	Intent	Policy
Prescribed Fire Use Prescribed Fire Plan → management-implemented ignition	• Immediate protection of life, property, and/or fire-sensitive resources. • Ecosystem sustainability • Achieve Resource Management goals and objectives • Long-term protection of life, property, and/or fire sensitive resources. • Restoration of historic conditions. • Cost effectiveness.	• Agency Administrator may select suppression actions in any FMU. • Context and circumstances of the fire dictate the appropriate response, based on the approved FMP. • Suppression actions triggered automatically in Full and Critical FMUs. • Management strategy or prescribed fire plan should be based on resource management objectives. • Suppression actions should comply with resource management objectives whenever possible. MIST tactics will be implemented
Response to Wildland Fire Any ignition → managed based on resource management objectives, values to be protected and likely consequenes of firefighter and public safety		

C. Fire Management Units (FMUs)

The fire management program at Wrangell-St. Elias National Park and Preserve complies with the policies resulting from the Federal Wildland Fire Management Policy Review of 2001, as well as those established by the Alaska Interagency Wildland Fire Management Plan. In accordance with DO-18, the Park/Preserve has been sub-divided into four Fire Management Units (FMUs), each indexed to an appropriate AIWFMP category. It should be noted that the areas contained within individual Fire Management Units at WRST are not contiguous (e.g., the Full Protection FMU includes acreage in both the southeast and southwest corners of the Park/Preserve). The following map shows the general location of the Park/Preserve's FMU boundaries as well as the AIWFMP protection zones for adjacent lands (Figure 1).

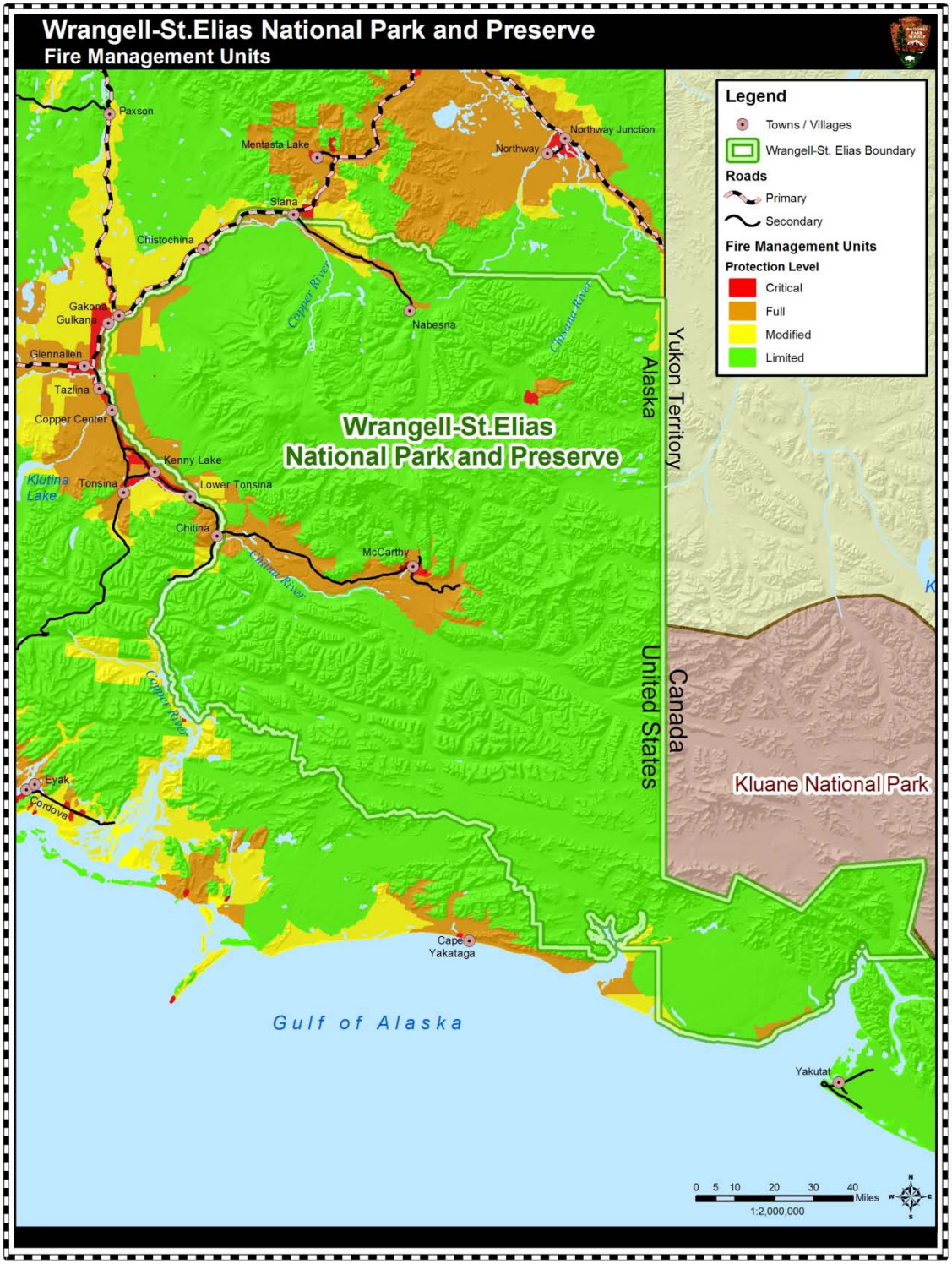

Figure 1: Fire Management Units at WRST

According to the AIWFMP, each FMU has specific, predetermined management strategies (or combinations thereof) that consist of the various management options described below. For example, wildland fire for resource benefit will be the pre-planned response for ignitions detected within the Preserve's Limited Protection FMU and in the Modified Protection FMU after the conversion date. These management strategies are summarized by FMU in Table 3.

Table 3: AIWFMP Management Options

Protection Category	Policy	Intent
Critical	• Aggressive suppression of fires within or threatening designated areas. • Highest priority for available resources.	• Prioritize suppression actions for wildland fires threatening human life, inhabited property, and/or other designated structures. • Complete protection of designated sites.
Full	• Aggressive suppression of fires within or threatening designated areas, depending upon availability of resources.	• Protection of uninhabited cultural and historical sites, private property, and high-value natural resources.
Modified	• Fires in designated areas receive initial attack depending on availability of resources, unless land manager chooses otherwise and documents with WFSA. • After designated **conversion date**, operational response to Modified protection zones is identical to that of Limited zones.	• Greater flexibility in selection of suppression strategies when chance of spread is high (e.g., indirect attack). • Reduced commitment of resources when risk is low. • Balancing of acres burned with suppression costs and with accomplishment of resource management objectives.
Limited	• Wildland fires allowed to burn within predetermined areas. • Continued protection of human life and site-specific values. • Surveillance.	• Reduction of long-term costs and risks through reduced frequency of large fires. • Reduction of immediate suppression costs. • Facilitation of bio-diversity and ecological health

Determination of WRST Fire Management Units and their respective policies is based on the proximity of values at risk, the role of fire within the WRST vegetative communities, and overall management objectives, as specified in DO-18. Variables such as fuel type, loading, and moisture level will be considered in the decision-making process for specific incidents, as well as in the writing of individual prescribed fire plans. Predetermined management parameters for FMUs, however, will tend to be based instead on relative risk posed to property or sensitive resources. Table 3 below summarizes the WRST FMUs and possible rationale for FMU determination.

A statewide Multi-Agency Coordination (MAC) group will be convened when necessary (usually when the Alaska Preparedness Level reaches Level 4 or 5) to establish priorities for suppression resource allocation and to determine the need for a temporary change in the selected fire management option identified in the AIWFMP for a specific geographic area(s). Such temporary changes may be implemented during periods of unusual fire conditions (e.g., numerous or unusually large fires, predicted drying trends, problematic smoke dispersal, shortages of suppression resources, unusually wet conditions, etc.). The duration and geographical extent of any such changes will be determined by the MAC group and will be reflected in the Park/Preserve's FMUs, which will be managed accordingly.

Table 4: Integration of DO-18 and AIWFMP

WRST Fire Management Units **(derived from AIWFMP Protection Categories)**	**Possible Rationales for FMU Determination**	Applicable **Management Strategies**
CRITICAL	Presence of permanent residences and valuable cultural resources, including National Historical Landmarks.	Response to Wildfire Prescribed Fire Use
FULL	Presence of private structures and of structures included on the National Register of Historical Places. Proximity to Critical FMU.	Response to Wildfire Prescribed Fire Use
MODIFIED	Proximity to Critical and Full FMUs. Presence of fire-dependent ecosystems. Appropriate balance of cost and control.	Response to Wildfire Prescribed Fire Use
LIMITED	Presence of fire-dependent ecosystems. Relative lack of significant fire-sensitive resources.	Response to Wildfire Prescribed Fire Use

The following discussion presents a detailed description of the four fire management units in WRST. The units are defined primarily by the presence of significant cultural resources and private property, as opposed to being defined by the physical and biotic communities present. As a result, topics such as the historic role of fire in WRST, weather analysis, fire regime and season, and fuel characteristics are discussed not by fire management unit, but for the entire Park/Preserve as a whole

1. Critical Protection Fire Management Unit

Physical Descriptors

The Park/Preserve's Critical Protection FMU consists of three small sub-units in the McCarthy-Kennecott area. The Park/Preserve also contains individual structures designated as Critical Protection sites. Pertinent areas outside of the Park/Preserve include small AIWFMP critical

protection zones along the highways and roads. (Critical protection zones along the Glenn Highway are separated from the Park/Preserve by the Copper River.)

b. Management objectives

In accordance with the AIWFMP, the Division of Forestry and the National Park Service assign the highest priority to the aggressive suppression of ignitions occurring within Critical Protection units and/or sites. The DOF and/or the NPS will respond whenever possible to ignitions within this FMU with an appropriate **response to wildfire**, unless the WRST Agency Administrator requests otherwise. **Prescribed fire** may also be implemented in this FMU, with the Superintendent's approval of a formal prescribed fire plan, for the purpose of preserving and/or restoring fire in its natural role, reducing hazardous fuel accumulations, or restoring historic conditions.

c. Management Constraints

The Preserve will make every reasonable effort to communicate to the public ongoing fire management efforts, fire situation, and socio-political and economic impacts of any fire management activities conducted within this FMU.

Firefighter and public safety will be the number one concern in all fire management activities.

Retardant and heavy equipment (including bulldozers) will not be used without the permission of the Superintendent or delegate, except in life-threatening situations.

Helicopter flight time will be minimized in all possible situations to ensure wilderness concerns are addressed.

Special Concerns

Employees involved in fire management activities will make every effort to avoid disruption of naturally, culturally and/or archeologically significant sites. The WRST Agency Administrator has primary responsibility for ensuring timely consultation with natural and cultural specialists concerning the location and protection of any such sites, which might be impacted by wildland fire or fire management actions. Other sensitive sites will be identified and protected when possible. Personnel participating in detection and/or reconnaissance flights will note any unrecorded structures or sites and report them to the Agency Administrator.

2. Full Protection Fire Management Unit

Physical Descriptors

The Park/Preserve's Full Protection FMU consists of a large contiguous sub-unit in the McCarthy Road corridor (running along the north side of the Chitina River eastward to the communities of Kennecott and McCarthy), large portions of the western portion of the Preserve that are owned by Ahtna, Inc., as well as an additional sub-unit surrounding the community of Chisana and Chisana National Historic District. The Park/Preserve also contains individual structures designated as Full Protection sites. Pertinent areas outside of the Park/Preserve include an AIWFMP full-protection zone straddling the Glenn and Edgerton Highways between Gakona and the confluence of the Chitina and Copper Rivers; a full-protection zone northeast of Noyes

Mountain on the Tetlin Indian Reservation; and two small full-protection zones near the village of Slana. These units, sites, and zones are indicated on the DOF dispatch fire atlas.

b. Management Objectives

The primary objective in the Full Protection FMU is to protect valued resources by minimizing the presence of uncontrolled fire. The DOF and/or the NPS will respond whenever possible to ignitions within this FMU with an appropriate **response to wildfire**, unless the WRST Agency Administrator requests otherwise. An appropriate **limited response to wildfire** may occur within this FMU with the Agency Administrator's concurrence with the DOF FMO on a Decision Criteria record (See AIWFMP). **Prescribed fire** may also be implemented in this FMU, with the Superintendent's approval of a formal prescribed fire plan, for the purpose of preserving and/or restoring fire in its natural role, reducing hazardous fuel accumulations, or restoring historic conditions.

In all cases, fire management strategies for incidents within the Full Protection FMU and/or sites will be aimed primarily at the protection of structures and other valued resources. Mitigation of immediate threats will take precedence, but implementation of alternative strategies aimed at long-term hazard fuels reduction and/or other management goals will also be allowed when deemed appropriate by the Agency Administrator.

Management Constraints

The Park/Preserve will make every reasonable effort to communicate to the public ongoing fire management efforts, fire situation, and socio-political and economic impacts of any fire management activities conducted within this FMU.

Firefighter and public safety will be the number one concern in all fire management activities.

Retardant and heavy equipment (including bulldozers) will not be used without the permission of the Superintendent (or delegate), except in life-threatening situations.

Helicopter flight time will be minimized in all possible situations to ensure wilderness concerns are addressed.

d. Special Concerns

Anyone involved in fire management activities will make every effort to avoid disruption of naturally, culturally and/or archeologically significant sites. The WRST Agency Administrator has primary responsibility for ensuring timely consultation with cultural and natural specialists concerning the location and protection of any such sites that might be impacted by wildland fire or fire management actions. Personnel participating in detection and/or reconnaissance flights will note any unrecorded structures or sites and report them to the Agency Administrator.

3. Modified Protection Fire Management Unit

Physical Descriptors

The Park/Preserve's Modified Protection FMU consists of various sub-units located in the McCarthy corridor; to the south and east of the Glenn Highway; in the Carden Hills area in the northeast corner of the Park/Preserve; and along portions of the Copper and Bremner Rivers to the south of Chitina. Many of these FMU sub-units abut larger AIWFMP modified protection zones located outside of the Park/Preserve.

Management Objectives

The primary objective in the Modified Protection FMU is to achieve an appropriate balance between protection of life and property and cost effectiveness through the implementation of alternative **response to wildfire** strategies. The DOF and/or NPS, in coordination with DOF, will provide initial attack for ignitions detected within the Modified Protection FMU if adequate firefighting resources are available and conversion has not yet occurred. Immediate reduction of acreage burned is less of a priority than in Critical or Full FMUs; accordingly, Incident Managers will consider a wide range of suppression strategies, including containment by natural barriers or indirect use of handline. If initial attack is not successful or a significant increase in suppression resources is required, a Wildland Fire Situation Analysis (WFSA) will be completed to determine the appropriate suppression strategy. This could include a range of responses from increased suppression effort and commitment of suppression resources to removal of suppression resources and monitoring of the fire. An appropriate **limited response to wildfire** is allowed within this FMU with the Agency Administrator's concurrence with the DOF FMO on a Decision Criteria Record (see AIWFMP). Once the Modified Protection FMU has converted, management objectives are identical to those established for the Limited Protection FMU. **Prescribed fire** may also be implemented in this FMU, with the Superintendent's approval of a formal prescribed fire plan, for the purpose of preserving and/or restoring fire in its natural role, reducing hazardous fuel accumulations, or restoring historic conditions.

Management Constraints

The Park/Preserve will make every reasonable effort to communicate to the public the socio-political and economic impacts of any fire management activities conducted within this FMU.

Firefighter and public safety will be the number one concern in all fire management activities.

Retardant and heavy equipment (including bulldozers) will not be used without the permission of the Superintendent (or delegate), except in life-threatening situations.

Helicopter flight time will be minimized in all possible situations to ensure wilderness concerns are addressed.

Special Concerns

Employees involved in fire management activities will make every effort to avoid disruption of naturally, culturally and/or archeologically significant sites. The WRST Agency Administrator has primary responsibility for ensuring timely consultation with natural, cultural, and wilderness specialists concerning the location and protection of any such sites that might be impacted by wildland fire or fire management actions. Personnel participating in detection and/or reconnaissance flights will note any unrecorded structures or sites and report them to the Agency Administrator.

4. Limited Protection Fire Management Unit

Physical Descriptors
The Limited Protection FMU includes all Park/Preserve holdings not contained within the Critical, Full, or Modified FMUs.

Management Objectives
Due to the near absence of values at risk within this unit, most natural ignitions occurring within the Limited Protection FMU will be managed for the purpose of preserving fire within its natural role within the ecosystem. **Prescribed fire** may also be implemented in this FMU, with the Superintendent's approval of a formal prescribed fire plan, for the purpose of preserving and/or restoring fire in its natural role, reducing hazardous fuel accumulations, or restoring historic conditions.

Management Constraints
The Park/Preserve will make every reasonable effort to communicate to the public ongoing fire management efforts, fire situation, and socio-political and economic impacts of any fire management activities conducted within this FMU.

Firefighter and public safety will be the number one concern in all fire management activities.

Retardant and heavy equipment (including bulldozers) will not be used without the permission of the Superintendent (or delegate), except in life-threatening situations.

Helicopter flight time will be minimized in all possible situations to ensure wilderness concerns are addressed.

d. Special Concerns
Employees involved in fire management activities will make every effort to avoid disruption of naturally, culturally and/or archeologically significant sites. The WRST Agency Administrator has primary responsibility for ensuring timely consultation with natural, cultural, and wilderness specialists concerning the location and protection of any such sites that might be impacted by wildland fire or fire management actions. Personnel participating in detection and/or reconnaissance flights will note any unrecorded structures or sites and report them to the Agency Administrator.

D. WRST Physical and Biotic Characteristics

1. Natural Characteristics

The area set aside by Congress as Wrangell-St. Elias National Park and Preserve encompasses 13.2 million acres, the National Park System's largest unit. In conjunction with Canada's Kluane National Park, Glacier Bay National Park, and Tatsheshini Provincial Park, the Park/Preserve comprises the largest parkland in North America and is recognized as a World

Heritage Site. Less than 200 miles east of Anchorage, the Park/Preserve is bordered by two of Alaska's major highways on the west, by the Yukon Territory and the Province of British Columbia on the east, and by the Gulf of Alaska and the Alaskan panhandle to the south and southeast. The Park/Preserve contains vast areas of rugged high mountain terrain, including substantial portions of the Wrangell, St. Elias, Chugach, Mentasta, and Nutzotin ranges. Wrangell-St. Elias contains nine of the 16 highest peaks in the United States. The area's vertical relief is staggering; Mt. St. Elias, for instance, the second tallest peak in the United States at 18,008 feet, sits just 6 miles north of tidewater, and much of the Park/Preserve is covered with perpetual ice and snow or barren rock. Alpine tundra is found at elevations between 3,000 and 5,000 feet. White spruce grow commonly in river bottoms at lower elevations, with the flat and/or rolling terrain surrounding the Wrangells supporting vast expanses of open black spruce forest and shrub thicket, as well as occasional stands of birch, alder, and willow.

The Park/Preserve is home to caribou, moose, brown and black bears, Dall sheep, wolves, lynx, trumpeter swans, Peregrine falcons, bald eagles, marine mammals, several species of fresh water and anadromous fish, and numerous additional bird and small mammal species. Sensitive animal habitat is described in the GMP's accompanying Affected Environment report.

2. Cultural Features

The prehistory and history of the Wrangell-St. Elias National Park & Preserve area includes occupations by Ahtna, Upper Tanana, Eyak, and Tlingit peoples, as well as by non-Native participants in various mining, homesteading, hunting, and trapping activities. There are roughly 745 identified cultural sites recorded thus far for WRST, but only about 2% of the park and preserve has been systematically surveyed to professional archeological standards.

There are currently 429 structural sites in the Fire Management structure sites database, some of which are identified as historic or cultural sites. These contain some combustible structural components, such as cabins, caches, root cellars, outhouses, meat drying racks, blacksmith shops, etc. The remaining sites are prehistoric and historic, containing largely lithic and inorganic materials with little or no combustible components. Numerous large fires were documented through the historic period, though very little is known of the fire history of the Copper Basin prior to European contact. Although many of the historic and prehistoric contain largely incombustible materials, the potential effects of fires on these resources cannot be quantified. Depending on various factors associated with any fire such as intensity, rate and depth of combustion, and surface fuel loads, inorganic historic or prehistoric materials can be detrimentally affected or even destroyed by fires. The **Alaska NPS Structure Protection Procedures** document is included as Appendix J.

3. Non-Federal Land Ownership within the Preserve

At present, approximately 1 million of the Park/Preserve's 13.2 million acres are under non-federal ownership, creating one of the most complex land-ownership patterns in any unit of the National Park System. (See the Land Ownership and Uses section in the General Management Plan's accompanying Land Protection Plan for further discussion of non-federal land ownership within the boundaries of the Park and Preserve.)

Numerous laws have provided for the continued conveyance of lands within the Park/Preserve by native villages and regional corporations, by the state, and by individuals.

4. Ownership of Adjacent Lands

Lands adjacent to WRST fall under the following categories of ownership:

- Public domain (BLM, USFS, USFWS)
- State-owned
- State-selected
- Native-owned land
- Native-selected land
- Canadian public lands (Yukon territorial and British Columbia provincial governments)

(See the WRST GMPs accompanying Land Protection Plan for details on ownership of adjacent lands.)

E. WRST Ecology and Fire

The vegetation of WRST is composed of both circumpolar boreal forest/shrublands and maritime/coastal community types. About 13% of the park is covered by coniferous forest, 2.6% mixed conifer/deciduous forest and 2% deciduous forest. Nearly 19% of the park is classified as shrublands (tall to dwarf shrubs) and 3.6% of the area is classified as herbaceous or graminoid dominated communities. Much of the Park/Preserve is covered with perpetual ice and snow or barren rock, approximately 60% of the 13.2 million acres of the park would be considered unburnable (barren, snow/glaciers, water and sparse vegetation). Land cover percentages were derived from 2009 WRST Detailed Landcover Map (major class types) which was based on Landsat imagery with a 30 meter square resolution (Jorgenson et al. 2009) (See Figure 2).

The major forest cover types of WRST are coniferous forest, consisting predominately of stands of white spruce (*Picea glauca*), black spruce (*Picea mariana*) in the boreal forest areas of the park. While Lutz (*P. xlutzii*) and Sitka spruce (*P. sitchensis*) are found in the more coastal influenced areas. White spruce stands grow commonly in river bottoms at lower elevations, well-drained upland sites and along elevational tree-line sites. The flat and/or rolling terrain surrounding the Wrangell Mountains supports vast expanses of black spruce forest and as well as occasional shrub thickets of birch, alder, and willow. Black spruce generally dominates poorly drained and north-facing sites. There is smaller component of broadleaf forest and mixed deciduous-conifer stands. Deciduous tree species include quaking aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), balsam poplar (*Populus balsamifera*), and needle-leaf tamarack (*Larix laricina*). Woody species in wetter scrub habitats also include two alder species (*Alnus*

spp.*)*, bog birch (*Betula nana*), and many species of willow (*Salix* spp.). Alpine tundra is found at elevations between 3,000 and 5,000 feet.

Chemical composition and vegetation structure make many tree and shrub species in the boreal forest quite flammable. Black spruce is an example of a fire-adapted species (its cones open after fire or prolonged hot and dry periods). Crowberry (*Empetrum nigrum*) and Labrador tea (*Ledum palustre*) burn with great intensity due to the oils contained within the plant (Johnson 1992). See the Fire Monitoring Plan (Appendix G) for more detail on fire effects on vegetation.

Figure 2: General landcover vegetation at WRST

Landcover Major Class	%Land	Acres
Forested		
Needleleaf Forest	12.6	1,658,849
Mixed Forest	2.6	348,328
Broadleaf Forest	1.8	241,046
Shrub		
Tall Shrub	5.0	664,535
Low Shrub	8.5	1,123,264
Dwarf Shrub	5.2	681,145
Herbaceous		
Graminoid Herbaceous	2.4	314,654
Bryoid Herbaceous	0.6	81,495
Forb Herbaceous	0.6	76,519
Non-Burnable/Other		
Snow/Glacier	28.4	3,748,049
Barren	24.8	3,261,736
Sparse	6.2	818,611
Water	0.8	102,755
Unknown	0.4	54,763

1. Fire Behavior Prediction

A. Canadian Forestry Fire Danger Rating System (CFFDRS)

For the purpose of predicting fire behavior, WRST uses the Canadian Forestry Fire Danger Rating System (CFFDRS). A full description can be accessed at http://fire.cfs.nrcan.gc.ca/research/environment/cffdrs/cffdrs_e.htm

Fire Weather Index System (FWI) Uses daily weather observations to estimate the moisture content of three different fuel classes which generate a set (three) of relative indicators of potential rate of fire spread, fire intensity and fuel consumption.

Fine Fuel Moisture Content (FFMC) Represents the moisture of litter and other cured fine fuels in a closed forest stand. Nominal depth of this fuel layer is 1.2cm.

Duff Moisture Code (DMC) Represents the moisture in the loosely compacted decomposing matter on the forest floor. Nominal depth of this fuel layer is approximately 7cm.

Drought Code (DC) Represents the moisture in deep, compact organic matter with a nominal depth of 18cm.

Initial Spread Index (ISI) A combination of wind speed and FFMC; indicator of rate of fire spread.

Build Up Index (BUI) A combination of DMC and DC and is an indicator of the total fuels available for combustion.

Fire Weather Index (FWI) A combination of ISI and BUI and is a relative estimate of potential fire intensity.

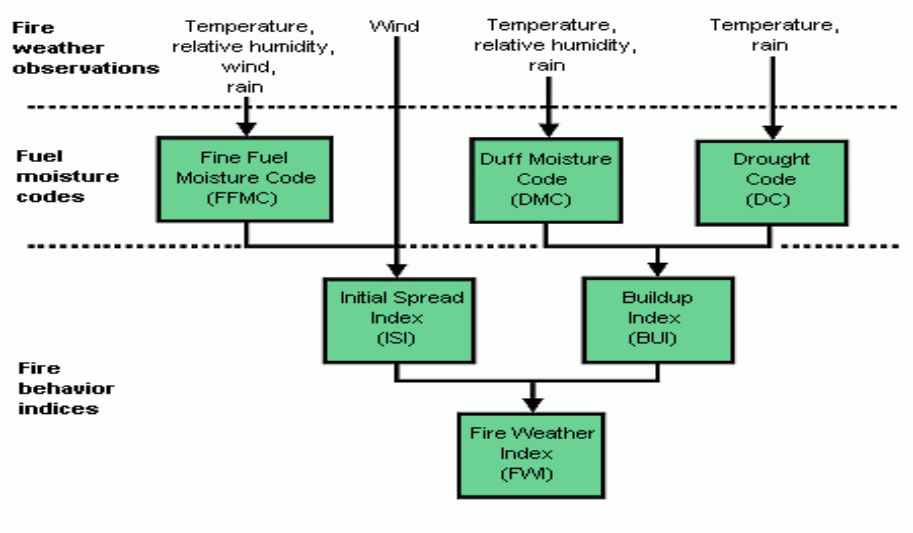

Figure 3: Structure of the Fire Weather Index System

b. Fire Behavior Prediction System (FBP)

Provides a systematic method of assessing fire behavior. FBP has five categories of inputs: fuels, weather, topography, foliar moisture content and type and duration of prediction (See Fig. 4). The four major outputs of the system are Rate of Spread, Head Fire Intensity, Fuel Consumption and Fire Description Code. A full description of the Fire Behavior Prediction System can be located at: http://cwfis.cfs.nrcan.gc.ca/en/background/bi_FBP_summary_e.php

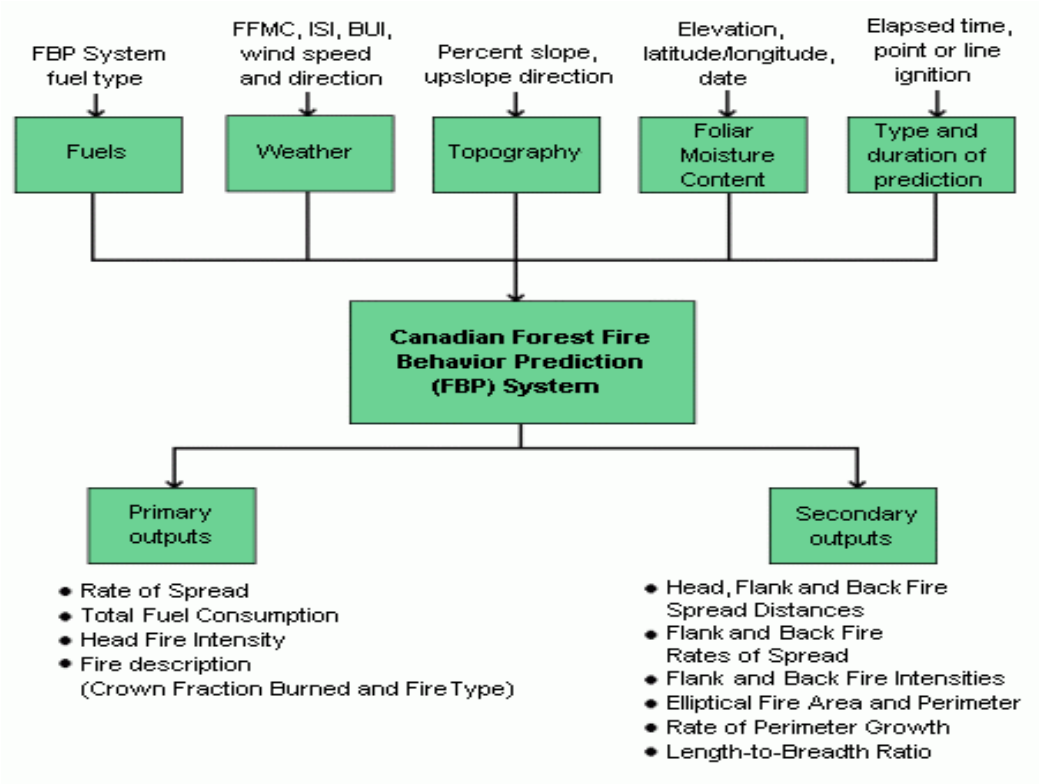

Figure 4: Structure of the Fire Behavior Prediction System

Fire behavior is strongly tied to fuel moisture levels, especially in the duff and moss layer. Those fuels (FFMC and DMC) are relatively quick to change in response to rain and humidity variations. Number of sequential days without rain significantly correlates 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 deep drying into the duff layer (DC), as well as drying of live fuels (Pyne 1984, Johnson 1992). Depth of burn is extremely important in determining resistance to fire control efforts and fire effects on vegetation (Schimmel and Granstrom 1996).

2. Lightning Activity Level (LAL)

Lightning records for WRST are shown in Figure 5. The Lightning Activity Level is a common parameter that is part of fire weather forecasts nationwide. LAL is a measure of the amount of lightning activity using values 1 to 6 where:

LAL 1: No Thunderstorms

LAL 2: Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent. 1 – 8 Lightning strikes every 15 minutes.

LAL 3: Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two or three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent. 9 – 15 Lightning strikes every 15 minutes.

LAL 4: Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent. 16 – 25 Lightning strikes every 15 minutes.

LAL 5: Towering cumulus and thunderstorms are numerous. They cover more than three-tenths of the sky and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense. > 25 Lightning strikes every 15 minutes.

LAL 6: Similar to LAL 3 except thunderstorms are dry

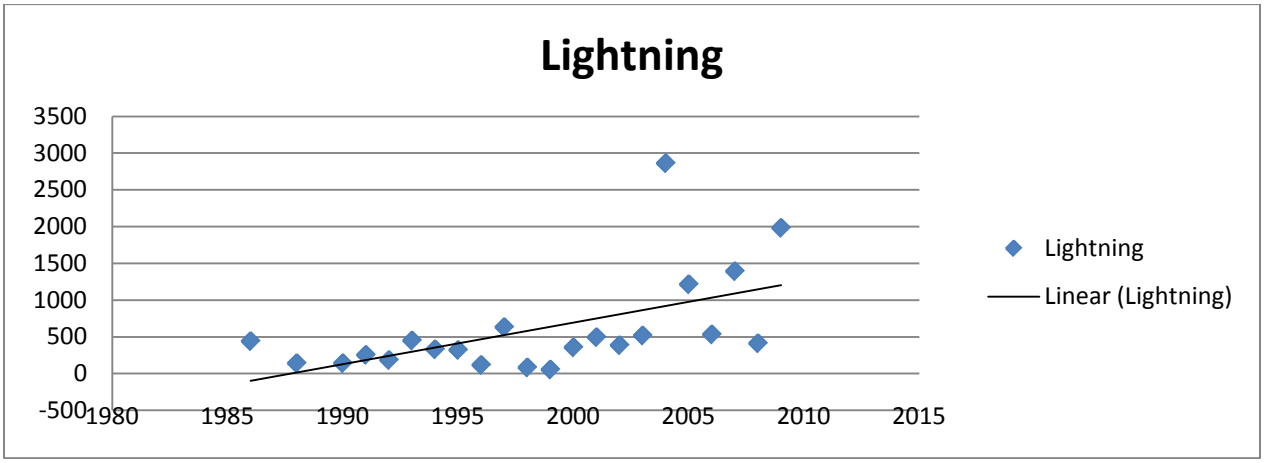

Figure 5: Lightning in WRST 1986-2009

3. Historic Role of Fire at WRST

The natural role of wildland fire at Wrangell-St. Elias varies considerably across the Park/Preserve's geographical zones. Higher elevations lack substantial fuels, and in the coastal areas south of the Bagley Ice Field fire is nearly precluded by high humidity and precipitation. In the boreal communities of the Copper River Basin, however, as elsewhere in the Alaskan interior, fire has been a key component for thousands of years, with periodic fires having served throughout the centuries to select plants and animals that are adapted to fire-caused change. Both black and white spruce depend on intense ground fire to clear organic layers and to thereby expose fertile seedbed. Black spruce, moreover, is at least partially dependent upon stand-replacement fire, in that its seeds become ready for germination at the peak of the Alaskan interior fire season and are released when its semi-serotinous cones are opened by canopy fire. Even more fundamentally, fire plays a key role in the regulation of the permafrost tables. Without periodic fire, organic matter accumulates, the permafrost table rises, and ecosystem productivity declines. Vegetation communities become less diverse and wildlife habitat decreases. Fire rejuvenates and maintains these systems. It removes some of the insulating

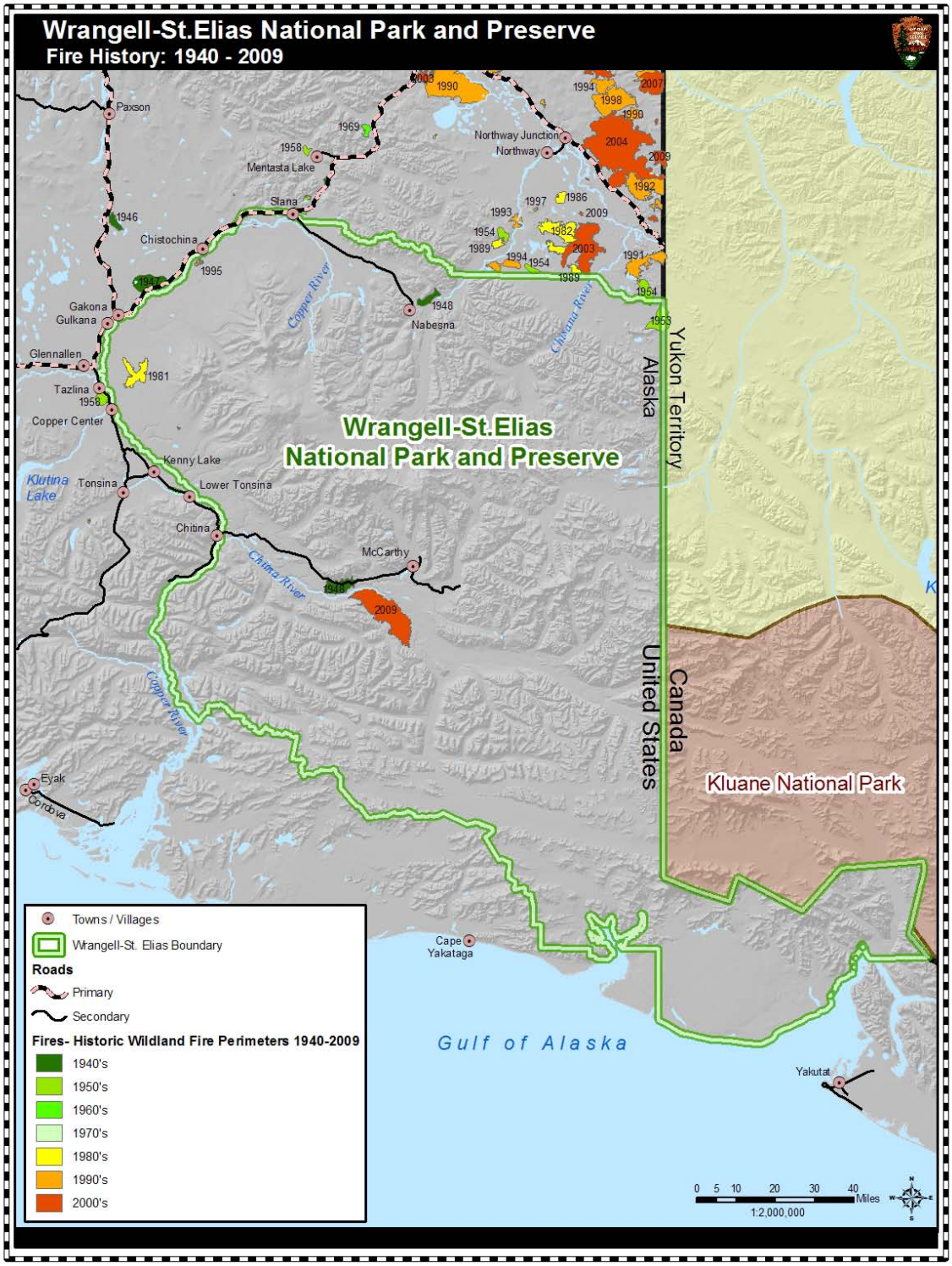

Figure 6: The perimeters of large fires from 1940-2009 in the WRST area. Fires below 100 acres are not shown.

organic matter and elicits a warming of the soil. Nutrients are added both as a result of combustion and through increased decomposition rates.

Intervals between occurrences of wildland fire are longer in the Copper River Basin than in other portions of the Alaskan interior, due largely to the influence of maritime weather patterns upon this transitional region. Nonetheless, periodic fire of considerable size and intensity is the norm in this area, as evidenced by forest mosaic patterns and by local history. The Fire Monitoring Plan in Appendix G provides an overview of various fire record studies in the Copper River Basin. As noted in the Alaska Interagency Fire Management Plan for the Copper Basin Planning Area, the earliest observations by white explorers indicate ample evidence of wildland fires of great magnitude; these wildland fires were attributable to the area's native population, who used fire to enhance hunting, to kill insect pests, and to kill timber for firewood. The writings of Canadian explorers W. H. Davies (1843) and A. P. Low (1896), for instance, contain references to numerous large fires in the area. In his journal of the Copper River Exploring Expedition (1898), William R. Abercrombie describes arriving at Klutina Lake to find "the entire valley…on fire…." Likewise, in reporting on his journey to the Tanana River in 1898, E. F. Glenn writes about discovering a fresh fire scar north of the Tazlina River "which seemed to extend as far as the country is visible toward the Copper River and northward almost to the Alaska Range." The regular occurrence of wildland fires hundreds of thousands of acres in size continued throughout the period of white settlement and into the 1960s, when improvements in communication and equipment dramatically improved the effectiveness of initial attack efforts. This recent exclusion, however, has not been total; within the last thirty years several fires have destroyed structures and/or threatened local communities. In 1981 the Wilson Camp Fire burned 14,890 acres on the west slope of Mt. Drum, growing to 8,000 acres the first day.

Fire records of recent history (1940-2009) indicate that the fire extent in WRST is low, relative to interior areas of Alaska. However, several very large fires occurred in WRST in the early 1900's and the 2009 Chakina Fire burned 56,413 acres, which is more than double the area burned in WRST between 1942 and 2008. A total of 89 fires (average= 1.3 fires/yr) have been recorded in WRST from 1942-2009 with a total of 106,205 acres burned (average = 1,562 acres/year) within WRST (based on combined data of NPS Fires and Wildland Fire History Perimeters – NPS PDS 2009). Figure 6 displays the perimeters of large fires from 1940-2009 in the WRST area. Fires below 100 acres are not shown.

4. Weather Analysis

As noted in the GMP, Wrangell-St. Elias is the only Park/Preserve in Alaska that spans three of the four climatic zones recognized within the state by the National Weather Service: maritime, transitional, and continental climates are all found within the Park/Preserve, with only the arctic zone absent. The mountains of the Park/Preserve serve as a barrier to moist maritime air from the Gulf of Alaska and dry continental air from the interior. As a result, coastal areas such as the community of Yakutat and the Chugach and St. Elias ranges receive extremely heavy precipitation, with sea-level snowfall and rainfall averaging over 130 inches and annual snowfall at higher elevations averaging more than 600 inches. Temperatures along the coast are relatively moderate, with winter lows around 0°F and summer highs in the 70s. The lower elevations of the Copper River Basin are situated in the transitional zone between the maritime and continental climates. Precipitation is much less here, about 10 to 12 inches annually, with about 50 inches of

snow. McCarthy, located up the Chitina River valley, receives about 24 inches of precipitation, with considerably heavier snowfall. The transitional zone grades into the continental zone on the north side of the Wrangell Mountains and Mentasta/Nutzotin Range. These mountains produce a secondary rain shadow, and precipitation drops to about 8 inches a year. The transitional and interior portions of the region are subject to extreme seasonal temperature variations, with lows down to -70°F and highs up to 80F. The high country of the Park/Preserve comprises a land of perpetual winter; snow occurs any time of the year, resulting in extensive snow and ice fields.

The National Park Service maintains Remote Automated Weather Stations (RAWS) at three sites within the Preserve: **Chisana** (at the public airstrip), **May Creek** (at the May Creek administrative site), and **Klawasi** (on the north side of Klawasi Peak). Data from both RAWS sites is available on the Internet through the Alaska Fire Service homepage (go to **fire.ak.blm.gov**. next click **weather**, then **AFS Fire Weather Database**). Records obtained from these RAWS are kept at the Western Region Climatological Center and are used in interagency efforts to monitor fire weather and generate fire weather indices.

5. Fire Season

As explained in the Fortymile Interim Fire Management Plan (1979) the seasonal fire cycle in the Alaskan interior consists of four “micro” seasons or phases, each varying with the changing weather patterns and the stages of vegetation development for the growing season.

The first begins in late April or early May with the loss of snow cover, and ends in late May or early June when green up begins. During the transition from 100% winter-cured fuels to green up, human-caused fires occur frequently; these fires are usually relatively easy to suppress due to high relative humidity recovery at night, cool day and night temperatures, and close proximity to roads, airstrips, and/or navigable water (areas humans are using). Spring fires that are not suppressed, however, often grow later in the season as fuels become dryer.

The second and third fire-cycle phases are primarily lightning driven. Suppression of such fires is harder, because of their occurrence in remote areas where detection and access are more difficult and because in turn more time typically passes between detection and initial attack. Fires occurring in June, the second period, usually do not develop the intensity of later summer fires; during hot, dry, and windy conditions, however, June wildland ignitions can result in extreme fire behavior.

The third period of fire activity begins in mid-July and runs through the first part of August. This is the period of potential maximum fire activity and are the most difficult to extinguish. The usual problems of accessibility and detection can be compounded by increased rates of spread and higher fire intensities if fuels continue to dry due to lack of rain. Even with prompt initial attack, fires are often beyond immediate control by the time forces arrive, and indirect attack is often the only viable suppression strategy.

The final micro-season runs from late August into early September. Hunters and fishermen usually cause ignitions occurring during this period. These fires are generally easy to control except during particularly dry autumn weather.

Seasonal distribution of fire activity in the Park/Preserve's fire-indigenous areas differs from that of other portions of the Alaskan interior, in that a much lower occurrence of lightning-caused ignitions results in a relatively constant rate of overall fire activity for the months of May through September. June exhibits the highest number of starts, accounting for approximately 22% of all ignitions within the peak five-month period. September accounts for the lowest number of starts within the period, at 15.4 %. The number of total starts is usually dramatically lower in April and October.

Within the pertinent areas of the Park/Preserve, the portion of fires attributable to lightning is about 10% of total annual incidents; this percentage remains fairly constant throughout the five-month peak season, with a slight increase in lightning-caused ignitions during the month of July.

Throughout most of the season the highest concentration of ignitions occurs near roads and/or dwellings. An important exception to this pattern is the increase in remote human-caused fires during hunting season in late August and September. (Refer to the Alaska Interagency Fire Management Plan for the Copper Basin Planning Area, 1983, for further statistics on seasonal fire behavior patterns in and around the Park/Preserve.)

6. Fuel Characteristics and Fire Behavior

Fuels in the Park/Preserve's fire-indigenous areas are similar to those found throughout the Alaskan interior and contribute to similar fire behavior and control problems. These areas are typified by complexes of fine fuels, both living and dead, which react rapidly to changes in weather conditions, including relative humidity. Fuel beds are often continuous. Deep organic mats allow fires to be carried beneath the surface, increasing the possibility of holdover fires and the difficulty of mop-up.

Fire behavior is essentially a function of fuel type, fuel loading, fuel moisture content, topography, and local weather conditions. Wrangell-St. Elias National Park and Preserve exhibits three major fire behavior systems of vegetation:

a. Grass

This system is characterized by continuous grass cover, with occasional trees or shrub clumps that do not appreciably affect fire behavior. Two subtypes are found in this system; matted grass common after snowmelt in the spring and standing dead grass common in late summer to early fall. The live to dead ratio and wind speed in grasslands has a pronounced effect on fire spread.

Fire behavior in both grass subtypes is relatively easy to suppress. This fuel type burns during the spring and fall. The burning period is shorter due to less solar radiation and high humidity recovery at night, diurnal effect. The rate of spread can be high in this fuel type but there is limited smoldering and mop-up is relatively easy.

b. Mixed woods

This system is characterized by aspen, willow, cottonwood, birch, and white spruce. On any specific site, individual species can be present or absent from the mixture. Stand mixtures exhibit wide variability in age and stand structure. Two phases associated with the seasonal variation in the flammability of the hardwoods are recognized; the leafless stage occurring during the spring and fall and the green stage during summer.

Rate of spread in both fuel types is weighted according to the proportion of softwood and hardwood components. In areas where the proportion of hardwoods is greater than softwoods, when the deciduous overstory and understory are in leaf, fire spread is greatly reduced with maximum spread rates only 1/5 that of spring or fall fires under similar burning conditions. During spring and fall, when the deciduous overstory and understory are leafless, the leaf litter can burn like the grass models. The diurnal effect shortens the burning period and there is little smoldering. In areas where the proportion of softwoods is greater than hardwoods, the dryness of the organic matte will dictate difficulty of extinguishment. The rate of spread will be relatively slow in these areas unless there is a very large grass component.

c. Conifers

Spruce-Lichen Woodland: This fuel type is characterized by open, park-like black spruce. Stands occupy well-drained upland sites. Forest cover occurs as widely spaced individuals and dense clumps. Tree heights vary considerably, but bole branches (live and dead) uniformly extend to the forest floor and layer development is extensive. Woody surface fuel accumulation is very light and scattered. Shrub cover is exceedingly sparse. The ground surface is fully exposed to the sun and covered by a nearly continuous mat of reindeer lichens, averaging 3-4 cm in depth.

This fuel type may support a high rate of spread but may or may not support a continuous crown fire. Mop-up may be difficult if the organic mat is deep and dry. Fire in this fuel type is relatively easy to control, as the surface fire dominates it.

Boreal Spruce: This fuel type is characterized by pure, moderately well stocked black spruce stands on poorly drained sites. Tree crowns extend to or near the ground and dead branches are typically draped with bearded lichens. The flaky nature of the bark on the lower portion of stem boles is pronounced. Low to moderate volumes of down woody material is present. Labrador tea is often the major shrub component. A carpet of feather mosses and/or ground-dwelling lichens dominates the forest floor. Sphagnum mosses may occasionally be present. A compacted organic layer commonly exceeds a depth of 20-30 cm.

Stand replacement and crown fires dominate fire behavior in this fuel type. At a rate of spread of 10 chains/hour a crown fire may be initiated. It is common to have spotting by aerial firebrands in a crowning spruce fire. Wind is the crucial factor, with spotting often occurring ½ mile ahead of the fire and up to two miles. The carrier fuel is the organic matte that has a tremendous surface-to volume ratio with immediate responses to changes in relative humidity, solar radiation, and wind. Rate of spread is relatively slow and predictable, while intensity is high in surface fuels. Mop-up may be difficult if the organic mat is dry.

7. Historical Alterations of Fuel Regimes

The large-scale alternations to the fuel regimes in the Park/Preserve are the result of fire and spruce bark beetle. There have been minimal large-scale alterations due to humans. Relatively small-scale alterations have occurred surrounding mining camps, inholdings, and within private lands including clear cutting on Native Corporation lands.

8. Control Problems

Control and extinguishment problems are dependent on fuel type, fuel loading, weather, and time of year. Alaska has four distinct periods of fire activity with different control and extinguishment problems associated with each.

a. Spring Green-up

Ignitions during spring green-up are usually wind driven surface fires that are relatively easy to control and extinguish. High winds can cause high rates of spread and control may be more difficult. These fires are mostly limited to fine fuels directly exposed to solar radiation, humidity, wind, and precipitation (i.e. grass). This period is typically from May 15 to June 10.

b. Transitional

Ignitions during this time are typically more difficult to control as hand-constructed firebreaks are likely to be challenged. Water under pressure (i.e. fire pumps with hose lays) and aerial support (i.e. medium helicopter with bucket) may be required for effective action at the fire's head. This period is typically from June 10 to July 10.

c. Cumulative Drought

Initial ignitions during this time and carryover fires from the previous period are most difficult to control and extinguish and may require indirect attack, aerial firing, and the use of natural barriers. Direct attack is rarely possible given the fire's intensity except immediately after ignition and should only be attempted with the utmost caution. Suppression action must be restricted to the flanks and back of the fire. Indirect attack with aerial ignition, if available, may be effective depending on the fire's forward rate of spread. Extinguishment may be difficult particularly in the conifers and mixed woods due to the deep, dry organic matte. This period is typically from July 10 to August 15.

d. Diurnal Effect

Ignitions during this period from August 15 to September 30 are easier to suppress because the reduced daylight allows for relative humidity to recover and shorter burning period. These fires are limited to fine fuels directly exposed to solar radiation (i.e. grass). Smoldering and creeping from large fires from the previous periods may still be evident. This period is typically from August 15 to September 30.

9. Non-Federal Land Ownership within the Park/Preserve

At present, approximately 1 million of the Park/Preserve's 13.2 million acres are under non-federal ownership, creating one of the most complex land-ownership patterns in any unit of the National Park System. (See the Land Ownership and Uses section in the General Management Plan's accompanying Land Protection Plan for further discussion of non-federal land ownership within the boundaries of the Park and Preserve.)

Numerous laws have provided for the continued conveyance of lands within the Park/Preserve by native villages and regional corporations, by the state, and by individuals.

10. Ownership of Adjacent Lands

Lands adjacent to WRST fall under the following categories of ownership:

- Public domain (BLM, USFS, USFWS)
- State-owned
- State-selected
- Native-owned land
- Native-selected land
- Canadian public lands (Yukon territorial and British Columbia provincial governments)

IV. WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS

A. Fire Fighter and Public Safety

All actions defined in the Fire Management Plan will conform to safety policies defined in agency and departmental policy, including, but not limited to: *Interagency Standards for Fire and Aviation Operations* (NFES 2724), *NPS Director's Order 18,* and *NPS Reference Manual 18,* Standards for Operations and safety Chapter 3.

Firefighter and public safety is our first priority. This Fire Management Plan and the activities defined within reflect this commitment. The commitment to and accountability for safety is a joint responsibility of all firefighters, managers and administrators. Individuals must be responsible for their own performance and accountability. Every supervisor, employee and volunteer is responsible for following safe work practices and procedures, as well as identifying and reporting unsafe conditions. All firefighters, fireline supervisors, fire mangers and agency administrators have the responsibility to ensure compliance with established safe firefighting practices.

B. Air Quality and Smoke Management

All fire management actions at WRST will be conducted in full compliance with local, state, and interstate air pollution control regulations as required by the Clean Air Act, 42 U.S.C. 7418. The Alaska Department of Environmental Conservation issues open burning permits; no local or interstate air pollution control regulations exist in Alaska. A Simple Approach Smoke Estimation Model (SASEM) analysis (or equivalent) will be performed prior to all prescribed fires and will be utilized as needed during wildland fires (as determined by the Preserve FMO). During all wildland fire activities smoke will be monitored for trajectory, mixing height, and impact to overall air quality.

C. General Implementation Procedures

1. Wildland Fire Decision Support System (WFDSS)

Beginning in 2009 the National Park Service initiated the WFDSS system in 23 'Pioneer Parks' which includes WRST. WFDSS is a decision support process that will help determine and document management of ignitions which follow current national direction. WFDSS will provide analysis using programs such as Farsite, RERAP and FSpro.

The WRST FMO will ensure that a WFDSS plan is enacted for every wildland fire at WRST. As the WFDSS process is refined, the WFIP and the WFSA will no longer be necessary. For default suppression responses within the Preserve, the WFDSS is satisfied by the dispatch office through its recording of initial detection and determination of the incident location (Fire Report). This will be defined as a Level One Response. Alterative suppression responses (e.g. suppression actions taken in the **Limited** Protection FMU) will be defined as a Level Two or Three Response depending upon complexity. Any response to wildland fire that is for resource benefit will receive decision documentation from the Park Superintendent or delegate.

2. DI-1202

The 1202 is the standard format for submission of fire data. Data is entered at https://www.nifc.blm.gov/cgi/nsdu/FireReporting.cgi. On WRST incidents an initial 1202 will be prepared by the Incident Commander and submitted by DNR. The WRST Fire Management Officer, however, will ensure the preparation and entry of an additional 1202 on behalf of the Preserve. The following items are pertinent to the production of the 1202; the WRST FMO will ensure that these items are retained and filed at the Yukon-Charley/Gates of the Arctic office in Fairbanks.

- Fire number (obtained from dispatch)
- Copy of WFDSS (all stages)
- Resource order forms (NFES 1470)
- Equipment rental or purchase receipts
- Accident and/or injury reports
- Personnel lists (including Emergency Time slips)
- All weather data reports and records
- Situation maps
- Rehabilitation plan

D. Limited Response

1. Rationale

Federal and NPS policy requires that the following elements be in place before **Limited** or **Modified** Management Options are implemented: 1) an approved Fire Management Plan; 2) appropriate environmental/subsistence compliance; 3) pre-established Fire Management Units; 4) prescription for implementation including a natural ignition; and 5) management oversight. As defined in the Department of the Interior's Department Manual, Part 620, Chapter 1, Section 1.3K, the above-mentioned prescriptions will be based on "safety, public health, environmental, geographic, administrative, social or legal considerations." Geography comprises the primary prescriptive variable at WRST; FMUs consist of extensive tracts of fire-dependent ecosystems, with relatively low numbers of resources to be protected.

As specified in the GMP and RMP, the Preserve's resource management objectives include the preservation of fire within its natural role whenever safely possible. Naturally occurring fires that do not threaten life or property offer an opportunity for the accomplishment of this objective; accordingly, wildland may be allowed to burn to accomplish resource benefit. Within the **Limited** and **Modified** Protection FMUs fire often poses little if any threat to sensitive or valued resources. Consequently, the detection of ignitions within this FMU will automatically trigger a limited response unless the Agency Administrator specifies otherwise. Ignitions within the **Modified** (prior to the conversion date) and **Full** Protection FMUs will trigger suppression actions. A full range of options, however, will remain available in these FMUs as an alternative response upon the request of the Agency Administrator.

Selection and formulation of all responses, including **Limited** or **Modified** response to wildfire, will be accomplished through the production of a **Wildland Fire Decisions Support System** (**WFDSS.**)

2. Objectives

The primary objective for **Limited** or **Modified** FMUs at WRST is to maintain the area's bio-diversity through the use of fire (including the naturally occurring spectrum of fire intensities and effects) while also ensuring the safety of life, property, and sensitive resources. Another important objective for wildland fire for resource benefit is the cost-effective reduction of hazard-fuel loads.

3. General Plan

Limited and **Modified** Management Options at WRST are predicated upon the annual establishment and/or adjustment of appropriate boundaries and management options for the Preserve's FMUs. Each winter the WRST FMO will meet with Preserve staff members and fire management personnel from the Alaska DNR to re-evaluate the location and categorization of these units. Final authority for the adjustment of FMUs and/or fire protection categories within the Preserve rests with the WRST Superintendent.

The FMU descriptions contained within this plan specify pre-planned management actions, to be enacted automatically by dispatch. Alternative actions, however, may be considered and/or selected by the Agency Administrator on a case-by-case basis, as determined by current fuel, weather, and fire management conditions and as dictated by NPS policy and the Preserve FMP.

4. Responsibility for Initiation of Decision Process

NPS policy requires that strategies for all wildland fires on NPS lands are selected using the initial stage of the **Wildland Fire Decisions Support System (WFDSS),** a standardized process for determining fire management responses and for documenting the resulting actions and outcomes. Ignitions occurring at WRST trigger pre-planned actions, specified by FMU parameters and implemented by dispatch (and/or the Incident Commander) on the authority of the AIWFMP and the WRST Fire Management Plan. In the case of pre-planned actions the initial WFDSS components are satisfied by dispatch through the recording of the ignition detection and subsequent determination of the incident location. The Preserve's FMU parameters also allow the implementation of *alternative* actions upon selection by the WRST FMO or Agency Administrator, in consultation with Alaska DNR FMO; initial WFDSS components for alternative actions are produced through the WRST FMO or Agency Administrator's completion of a Fire Situation report and preparation and signing of a Decision Criteria checklist.

FMU	Response Strategy (* = pre-planned response)	Required component	Completion timeframe	Responsible party
Critical Protection	Suppression*	Recording of detection & determination of FMU	ASAP	DNR FMO
	Response to Wildfire for Resource Benefit			
Full Protection	Suppression *	Recording of detection & determination of FMU	ASAP	DNR FMO
	Response to Wildfire for Resource Benefit	**Fire Situation** report	ASAP	**WRST FMO / Agency administrator** or DNR FMO
		Decision Criteria checklist	2 hours after detection	
Modified Protection	Suppression * (Before Conversion Date)	Recording of detection & determination of FMU	ASAP	DNR FMO
	Response to Wildfire for Resource Benefit (After Conversion Date)	**Fire Situation** report	ASAP	**WRST FMO / Agency administrator** or DNR FMO
		Decision Criteria checklist	2 hours after detection	
Limited Protection	Suppression	**Fire Situation** report	ASAP	**WRST FMO / Agency administrator** or DNR FMO
		Decision Criteria checklist	2 hours after detection	
	Wildland fire for resource benefit for Resource Benefit *	Recording of detection & determination of FMU	ASAP	DNR FMO

Table 5: Responsibility for Initial WFDSS Components

*Note: Because the **Fire Situation report** is a useful source for the documentation of escalating incidents (i.e. WFDSS tages II and III) it's recommended that the Agency Administrator complete a Fire Situation report even for default responses.*

5. Staffing Requirements for Limited Response

The Preserve has no specific requirements for staffing. Because of the relative scarcity of structures or other sensitive values within portions of the Preserve, most incidents may often be adequately managed through aerial surveillance every few days; as dictated by need other incidents may demand the continuous presence of monitors or fire behavior analysts. The Agency Administrator will make final staffing decisions for all WRST wildland fires managed fully or in part for resource benefit.

6. Monitoring Limited Response

Monitoring procedures at WRST will follow guidelines established by Preserve staff as well as the Alaska Fire Effects Working Group. Monitoring actions conducted at WRST specifically in support of wildland fire for resource benefit incidents will whenever possible include measurement of fuel moisture levels for surface and subsurface fuels (as represented by the surface and subsurface fuel models of the Canadian Forest Fire Danger Rating System, for instance) as well as for traditional fine and heavy fuel models. (Chapter IV Section F part 4)

7. Limited Response Step-up Staffing

Chapter IV Section E part 2

8. Pre-determined Implementation Procedures for Limited Response

The FMU parameters described within this plan (and adjusted annually) comprise the only pre-determined implementation procedures for **Limited Response** at WRST. Wildland Fire Decision documents will be generated in WFDSS by the Eastern Area Fire Management Officer as needed, and provided to the Agency Administrator.

9. Incident-Specific Implementation Procedures for Limited Response

WFDSS is comprised of seven subsections: Information, Situational Analysis, Objectives, Course of Action, Validation, Decision Summary and Periodic Assessments.

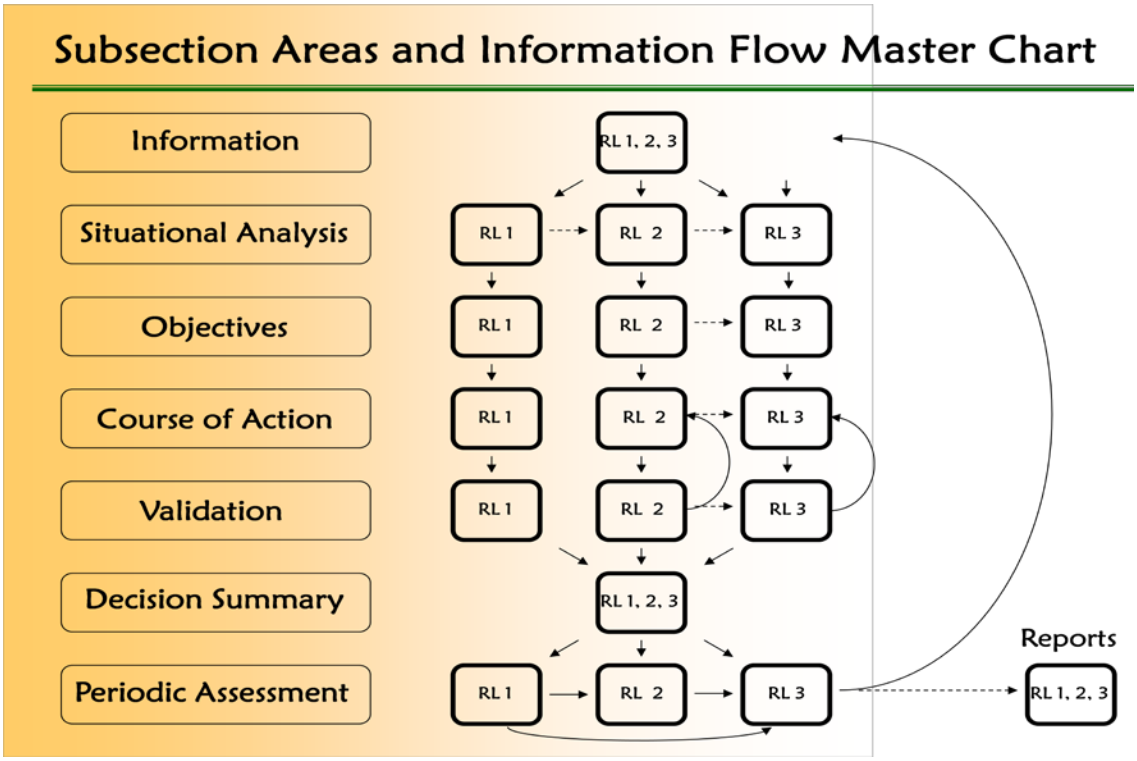

Figure 7: WFDSS Response Levels

Completion of the WFDSS entails three distinct stages depending upon the nature and complexity of the incident. A **Level One Response** is triggered by any wildland fire detection within WRST and consists of the decision making components described above. For simple pre-planned responses, these components alone will satisfy the WFDSS process.

A **Level Two** or **Three Response** will be initiated if the initial response is not successful.

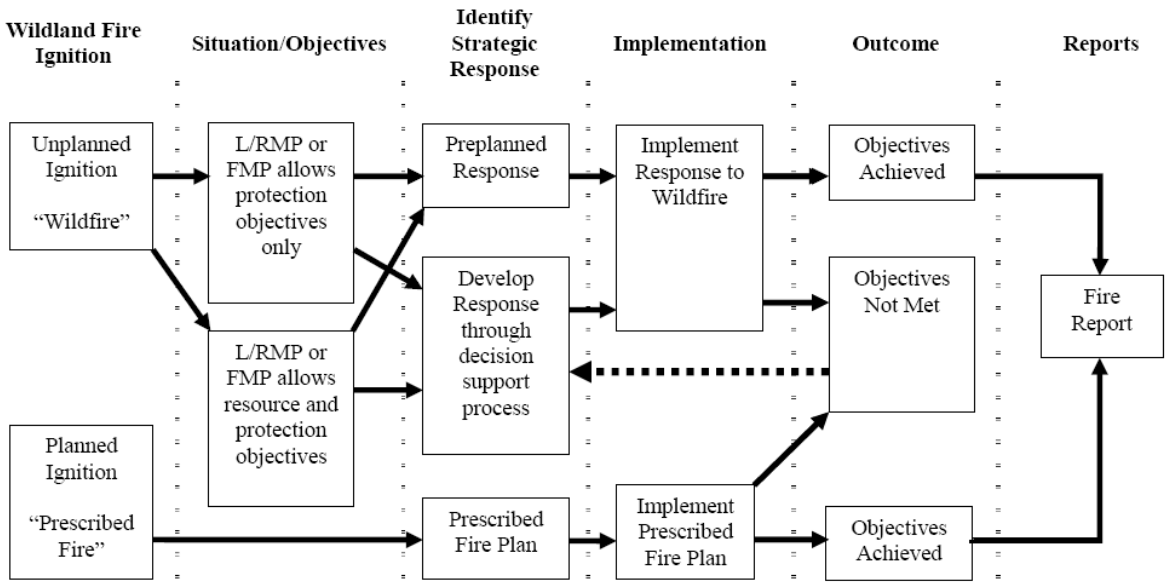

Figure 8: WFDSS Flow Chart

10. Permanent Project Records for Limited Response

The YUCH Fire Management Officer will ensure that a complete project record will be produced and retained for each **Limited Response** incident within WRST.. Each record will contain the following items:

- All approved planning documents guiding management options (WFDSS components).
- Summary of monitoring activities, including monitoring schedule; individual monitoring reports and findings.
- Funding codes and cost accounting.
- Project maps.
- Other information as appropriate (e.g. photo points).

11. Information and Interpretation for Limited and Modified FMUs

The information and interpretation component of the WRST's fire management program is specifically addressed in Chapter IX. The following objectives, however, pertain directly to **Limited Response**:

- When extended **Limited Response** incidents are likely to be visible to visitors, Preserve personnel will prepare and distribute handouts explaining the WRST fire management

program, the nature of the specific incident, and the desirability of preserving the area's natural fire regime.

- An attempt will be made to educate all WRST employees about local fire ecology, the Preserve's fire management objectives, and in-progress fire-use incidents.

- When **Limited Response** incidents occur near frequently used locations, interpreters or other Preserve employees will make periodic visits to answer questions.

12. Potential Impact of Limited or Modified FMUs

In managing **Limited Response** incidents for resource benefit, WRST administrators will take into account both the short and long-term impacts of any such activity upon all facets of Preserve use, including subsistence activity. Although some local residents have expressed concern over the impact of wildland fire upon subsistence hunting and/or trapping operations at WRST, the preservation of the area's fire regime is important to the long-term viability of the Preserve's wildlife populations. Nonetheless, the Agency Administrator will in all cases consider the short-term impact of fire-use actions on subsistence activities.

E. Response To Wildland Fire

Fire behavior in WRST can range from smoldering surface fire in tundra to fast moving ground or canopy fire in surface fuels or spruce stands. For more detailed discussion refer to Fuel Characteristics and Fire Behavior (Chapter III Section E part 6).

1. Preparedness Actions

a. Fire Prevention Actions

- Fire prevention and wildland fire for resource benefit will be discussed at selected staff safety meetings in the early spring to ensure that all personnel are aware of concerns and familiar with procedures for wildland fire, and prescribed fire.

- A brochure discussing campfire use will be included in all correspondence responding to requests for information about the Preserve.

- Preserve personnel will participate in fire prevention and safety fairs at local schools so that the general public is aware of the importance of fire prevention.

- During periods of high danger, the general public and Preserve visitors will be informed of conditions through press releases, interpretive media and, if necessary, the posting of signs at Preserve headquarters, public-use cabins, etc.

b. Staff readiness:

The WRST FMO will oversee the annual certification, training, and evaluation of WRST personnel involved in fire management activities, in accordance with the timetable shown in Table 6:

Table 6: Staff Readiness Timetable

January-February • Annual physical exams completed (for returning employees).
March-April • Fire qualifications updated and entered into Incident Qualifications and Certification System (IQCS). • NWCG courses in Fairbanks for fire crew members.
May • Annual wildland fire refresher training for all red-carded personnel. • Annual pack tests administered, as per NPS-18 standards. • Fire personnel status updated in ROSS
September • Critique fire season (all fire management activities). • Evaluate individual performance of Preserve staff; correct deficiencies and nominate personnel for specific training courses.

c. Program readiness

The WRST FMO will ensure the accomplishment of the following objectives each winter:

- Inventory fire equipment; order needed supplies and update inventory list.
- Review and confirm established Preserve and/or Regional procedures for utilizing fire-related accounts.
- Review and adjust FMU parameters (i.e. AIWFMP protection categories).
- Review and revise WRST Fire Management Plan.

2. Step-up Staffing and Pre-Attack Plan

The WRST fire step up plan will be in operation from approximately May 15th through August 15th every year. During years of unusual drought or wetness, starting and ending dates of the fire step up plan may be adjusted in writing by the WRST FMO and approved by the Superintendent. As required by NPS Reference Manual 18 this plan will be revised on an annual basis. Minor revisions may be made to the plan in writing during the fire season if a revision better meets WRST staffing needs. This need will be determined by the WRST FMO and approved by the superintendent or the Chief of Resources.

The WRST fire step up plan is based on the Fine Fuel Moisture Code in conjunction with the Lightning Activity Level. The FFMC is a component of the CFFDRS and represents the moisture of litter and other cured fine fuels in a closed forest stand. The Lightning Activity Level is the measure of the lightning activity.

FFMC	Fires
Low 0-80	3
Moderate 81-85	3
High 86-88	2
Very High 89-91	4
Extreme 92+	6

Table 7: FFMC Values for Fire Ignitions

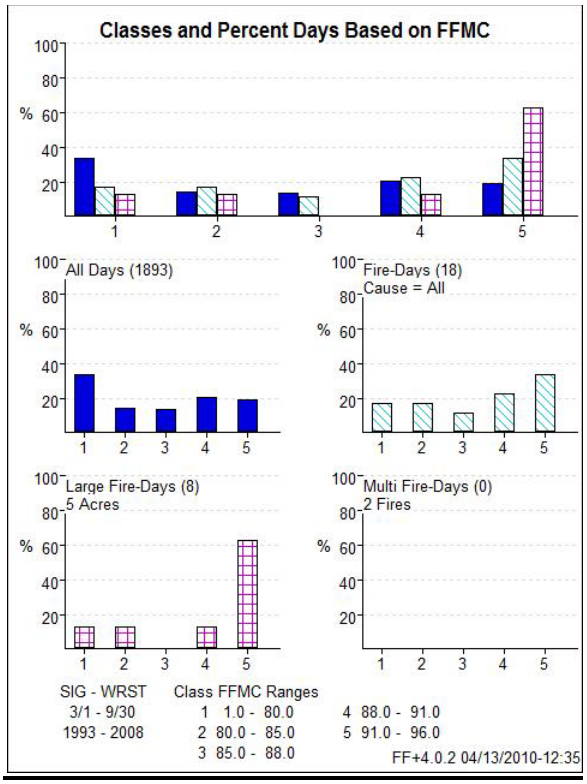

Figure 9: Classes and Percent Days Based on FFMC

The FFMC values in Table 6 will be used for the purpose of defining the Step Up Staffing Level.

The WRST FMO will make sure that the weather (Wx) data is collected and a determination of the staffing level for the next day may be made. At 1400 each day, RAWS data will produce the current FFMC and a predicted FFMC for the following day. The Fire Weather Forecast for Fire Weather Zone 224 will provide the predicted LAL.

The WRST FMO will use Table 7 Complexity Level to evaluate the predicted Fire Indices with the current number of fires. The complexity level is then evaluated against the Preparedness Level Table 8. The generated Preparedness Level is then applied to the appropriate Staffing Level.

Complexity Level:

The WRST FMO and fire staff is responsible for Yukon-Charley Rivers, Wrangell-St. Elias, and Gates of the Arctic National Parks and Preserves. Therefore, the following matrices will be used to assist in the pre-positioning of these personnel.

Fire Indices	0-3 fires	3-6 fires	6+ fires
FFMC 0-80	Low Complexity Level	Low Complexity Level	Low Complexity Level
FFMC 80-85	Low Complexity Level	Low Complexity Level	Moderate Complexity Level
FFMC 86-90 LAL 4, 5 or 6	Low Complexity Level	Moderate Complexity Level	High Complexity Level
FFMC 89-91 LAL 4, 5 or 6	Moderate Complexity Level	High Complexity Level	Very High Complexity Level
FFMC 92+ LAL 4, 5 or 6	High Complexity Level	Very High Complexity Level	Extreme Complexity Level

Table 8: Complexity Level

Number of Current Fires – A measure of complexity due to the number of fires within the park regardless of the FMU that is burning. This is also an indication of suppression or monitoring resource shortages.

Low: Few fires within the Preserve and relatively abundant resources available within the Valdez Copper River Area. May be early or late in the year and fire behavior is reduced and control and extinguishment are relatively easy.

Moderate: Several fires within the Preserve and relatively abundant resources available within the Valdez Copper River Area. Fires are difficult to extinguish and carryover fires are occurring.

High: Several fires within the Preserve and resources are becoming scarce within the Valdez Copper River Area. Fires are difficult to control and extinguish with multiple carryover fires occurring.

Very High: Many fires within the Preserve and resources are becoming scarce within the state of Alaska. Fires are difficult to control and extinguish with multiple carryover fires occurring.

Extreme: Many fires within the Preserve and there are **no** additional resources available within the state of Alaska. Fire activity is beyond the ability to control or mitigate and tactics are strictly point source protection around values at risk.

Preparedness Levels

Values at Risk: These values include life and property including historically significant sites. The low values at risk are those under non-sensitive protection. The medium values at risk are those under full protection. The high values at risk include sites that are under critical protection

	Low Value at Risk	Moderate Value at Risk	High Value at Risk
Low Complexity Level	Low Preparedness Level	Low Preparedness Level	Moderate Preparedness Level
Moderate Complexity Level	Low Preparedness Level	Moderate Preparedness Level	High Preparedness Level
High Complexity Level	Moderate Preparedness Level	High Preparedness Level	Very High Preparedness Level
Very High Complexity Level	High Preparedness Level	High Preparedness Level	Extreme Preparedness Level
Extreme Complexity Level	High Preparedness Level	Very High Preparedness Level	Extreme Preparedness Level

Table 9: Preparedness Level

Staffing Level 1: Low
FFMC 0-80
And

Staffing Level 2 Moderate
FFMC 81-85

Preparedness Level Table 8 has generated a “Moderate” or “Low” rating.

Fire personnel will work normal tour of duty hours and are required to have their fire packs and personal protective equipment immediately available. Fire personnel will monitor pertinent radio channels throughout the day.

A contract helicopter and two fire staff will be available within the state for response. Either Alaska DNR or WRST fire staff will fly surveillance flights at the discretion of the WRST FMO. If the predicted LAL is a 4, 5 or 6 the staffing level may be moved up at the discretion of the WRST FMO (per RM 18)

If a high visitation period is determined to pose exceptional human caused risk of wildland fire, the staffing level may be moved to a level 4 by the WRST FMO (per RM 18)

If a "Red Flag Warning" has been issued by the National Weather Service, the staffing level may be moved to a level 5 by the WRST FMO (per RM 18).

If the Preparedness Level Table 15 generates a "High", "Very High" or "Extreme" rating, the staffing level may be moved up at the discretion of the WRST FMO.

Staffing Level 3: High
FFMC 86-88 and
LAL 4, 5 or 6

Preparedness Level Table 8 has generated a "High" rating.

Fire personnel will status themselves with the WRST FMO by 0900.

Fire personnel will work normal tour of duty hours and are required to have their fire packs and personal protective equipment immediately available. Fire personnel will monitor pertinent radio channels throughout the day.

The contract helicopter and two fire staff will be available within the state for response. Either Alaska DNR or WRST fire staff will fly surveillance flights at a minimum of once per week.

If the predicted LAL is a 4, 5 or 6 the staffing level may be moved up at the discretion of the WRST FMO (per RM 18)

If a high visitation period is determined to pose exceptional human caused risk of wildland fire, the staffing level may be moved to a level 4 by the WRST FMO (per RM 18)

If a "Red Flag Warning" has been issued by the National Weather Service, the staffing level may be moved to a level 5 by the WRST FMO (per RM 18).

Campfires will only be allowed in approved / designated campgrounds or work areas.

If the Preparedness Level Table 8 generates a "Very High" or "Extreme" rating, the staffing level may be moved up at the discretion of the WRST FMO.

Staffing Level 4: Very High
FFMC 89-91 and
LAL 4, 5 or 6

Preparedness Level Table 8 has generated a "Very High" rating.

Fire personnel will status themselves with the WRST FMO by 0900.

Fire personnel will work normal tour of duty hours and are required to have their fire packs and personal protective equipment immediately available. Fire personnel will monitor pertinent radio channels throughout the day. Extended staffing of fire and other preserve red carded personnel will be determined by the WRST FMO by 1600. Extended staffing will generally be until the end of the burning period, but can be modified at the discretion of the WRST FMO. Funding for extended staffing will be established through the appropriate emergency account. Red Carded personnel working extended hours may be required to report to the Alaska DNR helibase by 1645. Personnel will be required to wear fire boots and Nomex and have their fire packs and personal protective equipment with them.

The contract helicopter and two fire staff will be available within the preserve. Alaska DNR FMO will be contacted daily for tactical and resource updates. Either Alaska DNR or WRST fire staff will fly surveillance flights at a minimum of every other day.

If the predicted LAL is a 4, 5 or 6 the staffing level may be moved up at the discretion of the WRST FMO (per RM 18). WRST FMO will contact Alaska DNR FMO to discuss detection flights.

If a high visitation period is determined to pose exceptional human caused risk of wildland fire, the staffing level may be moved to a level 5 by the WRST FMO (per RM 18)

If a "Red Flag Warning" has been issued by the National Weather Service, the staffing level may be moved to a level 5 by the WRST FMO (per RM 18).

Campfires will only be allowed in approved / designated campgrounds or work areas..

If the Preparedness Level Table 8 generates an "Extreme" rating, the staffing level may be moved up at the discretion of the WRST FMO.

Staffing Level 5: Extreme
FFMC 92+ and
LAL 4, 5 or 6
Or
RED FLAG WARNING

Preparedness Level Table 8 has generated an Extreme rating.

Fire personnel will status themselves with the WRST FMO by 0900.

Fire personnel will work normal tour of duty hours and are required to have their fire packs and personal protective equipment immediately available. Fire personnel will monitor pertinent radio channels throughout the day. Extended staffing of fire and other preserve red carded personnel will be determined by the WRST FMO by 1600. Extended staffing will generally be until the end of the burning period, but can be modified at the discretion of the WRST FMO. Funding for extended staffing will be established through the appropriate emergency account.

Red Carded personnel working extended hours may be required to report to the Alaska DNR helibase by 1645. Personnel will be required to wear fire boots and Nomex and have their fire packs and personal protective equipment with them.

The contract helicopter and two fire staff and the FMO (or delegated representative) will be available within the preserve. Alaska DNR FMO will be contacted daily for tactical and resource updates. Either Alaska DNR or WRST fire staff will fly surveillance flights every day.

Fire personnel will generally restrict physical activities to enable rapid response time.

If the predicted LAL is a 4, 5 or 6 the staffing level may be moved up at the discretion of the WRST FMO (per RM 18). WRST FMO will contact Alaska DNR FMO to discuss detection flights.

All open campfires within WRST are banned. Only self contained gas stoves, self contained charcoal barbecues and preserve provided cooking grill will be permitted at designated campgrounds and work areas.

3. Minimum Impact Suppression Tactics

It is the policy of the National Park Service that all fire management activities will be executed using minimum impact suppression guidelines. Accordingly, the following constraints apply to all fire management activity at WRST:

- Use water rather than retardant whenever possible; use of retardant will be used only with the approval of the Superintendent (or delegate), except in life-threatening circumstances. When retardant is necessary, use fugitives if available and avoid as much as possible the use of any retardant in or around lakes or marshes.

- Use cold-trailing or wet-lining techniques when feasible.

- Utilize soaker hoses or foggers in mop-up; avoid “boring” or other scaring hydraulic actions.

- Dozers and other heavy equipment will be used only with the approval of the Superintendent (or delegate), except in life-threatening circumstances.

- Minimize the falling of trees and the cutting of shrubs; limb vegetation adjacent to fireline only as needed to prevent additional fire spread.

4. Rehabilitation

Fire lines will be rehabilitated to stabilize the burn area and to mitigate the effects of suppression activities. The Agency Administrator will ensure that the Incident Commander consults with natural resource managers as needed, regarding any specific rehabilitation needs. When possible, burned areas will be allowed to regenerate naturally.

F. Fuels Management

The fuels management program will implement fire management policies and help achieve resource management and fire management goals as defined in: (1) Federal Wildland Fire Management Policy and Program Review, (2) Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and Sustaining Resource in Fire Adapted Ecosystems- A Cohesive Strategy (USDOI / USDA); and (3) *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan.*

Prescribed fire may be implemented for the accomplishment of certain resource management goals. Because of the relatively undisturbed nature of the WRST ecology, the Park and Preserve does not anticipate implementing landscape-scale burning for the purpose of restoring or preserving the area's indigenous ecosystems. WRST may, however, use prescribed fire for the purposes of restoring historical conditions at selected sites or for reducing hazard fuel loads in the vicinity of valued resources. These uses would facilitate the accomplishment of goals identified in WRST's Resource Management Plan, particularly the stabilization and restoration of historical sites and structures associated with the gold rush.

Currently the Carl Creek prescribed fire is in the planning stages. This is a burn to asses the effect of fire on the graminoid herbaceous and low shrub ecosystem in the Carl Creek drainage east of Chisana. There have been anecdotal reports of shrub encroachment in this area over the last thirty years by a concessionaire that uses the area for stock forage.
Other prescribed fire that may be implemented in the park would be debris removal pile burning in response to mechanical fuels reduction projects.

1. Annual planning

Any implementation of prescribed fire within the Preserve will be predicated upon an annual planning session attended by the WRST FMO or Agency Administrator, the Chief of Resource Management, and any other interested parties. Topics covered in this meeting may include the determination of prescribed burn units; the establishment of prescribed fire objectives; the presence and protection of sensitive resources; the mitigation of smoke management problems; determination of prescriptions and/or burning windows; and the impact of the proposed action on the full spectrum of Preserve uses, including subsistence hunting and trapping.

2. Individual plans

Each implementation of prescribed fire will follow a specific plan prepared by the FMO in accordance with the parameters outlined in Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide, available on the internet as follows: go to http://www.nwcg.gov/branches/ppm/fpc/archives/fire_policy/rx/rxfireguide.pdf

The written plan will be reviewed by the State Historical Preservation Officer for compliance with the National Historic Preservation Act. It will then be reviewed and approved by the Superintendent, in consultation with the Chief of Resource Management. Final authority for the *implementation* of the prescribed fire plan rests with the designated Burn Boss.

3. Staffing

All prescribed fires at WRST will be supervised by a Prescribed Fire Burn Boss (RXB3, RXB2, RXB1) certified by taskbook for the conduction of prescribed fires in appropriate fuel types and at the appropriate level of complexity. Burn bosses for WRST prescribed fires may be obtained from other agencies, provided that designated individuals are certified as such. Prescribed fires at WRST will be staffed exclusively by certified wildland firefighters. Specific operational positions will be filled in accordance with national requirements for training and experience as described in Chapter 6 of the Wildland Fire Policy Implementation Guidelines. The amount and specific nature of resources required for prescribed fire operations will be determined initially by the WRST FMO or Agency Administrator through the preparation of the prescribed fire plan. The designated burn boss, however, is responsible for the tactical implementation of the plan and as such must confirm the adequacy of planned staffing levels prior to ignition.

4. Monitoring

All prescribed fires will be monitored on both a short and long term basis, in order to provide the following types of information: 1) **anticipated fire conditions** (including rate of spread, anticipated weather, threats to resources and/or safety, fuel load, etc.); 2) **observed ambient conditions** (including topographic influences, current weather conditions, drought index, fire and smoke behavior, etc.); and 3) **assessment of post-fire effects** (including fuel reduction, vegetative change, etc.). Collection of all three types of information is necessary in order to help ensure adherence to prescription, accomplishment of management objectives, and establishment of baseline data. Complexity, frequency, and duration of monitoring activity will be dictated by burn objectives and will be specified by the prescribed fire plan. Objectives and guidelines for monitoring procedures at WRST are further specified in Chapter VIII.

5. Documentation

The WRST FMO or Agency Administrator will ensure that each prescribed fire is documented with the following items:

- Approved prescribed fire plan.

- Environmental and cultural compliance documents.
- Map of project and surrounding area.
- Monitoring data (including weather, fire behavior, and fire effects observations).
- Smoke dispersal information.
- DI-1202

6. Reporting Requirements

The FMO will report the intent to conduct a prescribed fire to the AKRO Fire Management Office by 3:00 p.m. the day before a prescribed fire. The FMO will also notify Division of Forestry dispatch and the Alaska Interagency Coordination Center the day prior to the burn and again immediately upon its completion. Each prescribed burn plan will list local entities that will be notified prior to any ignitions.

7. Prescribed Fire Critiques

Immediately following the prescribed burn the Burn Boss will conduct a review of the prescribed burn operation. The review will be attended by the overhead staff, crewmembers, Chief of Resource Management, Resource Specialists, and Fire Management Officer. Items for discussion will include safety, accomplishment of objectives, fire behavior and effects, and effectiveness of operations.

8. Air Quality/Smoke Management

All fire management actions at Wrangell-St. Elias National Park and Preserve will be conducted in full compliance with local, state, and interstate air pollution control regulations as required by the Clean Air Act, 42 U.S.C. 7418. The Alaska Department of Environmental Conservation issues open burning permits; no local or interstate air pollution control regulations exist in Alaska. During all wildland fire for resource benefit activities smoke will be monitored for trajectory, mixing height, and impact to overall air quality.

V. ORGANIZATIONAL AND BUDETARY PARAMETERS

The superintendent or the Chief of Resources is responsible to periodically access and certifies, by signature, that the continued appropriate wildland fire response is acceptable. The superintendent under certain conditions may delegate this responsibility to another organizational level. The preserve superintendent will meet the performance requirements stated in the *Interagency Standards for Fire and Fire Aviation Operations.*

The Preserve FMO will work with the regional FMO to remain current on funding sources and procedures and to ensure that appropriate budget accounts are utilized on WRST incidents.

Guidelines for funding and financial tracking of fire management programs and activities for individual parks are contained within Reference Manual-18. (On the internet go to http://www.nps.gov/fire/download/fir_wil_rm18.pdf ; click on **table of contents**, then click chapter 15 **fire financial program**.

A. Organizational Structure

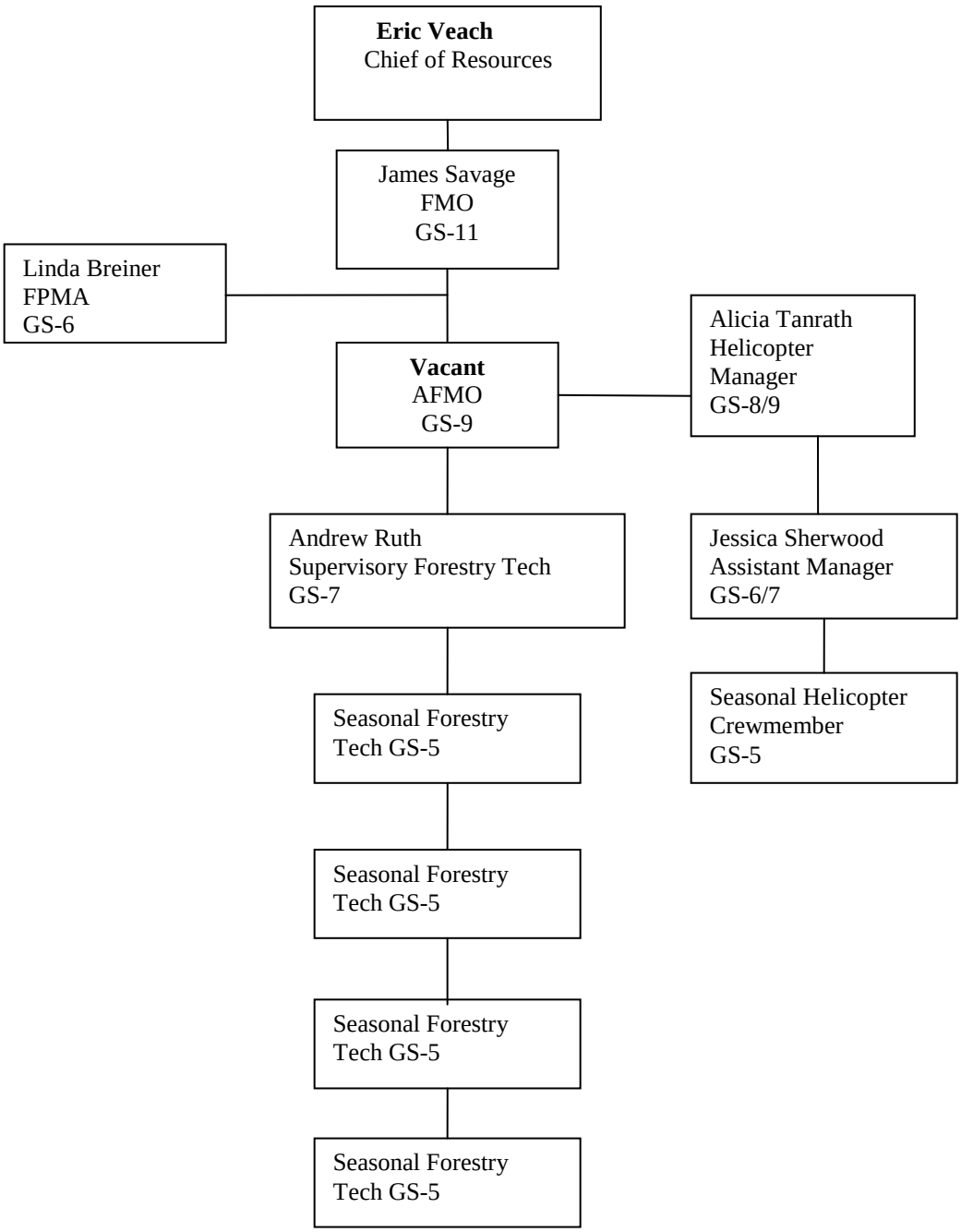

Figure 10: WRST Fire Staff Organization

1. Limited Delegation of Authority for Incident Management Teams

In order to ensure safe and efficient operations, a basic understanding of the cooperative relationship between the Park/Preserve's fire management program and the State of Alaska Division of Forestry is imperative for all Park personnel. As specified in the Statewide Master Agreement, the **Department of Natural Resources Division of Forestry** is responsible for providing fire management suppression services on all wildland fires occurring within the Park and Preserve (Figure 11). The management and staff of **Wrangell-St. Elias National Park and Preserve**, in turn, will ensure that all suppression services contribute to the achievement of the management goals of the Park/Preserve and the National Park Service.

Figure 11: WRST Fire protection organization zones within and around WRST

2. Additional Resources

Wrangell-St. Elias National Park and Preserve may use personnel to assist in information collection above and beyond the information provided by the Alaska Department of Forestry DOF. These personnel may work directly for the WRST FMO or, when an Incident Commander is assigned, directly for the IC. The WRST FMO and the Alaska DNR FMO will work together to determine the chain of command for these individuals.

3. Agency Administrator

An Agency Administrator will be designated for each incident at Wrangell-St. Elias. The Agency Administrator will function as the direct representative of the Park/Preserve Superintendent and as such will be responsible for the identification and accomplishment of WRST and NPS resource management goals. The Agency Administrator will prepare, in consultation with the Alaska DNR FMO, and sign key decision-making and validation documents (WFDSS). The Agency Administrator may also request that additional personnel be ordered to assist specifically with the accomplishment of WRST and/or NPS goals (e.g., resource advisors, monitors, fire behavior analysts, etc.). For most wildland fire activities the WRST Fire Management Officer will assume the role of Agency Administrator.

4. Incident Command Structure

For incidents at Wrangell-St. Elias, resource advisors will report to the Planning Section Chief as per NWCG specifications for Incident Command structure. Other personnel requested specifically to assist with the accomplishment of agency or Park and Preserve resource management goals (e.g. monitors, fire behavior analysts, fire module personnel, etc.) will normally report to the Fire Management Officer. Affected personnel will be briefed on contingent procedures and alternative chain of command for situations in which the WRST FMO is absent from the incident or out of regular contact.

In summary, NPS personnel may participate in fire management operations within the Park/Preserve in two distinct ways:

1. NPS employees may work to help ensure the achievement of Park/Preserve management goals under the supervision of the Fire Management Officer (or the Planning Section Chief, in the case of NPS personnel serving as resource advisors). (For example, an NPS employee working as a monitor in support of the wildland fire for resource benefit validation process would typically report to the FMO; a WRST staff member advising an incident command team on the presence of sensitive resources would report to the Planning Section Chief.)

NPS employees may serve directly with operational forces (or other branches of command) dispatched by the Alaska Interagency Coordination Center, under supervisors provided by the Division of Forestry or ordered through the interagency mobilization system. (For instance, a WRST employee assigned to assist with line construction on a small wildland fire might report

directly to a BLM jumper-in-charge dispatched from Fairbanks or to a Department of Forestry DOF engine foreman dispatched from Tazlina.)

WRST employees dispatched directly by the Park/Preserve may occasionally serve as interim Incident Commanders, as qualified, on WRST incidents. These rare instances will be in consultation with the Alaska DNR FMO. In most cases, however, operations will be conducted from the outset by state-dispatched forces, with WRST managers focusing on the identification and achievement of resource management goals and the conduction of monitoring efforts when necessary.

5. Fire Management Responsibilities for WRST Personnel

In light of the interagency nature of fire management actions at WRST as well as the co-lateral nature of the Park/Preserve's assigned FMO and fire crew, fire management responsibilities for individual Park/Preserve employees are best explained in two steps. All personnel at WRST have predetermined responsibilities within the Park's fire management program; these fixed responsibilities are shown in table 9, below. For specific incidents, however, specific functions will be filled by any one of several appropriate personnel. These incident specific functions, their organizational structure, and lists of personnel who may perform them are shown in Figure 12.

Table 10: Predetermined Fire Management Responsibilities

Position	**Superintendent**
Fire management role	The Superintendent of Wrangell-St. Elias National Park and Preserve is responsible for the planning and direction of all Park/Preserve activities and programs and as such is ultimately responsible for any wildland fire operation at WRST. The Superintendent may, however, choose to delegate any or all fire management responsibilities to appropriate personnel (e.g., Fire Management Officer, Chief Ranger, etc.).
Specific responsibilities	• Approves prescribed fire plans. • Approves use of retardant and/or heavy equipment in non life-threatening wildland fire situations. • Participates in all official fire reviews. • Participates in NWCG functions as qualified. • Approves Limited Delegation of Authority and provides briefing and evaluation of Incident Management Teams. • Signs and/or delegates authority for signature of Wildland Fire Decision Support System documents.
Position	Chief Ranger
Fire management role	The Chief Ranger assists in the development and implementation of key fire management policies and actions.
Specific responsibilities	• Participates in all official fire reviews. • Participates in NWCG functions as qualified.

Position	Fire Management Officer
Fire management role	The FMO oversees and coordinates the Park/Preserve's fire management program. The Park/Preserve's FMO is based in Fairbanks and has responsibility for fire management programs and activities at WRST, YUCH, and GAAR. Responsibilities listed below may be delegated to appropriate personnel (including, typically, the Chief Ranger or Chief of Resource Management, Senior Fire crew Member, and DENA FMO).
Specific responsibilities	• Serves as Agency Administrator for WRST incidents when feasible. • Ensures that WRST Superintendent/staff and key DOF personnel are informed of pertinent conditions and/or situations. • Works with WRST staff and DOF personnel to determine and adjust boundaries and strategies for WRST FMUs. • Prepares Prescribed Fire Plans. • Prepares Mechanical Fuel Reduction Plans. • Represents Region and Park on taskforces and in agency and interagency training. • Ensures the education of Park staff on fire management issues. • Participates in all official fire reviews. • Prepares and maintains fire records and reports. • Prepares funding proposals and manages the Park's fire account. • Manages the Park's fire cache and coordinates acquisition of supplies. • Ensures qualification of staff. • Serves as liaison with regional office staff. • Ensures Federal Fire Policy is followed. • Participates in NWCG functions as qualified.
Position	Chief of Resource Management
Fire management role	The WRST Chief of Resource Management functions as the primary resource advisor for all fire management activities at the Park.
Specific responsibilities	• Assumes function of Agency Administrator in the absence of the WRST FMO from Preserve incidents, *or* delegates this function to WRST Senior Fire-crew Member, DENA FMO, etc., as qualified. • Advises WRST Superintendent on approval of prescribed fire and mechanical reduction plans. • Advises Agency Administrator on wildland fire for resource benefit. • Advises Agency Administrator and Incident Commander/overhead team of location and sensitivity of significant resources during wildland fire incidents. • Participates in all official fire reviews. • Assists with the development of fire management objectives. • Participates in NWCG functions as qualified. •

Position	Fire Prevention/Education/Communications Specialist
Fire management role	The Fire Prevention Specialist is responsible for informing and educating media, visitors, and residents within and around the Park/Preserve about all fire management goals, objectives, and actions.
Specific responsibilities	• Develops and coordinates on-going programs for educating the public about the area's fire ecology and the Park's fire management program. • Develops and coordinates a "step-up staffing plan" for disseminating information during large or complex incidents. • Informs public of current fire situation. • Works as or with the Fire Information Officer. • Participates in NWCG functions as qualified.
Position	Fire Staff
Fire management role	Fire staff is based at Fairbanks but assist with fire management activities at WRST, YUCH, and GAAR.
Specific responsibilities	• May serve as Agency Administrator in the absence of the FMO, as qualified. • Serves as helicopter manager and/or crewmember during fire management and other resource management activities. • Serves as crew boss, etc. as qualified. • Supervises and assists with gathering and processing of data for use in long-term and incident-specific fire management planning. • Plans and implements hazard fuel reduction projects. • Assists with planning and supervision of prescribed fires. • Performs various resource management projects throughout the Park/Preserve. • Participates in NWCG functions as qualified.
Position	Other WRST Employees
Fire management role	Any WRST employee may be assigned to assist with fire management activities as environmental and/or cultural specialists, logistical advisors, firefighters, support personnel, law enforcement officers, etc., depending on qualifications, skills, and regular duties.
Specific responsibilities	• Advising of FMO or Agency Administrator during planning of fire management activities. • Gathering and processing of data for use in long-term and incident-specific fire management planning. • Reports ignitions to the FMO. • Firefighting. • Logistical support. • Law enforcement. • Participate in NWCG functions as qualified.

WRST SUPERINTENDENT

INCIDENT COMMANDER

- Responsible for all fireline operations.
- On complex incidents supervises ops, planning, and logistics sections.

WRST FIRE MANAGEMENT OFFICER

- Cooperates with Incident Commander to accomplish operational and resource management goals.
- May also function as Agency Administrator through delegation of authority.

RESOURCE MANAGEMENT

AGENCY ADMINISTRATOR

- Represents WRST Superintendent to ensure compliance of all incident operations with YUCH and NPS management goals.
- Prepares and signs implementation documents (WFDSS)
- Informs WRST and key Alaska DNR personnel of conditions and developments, in the absence of the WRST FMO.

RESOURCE ADVISOR

- Represents NPS in advisory role with respect to threatened resources and/or resource benefit.
- Reports to Planning Section Chief (on Type I or II incidents) or Incident Commander.
- Ordered by IC or Agency Administrator; filled by appropriate WRST personnel when possible.

FIRE USE MANAGER,
FIRE BEHAVIOR ANALYST,
RX FIRE BEHAVIOR ANALYST,
LONG-TERM ANALYST,
FIRE MONITOR, etc.

- Assist Agency Administrator in planning, implementation, and revalidation of Wildland Fire Use incidents.
- Report to the YUCH FMO if possible, otherwise the IC.

Ordered by Agency Administrator; filled through interagency mobilization system or by qualified WRST personnel

INCIDENT MANAGEMENT

INCIDENT OVERHEAD,
FIREFIGHTERS,
AIR OPS PERSONNEL,
SUPPORT STAFF

- Work under the Incident Commander to implement and/or support fireline operations.
- Ordered by the Incident Commander through the interagency mobilization system; augmented and/or assisted by qualified WRST personnel.

Figure 12: Specific Fire Management Functions at WRST.

B. Relation of Fire Management Program to WRST Organization

As indicated in Section A, the WRST fire management program is coordinated by a co-lateral duty FMO based in Fairbanks, Alaska. With respect to Wrangell-St. Elias fire management issues and activities, however, the FMO reports directly to the WRST Chief of Resources Management.

C. Periodic Assessment of Wildland Fire

The WRST Superintendent is ultimately responsible for the re-certification of wildland fire strategies through signature on periodic assessments.

D. Interagency Coordination

(See Section A.)

E. Interagency Contacts

Pertinent interagency contacts include dispatch personnel at the Alaska Interagency Coordination Center as well as operational and dispatch personnel at the State of Alaska Division of Forestry offices at Tazlina and Tok. Current phone numbers for these positions are listed in Appendix D.1.

F. Fire-Related Agreements

The National Park Service and the State of Alaska Division of Forestry have established a mutual agreement through the Bureau of Land Management concerning the State's provision of suppression services for incidents within Wrangell-St. Elias National Park and Preserve. This agreement is the Reciprocal Fire Protection Agreement between the Bureau of Land Management and the State of Alaska.

G. Reporting of New Ignitions

Whenever possible, WRST personnel should report undetected fire (suspected or confirmed) by phone directly to the local State of Alaska Division of Forestry dispatch center (see appendix D.1 for current phone numbers). During business hours, personnel lacking phone access may report fires by radio to WRST dispatch. Personnel should be prepared to provide as much basic information as possible (e.g. fire size and behavior, fuel type, topography, current weather, probable cause, values at risk, etc.).

H. Limited Delegation of Authority for Incident Management Teams

Type I, II, and III Incident Management Teams ordered for and/or assigned to incidents at Wrangell-St. Elias will operate under a written Limited Delegation of Authority, prepared and signed by the Park Superintendent or designee. The Limited Delegation of Authority will

specify pertinent priorities, concerns, and constraints for the incident in progress and will be treated as Park/Preserve policy until the conclusion of the incident or the Superintendent's amendment of the original Delegation statement through a subsequent signed statement.

VI. MONITORING AND EVALUATION

Wildland fire is integral component of WRST wildlife and plant community dynamics. Accordingly, WRST fire managers require a monitoring program that will help increase understanding of the relationship between fire and other ecosystem components. NPS fire and fuels management decisions need to be ecologically based and supported by scientific information in order to implement an effective and safe adaptive management strategy. Therefore, fire and fuels monitoring programs are an essential component of the fire management program. Monitoring efforts are aimed at providing information to guide management decisions as well as to assess the effectiveness of the Fire Management Program.

The purpose of the Alaska NPS Fire Ecology program is to provide scientific based information to guide Alaska NPS fire and land management planning, decisions and practices to maintain and understand fire adapted ecosystems. The primary focus areas of the program are to:

- Provide effective evaluation of Alaska NPS fire management program activities and fire on the landscape through *monitoring*
- Coordinate *research* and facilitate the use of scientific data, modeling and technology to enhance the fire management program
- Develop strategies to accommodate fire management issues as a result of climate change
- Provide fire ecology *information* and *outreach* to fire managers, other park staff, and the public
- *Collaborate* with other NPS programs, interagency partners, and other entities.

One of the primary tasks of the Fire Ecology program is to develop and implement a comprehensive Fire and Fuels Monitoring program for Alaska's parks. The Regional Fire Ecologist is responsible for coordinating monitoring efforts and maintaining fire effects data. The purpose of the fire and fuels *monitoring program* is to provide effective evaluation of the fire program management activities (wildland fire, prescribed fire or mechanical treatment) with respect to fuels, vegetation, wildlife habitat effects or additional identified objectives. The WRST fire monitoring program is designed to determine whether fire and resource management objectives are being met, as well as to document any unexpected consequences of fire management activities.

A. Past and Ongoing Fire/Fuels Monitoring & Inventories

This section provides a brief description of fire and hazard fuels inventories monitoring conducted by NPS fire and/or resource staff in WRST since its establishment in 1981. More detailed information regarding these projects and protocols can be found in the Fire and Fuels Monitoring Plan in Appendix G. General plot locations are shown in Figure 12.

Fire Effects Paired Plots (1981-Present)
Prior to the 2002 establishment of the Alaska NPS Fire Ecology program, the only formal fire effects study in WRST was the Alaska Region NPS Fire Paired Plot study. The project began in 1981 under the direction of Gary Ahlstrand, NPS Alaska Regional Research Ecologist. The purpose of the project was to assess vegetation change and succession as a result of fire and to determine fire history. Fire staff established paired vegetation 15-m x 30-m plots in burned and representative unburned habitat adjacent to the burned areas of varying ages. Between 1981 and 1988, at least 525 plots were installed across 9 different parks in Alaska. A total of 85 plots were established in WRST. Most of the plot locations were not permanently marked, however at least 8 plots in WRST were permanent. Two of the permanent plots were re-measured in 2006, however due to the low number of plots re-measured, data has not been analyzed. Recently 3 plots have burned in the 2009 Chakina Fire in WRST and will be re-measured to track post-fire succession.

Up until 2008 most of the data was only available in paper format, except for the vegetation cover data was in a TWINSPAN text format. Between 2003 and 2008, paired plot data for all the parks was entered into an Access database and plot locations were digitized off topographic maps and aerial photos. The Access database was converted to FFI V1.02 database through a contract with SEM in 2008. Original copies of data and photos are archived at the Alaska Regional Office and WRST Archives. Scanned copies of data and photos are stored at the regional office and with the Regional Fire Ecologist in Fairbanks.

Data from this project can be used to determine the vegetative and structural components that have changed over time since fire. The data can be utilized to develop fire successional models to update land cover vegetation maps and fuels maps utilized by the fire management program.

WRST Headquarters Hazard Fuels Reduction Monitoring (2009-present)
Wrangell-St. Elias National Park and Preserve (WRST) fire management staff developed a Hazard Fuels Management Plan (Wrangell-St. Elias NPS, 2009) to protect structures as well as the lives of visitors, employees, and firefighters in the event of a wildland fire near WRST Headquarters and Seasonal Housing areas. The main goal of this mechanical thinning project is to provide defensible space near WRST Headquarters and Seasonal Housing areas. The purpose of the monitoring is to document the pre- and post-treatment condition of the vegetation and fuels in the area surrounding headquarters structures and along the headquarters access road. The dominant vegetation types in this area are white spruce and black spruce stands, with a mixed understory of soapberry (*Sheperdia canadensis*), willow (*Salix* spp.), cranberry (*Vaccinium vitis-idaea*) and feathermosses (*Hylocomium splendens, Pleurozium schreberi*).

Monitoring plots were established in 2009, prior to implementation of the fuels treatments. Twelve treatment plots and six control plots were established. Plots will be revisited 1 year post treatment and 5-yrs post treatment. If additional monitoring is needed or desired, the FMO or Chief of Natural Resources will indicate this to the fire ecology program. Plot monitoring will be conducted by Eastern Area Fire Management personnel, with guidance from the Regional Fire Ecologist.

The 2009 data was entered into an interagency Fire Ecology sequel server database called FFI V1.02. Data will be used to provide an adaptive feedback and assess the following aspects of this project:

- evaluate the implementation of the hazard fuels prescription
- monitor the effects of the fuels treatments on vegetation and fuels
- model the effects of the fuels treatment on fire behavior

Susan Smith Fuels Reduction Monitoring (2009-present)

The main goal of this mechanical thinning project was to provide a defensible space on NPS land south and west of the Susan Smith private property. In order to help protect structures from wildland fire, a defensible space will be created and maintained around the park structures and along the headquarters access road by implementing the following fuels treatment:

1) Gradual (phased) reduction of spruce tree density and ladder fuels. The tree density reduction goal of Phase 1 is to thin the forest to spruce crown spacing of 3-5 feet. The ladder fuel reduction goal of the initial phase is to remove ladder fuels to 4 feet of trees left standing after the initial thinning treatment.
2) Reduce dead and down, 100 and 1000 hour woody fuel loading by 50%.

Monitoring plots were established to document the pre- and post-treatment condition of the vegetation and fuels in the area within the thinning treatment and adjacent control areas. This area is predominantly white spruce and black spruce forest types, with a mixed understory of Labrador tea (*Ledum palustre*), *Vaccinium*, willow (*Salix* spp.), alder (*Alnus* spp.) and feathermosses (*Hylocomium splendens, Pleurozium schreberi*).

Monitoring plots were established in 2009, prior to implementation of the fuels treatments. Eleven treatment plots and four control plots were established. All of the plots will be re-visited during the next growing season (~1 year) after fuels treatment implementation. If additional monitoring is needed or desired, the FMO or Chief of Natural Resources will indicate this to the fire ecology program. Plot monitoring will be conducted by Eastern Area Fire Management personnel, with guidance from the Regional Fire Ecologist.

The 2009 data was entered into an interagency Fire Ecology sequel server database called FFI V1.02. Data will be used to provide adaptive feedback on the effectiveness of the project and assess the following aspects of this project:

- Measure tree density reduction to thinning specifications and document trees with notable insects or disease.
- Record down-woody biomass reduction using a modified Brown's transect.
- Provide repeatable photo point documentation of the site.

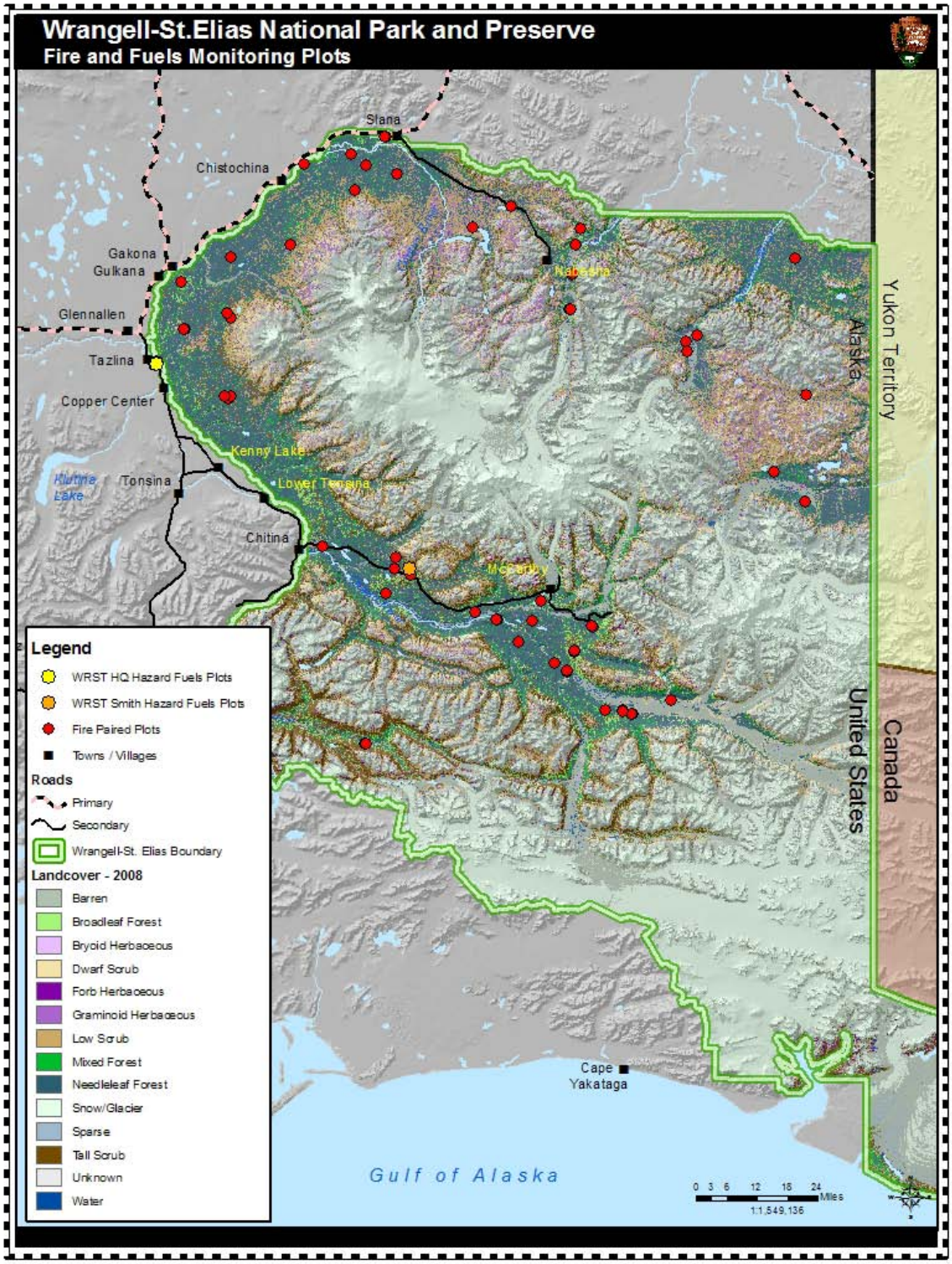

Figure 13: NPS fire effects and hazard fuels monitoring sites 1983-2009 at WRST.

B. Monitoring Plan

A detailed Fire Monitoring Plan for WRST is provided in Appendix G. Guidelines for monitoring wildland fires, prescribed fires and mechanical treatments within WRST were developed in consultation with the Interagency Alaska Fire Effects Task Group (FETG), NPS Fire Monitoring Handbook (FMH 2001), and NPS Alaska Regional Fire Ecologist.

The following are general recommendations for minimum variables to monitor fire or treatment effects within a framework of three monitoring intensities (Level 1 – 3). Brief descriptions of the three monitoring levels are provided below:

Level 1, Surveillance Monitoring - This level provides a basic overview of the baseline data that is required to be collected for all wildland or prescribed fires, some variables are required for mechanical treatments. Information at this level includes such items as RAWS weather data, general description of the fire environment (i.e. topography and fuel types), and fire location or perimeter. Information collected at this level precludes the necessity for on the ground measurements and can be done from remote sensing or an aerial platform. Data necessary to satisfactorily complete a Wildland Fire Report.

Level 2, Moderate Intensity Monitoring - This level of monitoring documents fire behavior observations (not addressed in this document), fuels, and general effects of wildland fires, prescribed fires or mechanical treatments on vegetation. Information at this level includes characteristics of the fire, such as rate of spread, fire behavior, and burn severity, as well as current weather conditions. Fuel conditions would be assessed by determining the fuels array, composition, and dominant vegetation within the burn area, in addition to using vegetation and fuels maps to predict potential fire spread. Information to assess pre and post fire or treatment effects would include duff depth and moisture measurements, photo points, vegetation cover, and tree parameters. This level of monitoring is recommended for wildland wildland fire for resource benefit and prescribed fires, but is dependent on the objectives of the burn and the resources of concern. Some of the variables monitored at this level would require on the ground measurements of specific sites.

Level 3, Comprehensive Monitoring (Short or Long-term Fire Effects) – This level would be used to monitor the effects of prescribed or wildland fires in greater depth, it may also be used for mechanical treatments. Level 3 monitoring requires collecting information on fuel reduction, vegetative changes, and soil parameter changes. This level of monitoring may also include wildlife utilization techniques. The number of variables monitored increases and the techniques are more rigorous. Information collected at this level is based upon management objectives and the resources of concern. Variables monitored at this level would require the establishment of ground based plots.

Fire and mechanical treatment monitoring should be designed to meet the objectives of each project and therefore the components of monitoring should be developed based on the project objectives. Suggested monitoring variables for Level 1 through 3 are provided in Table 10. Level 1 variables are recommended minimums for all wildland fires. The implementation of variables at Level 2 and Level 3 would depend on the objectives of the fire/treatment and the

resources of concern, and would remain up to the discretion of the FMO, fuels specialists, resource staff, and fire ecologist. The difference between Level 2 and Level 3 monitoring will often be the nature of data gathered for the same variable (qualitative vs. quantitative) or the number of plots, which may determine the statistical significance of findings.

Table 11: Recommended Monitoring Variables for the Three Major Fire Management Activities.
R= Required, O= Optional, N/A= Not Applicable

Monitoring Level	Monitoring Variable	Wild Fire	Prescribed Fire	Mechanical Treatment
1	Perimeter (> 100 acre fire) or Point Location	R	R	R
1	Fuel types	R	R	R
1	Site description	R	R	R
1	Weather (RAWS)	R	R	O
1	Fire Danger Indices	R	R	N/A
1	FRCC	R	R	R
1	Burn severity maps (> 300 acres)	R	R	N/A
2	Photos of burn or treatment area	O	O	O
2	Photo Points	O	R	O
2	Fire behavior	O	R	N/A
2	Smoke	O	R	N/A
2	Duff/fuel bed depths	O	O	O
2	Duff moisture	O	O	O
3	Duff consumption (pins)	O	O	N/A
2	Burn severity assessment	O	O	N/A
2	Vegetation class (pre & post)	O	O	O
2	Vegetation cover/ composition (Level 2 - quantitative)	O	O	O
2	Tree density by species and size class	O	O	O
2	Tree canopy cover	O	O	O
3	Tree heights, diameters	O	O	O
3	Ladder fuel heights	O	O	O
3	Active layer depth	O	O	O
3	Soil parameters	O	O	O
3	Tree ring disks/cores	O	O	O
3	Shrub or species specific densities	O	O	O
3	Coarse woody debris (Brown's transects)	O	O	O
3	Herbivory	O	O	O

VII. FIRE RESEARCH

The implementation of the WRST Fire Management Plan will not be predicated upon the prior completion of fire research. Whenever possible, however, fire management actions at the park will incorporate and facilitate research activities designed to increase understanding of local fire ecology and effects.

A. Summary of Existing Fire Research

Some of the studies described in the monitoring section of this document could also be considered fire research. Additional research studies pertaining to WRST are described below.

Future Fire Regime and Climate Modeling
A CESU agreement was developed with Dr. Scott Rupp at the University of Alaska-Fairbanks to assess how different climate scenarios may impact the fire regimes and vegetation within several parks over the next 100 years. The landscape dynamics model, Boreal ALFRESCO, will be used to simulate the potential response of vegetation and fire regimes to likely scenarios of future climate change using IPCC models. Results of this study will be presented to Park Service personnel and a final report will prepared in 2010. The following parks were selected for analysis: Denali, Yukon-Charley Rivers, Gates of the Arctic, Bering Land Bridge, and Wrangell-St. Elias.

Refinement and Development of Fire Management Decision Support Models Through Field Assessment of Relationships Among Stand Characteristics, Fire Behavior and Burn Severity.
JFSP Project # 04-2-1-96

This study was conducted as part of Joint Fire Science Program project funded in 2004 and completed in 2007. A final report has been submitted by Ann E. Camp (P.I.) – Yale University, Philip N. Omi (P.I.) – Colorado State University, Mary Huffman – Colorado State University, and James B. Cronan - Yale University. The study is prepared in two parts. Part I was conducted by Yale University and investigates the relationship between stand age and fire behavior in black spruce forests of interior Alaska. Part II was conducted by Colorado State University and examines the utility of two fire behavior prediction models, BehavePlus and the Canadian Forest Fire Danger Rating System's (CFFDRS) Fire Behavior Prediction (FBP) System, in the boreal forests of Alaska. Videography was used to sample fire behavior on six wildland fires in black spruce forests of Interior Alaska. Some of the study sites were conducted near YUCH, along the Taylor Highway. Information gained from this study should inform fire management on fire behavior in black spruce and the relationship to stand age and flammability. The final report is available at the following web site: http://www.firescience.gov/projects/04-2-1-96/project/04-2-1-96_final_report.pdf

B. Fire Research Needs

Specific goals for present and future monitoring and research studies specific to WRST include the following:

- Facilitate the prediction of fire behavior and fire effects at Wrangell-St. Elias through the establishment of vegetation and/or soils plots in front of the line of fire and the evaluation of severity and pattern of fire after burn-over.

- Create and update fuels maps.

- Determine the applicability and effectiveness of the Canadian Forest Fire Danger Rating System to Wrangell-St. Elias monitoring operations.

- Determine the effects of fire on known archeological sites and cultural landscapes.

- Use existing and establish new snow courses in association with RAWS sites to evaluate effect of snow levels on fire behavior; utilize RAWS sites to determine duff moisture content during fire season in order to better predict fire intensity.

- Determine the cumulative effects of fire on subsistence activities dependent upon wildlife distributions and other resources.

- Determine the impacts of potential climate change on fuels, fire risk and potential impacts on insect outbreaks such as spruce bark beetle.

VIII. PUBLIC SAFETY

Safety Issues at WRST

Fire management safety concerns at Wrangell-St. Elias include threats posed by fire and smoke to visitors, local residents, employees and wildland firefighters including reduced visibility on roads and falling trees.

B Mitigation of Safety Issues

Operational safety

All personnel engaged in fire management activities within the park/preserve will remain aware of the standard fire orders and "situations that shout watch out"; each employee will work to ensure constant implementation of LCES (effective use of lookouts, communication, escape routes, and safety zones). All personnel will be qualified by NWCG standards in all positions they hold; and will wear the proper personal protective equipment.

Visitor safety

Visitor use will not be allowed near fire perimeters. An attempt will be made to inform all visitors of any known wildland fire activity within the Park and Preserve, and signs will be posted on nearby roads and departure points if smoke produced during wildland and prescribed fire creates a safety concern. The Superintendent may initiate a temporary closure of some or all of the Park and Preserve if large or erratic fire behavior endangers visitor and employee safety to a significant degree. Closure may include air space.

3. Evacuation procedures

The Alaska Division of Emergency Services has developed a set of standard procedures for the evacuation of personnel and/or public due to risks posed by fire and/or smoke. Either the WRST Superintendent or the WRST Agency Administrator may request that the Alaska Division of Emergency Services implement these evacuation procedures for the Park/Preserve or for adjacent communities.

IX. PUBLIC INFORMATION AND EDUCATION

Wrangell-St. Elias National Park and Preserve is committed to providing pro-active and coordinated fire communication and education to target audiences (listed below). Park staff, Eastern Area Fire Management Program, the Regional Fire Communication and Education Program (RFC&E) and the Regional Fire Management Program, in concert will fulfill the plan outlined below in order to increase internal and external awareness and support. Fire management spans a broad spectrum of programmatic areas including operations, ecology, prevention, GIS, predictive services, fuels, leadership, etc. Based on evolving programs and situations, the park can determine the focus area as appropriate.

Vision
Recognition, acceptance, and support of the role of fire in ecosystems and the management of fire and fuels in the National Park Service (NPS).

Mission
To pro-actively support the Alaska NPS Wildland Fire Management Program through a comprehensive communication and education program that emphasizes wildland fire management and the role of fire in ecosystems.

Goals
- Internal and external audiences understand and support the role of fire in ecosystems and the management of fuels and fire.
- As an integral part of the NPS, the Alaska Fire Management Program collaborates with all disciplines.
- Provide accurate and timely fire information for local, regional, and national fire operations as needed.
- Coordinate and collaborate with stakeholders, partners and peers for maximum efficiency and effect.
- Facilitate an effective, two-way dialogue about fire in national parks in order to build trust and understanding with internal and external audiences.

Guiding Documents
- The *NPS Wildland Fire Management Strategic Plan* represents input from all levels and disciplines within the NPS Wildland Fire Management Program, from parks to the national office, as well as the NPS Natural Resource Program and our interagency partners. It is intended to establish key strategies that should be applied at all levels of the NPS Wildland Fire Management Program to achieve critical management objectives in support of the mission. View the plan at http://www.nps.gov/fire/download/fir_wil_strategic_plan_2008-2012.pdf.
- The *NPS Wildland Fire Management Communication Plan.* The NPS Division of Fire and Aviation Management has developed a communications initiative to reach internal and external audiences with a clear, consistent message about the role of wildland fire management in NPS units and surrounding communities. The purpose of this initiative is to reinforce the National Park Service's position as a resource for fire management information and to inform internal and external audiences about the role of wildland fire and the role of

NPS Fire and Aviation in managing it. A subsequent goal is to reinforce the cultural significance of the NPS and its historical leadership in land management. View this plan at http://inside.nps.gov/waso/custommenu.cfm?lv=3&prg=777&id=8080.

- The draft *Alaska Region Fire Communication Strategy and Guide* introduces the duties and responsibilities of the NPS Alaska Regional PIO and is located at www.nps.gov/akso/Fire/firehome.htm.
- NPS *Social Media Handbook*. The National Park Service, Alaska Region (NPS-AKR) Social Media Handbook provides guidance to parks and programs in the use of Social web including multimedia sharing websites, blogs and microblogs, social networking websites, document sharing repositiitories and third party widgets. The handbook describes many types of technologies but does not provide an endorsement for their usage. Available on the NPS Sharepoint site at http://inpakroms16sp:37964/AKRWM/Shared%20Documents/Forms/AllItems.aspx.

The *Wrangell-St. Elias National Park and Preserve* Fire Communication and Education (FC&E) Program, while tailored to the local level, complements the aforementioned plans in its vision, mission, and goals.

Other Important Fire Information References

While these documents provide the philosophy and general direction for the FC&E Program, there are two other important references for fire information work. Specific operational procedures (checklists, fax numbers, email lists, community contacts, etc are outlined in Standard Operating Procedures: Fire Communication and Education. The Information Officer Step-Up-Plan, (found in appendix G) provides Public Information Officer (PIO) recommendations during a park fire incident.

Staffing

The RFC&E Specialist steers the Alaska NPS Fire Communication and Education Program and serves as a resource to parks by coordinating all matters related to the program. The specialist assists parks in using ongoing communication and education strategies, consultation and collaboration to enhance fire management programs. When a fire incident occurs, regardless of the different scenarios that might unfold, the Eastern Area Fire Management Officer will contact the designated park Public Information Officer (PIO) and the RFC&E Specialist. The RFC&E Specialist then collaborates with the park's PIO through the duration of the incident. If the need arises, the PIO and/or the RFC&E Specialist will recruit personnel for specific duties or outside resources will be requested through dispatch procedures. For further information, review the Information Officer Step-Up Plan (found in appendix G). Park staff and Alaska NPS Regional and Eastern Area Fire Management Program staff actively participates in and supports the FC&E program.

If an incident management team deploys to manage a fire that affects Wrangell-St. Elias *National Park and Preserve*, park staff will interact with and support the team's PIO. Park staff and/ or the RFC&E specialist will share NPS messages with the IMT team for inclusion into information dissemination. The Interagency Master Agreement and Interagency Operating Plan and subsequent delegation of authority address specific IMT team procedures.

Key Messages

The cornerstone of any communication effort is a set of consistent, compelling messages for use in all proactive and reactive communication. Messages should be actionable where appropriate so that, in addition to educating, they will motivate the audiences to act on what they have learned. They help the communicator move beyond the facts and tell the fire story. Refer to the NPS Wildland Fire Key Messages tip card for tips on how to tell the story (what, why, and how). The card is located on the NPS SharePoint site at http://npsfamshare/commed/default.aspx.

Key messages are general concepts that can be incorporated into discussions, print materials, and other resources used in communication, education, information, and prevention efforts. Key messages are umbrella statements that require additional supporting points and examples for context. These messages are not meant as a script; however they are intended to provide a foundation for crafting comments in response to inquiries from the public and media. It may also be helpful to review the National Interagency Fire Center (NIFC) themes, as these messages are updated on an annual basis to include pertinent, emerging topics. These themes are part of the PIO toolkit and can be located at http://www.nifc.gov/PIO_bb.html.

The NPS Wildland Fire Management Program key messages are listed below. Details on the messages can be found in the NPS Wildland Fire Management Communication Plan. These messages and the Alaska wildland fire key messages are designed to meet the following criteria:

- **Coincide with *and not contradict* interagency messages.** It is critical that the wildland fire community speak with one voice to the public. The NPS wildland fire messages are designed to complement the interagency messages. The NPS wildland fire messages also are designed to be fluid. These messages do not address specific policy issues. NPS staff will rely on policy-related messages as they are revised.
- **Allow for customization.** These messages are a guide, not a script. Users are encouraged to provide additional, local detail to ensure the messages touch audiences in a relevant, credible way.
- **Include a call to action.** In addition to educating, messages should motivate the audiences to act on what they have learned.
- **Answer the questions what, why, and how.** Categorizing messages in this way will help users recall the messages during appropriate situations.

NPS Wildland Fire Key Messages

What
1. The NPS is a leader in the wildland fire community.
2. The NPS Wildland Fire Management Program is committed to safety, science, and stewardship.

Why
3. Wildland fire is an essential, natural process.
4. *Science tells the story:* Today's environment includes hotter, drier, and longer fire seasons. Research also indicates poor ecosystem health and an increasing number of homes in fire prone areas.

How
5. The NPS works with our neighbors and other partners to preserve and protect park resources and mitigate wildfire risk in the wildland-urban interface (WUI).

The Alaska Wildland Fire Coordinating Group, Wildland Fire Education and Prevention Committee developed Alaska interagency key messages and can be viewed at http://fire.ak.blm.gov/administration/awfcg.php

Alaska Key Messages

1. Public and firefighter safety is our first priority.
2. Wildland fire happens, be ready.
3. Wildland fire is an essential, natural process.
4. Alaskans work together to manage wildland fire.
5. Managing wildland fire in Alaska balances risks and benefits in an ever changing environment.

Wrangell-St. Elias National Park and Preserve will provide supporting points and highlight pertinent key messages on an incident-specific basis depending on the details of the fire and the communities affected.

Target Audiences

The park has identified eleven target audiences for fire key messages.

1. **Park Visitors** – In-park visitors and special groups
2. **Virtual Visitors** – Website visitors and those who utilize social web such as Twitter for information sharing
3. **Park Employees** - NPS, Alaska Geographic, concessions, and volunteers
4. **Local Communities** – Residents and property owners, local and tribal government, businesses, and special interests such as city councils or advocacy groups
5. **Student/Teachers** – K-12 students and teachers, college/graduate school students, and elder hostel groups
6. **Professional Peers/Partners –** Federal, state and local agencies, professional associations, and academics
7. **Special Interest and Tourism Related Groups**
8. **Commercial Use Authorizations –** Businesses that operate in the park such as flight services, guide services, hunt transporters, bear-viewing operations and boat charters
9. **Elected Officials** – Federal, state and local
10. **Media** – Print, television, radio, film, and web-based news publications
11. **Incident Management Teams (IMT)** – Type 1, 2, and 3 IMT teams that may be from Alaska or the Lower 48

Communication Methods

The following methods will be used to communicate with the target audiences listed above. There are both personal and non-personal methods which will facilitate reaching the largest number of people. The park will continue to improve and expand this list.

Personal

1. **Interpretive Programs** – Park staff will integrate fire messages into the variety of programs offered by the interpretative division.
2. **Education Programs** – Park staff, Regional and Eastern Area Fire Management staff will incorporate fire ecology concepts into curriculum-based education programs, student field research experiences and in-class programs.

3. **Employee Training** – Eastern Area Fire Management Program and park staff will coordinate employee training sessions to improve staff understanding of the fire management program.
4. **Presentations** – Regional and Eastern Area Fire Management staff will give peer presentations at conferences about current fire research, planning, or operations.
5. **Special Events** – Park staff, Regional and Eastern Area Fire Management staff will participate in local events (festivals, July 4th celebrations) to promote the fire management program.
6. **Public Meetings** – As needed, regional and Eastern Area Fire Management staff will conduct special public meetings related to a specific fire event, planning effort or to share general program information.
7. **Workshops** – With help from interagency and educational partners, RFC&E Specialist and the park staff will offer in teacher workshops that incorporate fire ecology and management issues. Regional and Eastern Area Fire Management staff and park staff will participate as needed.
8. **Media Interviews** – Park PIO and/or RFC&E Specialist will complete in-person or phone interviews for print, radio, and television outlets. When necessary the RFC&E Specialist will facilitate special media projects (books, documentaries etc.) by guiding research, scheduling interviews with appropriate staff, and coordinating filming schedules.
9. **Fire Interest List** – RFC&E Specialist maintains a listserv of individuals interested in receiving e-mails on all aspects of wildland fire.
10. **Recorded Phone Message** – Park PIO and/or RFC&E Specialist will maintain a recorded "Fire Information" message.
11. **Social Web** – Currently, Twitter is the main Social web tool utilized by parks in Alaska. Park PIO (or designee) will update the WRST Twitter pages (BeringLandNPS, CKrusensternNPS, KobukValleyNPS, and NoatakNPS) as necessary and the RFC&E Specialist will update the Alaska NPS Twitter page. Maintained year-round, these "tweets" will serve as brief updates on park information including fire. The RFC&E will coordinate with the park designee to disseminate information as necessary. This method of communication is two-way, allowing both the park and the public to make comments on the park page and providing the opportunity for the park to respond.
12. **Annual Operating Plan** – Currently a draft plan, this document can be reviewed in the spring to help inform park staff of expected fire management operations. It will help define the role of information during the fire season and the collaboration between jurisdictional and suppression agencies. A final version will be complete in late 2010.

Non-Personal

1. **Webpage** – Park staff will maintain a fire management webpage that is linked to the main park webpage. RFC&E Specialist can assist as needed.
2. **Fire News, Inciweb** – Eastern Area Fire Management staff, park PIO, and/or park staff with support from RFC&E Specialist will update Fire News throughout the duration of an incident. Update InciWeb as an incident warrants.
3. **AK 2day and Inside NPS** - Park PIO and/or RFC&E Specialist will submit information regarding fire management activities on these internal websites.

4. **Press Releases/ Updates –** Park PIO and/or RFC&E Specialist will use email, fax, and bulletin boards to distribute press releases/updates, photos and public fire maps for all target audiences as needed.
5. **Public Fire Maps –** Eastern Area Fire Management staff will produce internal and external fire incident maps. Regional Fire staff may provide some assistance.
6. **Press Kit –** RFC&E Specialist and park PIO will compile and annually update a fire information press kit.
7. **Fire Education Trunks –** RFC&E Specialist will supply the park with fire educational materials. Park staff, with assistance from the RFC&E Specialist, will resupply the materials as needed.
8. **Visitor Center Exhibits, Wayside Exhibits, Bulletin Boards, and Displays –** Park staff will maintain and update the interpretive information in visitor centers and wayside exhibits on fire management. RFC&E Specialist will provide support as needed.
9. **Portable Displays and Banner Stands –** RFC&E Specialist will store and organize several portable displays and banner stands for use at trainings, internal meetings, public events and conferences. These portable displays are either kept in an area cache or can be shipped from the Anchorage office as needed.
10. **PIO Supplies –** Fire information banners, nametags, and vehicle magnets are available at the regional office and area program.
11. **Publications –** Park staff will include fire management information in regular park publications. Eastern Area Fire Management Program will engage with the park staff in development of park publications. RFC&E Specialist and/or Eastern Area Fire Management staff with park support will research, write, and design additional handouts specifically about fire management such as newspapers, fire stories, brochures, posters, and templates. The area fire management program and RFC&E Specialist maintain a variety of fire brochures available for the park.
12. **Scientific Papers –** Park researchers and/or Regional and Eastern Area Fire Management staff will publish park papers in scientific journals and/or periodicals regarding new information from the park's fire management program.

Emerging Tools

This plan provides recommendations for regional and park level fire communication and education programs. Digital communication tools will continue to emerge. It is important to stay abreast of new technology in order to relay the NPS safety and educational messages about wildland fire. Currently, Twitter is the main social web tool used in parks; it is very likely that this will evolve and more tools will be used in the near future.

Evaluation

To maintain a successful program, the NPS Wildland Fire Management Program will seek evaluation opportunities such as independent surveys of visitors/residents/employees. Staff will conduct program reviews for the regional and park fire management programs. After action reviews are a part of the fire culture and will are used as appropriate.

Education Annual Plan by Season

The table describes the FC&E education annual plan which gives year-round direction for the FC&E program. Depending on the season, certain educational elements are emphasized. The table highlights these emphasis areas and links them to communication methods and target audiences. It is important to remember that this plan is general and will not prevent the program from engaging in new, innovative methods in the future.

Table 12. Communication/ Education Annual Plan by Season (recommended guidelines):

Season	Communication/ Education Emphasis	Communication Methods	Target Audiences										
			Park Visitors	Virtual Visitors	Park Employees	Local Communities	Students /Teachers	Professional Peers	Tourism Groups	Commercial Use Authorizations	Elected Officials	Media	Incident Management Teams
Spring	Pre-Season Information	Interagency meetings Fire interest lists Social web Webpage Press releases /updates Portable displays Publications Brochure distribution	*		*	*		*	*			*	*
	Key messages	Employee training Special events/ public meetings Interagency meetings Media interviews/ press kit Social web Webpage Portable displays Publications	*	*	*	*	*	*	*	*	*	*	*
	Student/ Teacher Education	Education programs Workshops					*						
	Employee Education	Employee training Presentations Special events/ public meetings Fire interest lists AK 2day and Inside NPS			*								
	Restock Comm. Ed Cache	Publications			*								
	Interagency Cooperation	Presentations Interagency meetings Fire interest lists Scientific papers			*			*					*
	Recruitment	Interagency meetings Fire interest lists Webpage			*	*	*						*

Season	Communication/ Education Emphasis	Communication Methods	Target Audiences										
			Park Visitors	Virtual Visitors	Park Employees	Local Communities	Students /Teachers	Professional Peers	Tourism Groups	Commercial Use Authorizations	Elected Officials	Media	Incident Management Teams
Summer	Incident Information Key messages	Special events / public meetings Media interviews/ Press kit Recorded phone messages Social web Webpage Fire News/ Inciweb Press releases / updates Public fire maps Exhibits/ bulletin boards Portable displays/ banner stands Special events/ public meetings Media interviews Social web Webpage Press kit Portable displays Publications	*	*	*	*		*	*	*	*	*	*
	Interpretation	Interpretative programs Fire education trunks Exhibits/ displays	*			*						*	
	Employee Education	Fire interest lists AK 2day and Inside NPS Presentations Scientific papers			*								
	Interagency Cooperation	Fire interest list Press releases / updates Fire News/ Inciweb			*			*					*
Fall	Post-Season Information	Special events / public meetings Media interviews Webpage Press releases / updates Publications	*		*	*	*	*	*			*	*
	Employee Education	AK 2day and Inside NPS Publications/ scientific papers			*								
	Interagency Cooperation	Interagency meetings Fire interest lists Press releases / updates Publications/ scientific papers			*			*					*
	Student/ Teacher Education	Education programs					*						
Winter	Post-Season Information	Webpage Publications	*	*	*	*							
	Development of New Materials	Exhibits/ displays Portable displays Printed publications Publications/ brochures	*		*	*	*	*				*	*
	Key message review	Employee training Interagency meetings			*			*					*
	Restock Comm. Ed cache	Publications											
	Employee Education	AK Today and Inside NPS Publications/ scientific papers			*								
	Interagency Cooperation	Presentations Interagency meetings Fire interest list						*					*
	Student/ Teacher Education	Education programs				*							

X. PROTECTION OF SENSITIVE RESOURCES

A. Archeological/Cultural/Historic Resources

As already indicated, Wrangell-St. Elias Park and Preserve contains one of the most important groupings of Athabaskan prehistoric and historic archeological sites in Alaska. The Park/Preserve also contains remains of other cultural groups, including Tlingit and Eyak Indians and the Chugach Eskimo. In addition to aboriginal sites, the Park/Preserve also contains ruins and structures representing Euro-American exploration, hunting, mining, and transportation themes.

If historic fire activity is any indication, one may presume that wildland fire has, at some point, affected virtually every prehistoric site within the preserve, and perhaps even many of the historic sites. Wildland fire effects on the types of materials commonly found in these sites will tend to be minimal. Thus, the Fire Management Plan will have no immediate impact on the majority of archeological and non-structural historical resources within the preserve.

Where wildland fire activity threatens cultural sites, which have been, designated Full or Critical protection status, the WRST FMO will immediately contact the park Cultural Resource Specialist for consultation, particularly if ground-disturbing activities are required for protection or fire suppression. The WRST FMO will also contact the Cultural Resource Specialist if fire suppression activities for the protection of inholdings might affect sites on surrounding Park/Preserve lands. Proactive measures will be taken to protect select structures within the preserve. The following discussion provides background and criteria associated with the selection process.

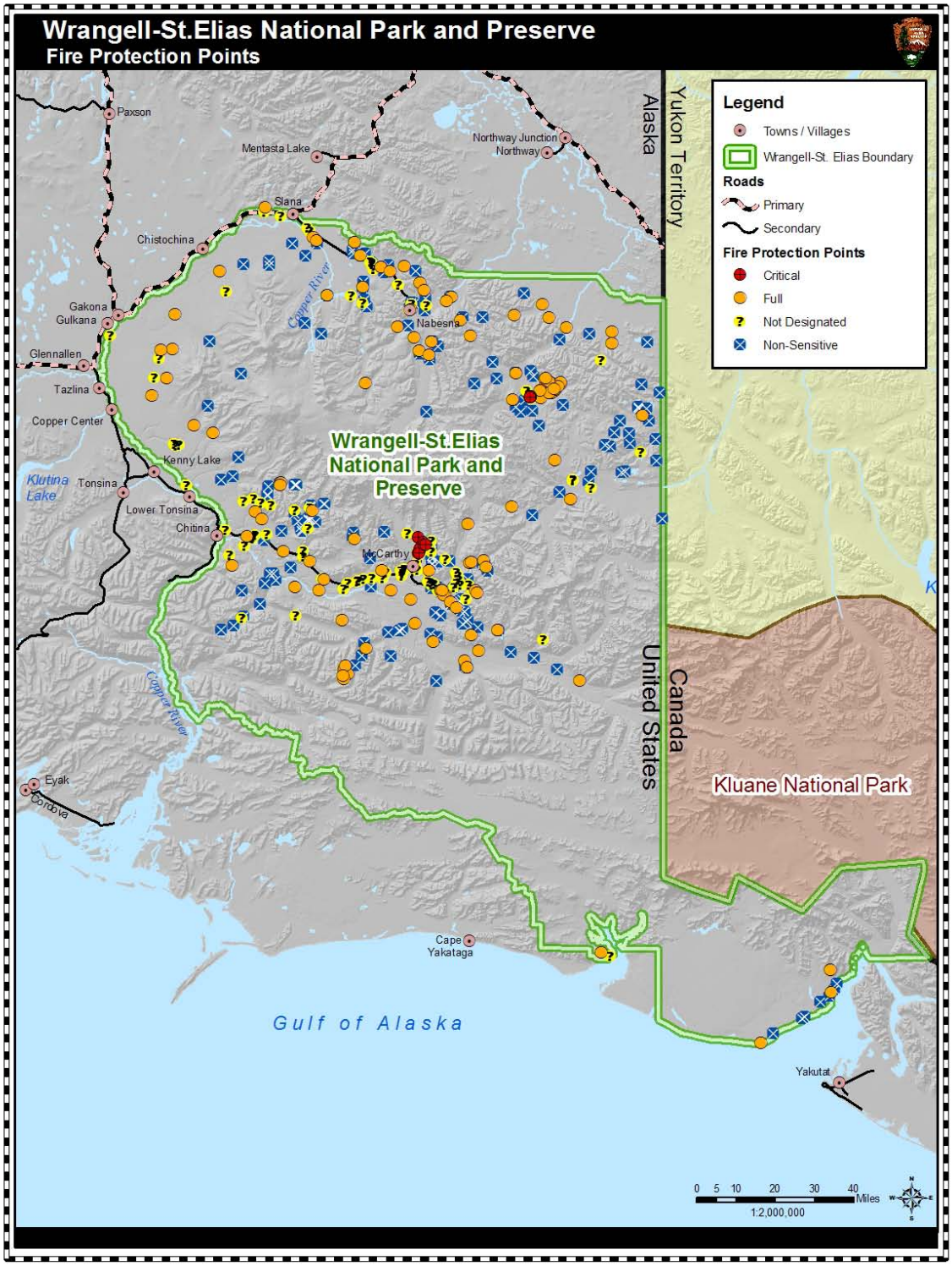

Figure 14: Fire protection points as of 2010 at WRST

1. Fire Protection Categories

a. Critical:

i. Definition

Fires occurring immediately threatening this designation will receive highest priority for protection from wildland fires by immediate and continuing aggressive actions dependent upon the availability of suppression resources.

ii. Objectives

Protect human life, inhabited property and designated physical developments without compromising fire fighter safety. Protection of the aforementioned elements is the primary objective, not control of the wildland fire.

iii. Recommended Criteria

1. Year-round residence.
2. Structural resources designated as National Historic Landmarks. (At present, the preserve contains no National Historic Landmark properties.)

b. Full

i. Definition

Fires occurring immediately threatening this designation will receive aggressive initial attack dependent upon the availability of suppression resources.

ii. Objectives

Protect sites designated as Full management from the spread of wildland fires burning in a lower priority management option. Minimize damage from wildland fires to the resources identified for protection commensurate with values at risk.

iii. Recommended Criteria

1. Structural resources designated or eligible for inclusion on the National Register of Historic Places.
2. Structural resources that have received NPS funds for rehabilitation or restoration.
3. Structural resources vital to the NPS mission i.e. administrative sites.

4. Structural resources with a high degree of structural integrity which are also representative of historic themes established by the Preserve.

c. Non- Sensitive

i. Definition

Fires occurring immediately threatening this designation will be allowed to burn under the influence of natural forces within predetermined areas while continuing protection of human life. Generally this designation receives the lowest priority for allocations of initial attack resources.

ii. Objectives

Within land manager policy constraints, accomplish land and resource management objectives through the use of wildland fire. Reduce overall suppression costs through minimum resource commitment without compromising firefighter safety.

iii. Recommended Criteria

1. Trespass structures.
2 Abandoned structures that are not eligible for inclusion on the National Register of Historic Places.

d. Not Designated

i. Definition

These sites are managed by agencies other than the National Park Service. Fires occurring immediately threatening this designation will receive the management objective desired by the appropriate management agency.

ii. Objectives

Within land manager constraints, accomplish land and resource management objectives by providing **Limited Response** actions commensurate with values at risk.

iii. Recommended Criteria

1. Structures which reside on Native Cooperation Land
2. Structure which reside on Private, State or University Land.

2. Historic Structure Management Plan

The Park/Preserve is currently in the process of developing a Historic Structure Management Plan that will address a variety of concerns related to historic structures. Utilizing existing data, cultural resource staff will outline documentation and survey needs within the park/preserve. Site eligibility for the National Register will be researched and nominations sent to the State Historic Preservation Officer.

In addition, recommendations for rehabilitation and stabilization projects will be made to the Superintendent. These recommendations will be based on careful consideration of site significance, condition, and relationship to established park historic themes. As the Historic Structure Management Plan develops, any necessary alterations or revisions will be made to the Fire Management Plan.

B. Sensitive Natural Resources

No threatened or endangered animal or plant species are known to be present at Wrangell-St. Elias. The Park/Preserve is, however, home to two plant species included on the US Fish and Wildlife Service species of concern list: C*ryptantha shackletteana* (Shacklett's Catseye) and T*araxacum carneocoloratum* (flesh colored dandelion family). These species grow on talus slopes and are therefore unlikely to be affected by wildland fire or fire management activities. In addition, the Park/Preserve is home to 72 species included on the Alaska Natural Heritage Program rare plants list (available from the WRST botanist and/or other resource management personnel). Certain plant communities within the Park/Preserve tend to harbor these and/or other rare plants; examples of these communities include limestone deposits, wetlands, high-elevation plateaus, scree slopes, sand dunes, and south-facing slopes. Designated Incident Commanders and Agency Administrators will make every effort to consult with appropriate resource advisors on the possible presence of any such communities and/or species.

Because fire is a natural component of the Park/Preserve's ecosystems, the impact of wildland fire on the above species is generally not a concern. Certain fire management activities could, however, pose a threat to these species, as well as to fragile soil layers and to other ecosystem components. This type of risk will be mitigated through the use of minimum impact suppression tactics, as specified by NPS policy (see Chapter IX, section B.4.). Furthermore, the Fire Management Officer and/or the Agency Administrator will ensure that all designated Incident Commanders consult in a timely manner with appropriate resource advisors regarding the presence of sensitive natural resources and the mitigation of their potential disturbance by fire management activities. The FMO and/or Agency Administrator will also cooperate with resource advisors to identify opportunities for the monitoring of fire effects for research purposes.

C. Developments and Inholdings

Private structures within the Park and Preserve will be assigned an appropriate AIWFMP protection category by DOF staff.

XI. REVIEWS OF FIRE MANAGEMNT PROGRAMS, PROGRAM COMPONENTS, WILDLAND FIRES AND THE FIRE MANAGEMENT PLAN

A. Park/Preserve-level Incident Reviews

All wildland fires within the Park/Preserve will be reviewed; prescribed fires implemented within the Park/Preserve will be reviewed as appropriate. The nature and scope of such reviews will vary in accordance with the complexity of the incident at hand, as follows:

1. Single-shift incidents

For incidents within the Park/Park lasting no more than one operational period, a critique will be conducted as quickly as practical upon completion of control and mop-up. As many personnel involved in the incident as possible will participate in the critique; the Incident Commander or Burn Boss will relay any special concerns or problems identified during the critique to the Chief of Resources Management.

2. Low-complexity multi-shift incidents

For simple incidents lasting longer than one operational period, a critique will be conducted within three days of completion of mop-up by the Chief Ranger, the Chief of Resources Management, the Fire Management Officer, and any others with special knowledge of or interest in the incident in question. The objective of the critique will be to determine the effectiveness of the WRST fire management program; procedures for such critiques are outlined in RM-18, Chapter 13, Exhibit 2.

3. Higher-complexity multi-shift incidents

The Alaska DNR FMO will conduct a closeout meeting with the Incident Management Team at the conclusion of each Type I or II incident to ensure the successful transition of the incident back to the Park/Preserve and to identity any incomplete fire business. Refer to Chapter 13, Exhibit 1 of Reference Manual 18 for a sample.

4. All on-going incidents

“Hotline” reviews will be used to examine the progress of on-going fire incidents, regardless of duration, size, or complexity. This type of review will provide confirmation of the decisions being made daily in the Wildland Fire Situation Analysis and/or help determine where the decision process has been faulty. Hotline reviews of WRST incidents will be conducted by the Park/Preserve FMO or by the Agency Administrator in conjunction with the designated Incident

Commander. Hotline reviews don't follow pre-established procedures; results, however, will be recorded in fire reports.

B. Regional and National-level Incident Reviews

A regional or national-level incident review may be conducted under any of the following circumstances:

- Fire crosses the Park/Preserve's boundaries into another jurisdiction without the approval of the landowner or agency.
- An incident results in adverse media attention.
- An incident involves death, serious injury or significant property damage, or exhibits potential to do so.
- An incident results in controversy involving another agency.

Refer to Chapter 13, Reference Manual 18 for distinction between regional and national-level reviews and for examples of each.

C. Entrapment and Fire Shelter Deployment Reviews

Fire shelter deployment is defined as the use of a fire shelter for its intended purpose in any situation other than training. All entrapments and fire shelter deployments will be reported to the regional Fire Management Officer, who will in turn develop a review team in cooperation with the Fire Management Program Center. The team leader will obtain reporting information from the WRST Superintendent, and the review will be conducted in accordance with the guidelines presented in Chapter 3 of Reference Manual 18 (see exhibits 4 and 5).

D. Program and Plan Reviews

An informal fire management review will be conducted annually to evaluate current procedures and to identity any needed changes to the WRST Fire Management Plan. A formal internal fire management review will be conducted every five years.

Minor changes to the WRST Fire Management Plan (including minor procedural changes, deletions, corrections, additions to appendices, etc.) may be made with the authority of the Park/Preserve's FMO. The Superintendent, however, must approve significant changes to the body of the Fire Management Plan.

XII. CONSULTATION AND COORDINATION

The following individuals were consulted in the preparation of this plan:

Jennifer Barnes, Region Fire Ecologist, National Park Service, Alaska Regional Office

Tom Betts, District Ranger, National Park Service, Wrangell-St. Elias National Park

Geoff Bleakley, Compliance Specialist, National Park Service, Wrangell-St. Elias National Park

Brad Cella, Fire Management Officer, National Park Service, Alaska Region

Dan Warthin, Fire Management Officer, National Park Service, Alaska Region

Mary Beth Cook, Botanist, National Park Service, Wrangell-St. Elias National Park

Joan Darnell, Chief of Environmental Quality, National Park Service, Alaska Region

Nancy Deschu, Hydrologist, National Park Service, Alaska Region

Bruce Greenwood, Environmental Protection Specialist, National Park Service, Alaska Support Office

James Hannah, Chief Pilot, National Park Service, Wrangell-St. Elias National Park and Preserve

Kato Howard, Fuels Management Specialist, Alaska Fire Service, Upper Yukon Zone

Marsha Henderson, Fire Management Officer, National Park Service, Wrangell-St. Elias National Park and Preserve

Mark Musitano, Fire Management Officer, National Park Service, Wrangell-St. Elias National Park and Preserve

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Carl Mitchell, Wildlife Biologist, National Park Service, Wrangell-St. Elias National Park and Preserve

Jan Passek, Fire Management Officer, National Park Service, Zion National Park

Ed Roberts, Chief of Interpretation, National Park Service, Wrangell-St. Elias National Park and Preserve

Sarah Robertson, Interagency Fire Planner, National Park Service/USDA Forest Service, National Interagency Fire Center

Danny Rosenkrans, Geologist, National Park Service, Wrangell-St. Elias National Park and Preserve

Devi Sharp, Chief of Natural and Cultural Resources, National Park Service, Wrangell-St. Elias National Park and Preserve

Hunter Sharp, Chief Ranger, National Park Service, Wrangell-St. Elias National Park and Preserve

Clarence Summers, Subsistence Specialist, National Park Service, Alaska Support Office

Chuck Sheaffer, Biological Technician, National Park Service, Wrangell-St. Elias National Park and Preserve

Jim Wilder, Biological Technician, National Park Service, Wrangell-St. Elias National Park and Preserve

Glenn Yankus, Environmental Protection Specialist, National Park Service, Alaska Support Office

Heather Yates, Subsistence Park Ranger, National Park Service, Wrangell-St. Elias National Park

Ruth Ann Warden, Park Ranger, National Park Service, Wrangell-St. Elias National Park

Lynn Wilcock, Fire Management Officer, State of Alaska, Division of Forestry, Mat-Su Area

Tom Zimmerman, Fire Science/Ecology Manager, National Park Service, National Interagency Fire Center

Joseph O'Brien, Assistant Fire Management Officer, Upper Yukon Zone, Alaska Fire Service

Morgan Warthin, Alaska Regional Fire Communication and Education Specialist, National Park Service, Alaska Regional Office

Jennifer Mitchell, Fire Ecologist, National Park Service, Alaska Regional Office

Julie Voracheck, Aircraft Dispatcher, Alaska Interagency Coordination Center, Alaska Fire Service

APPENDIX: A References

The following sources are either cited within the Fire Management Plan, were consulted during its preparation, or are otherwise pertinent to the management concerns outlined within the plan.

Alaska Interagency Fire Management Council. 1983. Alaska Interagency Fire Management Plan, Copper Basin Planning Area.

Alaska Interagency Fire Management Council. 1984. Alaska Interagency Fire Management Plan, Fortymile Planning Area.

Alaska Interagency Fire Management Council. 1988. Alaska Interagency Fire Management Plan, Southeast Planning Area.

Alaska Land Managers Cooperative Task Force. 1979. Fortymile Interim Fire Management Plan.

Alaska Wildland Fire Coordinating Group. 1998. Alaska Interagency Wildland Fire Management Plan.

Burgan, Robert E. and Rothermel, Richard C. Behave: Behavior Prediction and Fuel Modeling System. U.S. Forest Service. General Tech Report INT-167. 1984.

U.S. Departments of Agriculture and Interior. 1999. Wildland and Prescribed Fire Management Policy, Implementation Procedures Reference Guide.

U.S. Department of Interior. 1998. Departmental Manual, Part 620, Chapter 2: General Policies and Procedures—Alaska.

National Wildland Fire Coordinating Group. 1993. Prescribed Fire Complexity Rating System Guide.

National Wildland Fire Coordinating Group. 1996. Wildland Fire Qualification Guide.

National Park Service. 1998. Director's Order No. 18: Fire Management.

National Park Service. 1986. General Management Plan, Wrangell-St. Elias National Park and Preserve.

National Park Service. 1999. Reference Manual No. 18: Fire Management.

National Park Service. 1997. Resource Management Plan, Wrangell-St. Elias National Park and Preserve.

National Park Service. 1990. NPS-18 Guideline: Wildland Fire Management.

U.S. Forest Service, Department of Agriculture. 1999. Ogden, Utah. Fire Effects Information System.

APPENDIX B: Definitions

Agency Administrator: An incident-specific position filled by any qualified WRST staff member as designated by the Park FMO or Chief of Resources Management. The Agency Administrator represents the WRST Superintendent and works with the incident command team to ensure the compliance of wildland fire operations with Park/Preserve and NPS resource management policy.

Appropriate Management Response (AMR): Any wildland fire action selected and developed through either the initial decision-making process (i.e. WFIP stage I) or a WFSA. AMRs may be directed toward suppression or resource benefit, depending on predetermined parameters and incident-specific conditions.

BEHAVE: A system of interactive computer programs used for formulating fuel models based and predicting fire behavior.

Director's Order 18 (DO-18): A comprehensive statement of National Park Service wildland fire management policy.

Extended Attack: Any wildland fire suppression action lasting beyond one operational period.

Fire Management Officer (FMO): A permanent position with responsibility for the planning and coordination of fire management programs. WRST is served by an area FMO stationed in Fairbanks, Alaska.

Fuel Loading: Amount of live and dead organic matter present at a particular site.

Fuel Model: A simulated fuel complex based on representative descriptors; used to estimate rate of spread and other fire behavior indices.

Initial Attack: A wildland fire suppression action lasting no more than one operational period.

Prescribed Fire: Planned implementation of fire within a pre-determined area and under pre-determined conditions, for the accomplishment of resource management objectives and/or hazard fuel mitigation.

Reference Manual 18 (RM-18): A detailed set of guidelines for the operational implementation of the wildland fire management policies specified in DO-18. RM-18 consists of a continuously evolving on-line document.

Response to Wildland Fire: Fire, as a critical natural process, will be integrated into Land and Resource Management Plans and activities on a landscape scale, across bureau boundaries. Response to Wildland fires is based on ecological, social and legal consequence of the fire. The circumstances, under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate response to the fire.

Wildland Fire: Any occurrence of wildland fire not planned and ignited by management.

Wild Land Fire Decision Support System (WFDSS): A web based decision process which will utilize analysis programs such as Rapid Assessment of Values at Risk (RAVAR), Fire Spread Probability Model (FSPro) and Farsite.

Wildland Fire Suppression: Any Appropriate Management Response based on protection goals rather than resource management concerns.

Acronyms

AIWFMP	Alaska Interagency Wildland Fire Management Plan
ANILCA	Alaska National Interest Lands Conservation Act
AKSO	Alaska Support Office
BLM-AFS	Bureau of Land Management – Alaska Fire Service
DENA	Denali National Park
DNR	State of Alaska, Department of Natural Resources
DO-18	Director's Orders 18 – Wildland Fire Management
DOF	State of Alaska, DNR, Division of Forestry
FFMC	Fine Fuel Moisture Content
FMO	Fire Management Officer
FMP	Fire Management Plan
FMU	Fire Management Units
GAAR	Gates of the Arctic National Park and Preserve
GMP	General Management Plan
IC	Incident Commander
LCES	Lookouts, Communication, Escape Routes, Safety Zones
LCS	List of Classified Structures
MAC	Multi-Agency Coordination Group
NEPA	National Environmental Planning Act
NHPA	National historical Preservation Act
NPS	National Park Service
NWCG	National Wildfire Coordinating Group
RAWS	Remote Automated Weather Station
RM-18	Reference Manual 18 – Wildland Fire Management
RMP	Resource Management Plan
SACS	Shared Applications Computing System
SHPO	State Historic Preservation Officer
USFS	United States Forest Service
WFSA	Wildland Fire Situation Analysis
WFIP	Wildland Fire Implementation Plan
WRST	Wrangell-St. Elias National Park and Preserve
YUCH	Yukon-Charley Rivers National Preserve

APPENDIX C.1: Environmental Assessment

Fire Management Plan

for

Wrangell-St. Elias National Park and Preserve

Prepared by

National Park Service

Wrangell-St. Elias National Park and Preserve

March 7, 2002

ENVIRONMENTAL ASSESSMENT

Fire Management Plan for Wrangell-St. Elias National Park and Preserve

I. INTRODUCTION

A. Purpose and Need

The National Park Service proposes implementing National Park Service Director's Order 18 (1998) by establishing a fire management plan for Wrangell-St. Elias National Park and Preserve. This fire management plan is a comprehensive document and outlines Wrangell-St. Elias National Park and Preserve's fire management goals and describes the policies and actions by which these goals will be realized. The plan will formalize the fire management decision-making process and the procedures that have been in place for over 15 years, redefine fire management strategies, establish the park's fire management organization and responsibilities, and relate resource management goals to fire management strategies. With the implementation of the proposed action, fire management within Wrangell-St. Elias National Park and Preserve will remain status quo and the on-the-ground application of the fire management strategies will continue as in the past.

This plan is necessary for the management of wildland fire at Wrangell-St. Elias National Park and Preserve which is potentially complex. Fire poses a potential threat to life and property as well as cultural and historic resources in and around the Park/Preserve. At the same time, however, fire has long been an integral component of the area's ecosystems and is critical for the maintenance of virtually all native conditions, from plant and animal populations to soil and permafrost layers. Accordingly, the scope of the preferred alternative and other considered alternatives entail the planning and implementation of policies and practices flexible enough to allow the simultaneous pursuit of protection and resource management goals.

This environmental assessment (EA) has been prepared in accordance with the National Environmental Policy Act of 1969 and the regulations of the Council of Environmental Quality (40 CFR 1508.9). It evaluates the potential impacts to cultural and natural resource values which could result from implementing the Wrangell-St. Elias National Park and Preserve Fire Management Plan. The environmental assessment is intended to facilitate decision-making based on an understanding of the environmental consequences of the proposal and determine whether preparation of an environmental impact statement is required.

B. Background

The NPS Organic Act and the General Authorities Act prohibit impairment of park resources and values. The NPS Management Policies and Director's Order 12 use the terms "resources and values" to mean the full spectrum and intangible attributes for which the park is established and are managed, including the Organic Act's fundamental purpose and any additional purposes as stated in the park's establishing legislation. The impairment of park resources and values may

not be allowed unless directly and specifically provided by statute. The primary responsibility of the National Park Service is to ensure that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The evaluation of whether impacts of a proposed action would lead to an impairment of park resources and values is included in this environmental assessment. Impairment is more likely when there are potential impacts to a resource or value whose conservation is:

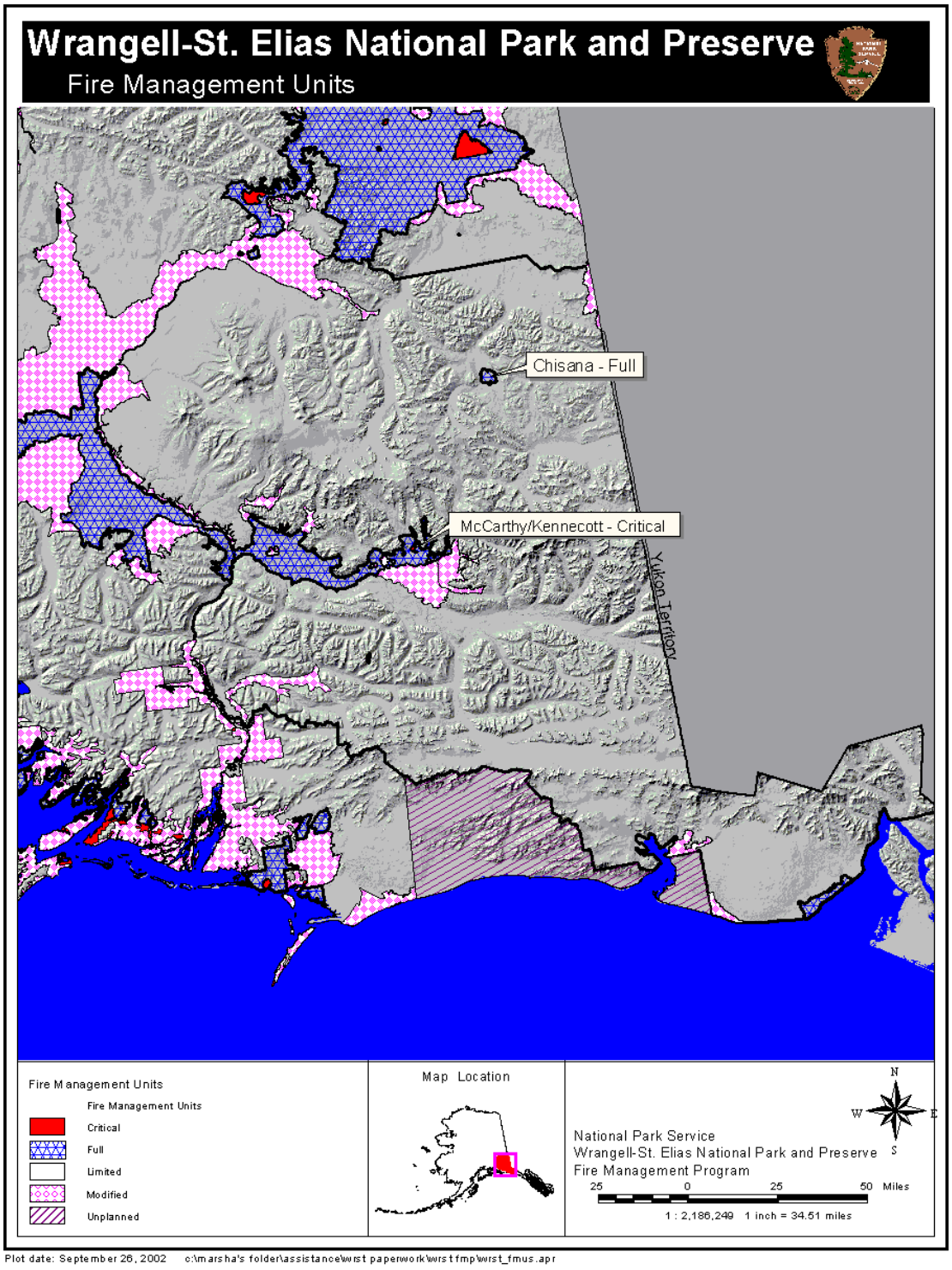
- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

Section 201(9) of the Alaska National Interest Lands Conservation Act states that Wrangell-St. Elias National Park and Preserve will be managed for the following purposes, among others: "To maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes and streams, valleys, and coastal landscapes in their natural state; to protect habitat for, and populations of, fish and wildlife including but not limited to caribou, brown/grizzly bears, Dall sheep, moose, wolves, trumpeter swans and other waterfowl, and marine mammals; to provide continued opportunities, including reasonable access for mountain climbing, mountaineering, and other wilderness recreational activities. Subsistence uses by local residents shall be permitted in the park, where such uses are traditional, in accordance with the provisions of title VIII"

In 1980 the National Park Service entered into cooperation with the Bureau of Land Management, the Alaska Department of Natural Resources, the Alaska Department of Fish and Game, the US Forest Service, the US Fish and Wildlife Service, the Bureau of Indian Affairs, and Native Regional and Village Corporations to begin producing a state-wide series of area-specific, interagency fire management plans (FMP). Three of the resulting plans—the Alaska Interagency Fire Management Plan for the Fortymile Planning Area (1983), the Copper Basin Planning Area (1983), and the Southeast Planning Area (1988)—provided direction for fire management at Wrangell-St. Elias until 1998, when a variety of documents, including 13 local planning area FMPs, were consolidated and approved as the Alaska Interagency Wildland Fire Management Plan (AIWFMP). Under the AIWFMP, fire protection needs are determined through annual land owner/manager reviews and lands are then placed under critical, full, modified or limited protection categories, with categorization based on presence and/or proximity of values to be protected as well as the resource management objectives of the pertinent land-management agency (see Figure 1 for description of categories). Each reported wildland fire is managed in accordance with the categorization of the sub-unit in which it occurs, with responses ranging from rapid and aggressive attack by all available forces in the case of fires detected in critical protection areas to periodic surveillance for certain fires detected in limited protection areas (see Figure 2 for map of Park/Preserve units).

Protection Category	Policy	Intent
Critical	Aggressive suppression of fires within or threatening designated areas. Highest priority for available resources.	Prioritization of suppression actions for wildland fires threatening human life, inhabited property, and/or other designated structures. Complete protection of designated sites
Full	Aggressive suppression of fires within or threatening designated areas, depending upon availability of resources.	Protection of uninhabited cultural and historical sites, private property, and high-value natural resources.
Modified	Fires in designated areas receive initial attack depending on availability of resources, unless land manager chooses otherwise and documents with WFSA. After designated conversion date, operational response to Modified protection zones is identical to that of Limited zones.	Greater flexibility in selection of suppression strategies when chance of spread is high (e.g., indirect attack). Reduced commitment of resources when risk is low. Balancing of acres burned with suppression costs and with accomplishment of resource management objectives.
Limited	Wildland fires allowed to burn within predetermined areas. Continued protection of human life and site-specific values. Surveillance.	Reduction of long-term costs and risks through reduced frequency of large fires. Reduction of immediate suppression costs. Facilitation of bio-diversity and ecological health

Table 13: Alaska Interagency Wildland Fire Management Plan Options



EA Figure 15: Fire Protection Boundaries

All of the alternatives discussed here, including the preferred alternative described throughout the proposed Wrangell-St. Elias National Park and Preserve fire management plan, would entail continued compliance with the Alaska Interagency Wildland Fire Management Plan (AIWFMP) while at the same time bringing the Park/Preserve's fire management program into compliance with recently developed National Park Service directives. NPS Director's Order 18 (1998) mandates a distinction between prescribed fire, defined as any fire planned and implemented by management, and wildland fire, defined as any unplanned ignition, whether human-caused or natural. Wildland fire incidents, in turn, fall into two categories: Wildland fire use entails the management of certain unplanned ignitions for the achievement of management goals, including the reduction of dangerous and unnatural accumulations of burnable vegetation and the preservation of fire in its natural role. And wildland fire suppression entails a broad spectrum of actions aimed at protecting life, property, and sensitive resources while also ensuring firefighter safety, cost effectiveness, and minimal disturbance from suppression activities.

Each of the alternatives presented in this Environmental Assessment comprises a particular combination of the various management strategies permitted under NPS Director's Order 18; these alternatives have been evaluated for their ability to contribute to the accomplishment of the resource management objectives described above.

C. Impact Topics Addressed and Analyzed

Impact topics were identified to focus the analysis of alternatives on the most relevant subject matter and resources of concern. A brief rationale for each impact topic follows, as well as the reasons for dismissing specific topics from further analysis.

Vegetation and Bio-diversity. The National Environmental Policy Act (1969) requires analysis of impacts on all affected components of the ecosystem, including biotic communities of plants and animals. NPS Management Policies (2001) requires maintenance of these communities, including their natural abundance, diversity and ecological integrity. Fire plays an important role in changes to vegetative cover, which in turn affects habitat and overall ecological health; therefore, effects on vegetation and bio-diversity are analyzed as an impact topic.

Cultural Resources. The National Historic Preservation Act, as amended in 1992 (16 USC 470 *et seq.*); the National Environmental Policy Act; and the NPS Cultural Resource Management Guideline (1994), and Management Policies (2001) require the consideration of impacts on cultural resources listed on or eligible for listing on the National Register of Historic Places. The undertakings described in this document are also subject to section 106 of the National Historic Preservation Act, under the terms of the 1995 Programmatic Agreement among the NPS, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers. Impacts to cultural resources (archeological, historic, and paleontological) are therefore analyzed in this environmental assessment.

Aesthetics and Recreation. The mission of the NPS, as described by its Organic Act of 1916, defines the purpose of all parks is to "…conserve the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same…". Wrangell-St. Elias National Park and Preserve was established to "To preserve unrivaled scenic and geological values associated with natural landscapes; to provide for the maintenance of sound populations of, and habitat for,

wildlife species of inestimable value to the citizens of Alaska and the Nation, including those species dependent on vast relatively undeveloped areas; to preserve in their natural state extensive unaltered arctic tundra, boreal forest, and coastal rainforest ecosystems; to protect the resources related to subsistence needs; to protect and preserve historic and archeological sites, rivers, and lands, to provide continued opportunities, including reasonable access for mountain climbing, mountaineering, and other wilderness recreational activities …; and to maintain opportunities for scientific research and undisturbed ecosystems". Scenic visual values, recreational activities, and general visitation within and around fire-treated areas may be temporarily impacted, thus visitor use will be considered as an impact topic.

Local Economy. The National Environmental Policy Act (NEPA) considers "impacts to the human environment" to include any effects of federal actions on the social and economic well being of communities and individuals. Impacts to the local economy are therefore analyzed in this environmental assessment.

Wetlands and Floodplains. NPS guidelines and policies require consideration of impacts on floodplains and wetlands (Executive Orders 11988 and 11990). Impacts to wetlands and floodplains are therefore analyzed in this environmental assessment.

Subsistence Use and Wildlife Habitat. Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA) states "In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands…the head of the federal agency…over such lands…shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs…". Subsistence use may be temporarily impacted, thus subsistence use will be considered as an impact topic.

Air Quality. The 1963 federal Clean Air Act (42 U.S.C. 7401 *et seq.* as amended), stipulates that federal land managers have an affirmative responsibility to protect a park's air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse air pollution impacts. The Park/Preserve is designated as a federal "Class II" airshed. Air quality would be affected in the short-term during any type of ignition event; therefore, it is analyzed as a relevant impact topic.

Water Quality and Fisheries. National Park Service policies require protection of water resources consistent with the Clean Water Act. Increased erosion following a fire may affect water quality and is therefore considered a relevant impact topic.

D. Impact Topics Considered and Dismissed

Threatened and/or Endangered Species. The Endangered Species Act (1973) requires disclosure of impacts on all federally threatened or endangered species. NPS policy also requires analysis of effects on federal species, as well as state-listed threatened, endangered, candidate, rare, declining and sensitive species. There are two plant species included on the US Fish and Wildlife Service species of concern list: Crypatantha *shackletteana* (Shacklett's Catseye) and *Taraxacum carneocoloratum* (flesh colored dandelion family. These species grow on talus slopes and are therefore unlikely to be affected by wildland fire or fire management activities. In

addition, the Park/Preserve is home to 72 species included on the Alaska Natural Heritage Program rare plants list.

Environmental Justice. Executive Order 12898, "Environmental Justice. "Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, requires all federal agencies identify and address disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. This project would not be expected to result in significant changes in the socioeconomic environment of the project area, and, therefore, would not be expected to have any direct or indirect impacts to minority or low-income populations or communities.

II. RANGE OF ALTERNATIVES

A. Introduction.

Each alternative consists of a different combination of the fire management strategies as mandated by NPS Director's Order 18 (DO-18), with each alternative representing a different application of fire as a management tool. The considered alternatives differ in their respective approaches to the management of naturally caused ignitions and in their allowance or preclusion of prescribed fire.

B. Actions Common to all Alternatives.

Under each alternative, mechanical fuel reduction may be used to mitigate hazard fuel buildup or recreate historical landscape/conditions in areas where prescribed fire or wildland fire would pose an unreasonable threat to property or resources.

All fire management actions at Wrangell-St. Elias National Park and Preserve will be conducted in full compliance with local, state, and interstate air pollution control regulations as required by the Clean Air Act, 42 U.S.C. 7418. No local or interstate air pollution control regulations exist in Alaska.

The Park/Preserve will employ three primary strategies in order to protect archeological, cultural, and historic sites from damage by fire or fire suppression activities: First, culturally significant structures will be assigned Critical or Full Protection status, as dictated by the Recommended Criteria for Fire Protection of Structural Resources Within WRST. Second, personnel conducting detection and/or reconnaissance flights within the Park/Preserve will be directed to remain alert for the presence of any undiscovered cultural sites or structures and to report their presence to the Park FMO. And third, designated Incident Commanders will consult with resource appropriate resource advisors regarding the identification and sensitivity of previously unknown sites and will cooperate with the Agency Advisor to mitigate any damage to such sites when possible.

Certain fire suppression activities could pose a threat to fragile soil layers and to other ecosystem components. This type of risk will be mitigated through the use of minimum impact suppression tactics, as specified by NPS policy.

C. Alternatives.

Alternative 1: Combination of Wildland Fire Use and Wildland Fire Suppression:
Natural ignitions occurring in certain areas and under predetermined conditions would be managed for the accomplishment of resource management goals, including the preservation of fire in its natural role and the reduction of burnable vegetation. Any fire posing a threat to life or property would be aggressively suppressed. Prescribed fires would not be implemented.

Alternative 2: Combination of Prescribed Fire Use, Wildland Fire Use, and Wildland Fire Suppression (NPS Preferred Alternative):
All three of the major management actions described under DO-18 would be allowed, as determined by a combination of pre-established and incident-specific decision-making criteria. Naturally occurring wildland fires which do not pose a threat to life, property, or significant resources would be managed for the accomplishment of resource management goals, including the preservation of fire in its natural role and the reduction of burnable vegetation. Prescribed fire would be implemented, in certain cases, under the direction of National Park Service personnel for the purpose of reducing hazardous fuel loads or restoring historic landscapes and/or conditions. Suppression would continue in or near developed areas, near Park/Preserve boundaries with administrative units having different fire management objectives, in areas known to contain sensitive cultural and/or archeological resources, or whenever insufficient resources are available to ensure the effective, long-term management of wildland fire to meet resource management objectives. This action would be a continuation of the fire management strategies as seen in the Park/Preserve for the past 15 years.

D. Alternatives Considered but Rejected.

Full Wildland Fire Suppression:
All ignitions, including those of natural origin, would be suppressed and no prescribed fire would be implemented. Reduction of flammable vegetation would be accomplished strictly by mechanical means (e.g. through the use of chain saws or other tools). Mechanical reduction would be limited primarily to the protection of historic and/or archeological sites and Park/Preserve boundary areas. In some cases, however, mechanical reduction could be used to restore selected landscapes to historic conditions.
This alternative is rejected for the following reasons: 1) the increased risk of catastrophic wildland fire which would result from the exclusion of the area's natural burn cycle; 2) the prohibitively high cost of large-scale mechanical fuel reduction; 3) non-conformance with the existing interagency management scheme and a potential to cause an impairment of park resources and values.

Full Wildland Fire Suppression and Prescribed Fire:
All ignitions, including those of natural origin, would be suppressed. The effects of natural wildland fire would be simulated through the use of planned ignitions conducted by park personnel in defined zones. Such fires would be ignited under predetermined fuel and weather conditions; control problems would thereby be minimal.
This alternative is rejected for the following reasons: 1) the inability to maintain a natural burn cycle through only prescribed burns; 2) the increased risk of catastrophic wildland fire which

would result from the exclusion of the area's natural burn cycle; 3) the prohibitively high cost of large-scale mechanical fuel reduction and prescribed burns; 4) non-conformance with the existing interagency management scheme and a potential to cause an impairment of park resources and values.

III. AFFECTED ENVIRONMENT

A. Introduction

The area set aside by Congress as Wrangell-St. Elias National Park and Preserve encompasses 13.2 million acres, the National Park System's largest unit. In conjunction with Canada's Kluane National Park, Glacier Bay National Park, and Tatsheshini Provincial Park, the Park/Preserve comprises the largest parkland in North America and is recognized as a World Heritage Site. Less than 200 miles east of Anchorage, the Park/Preserve is bordered by two of Alaska's major highways on the west and north, by the Yukon Territory and the Province of British Columbia on the east, and by the Gulf of Alaska and the Alaskan panhandle to the south and southeast.

B. Natural Environment

The Park/Preserve contains vast areas of rugged high mountain terrain, including substantial portions of the Wrangell, St. Elias, Chugach, Mentasta, and Nutzotin ranges. Wrangell-St. Elias contains nine of the 16 highest peaks in the United States. The area's vertical relief is staggering; Mt. St. Elias, for instance, the second tallest peak in the United States at 18,008 feet, sits just 15 miles north of tidewater, and much of the Park/Preserve is covered with perpetual ice and snow or barren rock. Alpine tundra is found at elevations between 3,000 and 5,000 feet. White spruce grow commonly in river bottoms at lower elevations, with the flat and/or rolling terrain surrounding the Wrangells supporting vast expanses of open black spruce forest and shrub thicket, as well as occasional stands of birch.

The Park/Preserve is home to caribou, moose, brown and black bears, Dall sheep, wolves, lynx, trumpeter swans, Peregrine falcons, marine mammals, several species of fish, and numerous additional bird and small mammal species. Sensitive animal habitat is described in the GMP's accompanying Affected Environment report.

C. Cultural Environment

Wrangell-St. Elias Park and Preserve contains one of the most important groupings of Athabaskan pre-historic and historic archeological sites in Alaska. The Park/Preserve's sites include numerous Athabaskan villages, camps, and hunting sites, as well as the remains of other cultural groups, including the Tlingit and Eyak Indians and the Chugach Eskimo. In addition to aboriginal sites, the Park/Preserve also contains ruins and structures representing Euro-American exploration, transportation, and mining activity; these resources constitute important historic and archeological resources. (See the General Management Plan's accompanying Affected Environment report for further descriptions of the Park/Preserve's cultural features).

D. Historical Role of Fire

Fire has been an inextricable component of the ecosystems of the Wrangell-St. Elias area for thousands of years, with periodic fires having served throughout the centuries to select plants and animals that are adapted to fire-caused change. Black spruce is at least partially dependent upon

stand-replacement fire, in that it's seeds become ready for germination at the peak of the Alaskan interior fire season and are released when its semi-serotinous cones are opened by canopy fire. Even more fundamentally, fire plays a key role in the regulation of the permafrost table throughout all the ecosystems of the Alaskan interior. Without fire, organic matter accumulates, the permafrost table rises, and ecosystem productivity declines. Vegetation communities become much less diverse, and wildlife habitat decreases. Fire rejuvenates these systems. It removes some of the insulating organic matter and elicits a warming of the soil. Nutrients are added both as a result of combustion and by increased decomposition rates.

The impact of aggressive suppression on the Alaskan interior at large and the Wrangell-St. Elias area in particular is difficult to assess. Organized suppression has occurred on a large scale in Alaska since 1939, the effects of this activity, however, are not yet clear. Alaskan fire management personnel feel that the fire ecology of the roadless portions of the Wrangell-St. Elias area may be relatively unchanged from its condition prior to the arrival of whites and the subsequent development of organized suppression efforts.

E. Wildland Fire Management Situation

The seasonal fire cycle in the Alaskan interior consists of four "micro" seasons or phases, each varying with the changing weather patterns and the stages of vegetation development for the growing season.

The first begins in late April or early May with the loss of snow cover, and ends in late May or early June when greenup begins. During the transition from 100% winter-cured fuels to greenup, human-caused fires occur frequently; these fires are usually relatively easy to suppress. Spring fires that are not suppressed, however, often grow later in the season as fuels become dryer.

The second and third fire-cycle phases are primarily lightening driven. Suppression of such fires is harder. Fires occurring in June, the second period, usually do not develop the intensity of later summer fires; during hot, dry, and windy conditions, however, June wildland ignitions can result in extreme fire behavior.

The third period of fire activity begins in mid-July and runs through the first part of August. This is the period of maximum fire activity.

The final micro-season runs from late August into early September. These fires are generally easy to control except during particularly dry autumn weather.

IV. ENVIRONMENTAL CONSEQUENCES

In addition to evaluating the impact of the alternatives on specific impact topics this environmental assessment also evaluates the potential for impairment of park resources and values per NPS policies derived from the Organic Act (See Background section) and each alternative is evaluated for potential impairment following the alternative resource analyses.

A. Impacts of Alternatives

Alternative 1. Wildland Fire Use and Wildland Fire Suppression

Vegetation and Bio-diversity:
Certain wildland fires would be managed for the accomplishment of resource management goals, including the preservation of fire in its natural role and the reduction of burnable vegetation therefore maintaining a naturally functioning ecosystem. However, in the Critical and Full Protection Units the exclusion of prescribed fire may result in an unacceptable increase in vegetation thereby increasing the threat to the resources found within these units.

A purpose of the park is "To maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes and streams, valleys, and coastal landscapes in their natural state." Fire is an inextricable component of the fire dependent ecosystem of this area and is known to maintain a balanced, naturally functioning ecosystem. This alternative would manage ignitions within established resource objectives to maintain the natural function of the ecosystem in the Park/Preserve.

Conclusion: Minimal impacts are expected with the use of this alternative due to an increase in vegetation resulting from no prescribed fire. The level of impacts to vegetation and biodiversity anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Cultural Resources: The prohibition of prescribed fire could hamper both the protection of historic and/or archeological resources and the restoration and/or protection of historic landscapes and conditions. Mechanical techniques employed in place of prescribed fire would tend to be more expensive and in some cases might not sufficiently mimic the effects of fire. However, certain wildland fires would be managed for the accomplishment of resource management goals including the reduction of burnable vegetation thereby better protecting the cultural resources from catastrophic fire.

Cultural resources are not specifically stated as a purpose of the park/preserve.

Conclusion: Minimal impact would occur due to an increase in vegetation resulting from no prescribed fire. The level of impacts to cultural resources anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Aesthetics and Recreation: The only impact would be the occasional closure of specific areas due to fire activity for the safety of visitors resulting in an inconvenience for the visitors or cause them to alter their plans.

A purpose of the Park/Preserve is "to provide continued opportunities, including reasonable access for mountain climbing, mountaineering, and other wilderness recreational activities." Selection of Alternative 1 would not result in a change in vegetative composition and it would support a naturally functioning ecosystem. Sight lines and access would be maintained.

Conclusion: This may result in a minimal impact by closing certain areas and more vegetation may be burned decreasing aesthetics. The level of impacts to aesthetics and recreation anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Local Economy: There would be a slight influx of revenue for businesses in communities near the incident from occasional suppression operations.

Conclusion: The increase in revenue would result in a minimal beneficial impact. The level of impacts to the local economy would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Wetlands and Floodplains: There would be a minimal risk of disruption to these communities due to fire suppression operations. There may be impacts due to erosion after fire has burned through the wetlands or floodplain. Once vegetation in these areas re-establishes erosion is expected to diminish.

A purpose of the Park/Preserve is "To maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes and streams, valleys, and coastal landscapes in their natural state." Fire is an inextricable component of the fire dependent ecosystem of this area and is known to maintain a balanced, naturally functioning ecosystem. Managing ignitions within established resource objectives would encourage the natural function of the ecosystem in the Park/Preserve.

Conclusion: There would be temporary minimal impacts due to a loss of vegetation. The level of impacts to wetlands and floodplains anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Subsistence Use and Wildlife Habitat: There would be a short-term impact on game species and plants in specific areas due to the decrease of vegetation within the burned areas. However, this alternative would more adequately facilitate the long-term preservation of the area's natural processes by allowing fire to play its natural role in the ecosystem.

A purpose of the park is "to protect habitat for, and populations of, fish and wildlife including but not limited to caribou, brown/grizzly bears, Dall sheep, moose, wolves, trumpeter swans and other waterfowl, and marine mammals" and "Subsistence uses by local residents shall be permitted in the park, where such uses are traditional, in accordance with the provisions of title VIII". Fire is an inextricable component of the fire dependent ecosystem of this area and is known to maintain a balanced, naturally functioning ecosystem.

Conclusion: This would not disrupt the natural function of the ecosystem in the Park/Preserve, therefore maintaining wildlife habitat and subsistence use within the Park/Preserve. There would be a negligible short-term impact resulting from a displacement of wildlife in the burned area.

This, however, would replicate a naturally functioning ecosystem and subsistence regime. The level of impacts to subsistence and wildlife habitat anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Air Quality: Under this alternative, smoke would be monitored for trajectory, mixing height, and impact to overall air quality. Certain wildland fires would be managed for the accomplishment of resource management goals, including the preservation of fire in its natural role and the reduction of burnable vegetation. This would reduce the possibility of catastrophic fire thereby reducing long-term, intense reduction of air quality.

Air quality is not specifically stated as a purpose of the park/preserve, though a degradation of air quality by fire could affect visitor use and recreation purposes. Fire naturally occurs in the Park/Preserve ecosystem and degradation in air quality at the levels expected would also be similar to a natural occurrence.

Conclusion: No long term impacts to air quality are expected. The level of impacts to air quality anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Water Quality and Fisheries: Certain wildland fires would be managed for the accomplishment of resource management goals including the preservation of fire in its natural role and the reduction of burnable vegetation. This would allow more low-intensity wildland fires that would reduce the erosion along streams.

A purpose of the park is “to protect habitat for, and populations of, fish and wildlife including but not limited to caribou, brown/grizzly bears, Dall sheep, moose, wolves, trumpeter swans and other waterfowl, and marine mammals”. Fire is an inextricable component of the fire dependent ecosystem of this area and is known to maintain a balanced, naturally functioning ecosystem. Selection of this alternative is would not disrupt the natural function of the ecosystem in the Park/Preserve. A fire is a common occurrence in this ecosystem and does result in some erosion, affecting water quality and fisheries habitat. The erosion is expected to continue at the same natural levels.

Conclusion: Long term impacts to water quality and fisheries are not expected. Short-term negligible impacts of increased sedimentation may occur initially after the fire and prior to reestablishment of vegetation. The level of impacts to water quality and fisheries anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Alternative 1, Cumulative Impacts: The on-going and future activity that would have a cumulative effect on resources of concern within and outside of the Park and Preserve’s boundaries analyzed in this Environmental Assessment is the adjacent landowners’ fire management plans. All public land management agencies in Alaska are signatories of the Alaska

Interagency Fire Management Plan, which allows for fire to burn on the landscape in limited suppression units. Much of the public lands surrounding the Park and Preserve is in a limited suppression unit and may result in multiple large fires, especially with an increase in vegetation due to no prescribed burns. The results of these multiple fires may be greater than fires managed just within the Park and Preserve boundary.

Alternative 2. Prescribed Fire Use, Wildland Fire Use, and Wildland Fire Suppression (NPS Preferred Alternative)

Vegetation and Bio-diversity: This alternative would have the least impact with the maximum potential for diversity through the careful implementation of prescribed fire in areas ill-suited to wildland fire use. Wildland fire posing a potential threat to life, property, or sensitive resources would be suppressed, while continued implementation of wildland fire use in remote portions of the Park/Preserve would ensure the cost-effective preservation of the area's natural fire ecology as well as the reduction of potentially dangerous fuel loads.

A purpose of the park is "To maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes and streams, valleys, and coastal landscapes in their natural state." Fire is an inextricable component of the fire dependent ecosystem of this area and is known to maintain a balanced, naturally functioning ecosystem. Selection of this alternative to use prescribed fire; wildland fire use within established resource objectives and wildland fire suppression would maintain the natural function of the ecosystem in the Park/Preserve.

Conclusion: A balanced and naturally functioning ecosystem would be maintained with the use of this alternative. The level of impacts to vegetation and biodiversity anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Cultural Resources: There would be improved long-term protection of registered and unregistered cultural resources with the use of fire near and surrounding cultural resources. The occasional use of prescribed fire would allow a relatively cost-effective means of reducing fuel loads and preserving historic landscapes and conditions where the presence of values to be protected prohibits the implementation of wildland fire use.

Cultural resources are not specifically stated as a purpose of the Park/Preserve.

Conclusion: Long-term protection of registered and unregistered cultural resources would result from this alternative. This is anticipated to not result in an impairment of park resources fulfilling specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Aesthetics and Recreation: The impacts would be similar to Alternative 1 with the addition of the occasional use of prescribed fire that would allow a relatively cost-effective means of reducing fuel loads where the presence of values to be protected prohibits the implementation of wildland fire use.

A purpose of the Park/Preserve is “to provide continued opportunities, including reasonable access for mountain climbing, mountaineering, and other wilderness recreational activities.” Selection of Alternative Two would not result in a change in vegetative composition and it would support a naturally functioning ecosystem. Sight lines and access would be maintained.

Conclusion: This may result in a minimal impact by closing certain areas and some vegetation may be burned decreasing aesthetics in limited areas. The level of impacts to aesthetics and recreation anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Local Economy: The impacts would be similar to Alternative 1 with the addition of the occasional use of prescribed fire that would allow a relatively cost-effective means of reducing fuel loads where the presence of values to be protected prohibits the implementation of wildland fire use.

Conclusion: The increase in revenue would result in a minimal beneficial impact. The level of impacts to the local economy would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Wetlands and Floodplains: The impacts would be similar to Alternative 1 with the addition of the occasional use of prescribed fire that would allow a relatively cost-effective means of reducing fuel loads where the presence of values to be protected prohibits the implementation of wildland fire use. Once vegetation in these areas re-establishes erosion is expected to diminish.

A purpose of the Park/Preserve is "To maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes and streams, valleys, and coastal landscapes in their natural state.” Fire is an inextricable component of the fire dependent ecosystem of this area and is known to maintain a balanced, naturally functioning ecosystem. This alternative would provide for a natural ecosystem in the Park/Preserve and not result in the impairment of this park purpose or any resources or values.

Conclusion: There would be temporary minimal impacts due to a loss of vegetation. The level of impacts to wetlands and floodplains anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Subsistence Use and Wildlife Habitat: The impacts would be similar to Alternative 1 with the addition of the occasional use of prescribed fire that would allow a relatively cost-effective means of reducing fuel loads where the presence of values to be protected prohibits the implementation of wildland fire use.

A purpose of the Park/Preserve is “to protect habitat for, and populations of, fish and wildlife including but not limited to caribou, brown/grizzly bears, Dall sheep, moose, wolves, trumpeter swans and other waterfowl, and marine mammals” and “Subsistence uses by local residents shall

be permitted in the park, where such uses are traditional, in accordance with the provisions of title VIII". Fire is an inextricable component of the fire dependent ecosystem of this area and is known to maintain a balanced, naturally functioning ecosystem. Selection of this alternative would not disrupt the natural function of the ecosystem in the Park/Preserve, therefore maintaining wildlife habitat and subsistence use within the Park/Preserve.

Conclusion: The natural function of the ecosystem in the Park/Preserve would not be disturbed, therefore maintaining wildlife habitat and subsistence use within the Park/Preserve. There would be a negligible short-term impact resulting from a displacement of wildlife in the burned area. This, however, would replicate a naturally functioning ecosystem and subsistence regime. The level of impacts to subsistence and wildlife habitat anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Air Quality: The impacts would be similar to Alternative 1 with the addition of the occasional use of prescribed fire that would allow a relatively cost-effective means of reducing fuel loads where the presence of values to be protected prohibits the implementation of wildland fire use.

Air quality is not specifically stated as a purpose of the Park/Preserve, though a degradation of air quality by fire could affect visitor use and recreation purposes. Fire is naturally occurring event in the Park/Preserve ecosystem. Degradation in air quality at the levels expected would be similar to a natural occurrence.
Conclusion: No long term impacts to air quality are expected. The level of impacts to air quality anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Water Quality and Fisheries: The impacts would be similar to Alternative 1 with the addition of the occasional use of prescribed fire that would allow a relatively cost-effective means of reducing fuel loads where the presence of values to be protected prohibits the implementation of wildland fire use.

A purpose of the Park/Preserve is “to protect habitat for, and populations of, fish and wildlife including but not limited to caribou, brown/grizzly bears, Dall sheep, moose, wolves, trumpeter swans and other waterfowl, and marine mammals”. Fire is an inextricable component of the fire dependent ecosystem of this area and is known to maintain a balanced, naturally functioning ecosystem. Selection of this alternative would not disrupt the natural function of the ecosystem in the Park/Preserve. Fire is a common occurrence in this ecosystem and does result in some erosion, affecting water quality and fisheries habitat. The erosion is expected to continue at the same natural levels.

Conclusion: Long term impacts to water quality and fisheries are not expected. Short-term negligible impacts of increased sedimentation may occur initially after the fire and prior to reestablishment of vegetation. The level of impacts to water quality and fisheries anticipated from this alternative would not result in an impairment of park resources that fulfill specific

purposes identified in the establishing legislation or are key to the natural or cultural integrity of the park.

Alternative 2 Cumulative Impacts: The on-going and future activity that would have a cumulative effect on resources of concern within and outside of the Park and Preserve's boundaries analyzed in this Environmental Assessment is the adjacent landowners' fire management plans. All public land management agencies in Alaska are signatories of the Alaska Interagency Fire Management Plan, which allows for fire to burn on the landscape in limited suppression units. Much of the public lands surrounding the Park and Preserve is in a limited suppression unit and may result in multiple large fires. The results of these multiple fires may be greater than fires managed just within the Park and Preserve boundary.

B. Cumulative Impact Mitigation

Potential cumulative impacts can be mitigated by the convening of a Multi-Agency Coordinating (MAC) group. As directed in the Alaska Interagency Fire Management Plan, "A statewide Multi-Agency Coordinating (MAC) group may be convened to implement a temporary change from the selected management options for a specific geographic area(s) during periods of unusual fire conditions (e.g., numerous fires, predicted drying trends, smoke problems, unusually wet conditions or suppression resource shortages)."

C. IMPACTS OF ALTERNATIVES SUMMARY

	Alternative 1: Wildland Fire Use and Wildland Fire Suppression	Alternative 2 (Preferred): Prescribed Fire Use, Wildland Fire Use, and Wildland Fire Suppression
Vegetation and Bio-diversity	Minimal impact: continued potential for minimal loss of diversity through fire exclusion in or near Critical and Full Protection Units and sites.	Least impact: maximum potential for diversity through careful implementation of prescribed fire in areas ill-suited to wildland fire use.
Cultural Resources	Minimal impact: Increased potential for uncontrolled fire due to increased fuels through fire exclusion in or near Critical and Full Protection Units and sites.	Improved long-term protection of registered and unregistered historic and/or archeological sites; improved maintenance of historical landscapes and conditions.
Aesthetics and Recreation	Minimal impact: occasional closures of specific areas; vegetation burned may decrease aesthetics.	Minimal impact: occasional closures of specific areas; vegetation burned may decrease aesthetics.
Local Economy	Minimal impact	Minimal impact
Wetlands and Floodplains	Minimal impact: may be some erosion until vegetation returns.	Minimal impact; may be some erosion until vegetation returns.
Subsistence Use and Wildlife Habitat	No long-term impact; some potential for short-term displacement of game from specific areas.	No long-term impact; some potential for short-term displacement of game from specific areas.
Water Quality and Fisheries	No long-term impact; some short-term erosion.	No long-term impact; some short-term erosion.
Air Quality	Minimal impact.	Minimal impact.

V. COORDINATION AND CONSULTATION

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LITERATURE CITED

Alaska Land Managers Cooperative Task Force. 1979. Fortymile Interim Fire Management Plan.

Alaska Interagency Fire Management Council. 1983. Alaska Interagency Fire Management Plan, Copper Basin Planning Area.

Alaska Interagency Fire Management Council. 1983. Alaska Interagency Fire Management Plan, Fortymile Planning Area.

Alaska Interagency Fire Management Council. 1988. Alaska Interagency Fire Management Plan, Southeast Planning Area.

Alaska Wildland Fire Coordinating Group. 1998. Alaska Interagency Wildland Fire Management Plan.

National Park Service. 1998. Director's Order 18: Fire Management.

National Park Service. 1997. Resource Management Plan, Wrangell-St. Elias National Park and Preserve.

United States Congress. 1969. National Environmental Policy Act.

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APPENDIX C.2: ANILCA Title VIII Section 810 (a)

Summary Evaluation and Findings

I. INTRODUCTION

This section was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It summarizes the evaluations of potential restrictions to subsistence activities which could result from the implementation of the proposed fire management plan and the actions described therein.

II. EVALUATION PROCESS

Section 810(a) of ANILCA states:

"In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands…the head of the federal agency…over such lands…shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be affected until the head of such Federal agency—

gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to section 805;

(2) gives notice of, and holds, a hearing in the vicinity of the area involved;
and

determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions."

ANILCA created new units and additions to existing units of the national park system in Alaska. Wrangell-St. Elias National Park and Preserve was created through the passage of ANILCA Section 201(a) in order to "maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes and streams, valleys, and coastal landscapes in their natural state; [and] to protect habitat for, and populations of, fish and wildlife including but not limited to caribou, brown/grizzly bears, Dall sheep, moose, wolves, trumpeter swans and other waterfowl, and marine mammals…." Sections 101 (a), (b), and (c) of ANILCA charges all national park units in Alaska with the preservation of historic and archeological sites.

The potential for significant restriction must be evaluated for the proposes action's effect upon "…subsistence uses and needs, the availability of other lands for the purposes sought to be achieved and other alternatives which would reduce or eliminate the use."

III. PROPOSED ACTION ON FEDERAL LANDS

The National Park Service specifies that every administrative unit with burnable vegetation develop a fire management plan—a unit-specific document outlining fire management goals and describing the policies and actions by which these goals will be realized (Director's Order 18). Since 1983, the Park/Preserve's fire management program has operated under the auspices of various interagency agreements, including most recently the Alaska Interagency Wildland Fire Management Plan, or AIWFMP (1998). Under the AIWFMP, fire protection needs at Wrangell-St. Elias are determined by NPS and State of Alaska Division of Forestry managers; lands within the Park/Preserve are then placed within critical, full, modified, or limited protection categories, depending on the proximity of values to be protected and on overall resource management objectives.

The proposed action entails the establishment of a Fire Management Plan for Wrangell-St. Elias National Park and Preserve. Both the preferred alternative and the other considered alternatives allow for continued adherence to the AIWFMP while at the same time bringing the Park/Preserve's fire management program into compliance with recently developed National Park Service directives. Specifically, NPS Director's Order 18 mandates a distinction between prescribed fire (planned and implemented by management) and wildland fire (unplanned, whether naturally ignited or human-caused), with wildland fire incidents further categorized, in turn, as either wildland fire use or wildland fire suppression. Each of the considered alternatives mandates a specific configuration of DO-18 management options and relates these options to the policies and procedures outlined in the AIWFMP.

The preferred alternative calls for the continued management of wildland fire at Wrangell-St. Elias National Park and Preserve through a combination of wildland fire suppression, wildland fire use, and prescribed fire. This statement of Summary Evaluations and Findings addresses the impact of these fire management policies and actions on subsistence activities within the Park/Preserve.

(See the Fire Management Plan and the accompanying Environmental Assessment for further discussion of fire management policies and proposed actions.)

IV. AFFECTED ENVIRONMENT

As mandated by ANILCA section 101(c), the entirety of Wrangell-St. Elias National Park and Preserve will be managed so as to allow for subsistence trapping, hunting, and fishing under applicable state and federal regulations.

Subsistence use is common among residents of the greater Wrangell-St. Elias area, though for the most part such activities are supplemented by cash income though some residents depend greatly on fish, game, vegetable foods, and wood taken from public lands. During ice-free periods, the Copper River makes park/preserve access more difficult for people living along the

main highways. An estimated 100 to 150 people, however, maintain primary residences within the Park/Preserve. This group uses subsistence resources; their subsistence-use activities are concentrated along the McCarthy Road, Nabesna Road, at Chisana, and at the May Creek/Dan Creek/Spruce Point area. The Malispina forelands also receives some subsistence use, though access to this area is by boat or airplane from Yakutat.

Subsistence research conducted during the 1970s by Reckord and McNeary drew a generalized picture of subsistence activities in and around what is now the Wrangell-St. Elias National Park and Preserve. Resources used for subsistence include the following, listed here in order of relative importance: salmon, furbearers, moose, caribou, Dall sheep, mountain goats, waterfowl, hare and bear. Residents within the Park/Preserve also rely on timber for firewood and building materials. Other resources including berries, ptarmigan, spruce grouse, trout, etc. are taken from Park/Preserve lands in relatively small quantities.

Much of the subsistence use currently occurring at Wrangell-St. Elias takes place within the Park/Preserve's Limited Protection fire management unit, with most of the remaining subsistence use occurring in the Park/Preserve's Modified Protection fire management unit. Under the proposed action, certain natural ignitions occurring within these areas would be managed for the accomplishment of resource management goals, including the preservation of fire within its natural role and the perpetuation, in turn, of healthy and biologically diverse plant communities and fish and game habitat. The proposed action would also allow managers to implement prescribed fire in these areas, under appropriate conditions and upon consideration of the impact of such activity upon subsistence use.

V. SUBSISTENCE USES AND NEEDS EVALUATION

To determine the potential impact on existing subsistence activities, three evaluation criteria were analyzed relative to existing subsistence resources that could be impacted.

The evaluation criteria are:
the potential to reduce important subsistence fish and wildlife populations by (a) reductions in numbers; (b) redistribution of subsistence resources; or (c) habitat losses;
what effect the action might have on subsistence fisherman or hunter access;
the potential for the action to increase fisherman or hunter competition for subsistence resources.

1) The potential to reduce populations:

The National Park Service has generally found populations of plants and animals important to subsistence activities to be healthy. Because site-specific information on population, distribution, and harvest is lacking for many of these species, is lacking, however, recognition of declining populations has been difficult.

The actions, which would be implemented under the preferred alternative, would be aimed directly at the safe and cost-effective preservation of the area's indigenous fire ecology. As such, the Park/Preserve's enactment of the preferred alternative would have a beneficial effect on the long-term viability of plant and animal populations pertinent to subsistence use within the Park/Preserve, through the preservation of the area's bio-diversity, the replenishment of key soil

nutrients, and the maintenance of suitable habitat. The occasional short-term displacement of plant and animal populations from specific locales by wildland fire is a natural and inevitable occurrence within the fire-dependent ecosystems of the Wrangell-St. Elias area. Under the proposed action, however, potential losses to subsistence users (including the displacement of important game species or the restriction of access to subsistence-use sites) could be mitigated through consideration of hunting and trapping activities by land managers in the planning and implementation of wildland fire use and prescribed fire incidents. There are a few users who have permits for use of public structures within the Park/Preserve. These structures are protected under Full Suppression as noted in Section XI, Protection of Sensitive Resources. In the event of loss or damage of this structure, the Superintendent of the Park may permit reconstruction of this structure. The long-term benefits of fire to the wildlife habitats of the Wrangell-St. Elias area outweigh any short-term losses by subsistence users and therefore will not be the sole reason for suppressing a wildland fire. However, subsistence use is an important factor in the determination of prescribed fire within the Park/Preserve.

2) Restriction of Access:

Occasional restriction of access to local areas by subsistence users because of wildland fire is inevitable in the Wrangell-St. Elias area, regardless of the Park/Preserve's fire management policy. Fire is an irreducible component of the Wrangell-St. Elias ecosystem. Aggressive suppression can temporarily lesson the frequency of extended wildland fire incidents, but in time the resulting build-up of burnable vegetation will simply engender increasingly catastrophic and uncontrollable fire behavior. Even more pertinent to the question of access are the after-effects of wildland fire activity. Wildland fire in boreal spruce often results in substantial amounts of blowdown; this occurrence, in turn, can act as a formidable obstacle to the accessing of subsistence-use areas.

No form of wildland fire management can eliminate these potential impacts. However, the proposed action—the enactment of a unit-specific fire management plan allowing for the continued management of the Wrangell-St. Elias fire environment through a combination of Wildland Fire Suppression, Wildland Fire Use, and Prescribed Fire—offers the best chance at striking an effective balance between the long-term maintenance of healthy game habitat and the short-term maintenance of user access. Under the proposed plan, the long-term preservation of the area's natural systems would be accomplished in part through the implementation of wildland fire use and prescribed fire incidents, giving managers a greater opportunity to mitigate the short-term impacts of fire and/or fire management actions upon subsistence activity.

3) Increase in Competition:

The enactment of the preferred alternative would not significantly increase competition for the use of subsistence resources. Displacement of plant and animal populations from specific sites would be short-term, and in fact in most cases the long-term viability of the populations in question depends directly on the natural processes which the proposed plan would be intended to safely perpetuate.

VI. AVAILABILITY OF OTHER LANDS

As stated earlier, wildland fire is an indigenous component of the plant and animal communities of the Wrangell-St. Elias area. Consequently, the availability of other lands is not a pertinent consideration in this particular case.

With respect to the question of subsistence use, the scope and intensity of wildland fire incidents managed for resource benefit (i.e., fire use incidents) will generally be of small significance when considered within the context of overall available acreage. Prescribed fires will be planned and managed so as to avoid any significant hardship to subsistence users.

VII. ALTERNATIVES CONSIDERED

This section discusses the considered alternatives with respect to their respective reduction or elimination of the need to use public lands necessary for subsistence purposes.

Alternative one (combination of wildland fire use and wildland fire suppression) would not significantly differ from the preferred alternative with respect to the reduction or elimination of the need to use public lands for the accomplishment of fire management goals; long-term effects would be favorable and short-term disruptions to subsistence activities would be minimal.

The preferred alternative (combination of wildland fire use, wildland fire suppression, and prescribed fire) would yield the same favorable long-term effects on lands used for subsistence activities as alternative two. Enactment of the preferred alternative, however, would allow more effective restoration and/or protection of significant fire-sensitive sites and/or landscapes, including long-used trails and access routes pertinent to subsistence use.

VIII. FINDINGS

This analysis concludes that the preferred alternative—the enactment of a fire management plan for Wrangell-St. Elias National Park and Preserve which would allow for the continued management of the Park/Preserve's fire environment through a combination of Wildland Fire Use, Wildland Fire Suppression, and Prescribed Fire—will not result in a significant restriction of subsistence uses.

APPENDIX D.1: Interagency Contacts

Alaska Interagency Coordination Center:

Center Manager	Dave Curry	356-5677
Initial Attack Coordinator	Bob Dickerson	356-5670

State of Alaska Division of Forestry,
Northern Region:

Fire Management Officer	Ken Stump	451-2676

State of Alaska Division of Forestry,
Tazlina (Copper Basin Area):

Area Forester	Gary Mullen	822-5534
Fire Management Officer	Gary Mullen	822-5534
Dispatch	business hours	822-5534
Dispatch	after hours	822-5533

State of Alaska Division of Forestry,
Tok (Fortymile Area):

Area Forester	Jeff Hermans	883-5134
Fire Line		883-3473

Fish and Wildlife Service,
Tetlin National Wildlife Refuge:

Fire Management Officer	Peter Butteri	883-5312

National Park Service:

Fire Management Officer, Alaska Region	Dan Warthin	644-3409
Fire Management Officer, Denali National Park	Larry Weddle	683-9548

APPENDIX D.2: Descriptions of FMU Boundaries

Critical

The Park/Preserve's Critical Protection FMU consists of three small sub-units in the McCarthy-Kennecott area. The Park/Preserve also contains individual structures designated as Critical Protection sites. Pertinent areas outside of the Park/Preserve include small AIWFMP critical protection zones along the highways and roads. (Critical protection zones along the Glenn Highway are separated from the Park/Preserve by the Copper River.)

Full

The Park/Preserve's Full Protection FMU consists of a large contiguous sub-unit in the McCarthy Road corridor (running along the north side of the Chitina River eastward to the communities of Kennicott and McCarthy), as well as an additional sub-unit surrounding the community of Chisana. The Park/Preserve also contains individual structures designated as Full Protection sites. Pertinent areas outside of the Park/Preserve include an AIWFMP full-protection zone straddling the Glenn and Edgerton Highways between Gakona and the confluence of the Chitina and Copper Rivers; a full-protection zone northeast of Noyes Mountain on the Tetlin Indian Reservation; and two small full-protection zones near the village of Slana. These units, sites, and zones are indicated on the DOF dispatch fire atlas.

Modified

The Park/Preserve's Modified Protection FMU consists of various sub-units located in the McCarthy corridor; to the south and east of the Glenn Highway; in the Carden Hills area in the northeast corner of the Park/Preserve; and along portions of the Copper and Bremner Rivers to the south of Chitina. Many of these FMU sub-units abut larger AIWFMP modified protection zones located outside of the Park/Preserve.

Limited

The Limited Protection FMU includes all WRST holdings not contained within the Critical, Full or Modified FMUs.

APPENDIX E: Sample Delegation of Authority

Sample Delegation of Authority:
Delegation of Authority
National Park Service
Eastern Area Fire Management

As of _____(Time Date, Year), I have delegated authority to manage the Fire Name, Fire Number National Park Unit, to Incident Commander Bill Jones and his Incident Management Team.

The fire, which originated as _____ (cause) occurring on _____(Start Date), is burning in the _____Drainage. My considerations for management of this fire are:

1. Provide for firefighter and public safety.
2. Manage the fire with as little environmental damage as possible.
3. Key cultural features requiring priority protection are:
    a. Cabin A at Lattitude XX and Longitude YY
4. Key resources considerations are:
    a. Wilderness impacts.
    b. Fisheries
    c. Concessionaires
    d. Other
5. Restrictions for suppression actions include:
    a. Retardant and heavy equipment (including bulldozers) will not be used without the permission of the Superintendent or delegate, except in life-threatening situations.
    b. Use of vehicles will be restricted to established roads and trails.
6. Minimum tools for use are:
7. My agency Resource Advisor will be: James Savage, Greg Biddle, Miranda Terwilliger, Andrew Ruth, Jessica Sherwood, Alicia Tanrath, or Eric Veach (Any of the above)
8. Agency Representative that will represent me on a day to day basis: James Savage
9. The fire borders are:
10. Manage the fire cost-effectively for the values at risk.
11. Provide training opportunities for the area personnel to strengthen our organizational capabilities. National Park Service personnel should be utilized and prioritized for trainee opportunities as qualified.
12. Minimum disruption of residential access to private property, and visitor use consistent with public safety.
13. Management actions are authorized in the WFDSS document, and no other actions are authorized on EAFM lands except in situations that immediately threaten life or property.

_____ _____
(Signature and Title of Agency Administrator) (Date)

APPENDIX F: Information Officer Step Up Plan

National Park Service
U.S. Department of the Interior

Alaska Wildland Fire
Management Program

Fire Communications
and Education
240 West 5th Ave
Anchorage , AK 99501
907-644-3478 phone
907-644-3809 fax

In many Alaskan towns and villages, residents are more familiar with wildland fire than with NPS employees. Some AK NPS employees are not familiar with wildland fire and park staff may not have experienced wildland fire events during their tenure in Alaska. Furthermore, Information Officers may be unfamiliar with Alaska wildland fire behavior and management and may require some assistance from AK NPS Fire Management staff. It is of utmost importance to keep these factors in mind while assessing the need for an Information Officer.

A wildland fire ignites on National Park Service land and AK NPS Fire Management and suppression organizations initiate the appropriate response based upon the Alaska Interagency and park Wildland Fire Management Plans and NPS policy. During this process, AK NPS Fire Management and park staff must anticipate fire and smoke events and distribute information to internal and external audiences before the events impact them. Consider Information Officer (PIO) assistance when:
Sizing Up the Fire

- Fire threatens structures
- Many large or small fires throughout the area
- Fire or smoke visible from town
- Fire moves towards a town or village
- Smoke impacts health or transportation in town, village or throughout the area
- Fire triggers media interest

Evaluating AK NPS Fire Management

· Fire Management staff anticipate not being able to, or cannot accomplish all outreach tasks.
· Internal and external communication methods such as local NPS Fire News updates (via Lotus Notes) and national NPS Fire News (located on the internet at http://www.nps.gov/fire/public/pub_firenews.cfm) no longer fulfill the needs of the incident.
· AK NPS Fire Management staff receives more calls or comments of concern regarding the management of the fire than they can sufficiently handle.

Evaluating AK NPS Employees

· NPS staff receives more calls or comments of concern regarding management of the fire than they can sufficiently handle.
· NPS staff cannot adequately respond to the number of information requests from local residents, visitors, and other park staff.
· NPS staff cannot fulfill fire related outreach needs.
· NPS staff voice concern about wildland fire management.
· A number of NPS employees or in particular, key staff members, are unfamiliar with AK wildland fire management and wildland fire in the boreal ecosystem.

Evaluating the Community

· Community vocalizes concern about the management of the fire.
· An incident of this nature has not recently occurred in this area.
· Community (at large) is unfamiliar with wildland fire and smoke thus reacts to it in either a negative or positive manner.
· Fire management activities or smoke impacts the community for more than a few days.
· Incident affects the economic viability of the community.
· Community has negative opinions about the NPS or government.
· Similar incidents occurred in the area and community members were affected in a negative way and still harbor and vocalize those emotions.
· Health impacts occur and/or evacuations are planned for or initiated.
· Incident directly affects the community. Such as…
- Threat or perceived threat to personal property or welfare
- Impacts planned events or historical happenings

- Creates resource management issues
- Their quality of life
- Effects on their value systems
    · Incident will impact the common thread that holds this community together. Such as…
- Hunting grounds, berry picking opportunities, recreational areas, natural beauty of the surrounding areas

During a fire incident that warrants a PIO, things AK NPS Fire Management, PIO and park staff must do in order to be successful…

· Listen, listen, listen to internal and external audiences.
· Make personnel available to answer questions.
· Actively seek out leaders in the community such as Village Councils, Tribal Council, Community Elders to communicate with.
· Always try to make sure the community hears it from NPS or involved agency first.
· Evaluate the most effective means of communicating to town or village residents and residents in the surrounding areas, for example, local radio station, local newspaper, Alaska Rural Communication System.
· Involve community members when giving out information.
· Continually assess community information needs.
· Work closely with all affected agencies (other land managers and suppression organizations).

A PIO can be informally requested or resource ordered. Situations that may warrant an informal request include:

· AK NPS employee where incident occurs is available and the workload does not warrant a full time PIO.
· AK NPS Regional Fire Communication and Education Specialist is available because this person is considered a local NPS resource.

Situations that may warrant a resource order include:
· FMO must look for assistance outside of park/preserve experiencing fire incident
· Workload demands a full time PIO be present.

- Size or complexity of the incident exceeds the experience, training or capabilities of the local PIO.
- Size of the information staff needed exceeds the capabilities of the local PIO.
- When local conditions (political or social) indicate that a non-local PIO may have more success in delivering pertinent fire related messages.

If and when it is determined that a PIO is needed, there are several potential candidates to choose from. A suggested prioritization of available PIOs is listed here:

1. AK NPS employee where incident occurs
2. AK NPS employees
3. AK NPS Regional Fire Communication and Education Specialist
4. AK agency employees and/or residents
5. NPS or other agency employees

Please note the AK NPS Regional Fire Communication and Education Specialist maintains a list of AK NPS PIO contacts.

The AK NPS Fire Management Officer has the discretion to select an PIO1, 2, PIOF, or trainee for the fire incident. The size and complexity of the fire incident often foretells what type of PIO is needed

Once the PIO arrives, encourage him/her to seek out support from local NPS employees, other local agency employees and community members. AK NPS Fire Management staff should continue to provide information about the fire to the best of their ability and as needed by the PIO in order to fulfill the information needs of the community, visitors, and park/preserve staff. AK NPS employees should be strongly encouraged to participate in information activities as they are initiated by the PIO.

Updated February 6, 2009

APPENDIX G: Wildland and Prescribed Fire Monitoring Plan

This section reserved for the Fire Monitoring Plan.

Appendix J Alaska Structure Protection Procedures

The following procedures provide guidance to NPS Park Management, Alaska Fire Service (AFS), the Alaska Division of Forestry (DOF), the USDA Forest Service (FS) and Incident Management Teams concerning structure protection priorities for wildland fire suppression activities on lands managed by the National Park Service (NPS) in Alaska. These procedures do not pertain to non-federal lands within NPS unit boundaries. This document was prepared in cooperation with regional and park wildland fire, resource management and cultural resources management staffs.

1. The safety of the public and fire suppression personnel is the first priority in fire suppression/structure protection decision and implications. Regardless of the protection status of the structure, if humans are present at a structure threatened by wildland fire, human safety is the priority. Firefighter safety will not be compromised for structure protection.

2. The priority of structure protection is determined by the selected fire management options (Alaska Interagency Wildland Fire Management Plan, 1998) and dependent upon the availability of resources. Firefighting resources may not be available or able to safely access the structure(s) identified for protection.

3. The appropriate laws, regulations and policies in conjunction with General Management and Resource Management Plan(s) will be referenced for decisions regarding protection of structures.

4. The determination of the wildland fire management options for lands and resources managed by the NPS is the responsibility of NPS park management in conjunction with NPS wildland fire and park personnel. The NPS will determine the fire management option for structures on NPS managed lands using the following criteria:

   A. The structure(s) is a primary domicile (Critical Management Option.)

   B. National Historic Landmarks that may be threatened by wildland fire (Critical Management Option.)

   C. The Structure has been determined eligible for or is on the National Register of Historic Places, has structural integrity (e.g. intact roof and walls, a reasonable probability for defense), is at potential risk from wildland fire and has been identified for or undergoing routine maintenance/restoration (Full Management Option.)

   D. NPS administrative (e.g. patrol cabin) or public use structures – public funds expended to construct or maintain (Full Management Option.)

   E. The use of the structure is provided for under NPS permit or an approved Mining Plan of Operations (Full Management Option.)
   F. The Structure is undergoing an eligibility or management assessment and has structural integrity (e.g. intact roof and walls, a reasonable probability for defense) or is involved in a legal process (Full Management Option.)

5. Unauthorized structures will not be protected.

6. In a wildfire situation, if information on the fire map atlas is not sufficient, the suppression organization fire management officer will contact the appropriate NPS Area or Regional Fire Management Officer for a decision.

7. If in a wildfire situation, an undesignated structure is discovered on NPS lands, appropriate NPS Area or Regional Fire Management Officer will be notified. NPS will determine fire management option for the structure using criteria listed in # 4. If the structure has intact roofs and walls, it will be afforded protection commensurate with Full Management Option until a final determination is reached.

8. NPS wildland fire and park personnel will initiate the actions to reduce hazardous fuels adjacent to structures on NOS managed lands that have been identified for protection. The NPS will clarify hazardous fuel reduction responsibilities of NPS permit holders within their permit stipulations. The NPS may assist permit holders with fuel reduction activities. The NPS also may assist non-federal entities with fuel reduction activities that are mutually beneficial to both parties.

9. The NPS wildland fire management officers are responsible for providing current NPS fire management option selections to the suppression organizations, ensuring changes are incorporated into the map atlas, and maintaining the NPS wildland fire management atlas. Structures that do not warrant protection will be identified as “non-sensitive” on the map atlas. Changes in wildland fire management options and updating of map atlas should be part of the annual fire management plan review.

10. Any fire operations that included structure protection actions in the preceding year will be evaluated to determine if the fire management category is appropriate and if the operations were safely and efficiently conducted.

Appendix K Eastern Area Contact List

EASTERN AREA FIRE MANAGEMENT
2010 CONTACT INFORMATION

NAME	OFFICE/FAX	HOME	CELL
YUGA/FAIRBANKS ADMIN CENTER-4175 Geist Road, Fairbanks, AK 99709			
Greg Dudgeon (YUGA)	455-0615/0602		978-9452
Tom Liebscher (YUGA)	455-0620/0602	374-4784	
Gary Youngblood (YUGA)	455-0616/0601		912-531-0100
VACANT (FMO)	455-0650/0601		
James Savage	455-0651/0601	457-3608	347-7102
Andrew Ruth	455-0654/0601	474-0372	699-2218
Alicia Tanrath	455-0659/0601		699-2142
Jessica Sherwood	455-0658/0601		699-2208
Linda Breiner	455-0653/0601		347-2924 (699-2238 Field)
Detailer/Seasonal phone	455-0655/0601		699-2268
Ansel Siegenthaler	455-0655/0601		510-316-1155
Anna (Janet) Selby	455-0655/0601		303-512-3067
Dallas Anderson	455-0655/0601		360-909-5237
Eric Hawes	455-0655/0601		518-281-6417
Joshua Hinson	455-0655/0601		614-441-6290
REGIONAL OFFICE-240 w. 5TH Ave., Anchorage, AK			
Dan Warthin	644-3409/3809	865-5984	444-8788
Jennifer Barnes (FAI)	455-0652/0601	458-7596	347-0257
Jennifer Mitchell (FAI)	455-0656/0601		347-8738
Brian Sorbel	644-3413/3809		947-1306
Morgan Warthin	644-3418/3809	865-5984	347-7997
Vacant (FPMA)	644-3412/3809		
YUKON-CHARLEY RIVER PARK & PRESERVE-EAGLE			
Lou Flynn (YUCH Dispatch)	547-2233 x 100/2247	547-2240	347-1661
Pat Sanders	547-2233 x 120/2247	547-2240	347-1661
GATES OF THE ARTIC-BETTLES			
Dalelynn Gardner	692-6100/5400	692-5021	
RJ Johnson	692-6102/5400		
WESTERN AREA FIRE OFFICE-DENALI *HELI 8816-3163-4869*			
Larry Weddle	683-9548/9624	768-2626	460-1688
Charlie Reynar	683-9549/9624	683-3322	978-9477
Gilbert Garcia	683-6220/9624		661-245-2805
Forrest Ford	683-6221/9624		406-581-1266
Susanna Nancarrow	683-6215/9624		509-280-7179
Denali Dispatch	683-9555		
WRANGELL- ST. ELIAS-P.O. Box 439, Copper Center, AK 99573			
Meg Jensen	822-5234/3281		960-1046
Eric Veach	822-7212/3281	259-4455	960-1042
Lona Ward	822-7217/3281		
Gulkana Dispatch	822-7425		

SAT PHONES *(to call SAT phone dial: 9-1-480-768-2500)*

Helicopter	8816-5145-0220	**FMO:**	8816-4142-6456
Manager	8816-4142-6466	**Unassigned:**	8816-4142-6395
Unassigned:	8816-4142-6454		

SATO - Carlson Wagonlit 1-877-565-4480 or 907-5654400
Fax 1907-565-4401; after hrs. 1-866-508-7324

Alaska Fire Service 800-237-3633
AFS UYD Zone Dispatch 356-5553/5555
Arctic Circle Air 474-0112
Evert's 450-2350
Cargo 450-2300
Warbelow's 474-0518/800-478-0812
Wright's Air 474-0502/800-478-0502
OAS – General Line 907-271-3700

AFS WX Bridge 356-5830
WX Service – 800-472-0391
 # FOR MSG.'s AWAY FROM OFFICE
Dial 455-0698; hit * when greeting is heard;
enter 3 digit phone code and # sign (e.g. 654#);
Enter passcode and # sign.

KJMP Radio Station (Trapline Chatter)**:** 907-488-2216