UNITED STATES AIR FORCE

JOINT BASE ELMENDORF-RICHARDSON, ALASKA

ENVIRONMENTAL ASSESSMENT FOR WILDLAND FIRE PREVENTION ACTIVITIES AT JBER, ALASKA

APRIL 2015

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FINDING OF NO SIGNIFICANT IMPACT

NAME OF PROPOSED ACTION: Wildland Fire Prevention Activities within the Richardson Training Area (RTA) at Joint Base Elmendorf-Richardson (JBER), Alaska.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The United States Air Force (Air Force) proposes to implement wildland fire prevention activities within the RTA to reduce the amount of grassy and downed woody vegetation that may contribute to an uncontrollable wildfire. Prevention activities will take place in May and June of 2015 within the RTA, to include training facilities such as the Small Arms Complex, Infantry Platoon Battle Course, Infantry Squad Battle Course, Digital Multi-Purpose Training Range, Malemute Drop Zone, Geronimo Drop Zone, along with small landing zones and other small training facilities. Three alternatives have been analyzed for their potential environmental impacts to reduce hazardous fuels. Alternative 1 implements the use of prescribed burns of up to approximately 2,000 acres within the RTA. Prescribed burns will include broadcast burning in the open grassy areas as well as debris pile burning. Debris piles will be formed by collecting and centralizing fallen woody vegetation. Burn piles will be in areas that have historically been used to burn fallen and downed vegetation. Additionally, existing fire breaks and fire access roads will be maintained to ensure firefighters have the ability to control both prescribed burns and wildfires. Two new fire access trails are also proposed under Alternative 1 to improve the response time to areas should a fire erupt. Wetland areas would be avoided during construction of firebreaks. Alternative 2 considers the use of mechanical methods to remove vegetation. Mowing would be employed to reduce grasses/shrubs in open areas, such as in drop zones, landing zones, and ranges. Mowing is a far less effective way to reduce the presence of fuels due to the amount of time involved and because mowing does not remove all the vegetation and can result in a buildup of dried biomass. The acreage to be mowed would be the same as what would be burned under Alternative 1. Fallen and downed woody vegetation would be collected and piled in central locations throughout the training area. Fire access roads and fire breaks would be maintained and constructed in the same manner as under Alternative 1.

The No Action Alternative was also evaluated under the Proposed Action. The No Action Alternative would result in the Air Force not taking preventative measures to reduce potentially hazardous vegetation throughout the RTA. Not implementing wildland fire preventative actions will compromise military readiness because of the certain types of live fire ammunition would be prohibited when the potential for a fire is high.

ENVIRONMENTAL CONSEQUENCES

The supporting Environmental Assessment (EA) addresses the potential environmental consequences from implementing the Proposed Action and Alternatives. Potential impacts to air

quality, water quality, soils, biological resources, cultural resources, and public access and recreation were analyzed. Based upon the analysis of baseline conditions; proposed activities; potential environmental effect; continued environmental stewardship; monitoring measures and programs, no significant direct, indirect, or cumulative impacts to the environment would be expected to occur under implementation of Alternative 1. Under Alternative 2 and Alternative 3 (No Action), indirect significant impacts may occur as a result of the buildup of hazardous vegetation. When combined with certain live fire activities, the potential for indirect significant impacts, specifically to health, safety, and private property may occur.

CONCLUSION

Based on the findings in the attached EA, conducted in accordance with the requirements of the National Environmental Policy Act and the Council on Environmental Quality, I conclude that implementation of Alternative 1, to implement prescribed burns and wildland fire management activities at JBER, would not result in significant impacts to the quality of the human or natural environment. Therefore, a Finding of No Significant Impact is warranted and an Environmental Impact Statement is not required for this action.

29 APR 15

BRIAN R. BRUCKBAUER
Colonel, USAF
Commander

Date

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The US Air Force proposes to implement wildland fire prevention activities within the Richardson Training Area (RTA) to reduce the amount of hazardous fuels that continuously accumulate in areas where live-fire training may result in the ignition of an uncontrollable wildfire. Hazardous fuels include fallen woody vegetation and open grassy areas. The RTA is located on Joint Base Elmendorf-Richardson (JBER), a joint military installation that supports the Air Force, Army, and tenant agencies/organizations. The RTA is located on the eastern portion of JBER and extends as far north as the Knik Arm and south into the Chugach Mountains (Figure 1.1).

The Air Force, 673d Civil Engineer Squadron (CES) has prepared this Environmental Assessment (EA) to identify the potential environmental effects associated with the implementation of wildland fire management actions within the RTA.

1.2 BACKGROUND

JBER resulted from the 2005 Defense Base Closure and Realignment Commission that re-directed installation management and structure from individual military installations to form a new joint base that included the former Elmendorf Air Force Base and the adjacent Army property, Fort Richardson.

Prior to joint basing, USARAK conducted prescribed burns and fuel reduction management activities throughout the RTA to reduce fuel loads that could result in a catastrophic fire. Wildfires regularly occur within the RTA and can present a hazard to the surrounding population. Wildfire also places a hindrance on the ability for USARAK to train Soldiers. When a wildfire is burning within a training area or training facility, training activities stop until the wildfire has been contained and no longer presents a threat. Historically, USARAK, in conjunction with the Alaska Fire Service (AFS) would conduct prescribed burning at training facilities such as; the Small Arms Complex, Drop Zones, Landing Zones, Digital Multi-Purpose Training Range, Infantry Platoon Battle Course, and other smaller training facilities.

Prescribed burns and vegetation reduction occurred at these facilities due to the likelihood that a fire may erupt as a result of live fire training. Prescribed burns were used as a means to ensure that these training facilities would be available year round and training capabilities would not be compromised due to wildfire.

Figure 1.1: JBER and Richardson Training Area Location

1.3 PURPOSE AND NEED

The purpose of the Proposed Action is to reduce hazardous fuel loads throughout the RTA at JBER and to reduce the potential impacts associated with a wildfire. The biggest impact wildfires can have on the military is the reduction of training days. The Proposed Action is needed because fuel loads present a hazard that may impact mission readiness should a wildland fire erupt. Accumulations of dead and down woody debris, "ladder fuels" including but not limited to snagged, wind thrown birch, cottonwood, and aspen as well as standing dead beetle-kill spruce, and open grass areas have contributed to increased wildland fire potential. By removing hazardous fuel loads throughout the training areas the risk associated with an uncontrollable wildfire is reduced.

1.4 REGULATORY COMPLIANCE

This Environmental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) as amended by the Council on Environmental Quality (CEQ), regulations implementing NEPA (CFR 40 Parts 1500-1508); and the Air Force Instruction 32-7061, which adopts 32 CFR Part 989, *Environmental Impact Analysis Process*. This EA has been prepared to determine the potential for significant impacts on the natural, cultural, and socioeconomic environment and to determine whether or not a Finding of No Significant Impact (FONSI) is warranted or if an Environmental Impact Statement (EIS) should be prepared.
In addition to NEPA this EA considers all applicable laws, regulations, and Executive Orders (EO), including (but not limited to) the following:

Clean Air Act (CAA)
Clean Water Act (CWA)
Endangered Species Act (ESA)
Migratory Bird Treaty Act (MBTA)
National Historic Preservation Act (NHPA)
Occupational Safety and Health Act (OSHA)
Marine Mammal Protection Act (MMPA)
AFI 32-7040 Air Quality Compliance
AFI 32-7064, Integrated Natural Resource Management
AFI 32-7065 Cultural Resources Management Program
EO 11514 Protection and Enhancement of Environmental Quality
EO 12372 Intergovernmental Review of Federal Programs
EO 12898 Environmental Justice

Any permits that are required will be obtained prior to the implementation of the Proposed Action and associated alternatives.

1.5 PUBLIC PARTICIPATION

Public participation opportunities with respect to the Proposed Action and Alternatives and this EA are guided by CEQ regulations published at 40 CFR Parts 1500-1508, and the requirements

of 32 CFR Part 989, Environmental Impact Analysis Process. Opportunities for public participation include a scoping, which assists the Air Force in identifying issues of concern and the appropriate scope of the analysis. Scoping is defined as "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a Proposed Action "(40 CFR 1501.7).

The Air Force sent Interagency/Intergovernmental Coordination Letters for Environmental Planning (IICEP) to the appropriate agencies on 20 June 2014. The IICEP process is used to identify the scope of the analysis and provide agencies and interested groups an opportunity to provide input regarding potential effects association with the Proposed Action. These agencies include federal, state, and local agencies, along with Alaska Native Villages/Tribes and Alaska Native Corporations (Appendix A).

As Part of the NEPA process, the Air Force made this EA and Draft FONSI available to the public for public comment and participation on 18 March 2015. The Notice of Availability was published in the Alaska Dispatch Newspaper with the public comment period ending on 17 April 2015 (Appendix B). The NOA was published on the JBER environmental webpage (http://www.jber.af.mil/environmental.asp). During the public comment period no comments were received by the Air Force.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The Proposed Action is to reduce the amount of grassy and fallen/downed woody vegetation within the RTA that may contribute to an uncontrollable wildfire, without losing training capabilities. Preventative measures such as maintenance of existing firebreaks and the creation of additional firebreaks and fire access trails are also proposed. The most common vegetation types that contribute to fuel accumulation are black spruce, white spruce, mixed spruce/hardwood stands, bluejoint reedgrass, and tundra. The action will occur in areas entirely within the RTA that have high training intensity and where vegetation accumulation may result in impacts to military training should a fire erupt. Section 2.2 identifies and describes alternatives identified during an Interdisciplinary Team (IDT) meeting, held on 6 May 2014. The IDT identified three alternatives including the No Action Alternative, to support the purpose and need for the Proposed Action.

2.2 ALTERNATIVES

2.2.1 Alternative 1

Alternative 1 considers the implementation of prescribed burns within the training areas at drop zones, landing zones, and ranges at JBER to reduce grasses and woody vegetation during the early growing season (May and June). Prescribed burning reduces the volume of fuel through combustion, and is the fastest, most complete and most cost-effective fuel removal treatment available (JBER, 2012). Prescribed burns are limited to this time due to weather and personnel constraints. The following actions would be implemented under Alternative 1.

- Use of two prescribed burning methods; broadcast burning and debris pile burning.
- Establishment of new firebreaks and fire access trails, and maintenance of existing firebreaks.
- Consolidation of fallen woody vegetation to historically used burn piles.
- Application of herbicide to prevent growth of willows and alders in drop zones and firebreaks.

2.2.1.1 Burning Methods

Two burning methods will be used to reduce the presence of vegetation, to include broadcast burning and debris pile burning. Broadcast burning takes place in open grassy areas and debris pile burning will involve direct ignition at locations where woody debris is consolidated. Debris piles are formed by consolidating woody vegetation found throughout the training area and burning in place. Historically, burn piles have been used at JBER with areas designated for burning ranging in size anywhere from 1 acre to 20 acres. Debris in the burn piles burned in place and avoid wetland, riparian, and other sensitive areas. Alternative 1 does not include the establishment of new burn piles or the expansion of existing burn piles. Figures 2.1(a-c)

identifies locations where debris piles have been developed in the past. These same locations will be used to site future burn piles, therefore no new burn piles are proposed under Alternative 1. Broadcast prescribed burns would occur within the areas identified in Figures 2.2 (a-e). Table 2.1 identifies the approximate acreage for a prescribed burn in a given area and the maximum acreage burned would be less than 2,000 acres. Typically, broadcast burning occurs in late spring when the snow has melted and before new vegetation growth begins. Debris pile burning can occur at any time of the year, however it is most common during the spring and early fall time period. Burn piles may also be used as collection points for firewood and mulch.

Training Facility or Area	**Approximate Acreage to be Burned**
Grazelka//Mahon Range	282
Handgrenade Range	6
Kraft/Record	103
Newton/Statler	65
Oates	15
Pendeau	27
Match Shoothouse	4
Zero Annex/Sportfire	37
Zero	33
IPBC Range	275
MPTR	257
MMDZ	600
ISBC Range	60
Biathalon Range	10
Neibar Drop Zone	46
Landing Zone Ranger	12

Table 2.1 Training Facilities to Receive Prescribed Burn Treatment and Approximate Acreage.

Prescribed burns will be carried out in coordination with the US Forest Service and Alaska Division of Forestry. A burn plan will be prepared each year and used to evaluate and minimize risks associated with prescribed burning. In addition, the burn plan will be reviewed by the Air Force Wildland Fire Center prior to permit coordination with regulatory agency(s). At a minimum, burn plans are required to contain the following;

- Burn objectives.
- Acceptable weather and fuel moisture parameters.
- Required personnel and equipment resources.
- Burn area map.
- Smoke management plan.
- Safety considerations.

- Pre-burn authorization/notification checklist.
- Coordination to consider wildlife, endangered species, cultural resources, and noxious weed effects.
- Alternative plan to cover plan of action if wind direction changes during a prescribed burn.
- Analysis of burn success and identification of lessons learned.
- When planning for prescribed fires, and when suppressing wildfire, utilize natural and existing man-made features whenever possible.
- Firebreaks must be constructed, maintained, or rehabilitated to prevent erosion.

Prescribed burns will not be carried out unless the conditions in the above list are favorable for a safe burn. The above list of requirements is also identified in the Wildland Fire Management Plan (WFMP) which is provided in Appendix C.

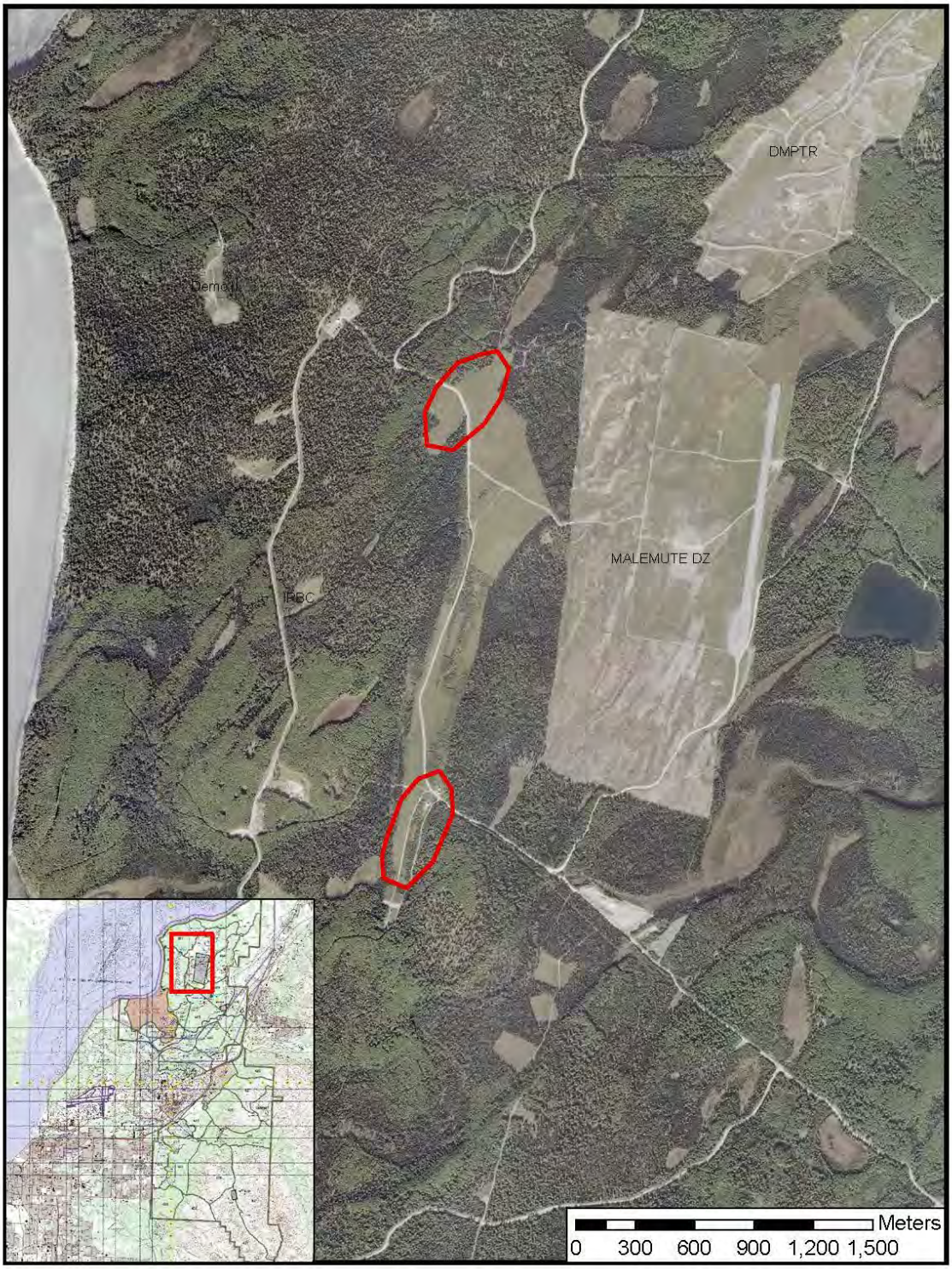

Figure 2.1(a) North Post Burn Piles

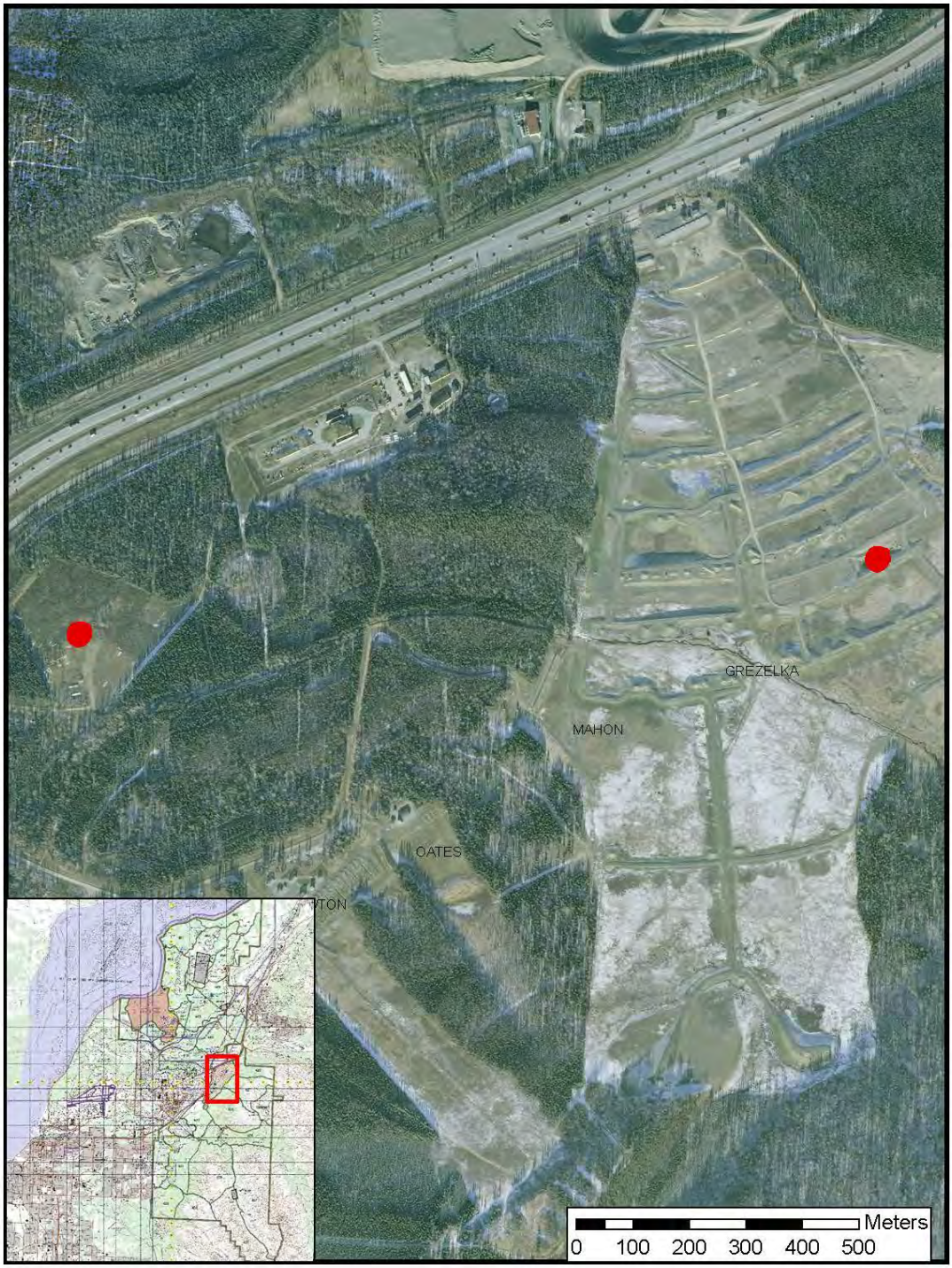

Figure 2.1(b) Small Arms Complex Burn Piles

Figure 2.1(c) South Post Burn Pile

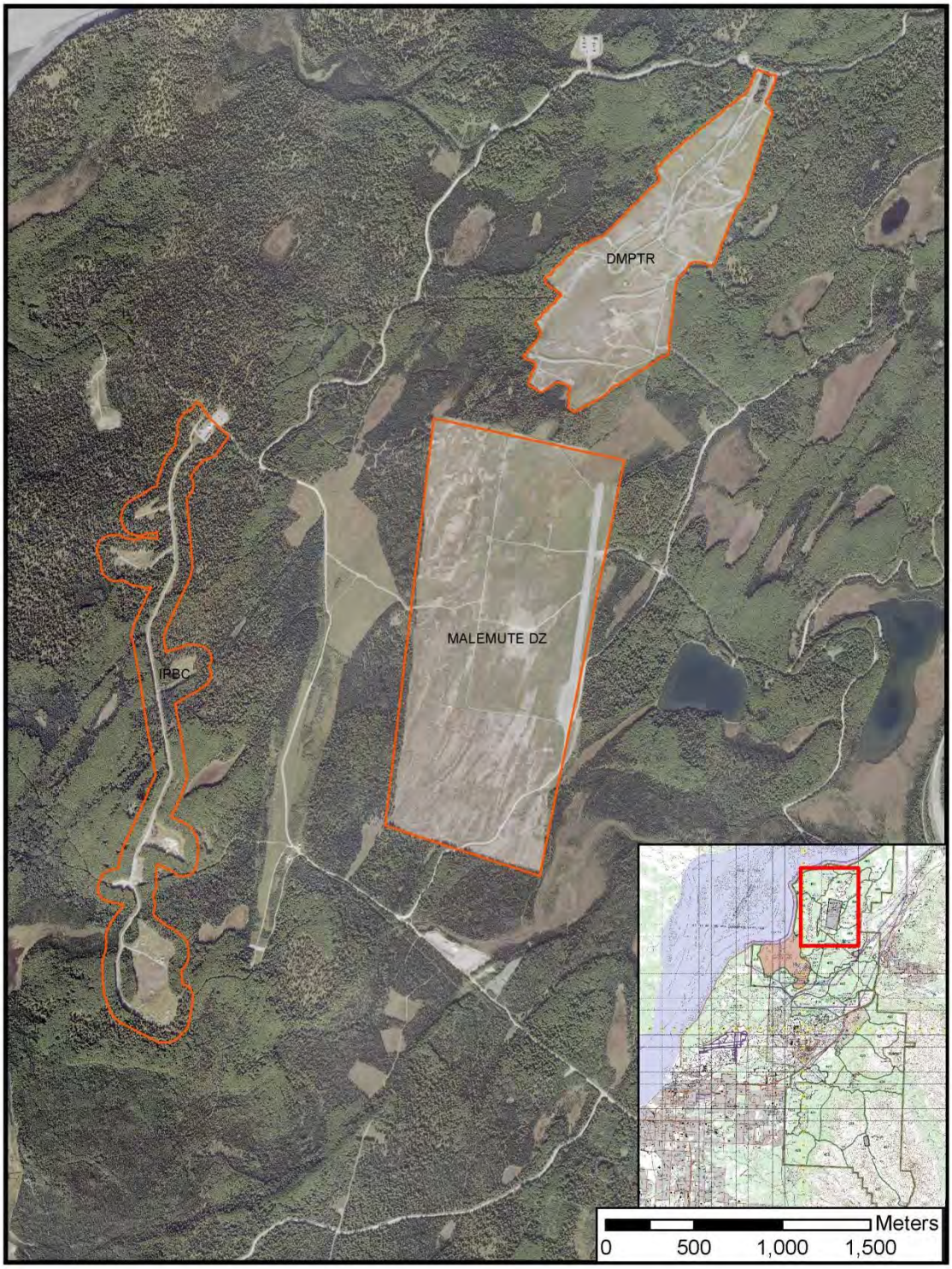

Figure 2.2 (a) North Post Prescribed Burn Area

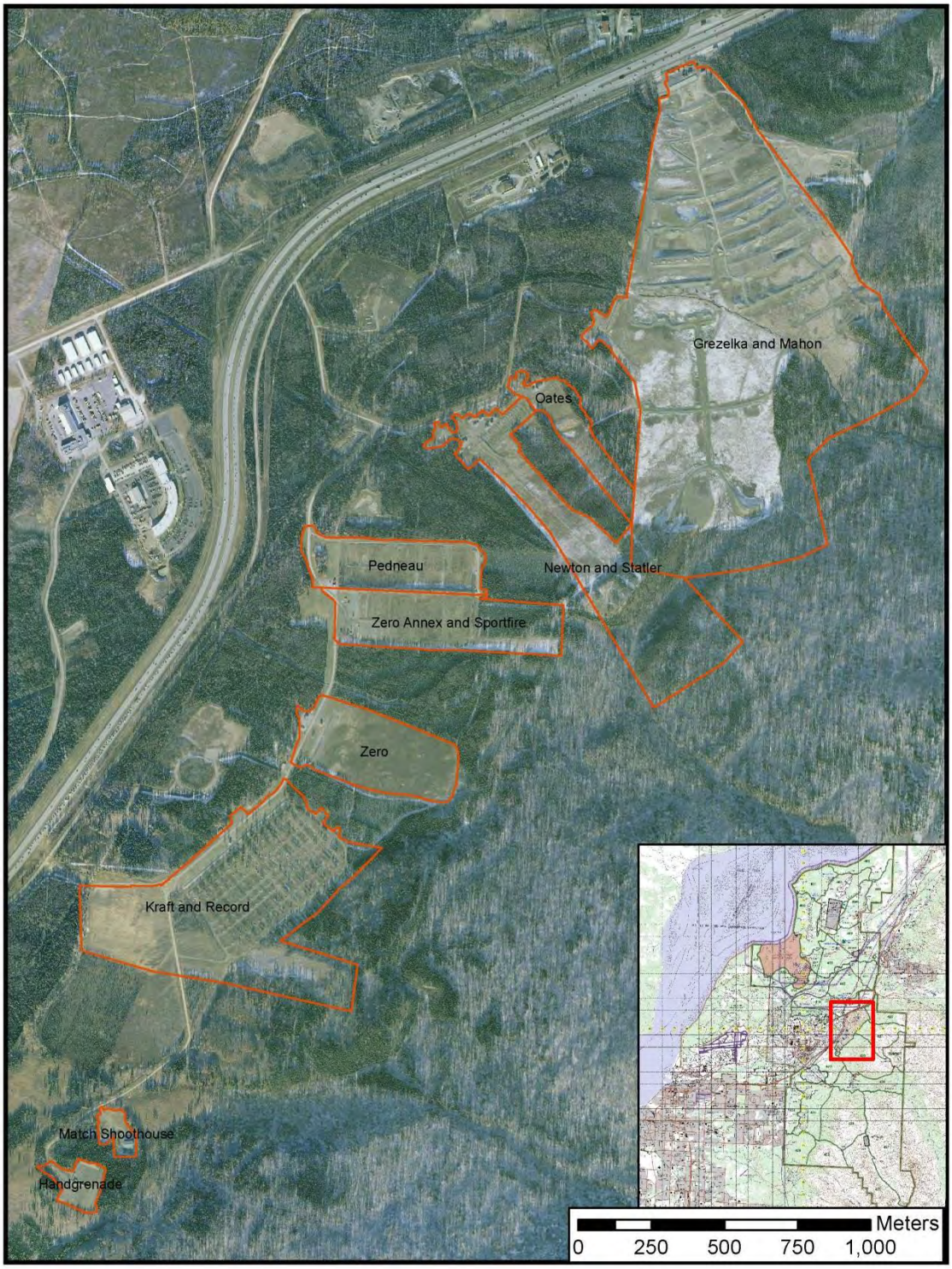

Figure 2.2 (b) Small Arms Complex Prescribed Burn Area

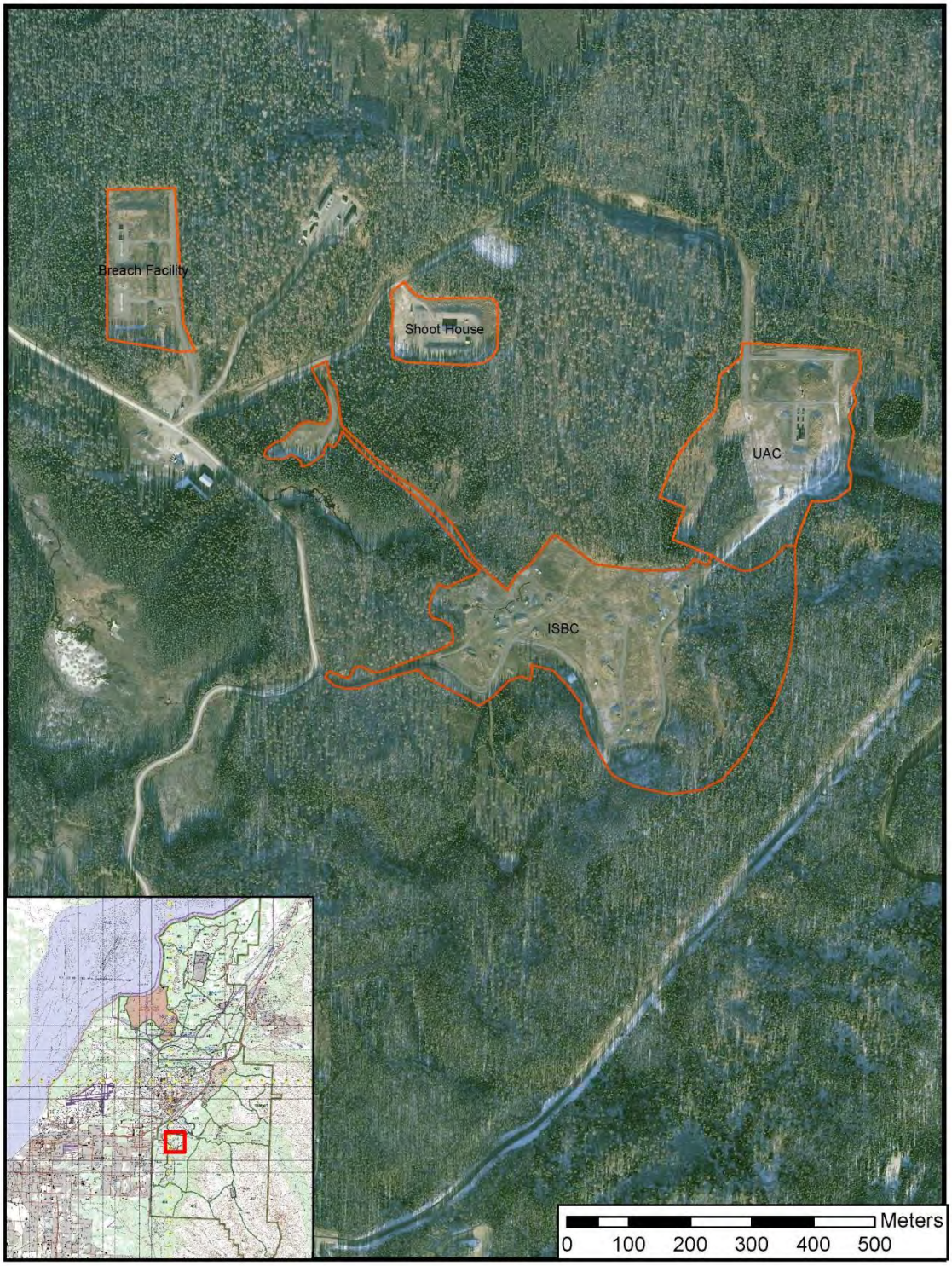

Figure 2.2 (c) South Post Prescribed Burn Area

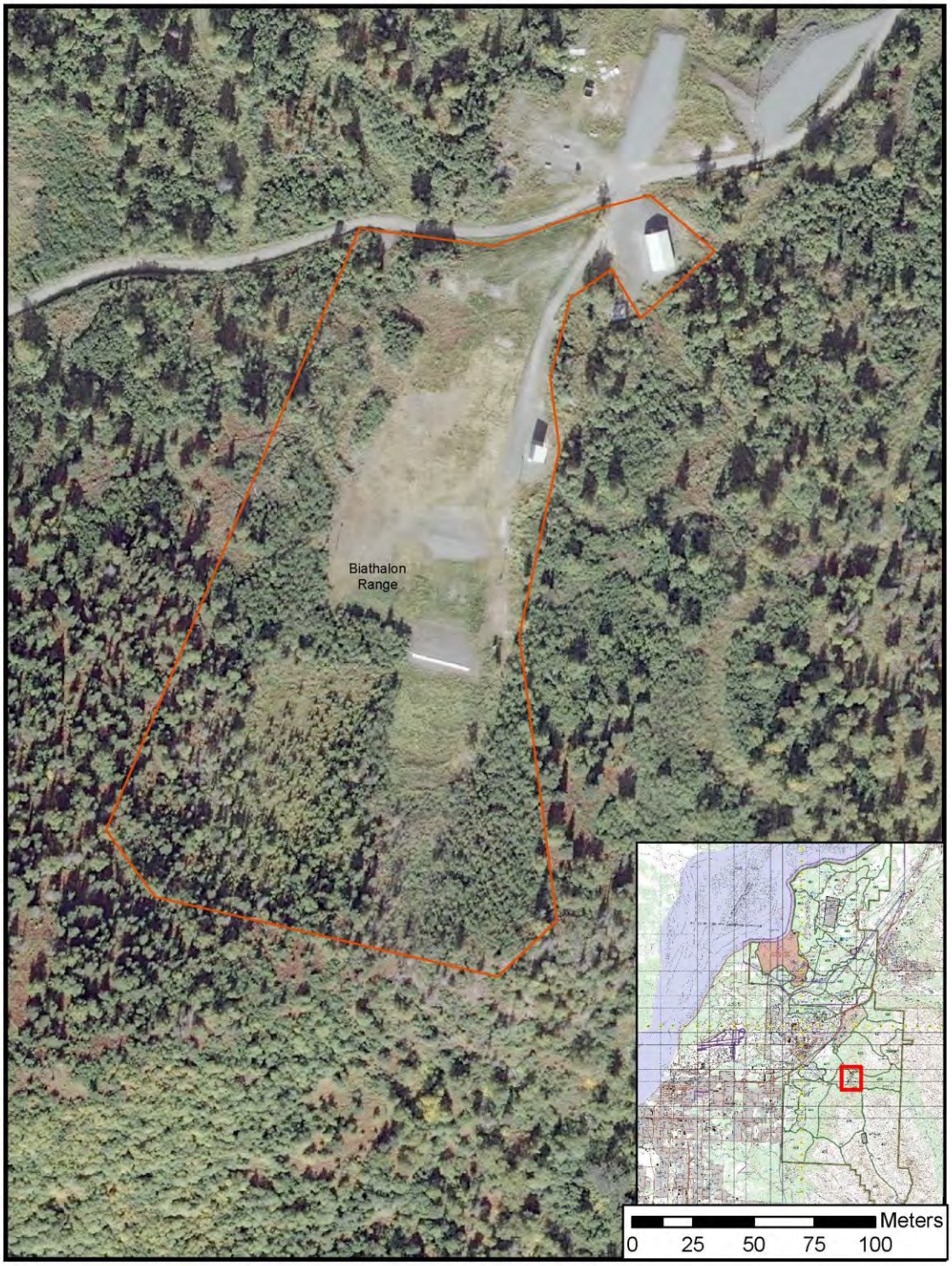

Figure 2.2 (d) Biathlon Prescribed Burn Area

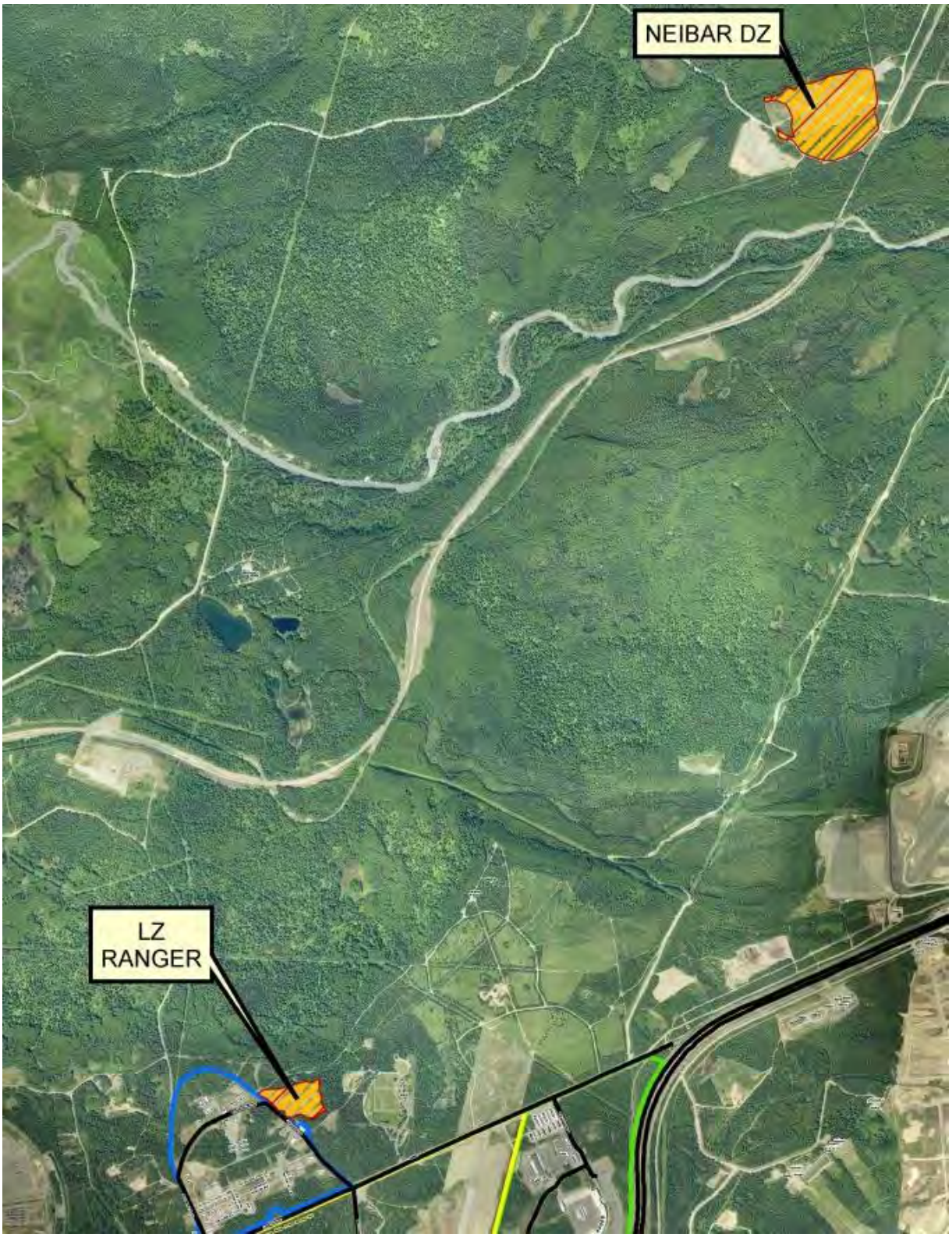

Figure 2.2(e) Niebar DZ and Ranger LZ Prescribed Burn Area

2.2.1.2 Firebreaks and Fire Control Access Roads

JBER maintains fuel break and firebreaks in areas that present a high risk of wildfire. Figure 2.3 identifies the existing firebreaks and fire control access roads in the RTA, most of which primarily are located within or near the Small Arms Complex. Firebreaks are essential to prescribed burns and wildfire management in general, as they contain potential fires and limit the amount of damage that could occur. Fire access roads provide infrastructure for wildland firefighters to access areas where a wildfire is occurring to control the spread of fire.

Under Alternative 1, established firebreaks would be maintained to assure that a prescribed or wildland fire does not escape a contained area. Maintenance activities include clearing brush and vegetation that have built up over time, re-establishment of firebreak edges, and erosion management activities such as grading, blading, and placement of sediment containment materials.

To control and support successful prescribed burns, new firebreaks and access trails will be constructed. Firebreaks can be established using hand thinning or tree removal techniques. Hand line/trenches may be dug to the depth of mineral soil using hand tools. Fire breaks will not exceed a 60 foot clearing limit and will be created either using bulldozers with sheer blades or by hand trimming, or a combination of the two methods. Taller vegetation, such as trees, will be sheared or pushed over, then windrowed or pushed into piles. Other vegetation will be cleared using equipment such as a Hydro-Ax that chops the vegetation and incorporates it with the duff and organic layers of the soil. Fuel breaks and fire access trails are only effective if they are maintained. Therefore, under Alternative 1, new and already established firebreaks and fire access trails would be maintained. Fuel breaks will be cleared at the end of each growing season, before grasses dry and add to the fuel load. Figures 2.4 (a-b) identify where new fire breaks and fire access trails would be developed under Alternative 1.

No firebreaks or trails would be constructed in wetlands prior to satisfying Executive Order 1199 and CWA 404 requirements. Supplemental NEPA would be required if it is determined that wetland areas would be impacted during construction of firebreaks.

2.2.1.3 Prescribed Burn Project Area

Project areas, in regards to prescribed burns are areas beyond where the physical prescribed burns would occur. Project areas serve as a designated buffer where incidental escapement of fire may occur by spotting or torching at the edges of the unit. Escapement of fire into the project area is not considered a wildland fire and would be managed appropriately by the Burn Boss. The project area will be developed and identified by AFS and will be included in the Burn Plan.

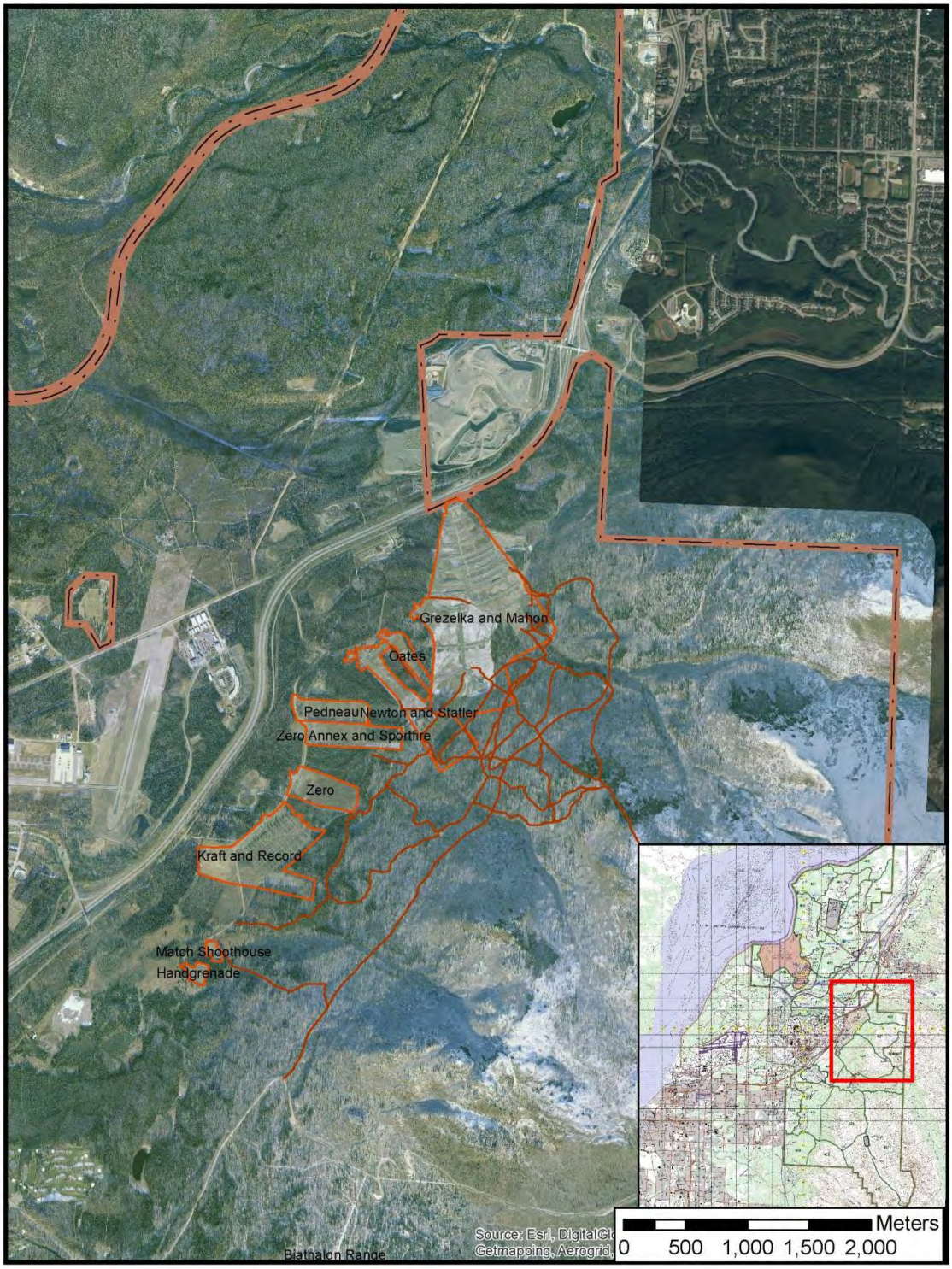

Figure 2.3 Existing Firebreaks Within the RTA

Figure 2.4(a) Proposed Fire Access Trail east of the IPBC

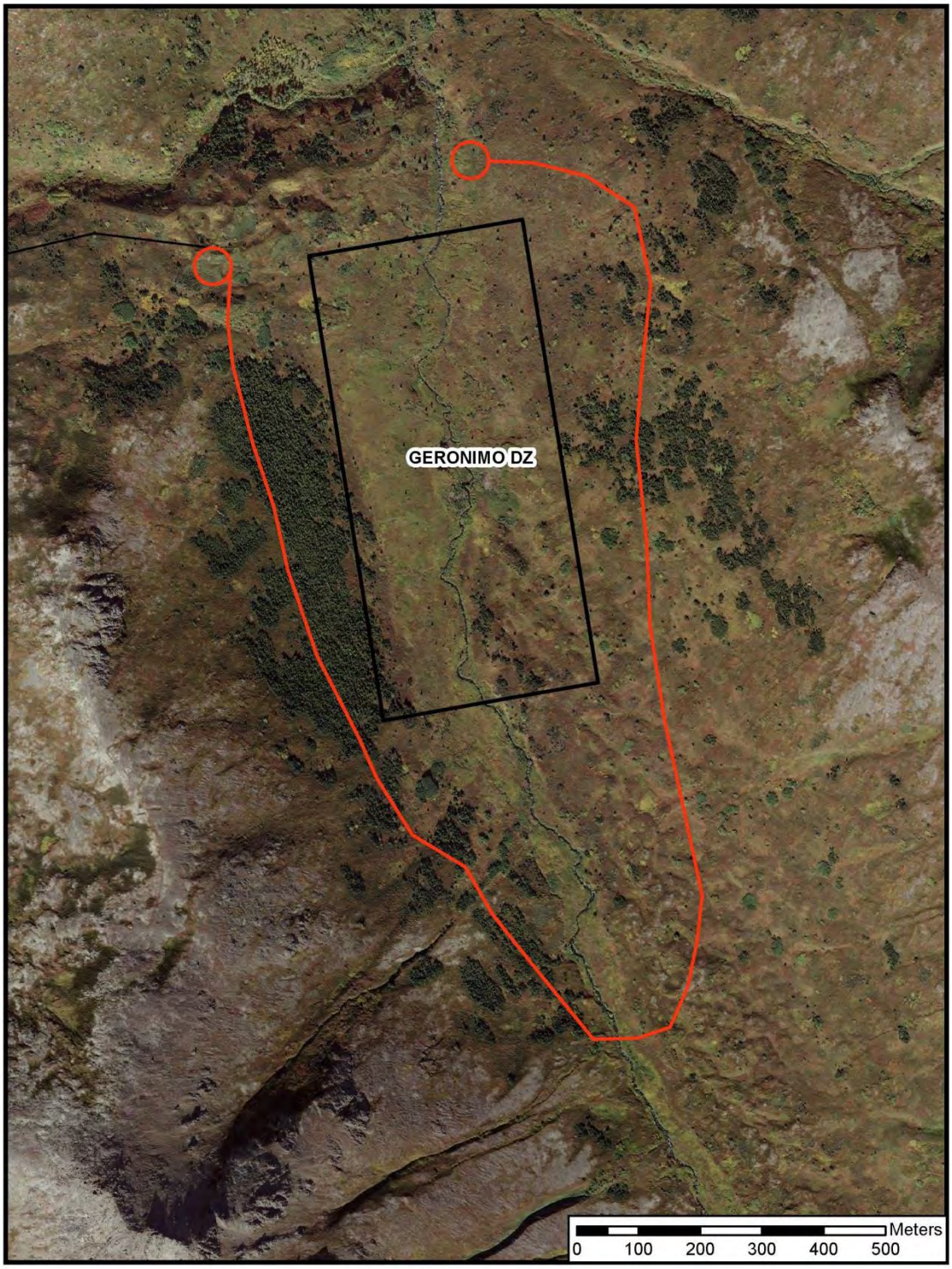

Figure2.4(b) Proposed Firebreak Around Geronimo DZ

2.2.1.3 Herbicide Application

Under Alternative 1, herbicides would be used to control the growth of vegetation, primarily in the landing zones and drop zones. The herbicides to be used along with their application rates are described in Table 2.2. The Material and Safety Data Sheet (MSDS) for these herbicides is provided in Appendix D. The need to apply herbicide is to reduce and control the re-growth of vegetation in a freshly burned or disturbed area. Without the application of an herbicide, vegetation such as alder and willow would quickly regenerate and become a safety hazard for Soldiers, especially in drop zones. Application of herbicides will be conducted by qualified individuals who are permitted to apply an herbicide on a military installation within the State of Alaska. Herbicides will be stored off-site (generally off base) or within an approved storage facility.

All herbicide application would be reviewed and approved by the Integrated Pest Management coordinator.

Herbicide	Application Rate per Acre
LV6	2 quarts/acre
Garlon	4 ounces/ acre
MSM (Metsulfuron methyl)	0.10 ounces/acre

Table 2.2- Herbicides to be applied and application rate

2.2.2 Alternative 2

Alternative 2 considers the use of mechanical methods to reduce the amount of woody and grassy vegetation throughout the training areas at JBER. Alternative 2 is similar to the actions listed in Alternative 1; however prescribed burns would not be used to reduce the amount of vegetation within the RTA.

Mowing would be employed to reduce grasses/shrubs in the open areas, such as in the drop zones, landing zones, and ranges. Mowing is a far less effective way to reduce the presence of fuels due to the amount of time involved and because mowing does not remove all the vegetation and can result in a buildup of dried biomass. The acreage to be mowed would be the same as what would be burned under Alternative 1 (Table 2.1).

A firebreak system with access trails would be implemented for Alternative 2 as described under Alternative 1. Firebreaks would need to be constructed and maintained, similarly to how they are described in Section 2.2.1.2. Piles of woody debris would not be burned, but instead discarded or repurposed as fire wood or mulch. Application of herbicides as described in Section 2.2.1.3 would also be implemented under Alternative 2.

2.2.3 Alternative 3 (No Action)

Alternative 3, or the No Action Alternative, would result in no active fire management in training areas at JBER to reduce the presence of vegetation that may present conditions favorable for wildfire. Vegetation would accumulate in areas where direct live-fire takes place and over

time, the risk of a wildfire would increase. A wildfire would impact the ability for the military to conduct training activities resulting in the loss of training days available for Soldiers, Airmen, and other service members. Wildfire also represents a significant risk to public health and safety. The No Action Alternative serves as a baseline against which the potential effects of the Proposed Action and alternatives are evaluated.

2.3 SCOPE OF RESOURCE ANALYSIS

The Proposed Action and alternatives have the potential to affect certain environmental resources. These potentially affected resources have been identified through communications with State and Federal agencies and Alaska Natives, review of past documentation, and public input. Specific environmental resources with the potential for environmental consequences include, Biological Resources (Vegetation, Wildlife, Threatened and Endangered Species), Air Quality, Water Resources (Quality), Cultural Resources, Public Recreation, and Health and Safety. Resource areas that were eliminated from consideration include, geology, socioeconomics, and land use.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

This section describes the affected environment and methodology used to analyze the potential impacts (environmental consequences) on the affected environment that would result from the implementation the proposed action to implement fire management activities at JBER. The affected environment represents baseline conditions against which environmental effects can be measured. An environmental impact or consequence is defined as a modification or change in the existing environment brought about by the action taken. Effects can be direct, indirect, or cumulative and can be temporary (short-term) or permanent (long-term). Effects can also vary in degree, ranging from only a slight discernable change to a drastic change in the environment. The terms "effect" and "impact" are synonymously used in this EA.

3.2 MEASURE OF ENVIRONMENTAL EFFECTS

The potential impacts of implementing the proposed action and alternatives can be characterized by one of the three types of impacts. They are as follows:

Direct impact: Those effects caused by an action and that occur at the same time and place as the action.

Indirect impact: Those effects caused by an action and that occur later in time or is farther removed in distance from the action.

Cumulative impact: Those effects that result from the incremental impact of the action when added to "other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time or within a special boundary.

Environmental effects also may be expressed in terms of duration. The duration of short-term impacts is considered to be one year or less, and long-term impacts are described as lasting beyond one year. Long-term impacts can potentially continue into perpetuity.

In addition to the type and duration of an impact to a resource area, effects to resource areas are characterized by the relative severity of an environmental effect. Four terms are used throughout this EA to indicate the relative degree of predicted impacts that the proposed action and alternatives would have. They are as follows:

Negligible: The term used to indicate the relative degree of severity of an environmental effect that could occur, but might not be detectable

Minor: The term used to indicate the relative degree of severity of an environmental effect that is measureable, but is clearly not significant.

Moderate: The term used to indicate the relative degree of severity of an environmental effect that might approach but not exceed a threshold of significance.

Significant: A measure in terms of the degree of severity of the environmental effect of an action reflecting the context and intensity of the effect, as defined in CEQ regulations (40 CFR 1508.27).

3.3 RESOURCE AREAS CONSIDERED

3.3.1 Air Quality

In accordance with the Clean Air Act (CAA), the EPA has established National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. These standards have been adopted by the State of Alaska. NAAQS exist for six principle pollutants and are presented in Table 3.1.

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour	None
	35 ppm (40 mg/m^3)	1-hour	None
Lead	1.5 µg/m^3	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m$^{3)}$	Annual	Same as Primary
Particulate Matter (PM10)	Revoked	Annual	
	150 µg/m^3	24-hour	
Particulate Matter (PM2.5)	15.0 µg/m^3	Annual	Same as Primary
	35 µg/m^3	24-hour	
Ozone	0.08	8-hour	Same as Primary
	0.12	1-hour (Applies only in limited area)	Same as Primary
Sulfur Oxide	0.03 ppm	Annual	----
	0.14 ppm	24-hour	----
	-----	3-hour	0.5 ppm (1300 µg/m^3)

Figure 3.1 National Ambient Air Quality Standards Principle Pollutants

Ambient air monitoring is not performed at JBER; however JBER does maintain an inventory emissions sources. JBER is in attainment for all six NAAQS principle pollutants, but is a major source of Criteria Air Pollutants (CAP's), specifically nitrogen oxides ($NO_{x)}$ and carbon monoxide (CO).

There are few stationary emissions sources within the Richardson Training Area and mobile sources such as vehicles operating throughout the training area do not represent a major contribution to air pollution. However, emissions from wildland fires can be a source of carbonaceous aerosol, CO, greenhouse gases (CO_2, CH_4), and a vast array of other gases,

including non-methane organic compounds (Urbanski, 2014). In general, carbon is released as CO_2, CO, and methane (CH_4). Carbon dioxide is a long-lived greenhouse gas and CH_4 is a short-lived climate forcer. While the vast majority of carbon is emitted as CO_2, wildland fire smoke is nonetheless a rich and complex mixture of gases and aerosols. Carbon dioxide is relatively inert and it is the more reactive, if less abundant, species that are responsible for much of the important atmospheric chemistry. Initial emissions from biomass burning include significant amounts of aerosols that are short-lived climate forcers. The primary aerosols produced by wildland fires are diverse in size, composition, and morphology, and in the consequent chemical and physical properties.

Fresh smoke aerosol number and mass are principally in fine particulates ($PM_{2.5}$). The majority of particle mass is organic aerosol, but black carbon and inorganic aerosol (e.g nitrate, sulfate, ammonium, and chloride) generally comprise 5–20% of $PM_{2.5}$ mass (Reid et al., 2005). While the particulate mass emitted by wildland fires is dominated by organic compounds, the individual particles may often be internal mixtures containing organic carbon, elemental carbon, and inorganics (Pratt et al. 2011). These trace inorganic components may have a significant impact on the chemical and physical properties, and hence an important influence on radiative forcing.

The impact of fire emissions on atmospheric composition and the realized climatic impacts depends on the composition of the emissions, location, and ambient environment (chemical and meteorological). The impact of wildland fire emissions on climate change is complex and highly variable and is beyond the scope of this analysis.

Under Alternative 1, the use of prescribed burning is expected to result in short-term, minor to moderate adverse air quality impacts. Impacts would be temporary in nature, lasting for the duration of the prescribed burn. An open burn permit from the Alaska Department of Environmental Conservation (ADEC) is required prior to burns exceeding 40 acres per year. Additionally, the ADEC requires a smoke management plan to mitigate the nuisance, health, and safety hazards to roadways, airports, and smoke sensitive features (such as hospitals, schools, and clinics). Additionally, prescribed burns are coordinated with ADEC immediately prior to ignition to ensure weather/atmospheric conditions are suitable such that smoke will not impact populated areas and cause potential health issues.

Prescribed burning in grassy/open areas would result in approximately 0.75 tons/acre of air emissions (AFS, 2008). This would represent approximately 1,374tons of emissions under Alternative 1 for burns occurring in open grassy areas. A second calculation, based on emission factors from Urbanski (2014) shows that prescribed burns could produce about 1,357 tons of emissions, excluding carbon dioxide. Quantifying the emissions associated with burn piles is more difficult because the mass of material depends largely on the amount of fallen vegetation generated during the previous year, however based on the emission factors generated by the

AFS, each acre of debris pile burned would result in approximately 15 tons of emissions (AFS, 2008).

While not negligible, these potential emissions would be much less than what could be produced if a large uncontrolled fire erupted in the RTA. The role of fire and the need for accelerated use (prescribed burns) has become widely recognized with respect to maintenance and restoration of fire-adapted ecosystems. Although smoke may be a public health and safety risk under the worst conditions, such as an uncontrolled wildfire, without periodic fires the natural ecosystem will decline and disappear. As fuel loads increase, so does the risk for wildfire and consequently additional public health and safety risks.

Additional short-term impacts to air quality would exist during the creation of fire breaks and fire access trails. These impacts would be temporary in nature and persist during the use of heavy machinery when clearing the trails. With the implementation of firewood and mulch for personal use, local emissions may be reduced due to the reduction in woody material within the RTA.

Temporary and minor site-specific negative impacts would occur as a result of applying herbicides as a method of preventing vegetation regrowth within the RTA. Chemical application would result in a limited amount of herbicides released into the air. Spraying would be performed in accordance with the manufacturer's recommendations and EPA approved guidance to reduce the airborne drift. Herbicide application would be conducted during weather conditions suitable for optimal effectiveness.

Alternative 2

Under Alternative 2, negligible, short-term impacts to air quality are expected. The use of mowers and heavy machinery would result in a temporary increase in emissions at JBER. The development and maintenance of fire breaks and fire access trails would also result in temporary negligible impacts to air quality. For both Alternatives 1 and 2, JBER would implement best management practices (BMP) to reduce the amount of fugitive dust when heavy equipment is being used to maintain or create fire breaks.

However, mowing will not completely remove vegetation and dry biomass could increase over time, increasing the risk of wildfire. As mentioned previously, uncontrolled wildfire could result in significant impacts to air quality.

Impacts to air quality as a result of applying herbicides within the RTA are expected to be the same as identified in Alternative 1.

Alternative 3 (No Action)

Under the No Action Alternative, there are no anticipated impacts to air quality. No additional wildland fire prevention actions would take place within the RTA contributing to emissions or

impacting air quality. However, without regular maintenance, fuel loads would increase throughout the RTA, greatly increasing the risk for an uncontrolled wildfire that would have significant impacts to air quality as well as public health and safety.

3.3.2 Water Resources & Water Quality Surface Water & Wetlands

Wetlands are prevalent throughout JBER. Within the RTA, nearly 4,990 acres of land is classified as wetlands, which includes marine and freshwater, tidal and non-tidal types. The largest contiguous wetland complex is the Eagle River Flats, which makes up the majority of the land within the Eagle River Flats Impact Area, approximately 2,165 acres. Table 3.2 provides more details on wetland types within the RTA.

Wetland Type	RTA Land Cover (%)	Wetland Characterization	Vegetation
Coastal Halophytic Zone	3	Shoreline tidal flats and barren mud flats.	rye grass, Lyngebye sedge, maritime arrow grass, glasswort, goose tongue, and alkali grass
Lowland Forest Wetlands	3	Bordering Ship Creek, McVeigh Marsh, Fossil Creek bottomlands; areas southwest of ERF; and south and west of Clunie lake	bluejoint grass, oak fern, red raspberry, lowbrush cranberry, red currant, and sedges
Lacustrine Wetlands	1	Open water and vegetated with sedges	marsh five-finger, marsh and woodland horsetail, cottongrass, shore sedge, and sphagnum moss
Alpine and Subapline Wetlands	0.3	Sub-alpine areas	bluejoint meadow wetlands

Table 3.2 Wetland Characteristics at JBER

<u>Eagle River and North Ranges</u>

Project area within the Eagle River and North Range areas include Malemute Drop Zone, MPTR Range, IPBC Range, and the Neibar Drop Zone. The Eagle River and North Ranges lie in an area with rolling topography. The unit is mostly wooded with mature tree stands, interspersed with wetlands, drainages, and other permanent waters, which typically drain to Eagle River, or directly to the Knik Arm of Cook Inlet. Wetlands are typically forested or shrub dominated and connected to waters of the U.S. via drainages, overland sheet flow, and/or groundwater. Wetlands receive water via sheet flow from adjacent range lands and uplands as well as from groundwater. Wetlands located within the range area have been cleared and otherwise altered in

construction of the range, but appear to maintain some hydrologic and bio-geochemical wetland functions.

The IPBC Range and Malemute Drop Zone occur within a relatively flat area surrounded by forested wetlands and uplands. Clunie Creek lies off the southeast corner of the Malemute Drop Zone and an unnamed tributary of the Knik Arm of Cook Inlet passes through the IPBC Range. The MPTR Range includes forested and shrub dominated wetlands in the southern end of the range. The wetlands lie in a relatively flat area that drains slowly via surface and ground water toward the Knik Arm of Cook Inlet. The Neibar Drop Zone includes several accessory training areas, none of which appear to contain wetlands.

Main Cantonment Area

Landing Zone Ranger is located on the Richardson side of the JBER, which is typically developed with some remnant patches of forested lands left as an urban wildlife refuge. There are no wetlands or waterways in the proximal vicinity of the Landing Zone Ranger.

Land Management Unit 12- Upper Ship Creek Training Areas

The Upper Ship Creek Training Areas are located near the foot of the Chugach Mountains with vegetation ranging from forested uplands to forested and shrub dominated wetlands. The Biathlon Range is located in LMU 12, but there are no wetland or water resources in the proximal vicinity of the range. Ship Creek is located approximately 1000-ft from the southernmost edge of the range.

Vegetative treatments to the Biathlon Range are not expected to affect Ship Creek due to the distal proximity of the treatment area from the creek.

Land Management Unit 13- Small Arms Complex and South Ranges

Projects areas within the Small Arms Complex and South Ranges include the Grazelka/Mahon Range, Handgrenade Range, Match Shoothouse, Kraft/Record Range, Newton/Statler Range, Oates Range, Pedneau Range, Zero Annex/Sportfire Range, and the Zero Range are all located at the base of the Chugach Mountains in the Arctic Valley area of JBER-Richardson, southeast of the Glenn Highway. Areas within the live fire ranges are cleared, but lands around the developed ranges are heavily forested. Ship Creek and several permanent tributaries and intermittent drainages flow though and between the developed ranges. Wetlands, connected by surface and/or ground water are interspersed throughout the lowland flats beyond the toe of the Chugach Mountains, up to the Glenn Highway.

There are several mapped wetland areas present within and adjacent to the boundaries of the ranges throughout the Small Arms Complex. These freshwater wetlands include depressional, flat, and riverine geomorphology and are dominated by forest and shrub-scrub cover. Many of these wetlands have been anthropogenically influenced and/or fully altered from their natural

state. Prior to development of the ranges, most of these lands were mapped as moist mixed forest and gravelly lowlands, within which wetlands may have been present as a mosaic with forested uplands. Within the range and on adjacent lands, there is a network of drainages that feed to several unnamed streams, then ultimately on to Ship Creek, which empties into the Knik Arm of Cook Inlet, a tidal water. Wetlands throughout the Small Arms Complex are likely fed by surface waters and some may have been fragmented from drainageways resulting from construction of the range facilities and infrastructure. Depressions are likely connected by groundwater to the Ship Creek drainages. Other wetlands are connected by surface water overflow and drainages.

3.3.2.1 Environmental Consequences- Water Resources, Water Quality, Surface Water, and Wetlands

Under Alternative 1, the use of prescribed burns is expected to have minor, short-term impacts on water quality and water resources. Impacts are expected to be minor for the use of prescribed burning due to procedures in place to prevent or minimize impacts through the use of best management practices (BMP) that USARAK employs under their Integrated Training Area Management (ITAM) program. A list of BMPs that the ITAM program uses to reduce impacts to erosion and water quality are identified in Appendix E.

Light to moderately severe fires, whether in uplands or wetlands, will result in temporary exposure of the soil, subjecting wetlands and waterways to soil erosion from run-off generated in the course of fire suppression and/or from subsequent precipitation events. Additionally, there will be a temporary release of nutrients into the environment as fire consumes the organics at and above the ground surface. It is not anticipated that burns will penetrate beyond the surface of the ground. The potential effect from run-off is dependent on the severity of the burn, how much water is used in fire suppression, and intensity and/or duration of subsequent precipitation events. The effect depends on the proximity to wetlands and waterways.

Development and maintenance of fire breaks and fire access roads are expected to result in long term moderate impacts to water resources and quality. Fire breaks and fire access roads will be maintained to prevent vegetation growth which will result in exposure of bare soil. In addition, the soil will be compacted in the fire breaks and trails as heavy equipment will be required to create and maintain them. Best Management Practices as identified in the Integrated Training Area Management Plan will be implemented to minimize the impacts associated with exposed soil. During construction of new fire breaks or fire access roads, wetlands and other jurisdictional waters will be avoided to prevent impacts. Hydrologic connectivity through non-wetland drainages may incur direct and/or indirect moderate impacts. Additionally, indirect moderate impacts to wetlands from changes in hydrologic flow in non-wetland areas may be incurred. Impacts to wetlands will be avoided through maintenance of adequate cross drainage

in all project areas to prevent drainage retention including obstruction of drainage flow and incidental creation of wetlands.

Prescribed burns are not anticipated to be conducted within wetland areas. However, in some project areas, temporary, indirect, and negligible to minor impacts may be incurred from nutrient and/or chemical release and erosion in the vicinity of wetlands and waterways resulting from Alternative 1. Prescribed fire followed by dry weather or low levels of precipitation is not expected to have any impact on water quality. The topography of the site will also affect how storm water is conveyed through the site, and thus influences the impact of the effect.

Application of herbicides within the RTA is anticipated to have minor short-term negative impacts to water quality and water resources. Application of herbicides will not occur within areas where surface water is present or into areas below the mean high water mark. Additionally, application of all herbicides will not occur where runoff water may flow during periods of intense rainfall or into water-saturated soils. When cleaning the equipment used to apply the herbicides, disposal will be done in accordance with existing waste management requirements. Indirect, temporary, minor impacts to wetlands and waterways adjacent to herbicide-treated areas may result from sediment, chemical, and/or nutrient laden run-off.

Wildfire management, when conducted properly, would reduce the potential for large uncontrolled fires that could damage sensitive areas, cause significant erosion, and reduced water quality. Thus, the overall impacts to water resources are considered to be minor and short-term.

Alternative 2

Impacts to water resources and water quality under Alternative 2 are anticipated to be moderate and short-term in duration. The use of mowers and heavy machinery to reduce accumulated vegetation will result in a minor and temporary increase soil compaction resulting in a slightly higher likelihood of runoff. Exposed soil is not anticipated to result from mowing. The areas where mowers would be used to reduce the presence of grasses have historically been free of deep rooted vegetation. BMP's to reduce soil runoff are in place throughout ranges and training areas, and would therefore continue to remain functional to manage stormwater runoff after mowing.

Impacts associated with fire break maintenance and construction will be the same as described in Alternative 1.

Impacts as a result from application of herbicides within the RTA are expected to be similar to those described in Alternative 1. Application rates and locations where herbicides would be applied would be done similarly.

Alternative 3

Under the No Action Alternative, there are no expected impacts to water quality and water resources. No wildland fire prevention activities would take place, which would result in an increase in forest cover and ground cover. Ultimately, fuels loading would occur within the RTA, significantly increasing the risk for wildfire. Uncontrolled wildfire would have long-term and significant impacts to water resources, water quality and other resources.

3.3.3 Soils

The Richardson Training Area lies in the Cook Inlet-Susitna Lowland and Kenai-Chugach Mountains physiographic provinces on the alluvial plain called the Anchorage Lowland is characterized by rolling hills with up to 250 feet of topographic relief in the eastern portion of the Chugach Mountains with the terrain flattening to the west into an alluvial plain that is inundated with broad, shallow streams and wetlands. The RTA contains many landforms that are characteristic of glacial terrain, including moraines, esker deposits, outwash plains, and estuarine sediments. The topography of the Anchorage Lowland has been primarily influenced by glacial activity and alluvial deposition and erosion by the four major drainages that originate in the Chugach Mountains.

In general, soils within the RTA are primarily shallow, immature, and tend to be nutrient poor, specifically of nitrogen, phosphorous, and potassium, which are the primary requirements for plant growth. The soils also have low water retention capacity, creating limiting conditions for plant growth in dry periods. In the wetland areas, the surface soil may be covered with peat.

JBER is located within an area that is classified as being outside of the permafrost regions of Alaska and/or generally free from permafrost. Permafrost is present in less than 1 percent of the RTA, occurring primarily in patches of forested bogs along Muldoon Road, as well as higher elevation areas within the Chugach Mountains (Figure 3.1).

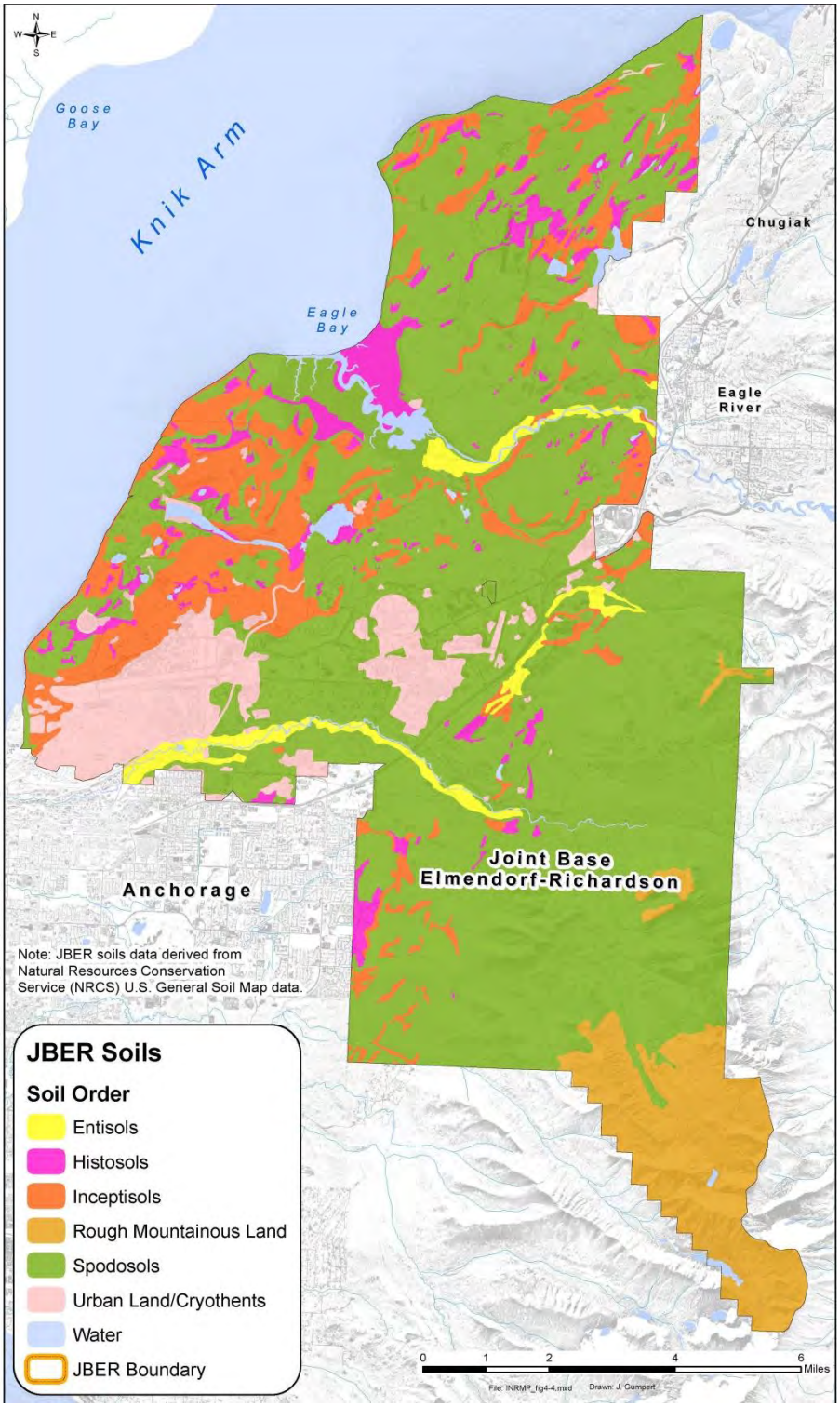

Figure 3.1 Soil Classifications on JBER

Erosion and sedimentation are natural processes that may be accelerated by disturbance of soils during construction and wildfires on JBER. Wildfire plays an important role in Alaskan ecosystems; however, fires generated by military training activities may cause unacceptable damage to critical vegetative cover that aids in stabilizing soils from erosion. Vegetation normally protects soil from erosion by slowing surface runoff, intercepting raindrops before they reach the soil, and anchoring the soil with roots. In response to fires caused by military training, fuel maps were created using concentrations of fire-prone vegetation and areas recommended for hazard fuel reduction projects; these may be found in the Transformation EIS (USARAK, 2004).

3.3.3.1 Environmental Consequences- Soils

Alternative 1:

Implementation of Alternative is expected to have minor, short-term negative impacts on soils. Prescribed burns will reduce vegetative cover and increase the potential for erosion. However, a majority of the proposed burn areas were disturbed during construction of the ranges, and continue to be disturbed by maintenance and training activities. Fire can increase the risk of soil erosion, but the gently sloping topography associated with these areas does not tend to result in high erosion rates under normal circumstances. In addition, the JBER area does not experience significant rainfall events that would result in erosion events. Vegetation regrowth generally occurs rapidly and soil loss, if any, would be minimal. Areas with steeper slopes are more prone to higher rates of soil loss, however once vegetation regrowth begins the conditions will stabilize resulting in negligible long-term impacts.

Increased soil compaction will occur where fire breaks and access trails are constructed, resulting in an increase in soil erosion. BMPs as described in the ITAM plan will be implemented to minimize soil loss. BMPs that could be employed include creating temporary and permanent diversions or dikes that would reduce slope length, collect storm runoff, and deflect runoff to outlets able to convey it by non-erosive means. Additionally, temporary silt fences or wattles would be installed in areas that could impact downstream water ways. Once the area has stabilized the silt fences or wattles would be removed and the landscape would be monitored to ensure soils have been stabilized.

The application of herbicides will result in minor short-term impacts to soil conditions that would remain until the herbicide breaks down. The herbicides that are proposed under Alternative 1 have relatively short duration in the environment, and will not be applied in areas of ecological sensitivity such as surface water and wetlands.

Alternative 2:

Impacts to soils are expected to be similar to those described in Alternative 1. The temporary reduction in vegetative cover when mowing occurs within the RTA will create a short-term, negligible impact on soils as they will be more easily moved by rainfall. However, mowing will not completely remove vegetative cover and dry biomass would remain at the site, providing some additional benefits to the soil. BMPs, as identified in Alternative 1 would be implemented to reduce impacts relating to erosion.

Alternative 3:

Under the No Action Alternative no short term impacts are expected to occur. Erosion would likely decrease over the short term as vegetation would be more dense providing more soil stability. However, the chance for an intense wildfire would increase. Should an intense wildfire breakout within the RTA a much larger area would be impacted.

3.3.4 Biological Resources (Vegetation)

The most extensive vegetation type in the RTA is closed, paper birch-white spruce, mixed forest that established after fires burned through the area in the mid-1700s. Birch forest is a mid-successional forest type, which will likely eventually be replaced with mature white spruce closed canopy forest. Within the RTA, there are several vegetative communities including coastal salt marsh, boreal forest, and high alpine tundra, talus slopes, shrub lands, snow beds, heaths, and meadows. Table 3.3 summarizes the relative abundance of vegetative ecotypes on JBER.

Ecotypes of Joint Base Elmendorf-Richardson	
Vegetative Ecotype	Percent Cover (%) (+/-1%)
Alpine Lake	<1
Alpine Tundra and Scrub	13
Coastal Marsh and Meadows	3
Human Modified (gravel, barrens, cleared grasslands, paved)	19
Human Modified Waters	<1
Lowland bogs, marshes, shrub-carr, and other wetlands	16
Riverine	2
Subalpine rocky moist, scrub, and meadow	7
Upland rocky forest, scrub, and barrens	39

Table 3.3 Vegetation Abundance of Ecotypes at JBER

The cantonment areas on both sides of JBER are typically anthropogenically modified from their original ecotypes. Forest types within the less disturbed portions of the RTA include white spruce, paper birch, and quaking aspen mixed forests in upland sites; cottonwood in moist forests and along principle streams with black spruce in wetter areas; and white spruce, mountain hemlock, and balsam poplar along tree lines at higher elevations. In the high alpine regions

above 1550 meters, vegetation is highly limited and dominated by crowberry, blueberry, willow, and mountain hemlock. Active training areas are typically reflected in human modified ecotypes including gravel pits, grasslands, and other barrens where forest trees and shrubs have been cleared and are maintained as open fields.

3.3.4.1 Environmental Consequences- Biological Resources (Vegetation)

Alternative 1

Prescribed burning in human modified project areas would control trees and shrubs, and other vegetation that has colonized the training site since the last land-clearing event. Most of the project areas subject to vegetative management are those areas that have already been modified. However, direct and/or indirect impacts to adjacent ecotypes may result. There is potential for fire to escape beyond the control burn area. BMPs, as described in the WFMP and specified in authorizations secured from the Alaska Department of Environmental Conservation- Division of Air Quality, are meant to limit or prevent the possibility of fire escapement. Impacts to vegetation within the majority of the areas to be burned would be minor and short-term.

Prescribed burning is an effective and efficient means to reduce or prevent the accumulation of hazardous fuels and is a recognized land management practice for natural resources management and fire protection. Even though vegetation would be altered or removed, forest health and wildfire management projects would benefit vegetation by controlling insects, disease, and reducing the threat of catastrophic wildfires that can damage natural resources over large areas and endanger communities. Vegetation removal and prescribed burning would be used to mimic natural disturbance. Prescribed burning is also used as a tool to prevent catastrophic fires that can endanger military facilities and the surrounding community, and result in significant natural resources damages.

Fire provides both positive and negative impacts to the environment. Short term loss of vegetation from fire can increase the risk of soil erosion, but fire can also infuse added nutrients to the soil. Farmers and ranchers have for centuries burned agricultural lands to enhance soil health and remove unwanted vegetation. Prescribed burning is a recognized land management tool, that when carefully managed results in an overall benefit to the soil and vegetation. Negative impacts are expected to be minor and temporary due to the use of best management practices to stabilize the soil and reduce or prevent erosion.

The application of herbicides will be used in a manner to avoid impact to vegetation beyond the limit of the project area. The herbicides that are proposed under Alternative 1 have relatively short duration in the environment, and will not be applied in areas of ecological sensitivity.

Construction of new fire breaks will result in permanent, minor change in vegetative structure in areas where new clearing, grading, and construction occurs. Forested and shrub dominated

systems will be converted to grassland and maintained in perpetuity to prevent regeneration of woody growth. In addition, construction of firebreaks or access trails may result in an incursion of invasive plants. Project areas will employ BMPs for management of invasive species by using clean equipment and use of weed free mulches, seeds mixes, and fertilizers. Fire breaks will be monitored for introduction and establishment of invasive species and any occurrences will be treated in accordance with the Invasive Species Management Plan. The overall effect of the changes in vegetation are expected to be permanent, but not significant since affected habitats are not considered critical habitat or to contain rare vegetative assemblage.

Alternative 2

Construction of new fire breaks are expected to be similar to the effects described in Alternative 1. Herbicide application would be conducted in a manner to prevent encroachment of adjacent habitats. Mowing and other mechanical management of vegetation within pre-existing training areas will affect vegetation that has colonized since the training area was created, but will not incur any significant impact to the existing human-modified ecotype.

Alternative 3

Under the No Action Alternative vegetation would not be removed and would thus increase in density over time. Grassy and low brush areas would present an increase risk for wildfires as a result of training. Forested areas would increase in density along with ladder fuels. A resulting wildfire would be more intense and would likely result in a larger fire than if fire management activities were implemented.

3.3.5 Biological Resources (Wildlife)

Wildlife and supporting habitat are abundant throughout the RTA, which includes a variety of large mammals, small mammals, amphibians, fish, and avian species, including game birds, waterfowl, passerines, and raptors. Table 3.4 identifies priority wildlife species at JBER.

Priority species are broken into four groups, and include the following;

Keystone or Key Species (K) play a disproportionately large role in ecosystem structure. Their significant ecosystem role may be because they are important to the feeding structure, provide a critical process in the system, provide necessary interactions, or generally have a significant impact on the environment.

Managed Species (M) unlike key species, are chosen based on human values instead of ecosystem values. These species may or may not be key or indicator species. They have socioeconomic importance as a locally harvested species.

Species with Legal Constraints (L) have been listed as endangered or threatened by the United State Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), and/or Alaska Department of Fish and Game. Additionally, this group could contain species that are of concern from an installation, regional or state perspective.

Indicator Species (I) are species that managers choose to track ecosystem health or status or have specific management programs. These species may or may not be key or managed spices, and may include invasive species.

Species	Ecotype Represented	Species Category
Mammals		
Little Brown Bat	Human modified, Upland, Lowland	M
Gray Wolf	All but Human modified and Pavement	M, K
Lynx	Upland, Lowland, Subalpine	K
Wolverine	Alpine, Subalpine, Upland	M
Harbor Seal	Coastal	L
Black Bear	Upland, Lowland, Subalpine	M
Brown Bear	All but Human modified and Pavement	M, K
Beluga Whale	Coastal	I, L
Moose	All but pavement	M
Dall's Sheep	Alpine	M
Beaver	Lowland, Riverine	K, M
Microtines	All but pavement	I
Collared Pika	Alpine	I
Snowshoe Hare	Upland, Lowland, Subalpine, Riverine	K,M,I
Birds		
Canada Goose	Lowland	M
Trumpeter Swan	Lowland	L
All grouse species	Upland, Subalpine, Alpine	M
Loons	Lowland	I
Bald Eagle	Upland, Lowland, Riverine	L,M
Northern Goshawk	Upland	I
Golden Eagle	Alpine	L
Sandhill Crane	Coastal, Lowland	M
Solitary Sandpiper	Upland, Lowland	L
Lesser Yellowlegs	Lowland	L
Boreal Owl	Upland	I
Olive-sided Flycatcher	Upland, Lowland	L
American Dipper	Riverine	I
Varied Thrush	Upland, Subalpine	I
Blackpoll Warbler	Upland Subalpine	L

Species	Ecotype Represented	Species Category
Townsend's Warbler	Upland, Riverine, Subalpine	L
White-crowned Sparrow	Upland, Subalpine	I
Golden-crowned Sparrow	Subalpine	I
Rusty Blackbird	Lowland	L
Amphibians		
Wood Frog	Lowland, Upland	I
Fish		
Northern Pike	Lowland, Riverine	I, K
Coho Salmon	Lowland, Riverine	K,M,I
Sockeye Salmon	Lowland, Riverine	K,M,I
Rainbow Trout	Lowland, Riverine	M

Table 3.4 Priority Wildlife Species

Several areas within the RTA have been identified as sensitive habitats for sensitive or unique wildlife or plant communities. These sensitive areas include;

- Ship Creek Riparian Area;
- Eagle River Flats and associated tidal wetlands;
- Alpine tundra in the adjacent Chugach Mountains;
- Old growth forest; and
- Snowhawk Valley

Fisheries: The main bodies that contain fish occurring on the northern part of the RTA include Eagle River, Otter Creek, Fire Creek, ponds on the ERF Impact Area, and the adjacent Eagle Bay of the Cook Inlet. Water bodies that contain fish on the southern part of the RTA are Ship Creek, North Fork Campbell Creek, Chester Creek, and Snowhawk Creek.

Terrestrial Mammals: Large mammals found within the RTA include black bear, grizzly bear, moose, Dall Sheep, and wolves. Small game and furbearers include coyote, lynx, red squirrel, snowshoe hare, hoary marmot, pine marten, beaver, river otter, wolverine, red fox, porcupine, mink, muskrat, and ermine or short-tailed weasel. All land mammal species are managed under the State of Alaska regulations.

Waterfowl and Eagles: The Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act offer protection for migratory birds and eagles that exist within the RTA.

An estimated 1 million waterfowl pass over or near the RTA during spring migration and 1.2 million during fall migration. Waterfowl are primarily found on the northern portion of the RTA near ERF Impact Area, Otter and Sixmile Lakes. The ERF wetland serves as a major staging area for migrating waterfowl. There are also Bald and Golden Eagles that nest and use habitat that falls within the RTA. Eagle populations are not well documented for the southern part of the RTA, but known nest locations exist within the northern portion. As part of the Integrated Natural Resources Management Plan (INRMP), conservation staff monitors the location of eagle

nests and occupancy throughout the year to ensure nests are not adversely affected during construction and training activities. In addition, when trees are removed, JBER follows the USFWS construction guidance and does not remove trees during the nesting season. The USAF is engaged with the USFWS concerning permit conditions related to prescribed burns.

3.3.5.1 Environmental Consequences- Biological Resources (Avian and Terrestrial Wildlife)

Avian and Terrestrial

Wildlife populations would be influenced directly and indirectly by the impacts on associated vegetative communities. Direct effects refer to mortality or disturbance that results in flushing, displacement, harassment or mortality of the animal. Indirect effects refer to modification of habitat and/or effects to prey species. The ability of wildlife to survive a fire depends upon the season, uniformity, severity and intensity of the burn, and the size and duration of the fire, as well as the animal's mobility and habitat use patterns.

Alternative 1:

Under Alternative 1, the use of prescribed burns is expected to have negligible to minor impacts on avian species. These impacts would be temporary in nature, lasting for the duration of the prescribed burn. Proposed burn treatment areas do not encompass habitat deemed to be significant or important to any of the listed avian species. Eagle nests have not been identified within any of the potential burn areas. Large terrestrial mammals would be temporarily displaced during prescribed burns but impacts would be short-term and negligible. More suitable and undisturbed habitat exists at other locations on JBER.

Development and maintenance of fire breaks and fire access roads will result in long term minor impacts to avian species. The loss of continuous forest habitat will have a negative impact for fragmentation sensitive species, but the creation of edge habitat will benefit other avian species, such as grouse. Similarly, impacts to terrestrial mammals would be minor but long-term due to the potential loss of a small amount of wooded habitat. However, firebreaks and access roads become primary game routes for large mammals and can enhance their ability to find food during winter months.

Temporary and negligible impacts would occur to avian species as a result of applying herbicides as a method of preventing vegetation regrowth within the RTA. All spraying would be performed in accordance with the manufactures label and EPA approved guidance to reduce the airborne drift. Herbicide application would be performed during weather conditions suitable for optimal effectiveness.

Alternative 2:

Under Alternative 2, the use of mechanical methods to reduce woody and grassy vegetation is expected to have negligible to minor impacts on avian species. These impacts would be temporary in nature, lasting for the duration of the mowing/chipping operations. Impacts to terrestrial mammals would be similar to those described for Alternative 1.

Impacts to avian species as a result of the development and maintenance of fire breaks and access roads within the RTA are expected to be the same as identified in Alternative 1.

Impacts to avian species as a result of applying herbicides within the RTA are expected to be the same as identified in Alternative 1.

Alternative 3 (No Action)

Under the No Action Alternative potential impacts to wildlife within the RTA are expected to be long-term in nature and moderate. If a large wildfire occurred, under certain conditions large amounts of forested area could be burned, resulting in a loss of habitat. The loss of habitat would result in displacement of wildlife. The species that would be most impacted would be tree nesting birds, as nests could be completely lost during fire events. Mammals would be temporarily displaced until the fire was extinguished and vegetation regrew.

Fisheries and Marine Mammals

Alternative 1

Impacts to fisheries under Alternative 1 are anticipated to be minor in nature. Prescribed burning does have the ability to effect water quality via a change in large woody debris, higher sediment concentrations, changes in surface water flow, water chemistry, and presence of macroinvertebrates (Arkel 2010, Bache 2005, Burton 2005, Rieman 2003). These impacts could be exacerbated by the condition of the ecosystem. In areas of heavy disturbance prior to the introduction of prescribed burns, the impacts associated with prescribed burns were greater than in areas where the overall condition of the ecosystem was healthy (Burton, 2005). Sedimentation as a result of the construction and maintenance of fire breaks can present adverse impacts on fisheries as a result of increased erosion; however with the implementation of BMPs, impacts associated with increased sediment are anticipated to be minor and short-term in nature.

Execution of wildfire management and prescribed burns would have no effect on the Cook Inlet beluga or its designated critical habitat. Erosion as a result of prescribed burning is highly unlikely to cause any measurable change to water quality in Eagle River or Knik Arm. Knik Arm waters contain such high sediment loads and turbidity levels that minor inputs resulting from prescribed burns would not be measurable.

Application of herbicides also can present adverse impacts on fisheries as a result of direct application, runoff, spray drift and through ground water (Helfrich 2009). Application of herbicides will be conducted in accordance with state, federal and manufacturer guidelines and be conducted by qualified individuals.

Alternative 2

Impacts as a result of implementation of Alternative 2 are anticipated to be similar to those identified in Alternative 1. However, under Alternative 2, there is likely to be an increase in sedimentation as a result of using heavy machinery to reduce grassy vegetation. Impacts associated with increased erosion are anticipated to be short-term in nature, as new vegetation growth will reduce the amount of sediment running into streams and surface water. Impacts associated with firebreaks and herbicide would be no different than those described under Alternative 1.

Alternative 3 (No Action)

Under the No Action Alternative, impacts to fisheries would be negligible in the short term, however over the long term, if no vegetation management was taken, may result in moderate short-term impacts. Impacts to fish species would be related to a change in fish habitat resulting in the potential for fish populations to be altered due to a change in habitat conditions. A large uncontrolled wildfire would substantially increase sediment and nutrient loads into the surface water and would temporarily cause adverse impacts. Once new vegetation took hold in areas where the burn occurred, sediment loads would likely return to levels present before the burn.

3.3.6 Cultural Resources

Several cultural resource studies, archeological surveys, and consultations with Native Alaskan have resulted in discoveries of prehistoric resources, historic properties, and/or sites with traditional, religious, or cultural significance at JBER. Certain areas within the RTA were excluded from past archeological surveys because of mission considerations, low site potential, or low potential for mission impact. Areas within the RTA that were excluded from past studies and surveys include; ERF Impact Area, alpine tundra zones, and wetlands.

Based on predictive modeling, there are five areas within the RTA that have a high potential to contain archeological resources. The five areas are the mouth of Eagle River; shoreline of the Knik Arm; upstream portions of Ship Creek; Fossil Creek draining area; and the Elmendorf Moraine. The Elmendorf Moraine is generally located north of the Cantonment areas and south of the ERF Impact Area.

There is one historic district within the RTA that is listed on the National Register of Historic Places (NHRP), which is the Nike Site Summit Historic District. Nike Site Summit is located on the eastern edge of the RTA.

3.3.6.1 Environmental Consequences- Cultural Resources

Alternative 1

Impacts to cultural resources under Alternative 1 are not anticipated. The Alaska State Historic Preservation Office has determined that there are no historic properties to be affected. Correspondence with the SHPO office was conducted on 30 May 2014 (Appendix F). Alternative 1 occurs entirely within areas that have been previously surveyed for cultural resources, and no sites were found to be of cultural significance. However, should archeological artifacts or human remains be identified, all work will cease and 673 CES must be contacted for further evaluation.

Alternative 2

Impacts to cultural resources under Alternative 2 are not anticipated. Alternative 2 occurs entirely within previously surveyed areas, which the SHPO determined not to have any historic properties. In comparison to Alternative 1, since more heavy equipment would be used to mow grasses and brush, there is an increased chance of identifying buried archeological resources. Should archeological artifacts or human remains be identified, all work must cease and 673 Civil Engineer Squadron must be contacted.

Alternative 3

No impacts to cultural resources are expected to occur under Alternative 3. Although there would be an increased risk of a wildfire under the No Action Alternative, there is a relatively low risk of fires burning unidentified archeological sites. No impacts to unidentified artifacts buried in the ground are expected as any potential artifact would be protected by soil.

3.3.7 Public Access and Recreation

The primary mission within the RTA is to maintain and enhance combat readiness of its Soldiers. Recreational activities are permitted in undeveloped and training areas as long as there are no conflicts with the military mission or with training activities. Outdoor recreation opportunities in the RTA are extensive and accessible to both military and civilian residents. Available activities within the RTA include: fishing, hiking, off-road vehicle trails, winter sports, wildlife viewing, camping, and boating. Access onto the RTA for recreation is authorized at specific entrances only, and all recreation activities must be conducted in accordance with applicable rules and regulations. Figure 3.2 identifies the recreation opportunities throughout JBER.

3.3.7.1 Environmental Consequences- Public Access and Recreation

Alternative 1

Under Alternative 1, the use of prescribed burns would result in minor, short-term impacts for areas that are being burned. Wildfire management procedures may result in temporary closures and have aesthetic impacts but these impacts would be minor and temporary. In addition, a majority of the range areas that would be impacted by prescribed burning are off-limits to the public for recreation or other purposes. During prescribed burns, Army Range Control would temporarily close areas to the public that would present potential safety risks. Other potential recreation areas would remain open unless closed due to military training. When the burns are complete the areas would be reopened for public access. Recreation could be temporarily reduced in burned areas due to the presence of blackened soil, ashes and other signs of fire. Some recreational users may prefer not to see the visible signs of fire; however these conditions will be temporary in nature.

Alternative 2:

Under Alternative 2, there would be no impacts to public access and recreation. The use of heavy machinery to remove the downed vegetation may temporarily prevent recreational users from accessing parts of the RTA for a relatively short period of time.

Alternative 3 (No Action):

Under the No Action Alternative, there would be no immediate negative impacts to public access and recreation. Public access would continue to be restricted by training events occurring within the RTA, but the training areas would not be off limits due to wildfire prevention activities.

However, there is potential for an uncontrolled wildfire to result in a significant reduction in recreational access. A larger wildfire would result in more areas being off limits to recreational users for significant periods of time, even after the fire is controlled.

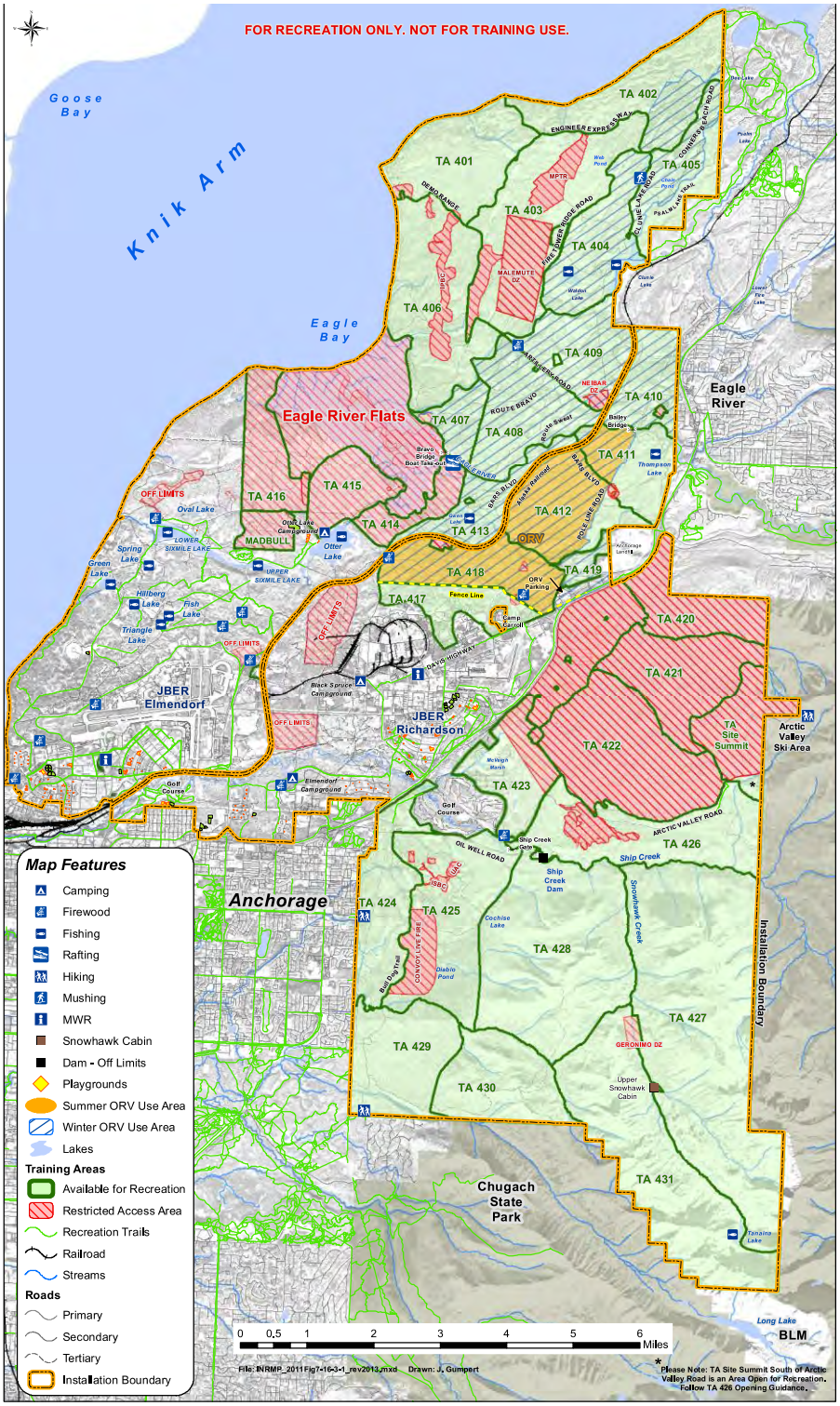

Figure 3.2 Recreation Opportunities at JBER

3.3.8 Health and Safety

The first priority in any fire scenario is firefighter and public safety. To minimize the inherent risks of conducting prescribed burns, the Air Force has promulgated mandatory standards and procedures, set out in AFI32-7064, Chapter 13. Requirements include development and implementation of an Wildland Fire Management Plan (WFMP). The WFMP serves as the installation's guide for reducing the potential for uncontrolled fires within the undeveloped areas of JBER.

The principal fire concern on JBER is human caused fires spreading out of control. While there have been several large-scale fires in the Matanuska-Susitna Valley to the north, no major fires have occurred on JBER since 1950. Fuels reduction, using prescribed burns, has been conducted within the Richardson range areas during the past 30 years.

Regionally, there have been two recent fires that occurred within military installations that caused concern to public health and safety. In 2013, the Mississippi Range Fire at the Army's Donnelly Training Area located outside Delta Junction, Alaska was initially identified as a one acre fire and was determined to be human-caused. However due to the location of the fire within a military restricted area, the fire wasn't investigated and was placed in monitor status. A Chinook wind event pushed the fire to the north out of the military restricted area and onto State lands. At that time the Alaska Incident Management Team (IMT) assumed command of the fire, which had grown to 40,841 acres. The IMT took several steps including establishment of a fire break surrounding the community of Whitestone and allocation of resources to slow the fire spread to the north. Due to weather conditions, primarily drought conditions and Chinook winds, the fire ended up impacting 67,711 acres of hardwoods, and creep in tundra and spruce. A summary of the events that occurred as well as the successes and challenges of the fire response team is included in Appendix G.

In May, 2014 a fire erupted in the 100 Mile Creek drainage located within the Army's Donnelly Training Area. The fire was declared when a one acre spot from the Oklahoma Range Prescribed Fire became established north of 100 Mile Creek located outside Delta Junction, Alaska. Initial efforts were undertaken to hold the fire on military lands and protect assets in the fire path. However, the discovery of unexploded ordnance (UXO) forced the fireline to be moved onto State lands to avoid the potential threat to firefighters. The fire impacted 23,270 acres before being contained; 16,407 acres of military lands and 6,863 acres of State land. One of the primary challenges with containing this fire was due to the presence of UXO, which forced the relocation of firelines. A detailed summary of the events that occurred, as well as the success and challenges of the fire response team for the 100 Mile Creek Fire is included in Appendix H. No UXO's are known to occur within the proposed areas for prescribed burns at JBER.

The JBER Integrated Natural Resource Management Plan (INRMP, 2013) contains a Wildland Fire Management Plan (WFMP) that outlines the following:

- Policy and guidance
- Resource risks
- Installation fire history

- Personnel qualification, training and fitness
- Fire response planning
- Wildland fire prevention and preemptive measures such as prescribed burning
- Fire suppression actions
- Fire detection and reporting

This WFMP is incorporated into this EA by reference and serves as the standard operating procedures that will be employed during prescribed burns conducted on JBER. These procedures are designed to minimize impacts to human health and safety. When conducted in accordance with these standard operational procedures, the impacts to human health and safety due to prescribed burning are considered to be minimal.

JBER Fire and Emergency Services also maintains Flight Management Instructions (FMI, 2015), also incorporated by reference, that outline in detail the safety, training, prevention and communication procedures undertaken to minimize potential impacts to human health and safety as a result of fires, including wildland fires.

As required by Air Force regulation, a site-specific burn plan will be prepared for each prescribed burn. To minimize risks to public safety, the site-specific plan will provide:

- A description of the burn unit's physical location, including a map.
- Identification of resource management objectives to be accomplished by the prescribed fire.
- Desired effects and tolerable deviations.
- Project area description that includes unit and fuel descriptors.
- A fire prescription containing key parameters needed to achieve desired results and provisions to record on-site conditions.
- The range of acceptable results expected, expressed in quantifiable terms.
- Smoke management components: actions to minimize prescribed fire emissions, evaluate smoke dispersion, public notification, air quality monitoring, and exposure reduction precautions.
- Provisions for weather data collection, acceptable parameters, and forecasts.
- Provisions for public safety and protection of sensitive features.
- Provisions for inter/intra agency pre-burn coordination and, where applicable, public involvement and burn day notification to appropriate individuals, agencies, and the public.
- Identification of the level of complexity of the fire and the appropriate organization needed. Minimum requirements for skill/knowledge element ratings of all elements of each position listed shall be stated. Describe the duties and responsibilities of positions within the organization.
- A communication plan.
- An assessment of existing fire breaks and whether additional fire breaks are needed prior to initiation of the prescribed burn.
- Provisions for line construction, pretreatment, and holding actions to keep the fire within prescription. Firing techniques, containment, patrols, and mop-up procedures are

required. Holding actions must be defined in the prescribed burn plan. The limits of acceptable holding actions must be clearly stated in the prescribed burn plan. These limits must be defined as specific actions that can be taken, not general terms.

- Identification of contingency actions to be taken if the fire exceeds prescription parameters and/or line holding capabilities and cannot be returned to prescription with project resources.
- A risk assessment that portrays an estimation of the probabilities and consequences of success/failure to the approving official. A safety plan and a "go, no-go" checklist are required.
- Provisions for fire proximity to endangered species and plant boundaries; consideration of existing and predicted weather, fire behavior, and fuel conditions; and drought evaluation impact and/or effect.
- The source of funding and estimated costs.
- Provisions for a test fire and recording the results.

Site specific plan will serve as a management tool to minimize potential impacts to human health and safety. These tools collectively represent the JBER strategy to manage and control wildland fires on base.

A team of fire professionals will be employed to conduct the prescribed burns. These professionals are recognized experts concerning wildland fire in the State of Alaska. The team would consist of professional fire fighters from JBER, US Forest Service and the Alaska Division of Forestry (DOF). The DOF will serve as the Burn Boss with overall authority over the burn. Personnel involved in any fire operations are required to meet strict standards for training, preparedness and fitness relative to their assigned duties. Participants would also have to adhere to basic safety standards associated with such work, including having the necessary PPE. Proper PPE will minimize risks to personnel. Fire crews will be provided daily briefings concerning operations and safety, to include burn techniques and objectives, weather conditions, communications, first aid and mop up requirements.

Nevertheless, potential health and safety impacts could result from conducting prescribed burns or from fire-suppression activities. Impacts could include injuries from firefighting, equipment accidents, smoke inhalation, or an escaped wildland fire. Proper training and outfitting would lessen the potential for impacts.

Additionally, appropriate permits will be obtained as a condition to conducting the prescribed burns. Permit requirements consist of an Open Burn permit issued by the State of Alaska Department of Environmental Conservation (ADEC), Division of Air Quality (DAQ), and a Burning Permit required by the DOF during the official wildland fire season. The site-specific burn plans will be submitted to the DOF to fulfill permit requirements set in 11 AAC 95.410.

As an additional safeguard, State regulations require 24-hour advance notification prior to initiation of open burns and a DAQ meteorologist would check weather conditions and patterns

to determine whether or not burns can proceed without impacts to human populations. If weather conditions are not favorable, burns will not be conducted.

The objective of the DAQ is compliance with regulations to minimize adverse environmental effects. Wood smoke, especially in large concentrations, is a health risk. The main inhalation hazards appear to be from CO, aldehydes, and total suspended particulates, particularly $PM_{2.5}$. Health effects can include eye and respiratory irritation, shortness of breath, headaches, dizziness, and nausea lasting up to several hours. Properly executed burn plan procedures should sufficiently minimize the potential for smoke to adversely affect populated areas, especially those more susceptible to adverse effects.

As specified in the WFMP and the FMI, burn plans will include specific details regarding procedures to be implemented in the event of an escaped fire, including calling in additional resources such as helicopter support. Under favorable conditions, the likelihood of fire escape is expected to be minimal. However, weather conditions in Alaska are known to change suddenly, especially in spring. The DOF will manage the burns, and has considerable experience in responding to sudden weather events. Adequate resources exist in the immediate area to address an escaped fire. Prior to initiation of any prescribed burn, the burn boss will coordinate with local fire departments.

3.3.8.1 Environmental Consequences- Health and Safety

Alternative 1

While the implementation of Alternative 1 would result in short-term increase in air pollution and an increase in fire risk, the long term impact would be positive. Reducing the amount of fuel through a controlled procedure will serve to substantial lessen the potential for a wildfire to erupt as a result of military live-fire training. With the commitment to comprehensive fire management planning, utilization of trained and experienced fire professionals and adherence to permit requirements, Alternative 1 does not present a potential for significant impacts to health and safety.

Alternative 2

Mechanical cutting of vegetation as described under Alternative 2 does not totally remove fuel loads and could actually contribute to bulk fuel loading as grasses and shrubs dry up after initial cutting. This could increase the potential for a wildfire in these range areas resulting in indirect significant impacts to health and safety of humans and property.

Alternative 3

Under the No Action Alternative vegetation would not be removed and would thus increase in density over time. Grassy and low brush areas would present an increased risk for wildfires as a result of training. Forested areas would increase in density along with ladder fuels. A resulting wildfire would be more intense and would likely result in a larger fire than if fire management activities were implemented. A resulting wildfire would have indirect significant impacts to human health, safety, and property.

4.0 CUMULATIVE IMPACTS

4.1 INTRODUCTION

CEQ regulations implementing NEPA define a cumulative impact as follows: a cumulative impact is the impact on the environment, which results from incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (CEQ, 1997). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). Environmental Protection Agency (EPA) guidance to reviewers of cumulative impacts analyses further adds that the concept of cumulative impacts takes into account all disturbances since cumulative impacts result in the compounding of the effects of all actions over time. Thus, the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting that resource no matter what entity (Federal, non-Federal, or private) is taking the action (EPA, 1999).

For purposes of this EA, significant impacts would occur if incremental impacts of the Proposed Action, added to the environmental impacts of past, present, and reasonably foreseeable actions would result in significant adverse impacts to resources at JBER and the surrounding area. The Air Force considered a wide range of past, present, and reasonably foreseeable future actions by coordinating with 673 CES Planning and researching existing NEPA documents to identify other projects in the area that could contribute to cumulative impacts.

Cumulative impacts analysis offers a fuller understanding of resource conditions that implementation of the Proposed Action might magnify, amplify, or otherwise exacerbate or cause beneficial or adverse impacts to resources on a regional or temporal scale. Table 4.1 identifies past, present, and reasonably foreseeable actions taken by JBER or within the surrounding area, other than the Proposed Action, that were reviewed to complete the cumulative impact analysis.

Action	Pre 2000	2000-2014	2014-Future	JBER or Regional Action
U.S. Army Alaska Transformation		X		JBER
Grow the Army		X		JBER
Range Upgrade and Expansion		X		JBER
F-22 Fighter		X		JBER

Action	Pre 2000	2000-2014	2014-Future	JBER or Regional Action
Beddown				
F-22 Plus Up		X		JBER
Resumption of Year Round Firing at Eagle River Flats Impact Area			X	JBER
Proposed Elmendorf-Airfield Runway Expansion			X	JBER
Otter Lake and Six Mile Lake Conservation Plan		X	X	JBER
3-Party Land Swap			X	JBER
North End Runway Material Extraction		X	X	JBER
Chugach State Park Master Plan			X	Regional
Joint Pacific Alaska Range Complex (JPARC)		X	X	Regional
Richardson Training Area Trail Upgrades		X	X	JBER
Wildland Fire Management Activities	X	X	X	JBER
Relocation of the Air National Guard 176th WG, to Elmendorf Air Force Base		X		JBER
Elmendorf Family Housing Expansion	X			JBER
Alaska Military Operations Areas	X			JBER and Regional
Increased EOD			X	JBER

Action	Pre 2000	2000-2014	2014-Future	JBER or Regional Action
Training Opportunities at JBER				
Resumption of Year Round Firing Opportunities at Eagle River Flats Impact Area			X	JBER
Proposed Changes to F-22 Flight Operations			X	JBER

Table 4.2 Past, present, and reasonably foreseeable actions

4.2 CUMULATIVE EFFECTS FOR AIR QUALITY

The area used for the air quality effects analysis is the Municipality of Anchorage, which covers the urban areas of Anchorage. Cumulative effects as a result of the proposed action are anticipated to be negligible to minor, and short-term in nature. Under Alternative 1, increased particulates and smoke would occur during the prescribed burns. Because of this, open burning is regulated by the Alaska Department of Environmental Conservation which considers the overall effect and timing of the prescribed burns. Stipulations and requirements to implement a prescribed burn would be coordinated directly with ADEC to ensure particulate matter and smoke does not exceed federal and state thresholds.

Most construction projects and training activities have some local air quality impacts. These impacts consist of dust generated from ground and vegetation disturbance due to construction and training. Procedures outlined in the construction permits and the JBER INRMP would serve to mitigate dust generation through use of BMPs.

Calculations based on an inventory of stationary sources on JBER estimate that 400 tons of pollutants are emitted annually from the base. Prescribed burning would add to these air quality impacts and the most notable increase would be emission of carbon monoxide (CO) and small particulate matter (PM). At one time, Anchorage was a non-attainment area for CO but ambient air quality conditions within the Anchorage bowl have improved such that the levels of CO and PM meet acceptable standards. Throughout this time, prescribed burns were conducted at JBER and other locations within the Anchorage area. Thus, it is apparent that there are no long-term cumulative impacts from this temporary activity. The impacts of these emissions on climate

change are complex and difficult to quantify, but based solely on the mass of emissions would be considered negligible when compared to world-wide emissions from other sources.

Under Alternative 2, impacts would be negligible because heavy machinery would be used to mow grasses in open areas within the training areas.

4.3 CUMULATIVE EFFECTS FOR WATER RESOURCES AND WATER QUALITY

The area used for the water quality effects is the Municipality of Anchorage. Cumulative effects as a result of the proposed action are anticipated to be negligible and short-term in nature. State and EPA regulations require storm water permits for all activities that disturb more than one acre of ground surface. Permitees must develop storm water pollution prevention plans (SWPPP) and implement BMPs to keep sediment from entering the storm water system, thus minimizing potential impacts.

The implementation of fuel reduction activities within the RTA will contribute a negligible amount of sediment into surface waters as there will be a temporary reduction in vegetative ground cover. Both Alternative 1 and Alternative 2 would have similar cumulative effects. In addition, with the implementation of BMPs for maintenance and construction of fire breaks and fire access trails will minimize sedimentation that can result from soil disturbance and erosion.

JBER, through the INRMP, actively monitors and repairs the impacts caused by training and recreation. Overall, INRMP activities and other installation environmental programs contribute long-term beneficial cumulative impacts to water resources. Overall, there would be no cumulative impacts anticipated with implementation of the proposed action.

4.4 CUMULATIVE EFFECTS FOR SOILS

The area used for the water quality effects is the Municipality of Anchorage. Cumulative effects as a result of the proposed action are anticipated to be negligible and short-term in nature.

Prescribe burning can contribute to short-term soil erosion and sedimentation, but as described in Section 4.3, these potential impacts would be minimized by the use of BMPs. BMPs are used to control erosion and runoff from construction sites and SWPPPs are required for construction projects disturbing more than one acre of surface soil. JBER does not experience heavy rainfall events generally associated with significant soil erosion.

Projects undertaken as part of the INRMP and other land rehabilitation initiatives have resulted in an overall long-term beneficial impact to soil resources. Continued management under the INRMP is critical towards protecting and preserving resources at JBER. It is also widely recognized that prescribed burns can increase ecosystem health, including soil fertility. The long-term cumulative impacts of the proposed action would be beneficial to overall soil health and fertility.

4.5 CUMULATIVE EFFECTS FOR BIOLOGICAL RESOURCES

4.5.1 Vegetation

Operational range safety requirements limit vegetation height and thus, some type of vegetation management is required for continued use of those areas. Prescribed fire is the most effective means of maintaining these ranges and has been used as a regular maintenance tool on these ranges.

It is well documented that wildfire as an ecological process is essential in creating and maintaining functional ecosystems and achieving land use objectives. However, predicting plant population and community response to fire is difficult. Plant population and community response is a product of the responses of all plants in a burned area and their interactions with the changed environment. However, as a general rule, burned areas tend to return to the same fire tolerant flora that existed previously. Fires of low severity, such as encountered during prescribe burns, are typically followed by a strong repopulation of preexisting vegetation. Fire affects the composition, structure, and pattern of vegetation on the landscape. However, in most terrestrial ecosystems, fire disturbance is necessary to maintain ecological processes and health. Thus, the long-term cumulative impacts to vegetation would be beneficial and contribute to ecosystem health.

4.5.2 Wildlife and Fisheries

Development in general can impact wildlife and fisheries. However, construction in urbanized areas does not typically have significant impacts due to lack of presence of wildlife and fisheries. Past activities have impacted wildlife and fisheries through gradual habitat loss. Current and future construction, training and non-military activities may all impact wildlife and fisheries. However, resource management projects, such as those outlined in the JBER INRMP, are designed to monitor, repair and mitigate impacts caused by these activities. BMPs are employed to mitigate construction impacts to wildlife and fisheries. JBER has implemented BMPs associated with storm water discharge permits that are designed to limit impacts to surface water quality. There are no anticipated cumulative impacts to wildlife and fisheries due to implementation of the proposed action.

Execution of wildfire management and prescribed burns would not contribute to cumulatively impact the Cook Inlet beluga or its designated critical habitat. Erosion as a result of prescribed burning is highly unlikely to cause any measurable change to water quality in fresh water bodies found on JBER or the Knik Arm. Knik Arm waters contain such high sediment loads and turbidity levels that minor inputs attributable to prescribed burning would not be measurable.

JBER continues to implement comprehensive resource management programs that improve wildlife habitat, enhance stream bank stabilization and fisheries, promote wildlife survival, and

effectively manage watersheds and wetlands. Prescribed burning is part of this overall management strategy and is an accepted and common resource management tool. Short-term impacts to habitat would be overshadowed by the overall long-term benefits to soil and ecosystem health. Additionally, resource management activities and other installation environmental programs contribute long-term beneficial cumulative impacts to wildlife and fisheries.

4.6 CUMULATIVE EFFECTS FOR CULTURAL RESOURCES

No significant impacts to cultural resources are anticipated as a result of the proposed action. To the extent possible, all prescribed burns and actions identified in the proposed action occur in previously surveyed areas. Neither the use of prescribed burns nor mechanical removal will have a measureable impact on cultural resources, therefore no significant cumulative impacts are anticipated as a result of the proposed action.

4.7 CUMULATIVE EFFECTS FOR PUBLIC ACCESS AND RECREATION

No significant impacts to public access and recreation are anticipated to occur as a result of the proposed action. The surrounding Chugach National Forest provides ample opportunities for recreation access and although certain access points onto the installation may be closed due to prescribed burns, recreation and access will be minimally impacted and only during the prescribed burn events. Therefore, implementation of the proposed action, in conjunction with the surrounding projects and actions will not result in significant cumulative impacts.

4.8 CUMULATIVE EFFECTS FOR HEALTH AND SAFETY

Under Alternative 1, no cumulative significant impacts to health and safety are anticipated to occur as a result of the proposed action. Should a wildland fire in the areas surrounding areas erupt, fuels will be reduced within the training areas at JBER. Under Alternative 2 and Alternative 3, significant impacts may occur as there would be increased within the installation, especially in the training areas. Implementation of Alternative 1, in conjunction with the surrounding land management activities and projects will not result in significant cumulative impacts.

4.9 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

An irreversible or irretrievable commitment of resources refers to impacts on or losses to resources that cannot be reversed or recovered, even after an activity has ended and facilities have been decommissioned. A commitment of resources related to the use or destruction of nonrenewable resources, and effects that such a loss will have on future generations. For example, if prime farmland is developed there would be a permanent loss of agricultural productivity. The proposed action to implement hazardous fuel management does not produce any irreversible commitment of resources. If management actions were to stop, vegetation would continue to grow similarly to before implementation of the management actions..

5.0 LIST OF PREPARERS

Dr. Mark Prieksat 673 CES/CEIE
Chief, Environmental Element

Brent Koenen 673 CES/CEIEC
Chief, Conservation/Natural Resources

Chris Garner 673 CES/CEIEC
Endangered Species Biologist

Jon Scudder 673 CES/CEIEC
Cultural Resources Manager and Native Liaison

Zack Walker, Colorado State University
NEPA Coordinator

Jessica Johnson, Colorado State University
Fisheries Biologist

Cassandra Schoofs, Colorado State University
Natural Resources Biologist

Charlene Johnson, Colorado State University
Wetland and Forestry Ecologist

Dawn Atwood, USARAK
GIS Analyst

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ABBREVIATIONS AND ACRONYMS

ADEC	Alaska Department of Environmental Conservation
AFS	Alaska Fire Service
BMP	Best Management Practice
CAA	Clean Air Act
CAP	Criteria Air Pollutant
CEQ	Council on Environmental Quality
CES	Civil Engineer Squadron
CO	Carbon Monoxide
CWA	Clean Water Act
DZ	Drop Zone
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
IDT	Interdisciplinary Team
IICEP	Interagency Intergovernmental Coordination for Environmental Planning
INRMP	Integrated Natural Resource Management Plan
ITAM	Integrated Training Area Management
JBER	Joint Base Elmendorf-Richardson
JPARC	Joint Pacific Alaska Range Complex
LMU	Land Management Unit
LZ	Landing Zone
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHRP	National Register of Historic Places
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
PM	Particulate Matter
RTA	Richardson Training Area
SHPO	State Historic Preservation Office
SWPPP	Storm Water and Pollution Prevention Plan

USAF	United States Air Force
USFWS	U.S. Fish and Wildlife Service
WFMP	Wildland Fire Management Plan

APPENDIX A

Interagency/Intergovernmental Coordination for Environmental Planning

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 673D AIR BASE WING
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

MEMORANDUM FOR SEE DISTRIBUTION LIST

FROM: 673 CES/CD
6346 Arctic Warrior Drive
JBER AK 99506-3221

SUBJECT: Environmental Assessment (EA) for Wildland Fire Management Activities at Joint Base Elmendorf-Richardson (JBER), Alaska.

1. Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, and its implementing regulations, the United States Air Force (USAF) intends to prepare an environmental analysis to determine the potential for significant impacts on the human environment from the proposal to perform management actions to reduce fuel loads at JBER, Alaska. The EA will address three alternatives: Alternative 1, the use of prescribed burns to reduce vegetation accumulation; Alternative 2, the use of mechanical methods to reduce vegetation accumulation; Alternative 3, the No Action Alternative.

2. The USAF will publish a notice of availability (NOA) of the EA in the Anchorage Daily News and on the JBER website at (http://www.jber.af.mil/environmental/index.asp). The NOA will initiate the public comment period and explain the method for submitting comments on the EA.

3. Please let us know if you have any general concerns that could be addressed in the EA. If you believe this proposal will significantly affect any tribal right(s) or protected resource(s), we invite you to consult with us on a government-to-government basis, in accordance with the Department of Defense *American Indian and Alaska Native Policy* and Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*. Please write to us and explain which tribal right(s) or protected tribal resource(s) will be affected and how they will be significantly affected. To initiate consultation, please contact Mr. Jon Scudder, Cultural Resources Program Manager, at (907) 384-6648 or jon.scudder@us.af.mil to determine a time which may be mutually convenient. Please provide your comments or requested information not later than 21 July 2014 in order to be considered during the preparation of the EA.

4. If you have any specific question about the proposal, we would like to hear from you. Please feel free to contact Mr. Zack Walker, NEPA Coordinator, at (907) 384-2460 or zachary.walker.17.ctr@us.af.mil. General questions may be directed to Mr. Bob Hall, Public Affairs, at (907) 552-8152 or robert.hall.58@us.af.mil. In advance, we thank you for your assistance in this matter.

WOOD.WILLIAM.ED.
WARD.1019415968

WILLIAM E WOOD, GS-13
Deputy Director

1 Attachment:
Distribution List

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 673D AIR BASE WING
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

MEMORANDUM FOR SEE DISTRIBUTION LIST

FROM: 673 CES/CD
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3. In an effort to analyze the potential effects of the proposed action, the USAF may contact you in their data collection efforts. Please provide your comments or requested information not later than 21 July 2014 in order to be considered during the preparation of the EA.

4. If you have any specific question about the proposal, we would like to hear from you. Please feel free to contact Mr. Zack Walker, NEPA Coordinator, at (907) 384-2460 or zachary.walker.17.ctr@us.af.mil. General questions may be directed to Mr. Bob Hall, Public Affairs, at (907) 552-8152 or robert.hall.58@us.af.mil. In advance, we thank you for your assistance in this matter.

WOOD.WILLIAM.EDWARD.1019415968

WILLIAM E. WOOD, GS-13

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 673D AIR BASE WING
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

MEMORANDUM FOR NATIONAL MARINE FISHERIES SERVICE (NMFS)
PROTECTED RESOURCES DIVISION AND HABITAT
CONSERVATION DIVISIONS
ATTENTION: MS. BARBARA MAHONEY

FROM: 673 CES/CD
6346 Arctic Warrior Drive
JBER AK 99506-3221

SUBJECT: Environmental Assessment (EA) for Wildland Fire Management Activities at Joint Base Elmendorf-Richardson (JBER), Alaska.

1. Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, and its implementing regulations, the United States Air Force (USAF) intends to prepare an environmental analysis to determine the potential for significant impacts on the human environment from the proposal to perform management actions to reduce fuel loads at JBER, Alaska. The EA will address three alternatives: Alternative 1, the use of prescribed burns to reduce vegetation accumulation; Alternative 2, the use of mechanical methods to reduce vegetation accumulation; Alternative 3, the No Action Alternative.

2. In accordance with the Endangered Species Act of 1973, as amended, we would like to request information regarding any federally-listed threatened and/or endangered species in addition to candidate or proposed-to-be-listed species that occur or may occur in the potentially affected area located on JBER. Please send information to our primary point of contact Mr. Zack Walker at the address below. Please provide your comments or requested information not later than 21 July 2014 in order to be considered during the preparation of the Draft EA. Additionally, we would appreciate you identifying a point of contact for any follow-up questions we may have.

3. If you have any questions or comments on this request, please contact Mr. Zack Walker, NEPA Coordinator at 673 CES/CENPP, 6346 Arctic Warrior Drive, JBER AK 99506-3221, (907) 384-2460 or zachary.walker.17.ctr@us.af.mil. An alternate point of contact is Mr. Brent Koenen at (907) 384-6224 or brent.koenen@us.af.mil. In advance, we thank you for your assistance in this matter.

WOOD.WILLIAM.EDWARD.1019415968

WILLIAM E. WOOD, GS-13
Deputy Director

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 673D AIR BASE WING
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

MEMORANDUM FOR UNITED STATES FISH & WILDLIFE SERVICE (USFWS)
ANCHORAGE FISH & WILDLIFE FIELD OFFICE
ATTENTION: SOCHETTA LOR

FROM: 673 CES/CD
6346 Arctic Warrior Drive
JBER AK 99506-3221

SUBJECT: Environmental Assessment (EA) for Wildland Fire Management Activities at Joint Base Elmendorf-Richardson (JBER), Alaska.

1. Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, and its implementing regulations, the United States Air Force (USAF) intends to prepare an environmental analysis to determine the potential for significant impacts on the human environment from the proposal to perform management actions to reduce fuel loads at JBER, Alaska. The EA will address three alternatives: Alternative 1, the use of prescribed burns to reduce vegetation accumulation; Alternative 2, the use of mechanical methods to reduce vegetation accumulation; Alternative 3, the No Action Alternative.

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WOOD.WILLIAM.EDWARD.1019415968

WILLIAM E. WOOD GS-13
Deputy Director

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

July 25, 2014

William E. Wood
Deputy Director
Department of the Air Force
Headquarters, 673D Air Base Wing
Joint Base Elmendorf-Richardson, Alaska 99506

Re: Environmental Assessment for Wildland Fire Management Activities at Joint Base Elmendorf-Richardson, Alaska

Dear Mr. Wood:

The National Marine Fisheries Service (NMFS) received your June 24, 2014, letter stating that the United States Air Force (USAF) intends to prepare an environmental analysis to determine the potential for significant impacts on the human environment from the proposal to perform management actions to reduce fuel loads at Joint Base Elmendorf-Richardson (JBER), Alaska. The USAF requested information on threatened and endangered species and critical habitat that may occur in the potentially affected area located on JBER.

Threatened and Endangered Species

Section 7(a)(2) of the Endangered Species Act (ESA) directs federal interagency cooperation "to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species" or result in the destruction or adverse modification of critical habitat. NMFS is responsible for administration of the ESA for cetaceans, sea turtles, anadromous fish, marine fish, seals, sea lions, marine plants, and corals. All other species (including sea otters and Steller's eiders) are administered by the U.S. Fish and Wildlife Service. Further information on NMFS ESA species and critical habitat within Alaska can be found at: http://www.alaskafisheries.noaa.gov/protectedresources/.

Cook Inlet beluga whales (*Delphinapterus leucas*) are listed as endangered under the ESA and are observed in Knik Arm waters, including waters adjacent to JBER. Beluga whales are regularly observed in and around Eagle Bay and Eagle River adjacent to JBER. The critical habitat for Cook Inlet beluga whales include two geographic areas of marine habitat, comprising 7,800 km^2 (3,013 mi^2) and is bounded by the Mean Higher High Water (MHHW) line on the upland (76 FR 20180; April 11, 2011). Area 1 includes all of Knik Arm, except all waters of the Port of Anchorage that are east of a line connecting Cairn Point (61°15.4′ N., 149°52.8′ W.) and Point MacKenzie (61°14.3′ N., 149°59.2′ W.), and north of a line connecting Point Mackenzie and the north bank of the mouth of Ship Creek

(61°13.6' N., 149°53.8' W.). These areas are bounded on the upland by Mean High Water, but do not extend into the tidally-influenced channels of tributary waters in Knik Arm near the action area. Area 2 is 5,891 km^2 (2,275 mi^2) of marine habitat, south of Area 1 to southern parts of Cook Inlet, including Kachemak Bay.

All marine mammals are protected under the Marine Mammal Protection Act, including the harbor porpoise (*Phocoena phocoena*) and harbor seal (*Phoca vitulina*) which have been regularly documented in Knik Arm.

Essential Fish Habitat

Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to consult on all actions or proposed actions authorized, funded, or undertaken by that agency, which may adversely affect Essential Fish Habitat (EFH). If a federal action agency determines that an action will not adversely affect EFH, no consultation is required and the federal action agency is not required to contact NMFS about their determination.

EFH has been designated in the project area for anadromous salmon. EFH for salmon consists of the aquatic habitat necessary to allow salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to healthy ecosystems. Further information on habitat and EFH within Alaska can be found at http://www.alaskafisheries.noaa.gov/habitat/efh.htm.

We hope this information is useful to you in fulfilling any requirements under section 7 of the ESA and Section 305(b)(2) of the MSA. Please direct any marine mammal questions to Barbara Mahoney in at 907-271-3448, and questions regarding EFH to Brian Lance at 907-271-1301.

Sincerely,

James W. Balsiger, Ph.D.
for Administrator, Alaska Region

cc: Zack Walker zachary.walker.17.ctr@us.af.mil
Brent Koenen brent.koenen@us.af.mil

WALKER, ZACHARY T CTR USAF PACAF 673 CES/CENPP

From: Klein, Kimberly <kimberly_klein@fws.gov>
Sent: Wednesday, July 23, 2014 5:20 PM
To: WALKER, ZACHARY T CTR USAF PACAF 673 CES/CENPP
Cc: KOENEN, BRENT A CIV USAF PACAF 673 CES/CEIEC
Subject: Wildland Fire Management at JBER

Thank you for your letter indicating that the United States Air Force (USAF) intends to prepare an environmental analysis of fuel reduction activities at JBER. There are no listed species requiring consultation under Section 7 of the Endangered species Act in the vicinity of JBER.

For future projects please try our online tool that was developed to help streamline the Endangered Species Act, section 7 consultation process. This web-based tool called IPaC (Information, Planning, and Conservation) is a decision support system that allows our partners to explore the landscape and download a preliminary and official U.S. Fish and Wildlife Service species list.

The U.S. Fish and Wildlife Service provides species lists for actions authorized, funded or carried out by federal agencies. The species list fulfills the requirement, under section 7(c) of the Endangered Species Act, to provide a list of threatened and endangered species upon request for federal actions and National Environmental Policy Act (NEPA) compliance. At this time, the list generated from IPaC will not deliver information on candidate species in your action area. Please visit our candidate conservation webpage <http://www.fws.gov/alaska/fisheries/fieldoffice/anchorage/endangered/candidate_conservation.htm> for more information on candidates or feel free to call me at the number below.

Simply go to the IPaC webpage <http://ecos.fws.gov/ipac/> and click on the "Initial Project Scoping" tab to specify your project's action area and request a species list. Remember, the action area refers to the area directly or indirectly affected by the proposed action; this area will usually be larger than the project footprint. Look for the link on the upper right side of the page to generate an official list.

Please visit the Anchorage Fish and Wildlife Field Office's website <http://www.fws.gov/alaska/fisheries/fieldoffice/anchorage/endangered/program_overview.htm> for more information about the listed species and critical habitat in your proposed action area. For the purposes of section 7 consultation, the Juneau and Anchorage Field Office boundaries have been combined. Please feel free to forward this announcement to others.

Thank you!

Kimberly Klein
Endangered Species Biologist
U.S. Fish and Wildlife Service

1

APPENDIX B

Notice of Availability

NOTICE OF 30-DAY PERIOD
FOR PUBLIC COMMENT

Joint Base Elmendorf-Richardson has prepared an Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) covering a proposed implementation of wildland fire management activities within the Richardson Training Area of JBER. The proposed action consists of several prescribed burns on various Army training ranges north and south of the Glenn Highway. The prescribed burns will be conducted in Spring 2015. The prescribed burns vary in size from 4 to 600 acres, totaling less than 2,000 acres. JBER will provide the community 24-hours advance notice of burn events.

The draft Finding of No Significant Impact (FONSI) and EA and supporting documents may be found at www.jber.af.mil/environmental/index.asp. The documents will be available for 30-day public review.

Written comments shall be received and considered until 17 April 2015, and should be directed to Mr. Jeremiah Erikson via e-mail at jber.pa.3@us.af.mil or at the following address: 673 ABW/PA, 10480 Sijan Avenue, Suite 123, Joint Base Elmendorf-Richardson, Alaska, 99506.

APPENDIX C

Wildland Fire Management Plan

Letter of Instruction

This Wildland Fire Management Plan (WFMP) complies with Air Force Instruction 32-7064, *Integrated Natural Resources Management*, Chapter 12, *Wildland Fire Management*. A collaborative approach to the development and implementation of this WFMP will ensure the safety and welfare of firefighters, JBER and the surrounding community during suppression of wildland fires while benefiting from the effects of fire to natural resources.

The WFMP supports the goals and objectives of the JBER Integrated Natural Resources Management Plan. This guidance document integrates wildland fire with natural resources management to ensure no net loss of military training lands and conservation of the boreal forest to sustain realistic military training.

WFMP was coordination with 673 CES Fire Chief, 673 CES Environmental Compliance, JBER-Richardson Range Control and Air Force Wildland Fire Center, at Eglin AFB.

DAVID T. DONAN
Chief, JBER Fire Emergency Services

BRIAN P. DUFFY 9 JUN 14
Colonel, USAF
Commander

Note: During the 2014 INRMP update, BLM Alaska Fire Service wildland fire responsibilities on JBER were transferred to Alaska Division of Forestry. This document has been edited accordingly, but not staffed for re-signature since the intention of the document has not changed.

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1.0 ACROYMN LIST

ABWI	Air Base Wing Instruction
ADoF	Alaska Division of Forestry
AFI	Air Force Instruction
AFS	Alaska Fire Service
AFCEC/CXF	Air Force Civil Engineer Center, Fire Emergency Services Division
AFWFC	Air Force Wildland Fire Center
BLM	Bureau of Land Management
DoD	Department of Defense
DoDI	Department of Defense Instruction
GIS	Geographic Information Systems
FES	Fire Emergency Services
FESCS	Fire Emergency Services Certification System
IAW	in accordance with
ITAM	Integrated Training Area Management
INRMP	Integrated Natural Resource Management Plan
JBER	Joint Base Elmendorf-Richardson
JBER-E	JBER-Elmendorf
JBER-R	JBER-Richardson
MOA	Memorandum of Agreement
NFES	National Fire Equipment System
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NFP	National Fire Plan
NWCG	National Wildfire Coordinating Group
WFMP	Wildland Fire Management Plan
WFPM	Wildland Fire Program Manager
WFSA	Wildland Fire Situation Analysis
USARAK	United States Army Alaska
UXO	Unexploded ordnance

2.0 INTRODUCTION

The purpose of this plan is to promote a cooperative, consistent, cost-effective, interagency approach to wildland fire management. The response to a wildland fire is determined by the management option designation and the likely consequences of the fire on firefighter and public safety. The options offer a choice of responses from aggressive suppression to surveillance and that range of responses provides an opportunity for Joint Base Elmendorf-Richardson (JBER) to achieve both protection and meet natural resource management goals and objectives. The response listed under each option addresses normal fire conditions and a high percentage of wildland fire situations that occur on JBER. Situations may arise where non-standard responses are prudent and justifiable.

This Wildland Fire Management Plan (WFMP) is consistent with land and resource use defined in the Integrated Natural Resources Management Plan (INRMP). The WFMP also meets state and federal fire management policy and guidance, meets state and federal regulatory requirements and identifies agency-specific goals and objectives. There are three fire management options on JBER; critical, full and limited. These resource assignments prioritize and describe the standard response to a wildland fire. Infrastructure, ecological considerations and suppression costs were factors used to develop the management option criteria.

3.0 POLICY AND GUIDANCE

Policies, standards and directives in this section identify the overarching federal wildland fire policy, directives, instructions and professional criteria requirements of the JBER wildland fire management plan.

3.1 Federal Fire Policy

The *Federal Wildland Fire Management Policy and Program Review Final Report (December 18, 1995)* was the first joint comprehensive fire policy for the Departments of the Interior and Agriculture. The final report contained guiding principles that directed federal agencies to achieve a balance between suppression to protect life, property and resources, and fire use to regulate fuels and maintain healthy ecosystems. It promoted the use of wildland fire to accomplish resource management objectives and supported implementation of policies and recommendations in conjunction with states, tribes and local governments.

The *Review and Update of the 1995 Federal Wildland Fire Management Policy (January 2001)* contains specific actions to enhance wildland fire management and seeks to build on the strengths of the original policy. Firefighter and public safety are listed as the first priority and the 2001 policy directs all fire management plans and activities to reflect this commitment. The 2001 guiding principles and policy statements guide the philosophy, direction and implementation of fire planning, activities and projects on federal lands. All the principles and policy statements are incorporated by reference into this plan and, where appropriate, the statements are included within this plan.

The first *Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy* was issued in 2003; it was replaced by the *Guidance for Implementation of Federal Wildland Fire Management Policy,* issued February 13, 2009. The 2009 *Guidance* affirmed the soundness of the *2001 Review and Update* and clarifies implementation direction to fully achieve the intent of the 2001 policy.

The National Fire Plan (NFP) was developed in August 2000, following a landmark wildland fire season in the Lower 48, with the intent of actively responding to severe wildfires and their impacts to communities while ensuring sufficient firefighting capacity for the future. The NFP addresses five key points: firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability.

Fuels management was addressed further in the *Healthy Forests Initiative* (August 2002) which sought to reduce the risks severe wildfires pose to people, communities and the environment. The Initiative was followed by the Healthy Forests Restoration Act of 2003, which contains a variety of provisions to speed up hazardous-fuel reduction and forest restoration projects on specific types of federal land that are at risk of wildland fire or of insect and disease epidemics.

3.2 Department of Defense Policy

Department of Defense Instruction (DoDI) 6055.06 *Wildland Fire Response*, states that fire department resources preparedness and response to wildland fires be accomplished in accordance with the *Review and Update of the 1995 Federal Wildland Fire Management Policy* and *Interagency Fire Management Agreement*. Exceptions are provided under Department of Defense (DoD) Directive 3025.15, *Military Assistance to Civil Authorities.*

3.3 Air Force Policy

Wildland Fire Management and how it interconnects with the INRMP is addressed in Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*; Chapter 12. This WFMP meets AFI 32-7064 requirements.

3.4 Wildland Fire Qualifications and Standards

The applicable qualifications and standards used for Air Force wildland firefighting activities and operations are as follows:

a. The National Wildfire Coordinating Group (NWCG) *Wildland Fire Qualification System Guide* (PMS 310-1) (NWCG, 2010) contains the training experience and physical requirements for various Incident Command System positions. The DoD accepts these standards for the use in both wildfire suppression and prescribed fire operations on DoD lands.

b. National Fire Protection Association (NFPA) 295, *Standard for Wildfire Control*, specifies management, organization, equipment, apparatus and procedures required for wildland fire control.

c. NFPA 299, *Standard for Protection of Life and Property from Wildland Fire*, provides fire safe development standards for areas potentially threatened by wildland fire.

d. NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, specifies the minimum requirements in terms of performance objectives and professional competence required for service as an apparatus driver operator for each level of responsibility.

e. NFPA 1051, *Standard for Wildland Fire Fighter Professional Qualifications*, identifies the minimum job performance requirements for wildland fire duties and responsibilities.

f. NFPA 1143, *Standard for Wildland Fire Management*, specifies practices and policies required for a fire protection organization to develop a wildland fire management program.

g. NFPA 1144, *Standard for Protection of Life and Property from Wildland Fire,* provides minimum planning, construction, maintenance, education, and management procedures to protect life, property and other resources threatened by wildland fire. It is designed to assist agencies challenged by wildland urban interface growth and the monetary losses associated with this urban encroachment.

h. NFPA 1500, *Standard for Fire Department Occupational Safety and Health Program,* contains minimum requirements for a fire service-related occupational safety and health program.

3.5 JBER Standard Operating Procedures

The objective of fire suppression is to attack and suppress wildfires at minimum cost while protecting values at risk and minimizing the impacts from suppression activities. For purposes of this fire management plan, a wildfire is defined as, “Any non-structural fire that occurs in the wildland”. Three distinct types of wildland fire have been defined and include wildfire, wildland fire use, and prescribed fire. Wildfire suppression is simply the act of putting out a wildland fire using safe and

efficient methods. In some cases, a wildfire on JBER training lands can be controlled with a single attack response vehicle; in others, large numbers of fire fighters, fire apparatuses, and equipment may be required. Because of this range of resource needs, fire suppression can be relatively simple and straightforward or extremely complex. More response information is provided in section 6.5 *Fire Suppression Actions.*

3.6 Wildland Fire Qualifications

The NWCG PMS 310-1 is incorporated in this plan by reference as are NFPA standards 295-299. The DoD accepted these standards for use in both wildlife fire suppression and prescribed fire operations on DoD lands.

3.7 JBER INRMP

The WFMP is a component plan of the JBER INRMP. The related goals and objectives of the INRMP are consistent with the goals, objective and operational practices of the WFMP.

4.0 GOALS AND OBJECTIVES:

Below are the specific guidelines for the JBER wildland fire management program. These mutually developed goals and objectives consider the safety risk, mission requirements, interagency nature and public interest requirement of a WFMP.

A. Goals
The preliminary goals and objectives are arranged by four subject categories; Safety, Interagency Management and Budget, Data Sharing and Distribution and Compliance, Coordinate and Education

Goal 1: Complete mission-related activities and accomplish fire-related land-use and resource management in a manner protective of human life and health, property, and valued natural and cultural resources, when possible.

Objectives:
- Protect human life; emphasize fire fighter and public safety as the single, overriding priority.
- Prioritize protection action areas; allocate firefighting resources without compromising safety.
- Participate in unexploded ordnance management planning prior to allocating field resources.
- Safely suppress all wildland fires to assure minimal military impacts.
- Integrate mission objectives, land use, fire management and natural resource goals.

Goal 2: -Facilitate the development of interagency planning and partnerships

Objectives:
- Conduct an annual, pre-season review of the fire protection needs and land management options and identify limitations/challenges for potential management activities.
- Define criteria for prioritizing the allocation of resources in response to a wildland fire using operationally, fiscally and ecologically sound principles.
- Work with United States Army Alaska (USARAK), United States Department of Agriculture- Forest Service (USFS) and Air Force Wildland Fire Center (AFWFC) to annually develop a wildland fire budget. Program the budget for the upcoming year and a minimum of three out years.
- Work with USARAK, USFS, Alaska Division of Forestry (ADoF) and AFWFC, if necessary, to review, modify and finalize annual burn plan.
- Promote cooperation, collaboration and partnerships for fire management between Army, Air Force and other federal, state and local or tribal governments.

Goal 3: Identify, collect, maintain and monitor strategic wildland fire spatial data.

Objectives:
- Identify and establish high priority wildland related geospatial datasets necessary to support implementation of wildland fire prevention, response and resource recovery.
- Promote standard data collection procedures for wildland fire management and share data with wildland fire partners.

- Use spatial data sets to identify and prioritize prescribed burn areas annually and support budgetary cost estimates.

Goal 4: Adhere to all compliance requirements. Focus on coordinating and educating of on- and off-base entities.

Objectives:

- Work with USARAK and ADoF to modify Title V air permit annually, if needed.
- Maintain Mutual Aid Agreements with applicable off-base entities to ensure effective suppression off-base and out-of control base fires
- Provide adequate public notification of all planned prescription burns.

5.0 RESOURCE RISKS

5.1 Firefighter Safety

Public and firefighter safety is the first and highest priority. Safety is the responsibility of everyone assigned to a wildfire incident. Safety is an attitude that must be promoted at all operational levels. Once personnel are committed to an incident, those resources become the highest value to be protected.

Fighting wildfires is inherently dangerous, and firefighters risk injury or even death in these operations. Nationally, there are wildland firefighter fatalities nearly every year. In addition to the danger from the fire itself, the need to use cutting tools, mobile apparatuses, heavy equipment, and aircraft add to the risk involved. If firefighters know how to recognize potentially hazardous situations and how to mitigate them, they can reduce or eliminate much of that risk.

The training program and the qualification and certification process are the foundations of the safety program. Only qualified personnel will be assigned firefighting duties. All assigned wildland fire personnel, whether on wildfires or prescribed fires, must meet National Wildfire Coordinating Group, or equivalent NFPA training standards. All personnel engaged in actual fire line operations (in the vicinity of the fire) must have completed: S-110 Basic Fire Suppression Orientation; S-130 Firefighter Training; S-190 Introduction to Fire Behavior, Your Fire Shelter, Standards for Survival and I-100 Introduction to Incident Command System. All trained personnel will be required to complete an annual four-hour refresher course. All personnel will have certified training in accordance with current Air Force Instruction (AFI)s for tasks they are assigned.

The Incident Commander must ensure that safety briefings take place at all operational levels. The identification and location of escape routes and safety zones will be identified and stressed at every briefing.

All fire suppression actions must be in compliance with DoDI 6055.6, AFI 32-2001, and the National Wildfire Coordinating Group *10 Standard Fire Orders* and *18 Watch-Out Situations*. It is mandatory that all firefighting personnel assigned be equipped with the proper personal protective equipment necessary for fighting wildfires. Wildland firefighters must be intimately familiar with the tools used and personal protective equipment worn. Knowledge of proper selection, use and care of the various tools used in wildland firefighting aids firefighters in performing their job as efficiently and effectively as possible. Likewise, knowledge of the proper donning, care, capabilities and limitations of personal protective equipment, gives firefighters a better sense of which situations are tenable and which are not. Firefighting personnel will ensure that proper personal protective equipment is worn at all times when actively engaged in firefighting duties.

5.2 Mission

JBER must provide relevant training at home station that adequately portrays the operational environment in training venues and facilities that allow units and staffs to achieve mission essential task list proficiency. The training process for JBER-Richardson (JBER-R) brigade combat teams and echelons above brigade units is to gain proficiencies in four levels: (1) individual skills and marksmanship; (2) squad level collective training; (3) unit's transition to critical collective tasks at platoon and company levels, and (4) mission validation for battalion and brigade level operations. Units must comply with current published pre-deployment training guidance, as well as Army regulation 350-1 training requirements.

Airborne units conduct airborne operations to train and sustain individual paratrooper skills and hone collective task execution. Given limited training time to devote to airborne operations, priority will be given to individual jumper and jumpmaster proficiency and collective proficiency up to battalion level. Airborne operations will be executed in accordance with (IAW) the Army's Airborne Standard Operating Procedures. At a minimum, a battalion headquarters will be designated to provide command oversight for each airborne operation. Airborne troop leading procedures inherent to airborne operations will not be abrogated.

Soldiers must strive to be an expert in employing his/her assigned weapon. Small arms mastery is achieved by effective employment of soldiers' assigned weapons, optics, lasers and night vision devices. Leaders at all levels will maximize the use of the engagement skills trainers and ensure that soldiers are exposed to more advanced skills such as close quarter or short range marksmanship tables, long range marksmanship, non-standard firing positions, high angle fire, target discrimination, and firing under physical stress. Direct, indirect, and aerial gunnery will be planned, resourced and executed as part of a unit's training glide path. Minimum platforms for gunnery requirements include: machine gun crew, mortar, howitzer and aviation.

Another DoD mission consideration is unexploded ordnance (UXO). There are a number of past and present training operations that present lingering UXO concerns. A fair percentage of JBER-R standing timber or transitional grass ecotone converge into timber land within current range training lands or has historically been located within a range safety firing fan for various live fire ranges. It is recommended that Explosive Ordnance Disposal personnel be involved in the annual, pre-season fire protection meeting.

5.3 Biological and Cultural Considerations

JBER does not have any endangered or threatened terrestrial flora or fauna. Yet, the Incident Commander needs to select suppression tactics commensurate with the fire's potential or existing behavior, and leaving minimal environmental impact. Minimum impact suppression is an increased emphasis on suppressing a wildfire while minimizing the effects of suppression measures on the vegetation, soils and watershed. Minimum impact suppression tactics will not over-ride considerations for safety or containment or control of the wildfire. However, they will be used to the maximum extent possible within these constraints.

Protection of the local environment will be considered in fire management strategies, particularly in the location of fuel breaks and control lines. Bulldozers are a useful tool in fire suppression efforts but can have a severe impact on natural and cultural resources. The use of dozers to construct fire-lines within pre-established fuel breaks provides for safe dozer operations, enhances ground firefighter safety, and causes the least environmental impact, as these areas are pre-approved for vegetation removal. Dozers are used as a means of last resort in fire suppression because of their potential impact on the environment. Dozer operations in support of a wildland fire have never occurred on JBER; dozer operators are not expected to respond to wildfires on JBER unless it is an absolute emergency.

Fire managers must be familiar with the long-term effects of physical ground/vegetation disturbance. Specific concerns include invasive species introduction through the use of dirty equipment or the creation of invasion routes. Ground disturbance on sloped land may result in lingering erosion problems or permanently damage cultural sites. The use of fire suppression chemicals (foam and retardant), the aerial use of chemical retardant, fire foam or saltwater will be weighed against the potential for fire damage to sensitive plants.

JBER has few archeological sites identified. A complete survey of this installation is ongoing but not complete. Alpine and wetland or riparian areas have received limited archeological surveys. A recent survey along a salmon bearing stream yielded no archeological artifacts. Wildfires may harm unknown archeological areas but riparian areas thought to have high potential for sites are unlikely to be targeted for prescribed burns or experience wildland fire because of the saturated soils conditions associated with this ecosystem.

Use of aerial fire retardant near lakes, wetlands, streams, rivers and adjacent to water sources used for human water consumption should be avoided to protect fish habitat and water quality. If feasible in these areas, the use of water rather than retardant is preferred. When retardant use is necessary, avoid aerial or ground application of retardant or foam within 300 feet of

a waterway or wetland; application beyond 500 feet is preferred. Examples of when the use of retardant is authorized are for the protection of:

- Human life
- Permanent year-round residences
- National Historic Landmarks
- Structures on or eligible for the National Register of Historic Places
- Government facilities
- High value resources on JBER managed land and those of adjacent land owners
- Threatened, endangered, and sensitive species habitats as identified by resource specialist

6.0 INSTALLATION FIRE HISTORY

Fire may have had a more important influence on ecosystem functions in the Anchorage area during pre-settlement times. Wildfires were prevalent in the 1800s and early 1900s, as indicated by early to mid-successional forest stages that have developed over the past 200 years, 48% of JBER-R has been affected by fire (Jorgenson *et al*. 2002).

Although wildfires are a concern at JBER, they rarely present a significant problem. The 2005 BLM Wildland Fire Management Plan estimated the natural fire regime occurs in the Alaska coastal forest every 200 to 600 years. The principal concern on JBER is human caused fires. Numerous fires have been recorded in the Matanuska-Susitna Valley to the north, but no major fires have occurred on JBER-R since 1950 (Jorgenson *et al*. 2002). Severe drought conditions occur about once every 20 years (U.S. Army, Alaska 1998), and in normal years there is an average of less than five wildfires. These fires are usually mission-related, small, and easily contained. A number of firebreaks are developed on JBER-R and the Integrated Training Area Management (ITAM) Geographic Information Systems (GIS) includes this information in a data layer.

Most military activity occurring on JBER-Elmendorf (JBER-E) happens in disturbed wildland areas that for the most part are not readily combustible. Most wildland fires occurring on JBER-R have been small and confined to areas behind the small arms complex. Nine wildfires, all human caused, have been recorded on JBER since 1956. The largest fire occurred in 2006, the Otter Lake Fire, which burned 81 acres.

7.0 WILDFIRE PROGRAM

7.1 Responsibilities

The 673d Civil Engineer Squadron Installation Management Flight, Natural Resources Section, is responsible for preparing and updating the WFMP, coordinating project funding where appropriate, and conducting land management responsibilities on all JBER lands, to include:

- Identifying and mitigating hazard fuel risk
- Creating fuels maps and incorporating the maps into the appropriate management plans
- Compliance with cultural resource issues
- Compliance with the INRMP
- Determining landscape fire management options according to the Alaska Interagency Wildland Fire Management Plan
- Attending spring fire preview and fall review meetings
- The natural resource manager in conjunction with wildland fire program manager (WFPM) will ensure all pre and post plan prescribed burn coordination occurs with all appropriate organizations. This responsibility will be accomplished thru the distribution of meeting minutes to all appropriate parties.
- Documenting fire history
- Ecosystem management considerations
- Burned area rehabilitation
- Pre- and post- wildland fire monitoring requirements

- Assisting in Fire planning

The JBER Fire and Emergency Services (FES) are responsible for developing fire indices on a daily basis during fire season. The fire department provides initial attack and limited suppression activities. Under a pending agreement with the ADoF, provides fire suppression on JBER. The 673d JBER FES is responsible for:

- Completing Wildland Fire Situation Analysis (WFSA) process during wildfires and holds a post fire meeting(s) to discuss lessons learned and develop best management practices to reduce future wildfire risk
- Attending spring fire preview and fall review meetings
- Risk assessments for military lands and structures on training lands, with support from Range Control and Natural Resources
- Acting as a Resource Advisor during wildland fires
- Identifying and mitigating hazard fuel risk, with support from Range Control and Natural Resources
- The WFPM, in conjunction with the natural resource manager will ensure all post wildfire coordination occurs with all appropriate organizations by distributing meeting minutes to all appropriate parties

Fire planning is a continual process. Most fire planning is based on five years of records including both weather and fire occurrence. ADoF manually enters fire weather observations into the National Weather Information Management System program. Combining this information with fire occurrence data can improve the efficiency with which JBER can staff its response resources. Based on fire occurrence data and response time, fire managers can determine if existing fire control forces are adequate and if additional suppression forces will be needed.

Fire Danger Rating System data can also be worked into the GIS database. By putting spatial data in an integrated system where it can be organized and analyzed, fire managers will be able to find patterns and relationships to increase efficiency in the decision-making process. Response times, suppression success, and risk factors can all be combined to determine what locations and times require more or fewer suppression resources. In addition, fire managers need to analyze such things as the adequacy of detection to determine if fires are reported while they are small enough to control.

Range Control, in coordination with the WFPM, can also determine if additional training restrictions need to be imposed as a result of unfavorable fire danger ratings or, conversely, if the Fire Danger Rating System restrictions are too tight. This kind of planning, based on experience with the fire danger, allows fire managers to fine tune the Fire Danger Rating System and associated restrictions over time.

7.2 Qualifications, Certification, Training, Fitness and Medical Surveillance Standards for Wildland Fire Personnel

Wildland Fire Personnel Certification Standards: All military, civilian, contractor and emergency services personnel involved in wildland fire management must possess certifications appropriate for their expected level of involvement in the wildland fire organization. All Air Force personnel must meet the applicable NFPA or NWCG Standards for wildland fire activities.

The Air Force Wildland Fire Center is responsible for issuing, maintaining and tracking the NWCG certifications and qualifications for AF personnel, to include contractors and volunteers where appropriate. AF personnel whose Job Series is in the 0400 Natural Resources Management and Biological Sciences or 0300 General Administrative, Clerical, and Office Service Occupational Groups, as well as contractors and volunteers that assist them, must meet the training and qualification standards specified in the NWCG *Wildland Fire Qualification Subsystem Guide* (PMS 310-1/NFES 1414). The installation WFPM will annually provide the AFWFC with updates of NWCG certifications, training and experience for applicable personnel.

Air Force Civil Engineer Center, Fire Emergency Services Division (AFCEC/CXF) is responsible for tracking National Fire Protection Association certifications in accordance with DoDI 6055.06-M, *DoD Fire & Emergency Services Certification System*. Personnel in the GS-0081 Job Series, 3E7X1 career paths, and contractors working with Fire and Emergency Services on AF-managed lands must meet the certification standards specified in NFPA 1051 – *Standard for Wildland Fire Fighter Professional Qualifications* and NFPA 1002 – *Standard for Fire Apparatus Driver/Operator Professional Qualifications*. National Fire Protection Association certifications documented in the Fire Emergency Services Certification System (FESCS) database may be used to grant commensurate National Wildfire Coordinating Group wildland fire certifications in accordance with the NFPA to NWCG crosswalk at http://www.usfa.fema.gov/downloads/pdf/wildland_training_crosswalk.pdf.

AF personnel who participate in wildland fire activities will be certified, as a minimum requirement, in Cardio-Pulmonary Resuscitation and Standard First Aid by the American Red Cross or comparable certification authority.

The position description of all Air Force employees will reflect the wildfire duties and required certifications necessary for the individuals expected to participate in wildland fire activities must reflect the expected. Position descriptions for civilian personnel with wildland fire management duties must state if the position qualifies as a primary or secondary wildland fire fighter, as described in Chapter 46 of the Office of Personnel Management *CRCS and FERS Handbook for Personnel and Payroll Offices*. Natural resources management personnel not classified as a primary or secondary wildland firefighter may perform collateral duty in wildland fire management activities as qualified and if authorized by the incident commander.

7.2.1 Wildland Fire Personnel Physical Fitness Standards

WFMP will establish the physical fitness standards required for personnel that participate in wildland fire management activities based upon their expected level of participation. NWCG publications PMS 310-1/National Fire Equipment System (NFES) 1414 – *Wildland Fire Qualification Subsystem Guide*, NFES 1596 – *Fitness and Work Capacity*, and NFES 2071 – *Fit to Work, Fatigue and the Firefighter* provide guidance for establishing physical fitness standards for various wildland fire management activities.

NWCG Publication PMS 307/NFES 1109 – *Work Capacity Test Administrator's Guide* shall be the AF standard for assessing fitness for personnel that participate in wildland fire activities. The Work Capacity Test will be utilized to assess three levels of fitness for personnel involved in wildland fire activities: (1) Arduous, (2) Moderate, and (3) Light.

Civilian personnel, contractors and volunteer's fitness tests are tied to specific qualification in PMS 310-1. Most qualifications directly related to firefighting are tested at the arduous level up to the strike team leader level. Personnel whose job description requires participation in wildland fire management activities as a primary or secondary firefighter on AF installations must meet the pre-employment medical and physical examination criteria contained in NFPA 1582 – *Standard on Comprehensive Occupational Medical Program for Fire Departments*.

7.3 Fire Response Planning

In fire-prone areas, climate, human activity and types of vegetation (or fuels) determine the level of wildland fire risk. Pre-suppression activities are those activities that reduce wildland fire risk. These pre-suppression actions are planning, prevention, fuels management, and prescribed burning. Pre-suppression planning stresses safety, effective fire response planning, and pre-suppression priority.

Pre-suppression priorities for JBER lands are established by this WFMP. Pre-suppression priorities have been determined for each ecological management subunit on JBER-Richardson.

The Alaska Wildland Fire Management Plan established four fire management options to be used by land owners to determine pre-suppression priorities: Critical, Full, Modified, and Limited. Land managers may select among these options for different parcels of land, based on evaluation of legal mandates, policies, regulations, resource management objectives and local conditions (Alaska Wildland Fire Coordinating Group 1998). JBER has three wildland fire management areas, critical, full and limited and a special subset of the limited land management area described as restricted or hot zone. These restricted or hot zones may contain unexploded ordnances. Presently these management areas are not digitally displayed in this management plan. JBER will strive to create a GIS map illustrating all wildland fire management area in 2014. The fire management options for each of the land management areas are described below:

Critical Management Option. These lands receive maximum detection coverage and are given highest priority for attack response, which is immediate and aggressive. Land owners/managers are notified of the situation as soon as possible. These areas receive priority over adjacent lands and resources in the event of escaped fires.

Full Management Option. These areas receive maximum detection coverage as well as immediate and aggressive initial attack response. If the fire escapes and requires additional suppression, affected land/lease owners and tenant organization e.g, lease holders, Anchorage School District will be notified if necessary to develop further fire suppression or implement evacuation strategies.

Limited Management Option. This option is used in areas where the resources at risk do not warrant the expense of suppression or in areas where natural fire is important to ecosystem sustainability. Fires within these areas receive routine detection effort. Attack response is based on the need to keep the fire within limited management option areas and the need to protect critical sites. Land owners/managers are immediately notified of the fire situation, and the status of unmanned fires is monitored.

In addition, another additional fire management option category has been developed, Restricted Areas or Hot Zones.

Restricted Areas or Hot Zones. These areas include impact areas and other locations where no "on the ground" firefighting can be accomplished due to danger of unexploded ordnance. High hazard impact areas are managed as hot zones with limited management. Fire in these areas is suppressed through back-burning and aerial-dropped retardants (Alaska Wildland Fire Coordinating Group 1998).

Boundaries between management options should be readily identifiable from both the air and on the ground throughout the fire season and also be feasible for potential placement of suppression control lines. Any management option may border against any other management option. Either the suppression organization or land managers may make recommendations for relocating or reinforcing fire management option boundaries through prescribed fire or mechanical methods. Only the land managers can approve boundary changes or boundary reinforcement activities for the lands they manage. Consensus between land managers adjacent to proposed fire management option boundary changes should be attempted to minimize establishing boundaries that reflect administrative unit boundaries or creates boundaries that are not operationally or ecologically feasible. Hazard reduction plans may be developed to reinforce fire management option boundaries. Any reinforcement activities will be reviewed by the suppression organization, but can only be authorized by the land managers.

The land managers determine the fire management option for the lands under their jurisdiction. An essential attribute of the fire planning effort in Alaska is providing the land managers with the flexibility to change the fire management option for lands they manage as warranted due to changes in land use, protection needs, laws, mandates or policies. The suppression organizations are encouraged to suggest option changes to land managers based upon suppression concerns.

To accommodate changes in the map atlas and distribution of maps, land managers are encouraged to make changes in their selected fire management option boundaries between September 30 and March 1. All changes should be recorded on the map atlas by April 1. Fire management options boundaries should not be changed during the fire season. However, if a change of the selected management option is requested and can be accommodated by all affected land managers and the suppression organization; it may be accepted and recorded on the map atlas outside the aforementioned time period.

7.4 Fire Prevention

7.4.1 Education

All commanders, directors, natural/cultural resource managers, and fire managers have a role in developing fire prevention orientation and training programs to educate the users of JBER lands. In coordination with resource protection managers, fire prevention orientation and training programs will be designed and implemented to explain wildfire ignition potentials, probability of escape, impact on natural resources, and the threat to high value areas within and outside the installation. JBER will actively implement an education and notification process relating to wildland fire for military personnel, the public and adjacent landowners. Range Control will be notified when fire danger is high. Wildland fire prevention and awareness will be taught to troops. Each year, during spring, a wildland fire article will be written by Natural Resources for the JBER newspaper addressing wildland fire prevention and awareness. During ongoing wildland fires, articles and news releases will be written and released to Range Control, the media, and the Public Affairs office in a timely manner. Public information notices will be issued at least two weeks in advance of all prescribed fires in newsprint and radio.

7.4.2 Enforcement

Enforcement is a very important component of an effective fire prevention program. Enforcers of wildfire prevention include resource management staff, fire management personnel, law enforcement personnel (military police and conservation enforcement officers), Range Control staff, and all commanders, their staff and leaders at all levels. The Range Control staff has

the responsibility for ensuring that all regulations and standard operating procedures are adhered to in accordance with U.S. Army Alaska Regulation (AAR) 350-2 or other standard set by JBER. Range Control has authority to stop live-fire training for noncompliance with any regulation or standard operating procedure. Range Division range inspectors; maintenance, integrated training area management personnel, Civil Engineer Environmental, Real Estate and Grounds staff have the responsibility to report fires or any observed noncompliance with fire prevention procedures to Range Control safety staff. All fires shall be reported to the fire department via 911. Commanders and managers must be aware and involved in fire prevention to ensure compliance with the WFMP requirements.

Existing military training regulations and standard operating procedures cover training activities and restrictions based on specific fire danger ratings. However, communication and enforcement of these restrictions even at the lowest levels is necessary to be effective. Supervising personnel will be held accountable for knowing and implementing these restrictions. Range Control managers and safety technicians who manage the training areas are also accountable. Public laws, Air Force regulations, the Commanding General's command policies/guidance, and range directives outline individual responsibilities and accountabilities for enforcement of fire restrictions and implementation of the WFMP. This information must be passed along by the commander and supervisor and discussed in training sessions given to individuals using JBER land. In order to effectively control ignitions to the maximum extent possible, the installation must ensure that the necessary precautions are followed and that there is strict enforcement and accountability for violations. Though the burden for enforcement will largely fall upon Range Control, it is ultimately the responsibility of all users of JBER lands to prevent fires and enforce fire prevention regulations. Wildland fire prevention is similar to personnel safety; everyone has a responsibility to prevent its occurrence. All personnel must know and understand the fire prevention procedures.

7.4.3 Engineering

Engineering involves the alteration of a range design/alignment or physically disrupting the fuels to reduce the likelihood of a fire starting or to reduce its effects, if one does start. This can be accomplished by eliminating fire causes biologically, mechanically, or chemically through reduction of available fuel loads, improving access for fire apparatus, increasing water resources available on site, adjusting target placement, and providing buffer or safety zones.

Engineering activities include the construction of fuel breaks and firebreaks and recognized fuel modification programs (i.e., prescribed burns, mechanical/chemical treatments, and mowing) to minimize the threat of fires. Engineering activities will be coordinated among all JBER's land and fire managers to include appropriate National Environmental Policy Act (NEPA) documentation, Endangered Species Act, Section 7 consultation and National Historic Preservation Act, Section 106 consultation, as required.

Coordination is essential as engineering activities may result in restricted operations and total or partial closure of the training ranges. A work plan, identifying engineering projects by priority, will be developed. This process will ensure that engineering projects can be completed and will eliminate any conflicts between the required maintenance of the ranges and military training activities. The Range Planner and the Wildland Fire Program Manager shall collaborate to develop an annual work plan facilitating maintenance of all required wildland fire infrastructure.

7.4.4 Fire Danger Rating System

Limiting military activities according to fire danger reduces the likelihood of starting a fire. Certain military activities are restricted when thresholds of risk are reached. The JBER Fire and Emergency Services Flight collects weather readings during fire season from remote weather stations located in the training areas. Weather readings, along with other fire danger parameters, are used to calculate the fire danger rating. The fire danger rating is used on JBER to reduce the risk of wildfire. The fire department provides the rating to Range Control, which restricts the use of munitions and pyrotechnics as the fire danger increases. Range Control is responsible for ensuring all necessary organizations are kept appraised of current fire conditions. At a minimum, the following organizations, Civil Engineering, Security Forces, Force Support Services, and Public Affairs, must be kept apprised of current fire conditions.

The Fire Danger Rating System is outlined in U.S. Army ARR 350-2. The system utilizes the Canadian Forest Fire Weather Index System and the Fire Weather Index. Fire Weather Index is calculated and translated into Low, Moderate, High or Extreme by the fire department. Each level on the scale corresponds to training restrictions. Range Control is responsible for conveying and implementing the Fire Danger Rating System to soldiers. Fire Weather Index calculations are based on weather

observations from Remote Automated Weather Stations established in all of the major training areas. The Fire Weather Index is calculated from May through September. Interpretation of the indices is necessary as no single index gives a complete picture of the fire danger. The Canadian Forest Fire Weather Index System consists of six components that account for the effects of fuel moisture and wind on fire behavior. The first three components, the fuel moisture codes, are numeric ratings of the moisture content of litter and other fine fuels, the average moisture content of loosely compacted organic layers of moderate depth, and the average moisture content of deep, compact organic layers. The remaining three components are fire behavior indices, which represent the rate of fire spread, the fuel available for combustion, and the frontal fire intensity; their values rise as the fire danger increases.

Calculation of the components is based on consecutive daily observations of temperature, relative humidity, wind speed, and 24-hour rainfall. The six standard components provide numeric ratings of relative potential for wildland fire. The Fine Fuel Moisture Code is a numeric rating of the moisture content of litter and other cured fine fuels. This code is an indicator of the relative ease of ignition and the flammability of fine fuel. The Duff Moisture Code is a numeric rating of the average moisture content of loosely compacted organic layers of moderate depth. This code gives an indication of fuel consumption in moderate duff layers and medium-size woody material. The Drought Code is a numeric rating of the average moisture content of deep, compact organic layers. This code is a useful indicator of seasonal drought effects on forest fuels and the amount of smoldering in deep duff layers and large logs. The Initial Spread Index is a numeric rating of the expected rate of fire spread. It combines the effects of wind and the Fine Fuel Moisture Code on rate of spread without the influence of variable quantities of fuel. The Buildup Index is a numeric rating of the total amount of fuel available for combustion. It combines the Duff Moisture Code and the Drought Code. The Fire Weather Index is a numeric rating of fire intensity. It combines the Initial Spread Index and the Buildup Index. It is suitable as a general index of fire danger throughout the forested areas of Canada and Alaska. Table 1 below is used to guide the fire manager to make accurate determinations.

Table 1 Fire Danger Rating Parameters for Military Ranges

	LOW	MODERATE	HIGH	EXTREME
Fine Fuel Moisture Code	<77	77-86	86-94	>94
Duff Moisture Code	<70	70-80	80-90	>90
Drought Code	<150	150-300	300-400	>400
Initial Spread Index	<2	2-5	5-10	>10
Buildup Index	<60	60-70	70-80	>80
Fire Weather Index	<3	3-12	12-22	>22

NOTE: These are only guidelines and an informed determination will take interpretation. Example: Drought Code may be extreme while Fine Fuel Moisture Content is low and Duff Moisture Code is moderate. It would be logical to place the fire danger at moderate, if the weather trend is toward warm and dry, because Fine Fuel Moisture Content will change quickly to moderate and perhaps even high.

Seasonal fire hazards caused by dry weather may restrict use of tracer and other potentially incendiary ammunition. Units using ranges, training facilities, and training areas are responsible for knowing the daily fire danger rating and adhering to the restrictions in U.S. ARR 350-2. This information is available from the Range Control office. Regardless of the season, trainers must ensure that flame-producing pyrotechnics are not used on or near fuels that may start a forest or range fire. Throwing away cigarettes, matches, or other burning materials is prohibited.

Table 2 Fire Danger Rating Restrictions

Fire Danger Rating	Restriction
Low	No restrictions.
Moderate	Ball and blank ammunition may be used without restrictions. Pyrotechnics, including smoke, trip flares, and tracers are prohibited in training areas, unless the pyrotechnics are used in a container that completely contains all burning elements of the device. An example of this would be using a cut-off drum to contain a smoke grenade. Any device used will be observed until the pyrotechnic is completely burned to ensure no fire is ignited outside of the container. Aircraft restrictions: Flares or foreign equivalent will be deployed above 1,500 feet above ground level.
High	Ball and blank ammunition may be used without restriction. Non-aerial pyrotechnics permitted on the small arms complex only. All other use of pyrotechnics is restricted. Ground units will carry required firefighting equipment. Aircraft restrictions: Flares or foreign equivalent will be deployed above 5,000 feet above ground level.
Extreme	Ball and blank ammunition use is restricted to the small arms complex. Use of any pyrotechnics is prohibited. Ground units will carry required firefighting equipment. Aircraft restrictions: Flares or foreign equivalent will be deployed above 5,000 feet above ground level.

Waivers to this portion of U.S. ARR 350-2 represent a direct liability to the Command in terms of the cost for fighting any fire that results from a waived condition.

7.4.5 Ignition Control

Ignition control is accomplished primarily through the enforcement of the fire danger rating system by controlling the use of classes of ammunition and pyrotechnics that have higher fire hazards associated with their use. The fire danger rating is provided to Range Control, which restricts the use of munitions and pyrotechnics as fire danger increase. Open burning requires a permit, except for small warming fires. All open burning shall be conducted in accordance with 673d Air Base Wing Instruction (ABWI) 32-2001. All fires may be prohibited during extreme fire danger conditions. These restrictions apply to both Army and Air Force units.

7.4.6 Fuel Hazard Assessments

All vegetation should be actively managed to reduce fire risk within 30 feet of a structure. Trees should be pruned and spaced at least 10 feet apart out to 100 feet from a structure. Standard assessment forms are used to survey structures. The forms were developed by the BLM/AFS and look at vegetation, building material, location and hazardous material storage. Assessments are updated annually with new structures. Structures are visited on a five-year rotation system. Assessment data is stored in a database that is linked to a GIS, with aerial and ground photos of the structures.

Fuel assessments at a landscape scale look at vegetation flammability, weather, historical fire patterns, fire behavior, and proximity to values at risk. Areas with continuous black spruce leading to high value locations receive the highest concern. Wildfire vegetation fuels maps are updated annually along with forest stand maps. The fuels maps reside in a GIS and are updated using wildfire and prescribed fire history data, construction and land clearing overlays, aerial photos, and ground truth plot information. Fuels maps are used for wildfire and prescribe fire planning, military training range location, and hazard fuel assessments. Fuels maps follow the Canadian Fire Behavior Prediction System fuel types (Forestry Canada Fire Danger Group

1992). In fire-prone areas, climate, human activity, and types of vegetation (or fuels) determine the level of wildland fire risk. Common fuels found on JBER include the following (Musitano and Hayes 2002):

Black spruce – These stands are highly flammable and are generally located in wetter and cooler sites. Crown fires are common and typically result in extensive mortality.

White spruce – White spruce is less flammable and located in generally warmer and drier sites. Crown fires may occur during drought conditions.

Mixed spruce/hardwood stands – In these stands the conifers are generally white spruce with black spruce sometimes present. Black spruce is highly flammable and conducive to crown fire. White spruce is less flammable and less conducive to crown fire. The associated hardwoods are generally less flammable and may include birch, aspen, and/or cottonwood. Surface fuels include mosses, lichens, leaf litter, grasses, and shrubs. Fires in these mixed stands are generally of moderate intensity.

Bluejoint Reedgrass *(Calamagrostis canadensis)* – This species occurs in patches on all JBER lands. It may occur in association with hardwoods, mixed forest stands, or may predominate in clearings. Fires with this grass start easily, spread quickly, and burn intensely when conditions are right.

Tundra – In these areas, very flammable grasses dominate. Dwarf birch and willow may be present and are generally highly flammable, especially if they have high lichen content. In alpine tundra, short shrubs, mosses, and lichens dominate. Vegetation in these areas is moderate to highly flammable.

7.4.7 Fuels Modification

Fuels modification is defined as removing and/or modifying an area or wide strip of flammable vegetation. Fuel modification can provide a reduction in radiant and convective heat, thereby providing fire suppression forces a safer area in which to fight the fire.

Fire hazard is managed by changing the vegetation type. The goal is to maintain a fuel condition that makes fires easier to control. Maintenance treatments are necessary because the flammable biomass will grow back over time, thus making fires more difficult to suppress.

The following methods, in order of decreasing effectiveness, are used to achieve lower fuel loading or a more manageable fuel matrix. A mixture of these techniques is often used in fuel management. The first method is reduction of the total amount of fuels so that there is not enough or as much to burn. Examples of reducing total fuels are prescribed burning and mechanical or chemical removal. The second method to achieve lower fuel loading is manipulating the spacing of vegetation (both horizontally and vertically) so that it is difficult for fire to spread. Examples of spacing include mowing, grazing, or masticating. The third method is to decrease the flammability of fuels by increasing the moisture of the vegetation or by changing the vegetation to less flammable species. This can be accomplished by watering, but this technique is only applicable for very small plots of land, such as around an individual house. More often this is accomplished by partially or totally replacing the fuels with fire resistant plants.

There are four categories of fuel modification treatments that can accomplish these objectives, including prescribed burning, mechanical treatments, chemical treatments and biological treatments. The methods used in fuel modification, fuel breaks, and firebreaks will vary due to terrain and acreage, and the shapes of areas to be treated. In many situations, a combination of these treatments is applied.

Prescribed burning reduces the volume of fuel through combustion. Fuel material can be ignited by hand or by mechanical devices at some distance from the site (i.e., helitorch, aerial firing device, etc.). Burning generally takes place when conditions permit adequate combustion as well as control. Prescribed burning is executed by qualified individuals under precise weather conditions and after extensive precautions is taken, such as installing firebreaks or control lines. Prescribed burning is the fastest, most complete, and most cost-effective fuel removal treatment available. However, it generates many concerns over the chance of escape, as well as air quality impacts. Coordination and notification of interested parties are major tasks. The Army and Air Force have successfully conducted numerous prescribed burns on DoD lands in the past.

Mechanical treatments rip up, bury, flail, or cut down vegetation and rearrange the fuel structure. Mechanical treatments generally involve the use of a bulldozer or tractor with a variety of attachments, such as a blade, large chain, rollers, a cutting (or pushing) blade, or a disk. These attachments scrape or break off the vegetation, beat up and crush or cut the fuel into small pieces, or bury the pieces. It reduces the fuel height and thus reduces the intensity of a grass fire. Mowing is especially effective in increasing the ease of fire control if it takes place just inside the firebreak. Mowing is done by a tractor (usually with a rotary or flail mower attachment) in areas of grass and typically carried out by contract or range maintenance personnel. Hand labor is a subset of mechanical treatment, where human labor is used instead of mechanized equipment. Its primary disadvantage is its labor cost, but in certain situations there is no other viable alternative.

Chemicals such as herbicides and growth retardants can prevent seeds from germinating and kill mature fuels. Chemicals can be applied by hand, with a truck/tractor sprayer, or aerially. Vegetation is not removed, but further growth is suppressed or stopped. Where plants are killed, the standing vegetation presents a temporarily increased fire hazard until the plant material decays. Thus, the fuel volume is not decreased immediately by this treatment, but will slowly be reduced by decomposition. It is essential that treatment frequency be high enough to prevent significant growth in the interim periods. Chemical treatments that reduce or prevent growth are most desirable. The choice of herbicides depends on the environmental setting, effectiveness on the vegetation in question, and the consequences for native species and human health and safety. While it can be an effective and efficient method, chemical control may not be appropriate in all settings.

Biological treatments are the introduction of a biological control measure to counteract the undesired fuels. These measures can include the deliberate introduction of other plants or insects that will replace, modify or retard the undesired fuels. Simple biological treatments may be the introduction of fire resistant native or invasive plants to out-compete undesired fuels. Creating a vegetative fuel break is a common means of a simple biological treatment, though it is not an effective means of fire control in all situations. Another example is the introduction of a species of plant(s) to shade out or out-compete undesired fuels in a controlled area.

7.4.8 Fuel/Fire Breaks and Natural Barrier Systems

JBER maintains a fuel break/firebreak system on locations with the highest wildfire risk to minimize the spread of fires. If a wildfire escapes the initial attack, fuel breaks and other fuel modification areas provide the most logical location for fire containment lines. Well-maintained fuel breaks and fuel modifications provide defensible space that aids in wildfire containment. Incorporating them into wildfire pre-suppression planning, initial attack responses, and resource deployment strategies can enhance the effectiveness of fire suppression. They also provide follow-up resources with a quick alternative attack strategy and a place to assemble that has been designated in advance and is well documented and mapped.

Fuel breaks are defined as strategically located blocks or strips within which vegetation has been manipulated to reduce fuel volume or flammability as an aid to fire control. Fuel breaks are most effective if they are linked to other natural or man-made fire containment barriers. Drivable fuel breaks, or fuel breaks that have periodic access, are an important part of a successful fuel break system. Additionally, a fuel break system encompassing a large area is much more effective than an isolated single fuel break or small segments of fuel breaks. Fuel break widths are determined by fuel type, terrain features, and expected fire weather conditions, especially wind direction and speed. Generally, the wider the fuel breaks, the higher the probability and safer is the task of containing the fire.

Fire fuel break establishment consists of the following procedures. Breaks can be created using hand thinning or tree removal techniques. Hand line/trenches may be dug to mineral soil using hand tools. Fuel breaks created with hand thinning are usually 15 - 120 feet wide. Breaks can be created using dozers with shear-blades and or straight blades. Vegetation is sheared or pushed over and windrowed or pushed into piles. The duff and or organic matter are rolled up into the windrows or piles to expose mineral soil. Piles and windrows are burned following stipulations outlined in a burn plan. The soil may then be disked, creating furrows to enhance hardwood and shrub re-vegetation. Fuel breaks created with dozers are usually 15 - 30 feet wide. Breaks can be created using hydro-axes with masticating and rotary blades. Vegetation is chopped up into pieces. Masticating heads incorporate vegetation with the duff and organic layers of the soil. The soil may then be disked, creating furrows to enhance hardwood and shrub re-vegetation. Fuel breaks created with hydro-axes are usually 15 - 30 feet wide.

Fuel breaks provide safe access for firefighting personnel and equipment. Firefighters can be rapidly positioned along these predetermined fire control lines. The low volume fuels within the fuel break, can be fired out (black lined) quickly to further widen an existing firebreak or quickly create a new one under conditions where backfiring operations would be impossible in the adjacent dense vegetation. In situations where the vegetation within the fuel break is not too dense, the fuel break can be used to anchor a backfire, thus allowing a wide black line to be established between the fire and the fuel break.

Fuel breaks normally will not stop the head of a fast spreading, high intensity wildfire that has the potential for long distance spotting. In this situation, the overall fuel break system aids firefighters in the containment of the flanks, rear of the wildfire, and/or reducing the size of the main fire front. If time permits, they may also provide a location from which to backfire, potentially slowing or stopping the advance of the main fire.

Fuel breaks will only remain effective if they are continually maintained. The condition of the fuel break and vehicle accessibility will be reviewed annually to determine necessary maintenance. Fuel breaks shall be cleared at the end of the growing season, before the grasses dry and add to the dead fuel load in the area.

Firebreaks are defined as cleared-to-mineral-soil fire control lines. Similar to fuel breaks, to be effective, firebreaks must be maintained each year prior to potential use in fire control. Firebreaks will be 15 to 30 feet in width or more, but will sometimes be constrained by terrain. An annual preventive maintenance schedule for all designated firebreaks will be developed. During construction and maintenance, all berms should be removed to the extent necessary to minimize erosion. Water bars are to be installed at all natural watercourses on firebreaks, except where permanent drainage structures are provided.

Natural fire barriers (i.e., rivers, streams, roads, etc.) can be used as a control line to stop the spread of fire. A natural barrier is defined as any area where a lack of flammable material obstructs the spread of wildfires. An indirect attack strategy may involve the withdrawal of fire suppression resources to roads, trails, and other natural fuel breaks. The fuel between these barriers and the fire can be burned out or backfired if necessary.

Fuel management corridors are much wider than fuel breaks but do not include any road infrastructure. These are designed around existing natural fire barriers that may become overgrown with vegetation in the future. The corridor is monitored for encroaching vegetation and management is initiated when it reaches a threshold level. Fuel management corridors are designed to slow or even stop a fire. At a minimum, they provide an area in which fire intensity is much lower than the surrounding vegetation, much the same as a fuel break.

Fire and fuel break effectiveness in the event of a wildfire depends on regular maintenance. Standards will be adhered to wherever terrain permits. In some locations slope, drainages, or other factors may make these standards unreasonable. In these situations, the standards will be met to the greatest extent feasible.

7.5 Preemptive Measures

7.5.1 Prescribed Fire

Prescribed burning is defined as the controlled application of fire under specified environmental conditions that allow the fire to be confined to a predetermined area while at the same time producing fire behavior required to attain resource management objectives. Because of the potential for unintended circumstances, extensive planning, coordination, and a risk management burn plan must be completed prior to ignition of any prescribed burn. Prescribed burns also mimic the important ecosystem functions of wildfire while reducing risk to human environments and other resources. JBER, through a memorandum of agreement (MOA) with the USFS, conducts prescribed burns to improve wildlife habitat, to decrease the potential for ignitions and fire escape from live firing, and to increase the size of military training areas.

JBER recognizes two types of prescribed fires: (1) those ignited by qualified personnel in accordance with an approved prescribed burn plan, and (2) wildfires managed under prescribed conditions as addressed in an approved WFMP.

The opportunity to conduct prescribed burns in Alaska is usually limited to May, between snowmelt and spring growth of plants. Often this period is very wet, which makes burning difficult. Fall is another time of the year when burns can be

accomplished, but the burning window in the fall is narrower due to weather and personnel constraints. Another limiting factor is that winds must be low to prevent smoke from entering urban areas. The approved burn plan is used to evaluate conditions and minimize the risks associated with prescribed burning.

Prescribed burning is an effective and efficient means to reduce or prevent the accumulation of hazardous fuels, where permitted, and will be used as a recognized land management practice for natural resources management and fire protection. The decision to use prescribed burning will be based on the safety hazard involved, the hazard that will develop if burning is not accomplished, the type of natural habitat involved, the impact on the areas total ecosystem, and applicable state and local regulations and coordination with installation fire departments.

In the process of developing practical fuel reduction programs, fire managers will consider the use of prescribed fire. When applied in a safe, carefully controlled situation, it is often the most cost-effective means of achieving management and natural resource objectives. Consideration will be given to prescribed fire to protect habitats, natural resources, and capital improvements as well as reduce hazardous fuels, construct and reinforce fuel breaks, and control alien plants. Well placed prescribed burning units can help prevent large wildfires or slow their advance.

Prescribed burning on JBER training lands will only be executed by qualified individuals. A National Wildland Coordinating Group certified prescribed "Burn Boss" must supervise all prescribed burns. The Burn Boss has the responsibility to make the on-site, tactical "go, no-go" decisions and ensures all prescription, staffing, equipment, and other prescribed burn requirements are met before and during the burn.

Individual prescribed burns are required to have plans and appropriate National Environmental Policy Act (NEPA) documentation prepared after coordination between the USFS and ADoF and the Natural Resources Branch. ADoF will prepare the burn plans for JBER as part of a MOA. Burn plans are used to evaluate and minimize risks associated with prescribed burning and include how the fire will be set. At a minimum, burn plans will include the following:

- Burn objectives.
- Acceptable weather and fuel moisture parameters.
- Required personnel and equipment resources.
- Burn area map.
- Smoke management plan.
- Safety considerations.
- Pre-burn authorization/notification checklist.
- Coordination to consider wildlife, endangered species, cultural resources, and noxious weed effects.
- Alternative plan to cover plan of action if wind direction changes during prescribed burn.
- Plan for analysis of burn success and identification of lessons learned.
- When planning for prescribed fires, and when suppressing wildfire, utilize natural and existing man-made features whenever possible.
- Firebreaks must be constructed, maintained, or rehabilitated to prevent erosion.

The prescribed burning window is very narrow, particularly during spring between loss of snow cover and green-up, usually occurring in May. Often this period is very wet, which makes burning difficult. Fall burns are another option but the weather window is very narrow and resource availability is limited. In addition, winds must be such that they do not blow smoke into urban areas, which further narrows the window. It is difficult to long-range plan prescribed burning due to weather, military training, and availability of resources. An air permit from the Alaska Department of Environmental Conservation is required for any burning as well as NEPA documentation.

7.5.2 Prescribed Burn Objectives

The primary objective is to use management-ignited or training-ignited prescribed fires in a safe, carefully controlled, and cost-effective manner as means of achieving fire management objectives. Management-ignited prescribed fires, often referred to as simply "prescribed fires," are defined as intentionally set fires used to achieve a resource management objective. Training-

ignited prescribed fires are defined as fires that are unintentionally started during normal military training, but are allowed to burn to achieve a predetermined resource management objective.

Prescribed fire may be used as a management tool to support mission needs and to attain the goals and objectives of the INRMP, and is designed to implement the land management policies. Prescribed fires are used for silvicultural treatment of sites, preparation for reforestation, hazard fuel reduction, habitat enhancement, and insect and disease control. Prescribed fires are also used as a tool to reduce fuel loading on ranges where the risk of wildfire limits military training opportunities. Wildland fire escapement from impact areas are reduced through prescribed fires and mechanical treatments along the boundaries of impact areas. Burning often opens areas to additional military training options, particularly maneuvers that are hampered by dense cover.

7.5.3 Procedures

Prescribed burning consists of the following procedures. A management-ignited prescribed fire burn plan must be completed for all prescribed burning projects in advance of ignition. A training-ignited prescribed fire burn plan must be in place prior to any declaration of any training-ignited fire as a training-ignited prescribed fire. In the prescribed fire/training-ignited prescribed fire burn plans, appropriate actions to take must be addressed if on-site conditions change and cause one or more prescription parameters to exceed acceptable limits. A prescribed fire that exceeds, or is anticipated to exceed, one or more prescription parameters or line holding capability must be declared a wildfire and cannot be re-delegated as a prescribed fire. At this point, appropriate suppression action must be taken.

Each prescribed fire must be conducted in compliance with the approved burn plan. Only trained and qualified personnel may be used to execute each prescribed burn plan. The number of resources required to safely achieve prescribed fire objectives must be based on the size and complexity of each project. Minimum manning will vary with the size and complexity of each prescribed burn. The WFPM, in coordination with AFWFC, must personally approve the prescribed fire/prescribed natural fire burn plan and any changes. Only in the absence of the WFPM may this responsibility be re-delegated

When planning for prescribed fires and when suppressing wildfire, utilize natural and existing man-made features whenever possible. Firebreaks must be constructed, maintained, or rehabilitated to prevent erosion. When the burn prescription window is open, crews assemble at the burn unit. The edge of the burn unit is lit using hand lighting or aerial lighting techniques. Roads, trails or changes in vegetation types surround burn units and these features are utilized as fire lines. Next the interior of the unit is lit using hand lighting or aerial lighting techniques. The interior is lit using a systematic grid pattern. The mop-up process starts after the entire unit is lit. Mop-up consists of extinguishing all hot spots within a specified distance from the burn perimeter. During mop-up, burning trees and shrubs are cut down and extinguished. Smoldering sites are dug up with hand tools and extinguished. Water is applied on an as-needed basis during mop-up, either by backpack pumps, draft pumps, fire engines, or helicopter buckets. The final process involves monitoring the burn unit until the fire is completely out; this process can take anywhere from several days to several months. The ADoF prepares the burn plan which is then approved by the AFWFC and JBER's WFPM. The ADoF working in conjunction with the JBER FES Flight and Range Control implement the prescribed fires IAW the approved burn plan.

7.5.4 Prescribed Fire Ignitions

Two types of ignition actions are recognized on JBER 1) igniting a prescribed fire and 2) conducting a training exercise where firefighters practice igniting a prescribed burn. Determination of prescribed fire complexity shall be based on an assessment of technical difficulty and potential consequences. Complexity shall be used to delegate approval authority, set standards for personnel staffing and skill requirements, and to determine the level of burn plan detail. Prescribed fire projects should be classified as Complex, Intermediate or Basic. Burn complexity will be determined by the WFPM in conjunction with ADoF and shall be made in the context of existing or potential social, political, economic, biological and/or legal consequences.

Complex prescribed fire is defined as those where prescribed burning occurs under particularly challenging conditions and/or constraints. This classification includes prescribed fires where the difficulty of achieving resource management objectives is high or where the consequences of project failure may be serious. All training-ignited prescribed fires shall be classified as complex fires. Intermediate classification includes prescribed fires where the difficulty of achieving resource management objectives is not particularly high or complicated and where the consequences of project failure are less serious and can be mitigated. Prescribed fires of basic complexity are defined as those where few constraints, other than the normal prescription

parameters, exist. This classification includes prescribed fires where achieving resource management objectives is routine and the probable consequences of project failure are low.

7.5.5 Prescribed Fire Burn Plan Requirements

A prescribed fire burn plan shall be completed for each management-ignited prescribed fire. Prescribed burn plans describe expected results and the conditions necessary to achieve them as part of a vegetation management program. It shall include all items outlined below. The detail needed should be commensurate with project complexity. If a given item is not applicable, it should be so indicated in the plan.

- A description of the burn unit's physical location, including a map.
- Identification of resource management objectives to be accomplished by the prescribed fire.
- Desired effects and tolerable deviations.
- Prescribed fire management of vegetation on JBER training lands requires an understanding of the type, age class, condition, availability, and arrangement of the fuel that can impact the natural resources, structures, and soils. All prescribed burns must have measurable objectives. Monitoring must occur before and after each prescribed fire to document and verify that the stated objectives have been met.
- Project area description that includes unit and fuel descriptors.
- A fire prescription containing those key parameters needed to achieve desired results (i.e., acceptable fire behavior, acceptable limits of environmental elements) and provisions to record on-site conditions.
- The range of acceptable results expected, expressed in quantifiable terms.
- Prescribed burn plans shall include the following smoke management components: actions to minimize prescribed fire emissions, evaluate smoke dispersion, public notification, air quality monitoring, and exposure reduction precautions. JBER fully supports the Clean Air Act (1967) and amendments to the Act (1972, 1977) to protect and enhance the quality of national air resources and to protect public health and welfare. JBER will comply with all applicable State of Alaska and local laws pertaining to prescribed burning and the acquisition of appropriate burning permit(s).
- Provisions for weather data collection, acceptable parameters, and forecasts.
- Provisions for public safety and protection of sensitive features.
- Provisions for inter/intra agency pre-burn coordination and, where applicable, public involvement and burn day notification to appropriate individuals, agencies, and the public.
- Prescribed burn plans will be coordinated with directorates to include: ADoF; JBER Fire and Emergency Services (FES) Flight; Staff Judge Advocate; JBER Natural Resources Office; Training, Mobilization, Installation Range Office, the AFWFC and any other delegates that may be identified through JBER. Technical experts from outside agencies (e.g., National Park Service) may review the JBER prescribed burn plans.
- Identification of the level of complexity of the fire and the appropriate organization needed. No less than the organization described in the approved plan shall be used to execute the burn. Minimum requirements for skill/knowledge element ratings of all elements of each position listed shall be stated. Describe the duties and responsibilities of positions within the organization.
- A communication plan.
- Provisions for line construction, pretreatment, and holding actions to keep the fire within prescription. Firing techniques, containment, patrols, and mop-up procedures are required. Holding actions must be defined in the prescribed burn plan. The burn plan will allow the Burn Boss to take limited holding actions on fires outside the planned perimeter. However, there must be defined limits in the amount and kind of holding that can be done before any fire is determined to have exceeded the approved plan and must be declared a wildfire. The limits of acceptable holding actions must be clearly stated in the prescribed burn plan. These limits must be defined as specific actions that can be taken, not general terms. If a prescribed burn accidentally crosses the prescribed perimeter, immediate action by the holding crews must be taken to control it.
- Identification of contingency actions to be taken if the fire exceeds prescription parameters and/or line holding capabilities and cannot be returned to prescription with project resources. If the fire exceeds the predetermined and pre-approved constraints on holding actions, the fire must be declared a wildfire and appropriate fire suppression action taken. If a single spot fire escapes, it may be designated as a separate fire. If additional suppression forces are needed, the spot fire is declared a wildfire. The prescribed burn may continue as long as adequate holding forces remain on the prescribed burn as specified in the prescribed burn plan, separate from the suppression action on the spot fire, and the

burn remains in prescription. In no case should the capability to hold the prescribed burn be jeopardized by moving essential holding forces to fight a spot fire.

- A risk assessment that portrays an estimation of the probabilities and consequences of success/failure to the approving official. A safety plan and a "go, no-go" checklist are required.
- Provisions for fire proximity to endangered species and plant boundaries; consideration of existing and predicted weather, fire behavior, and fuel conditions; and drought evaluation impact and/or effect.
- The source of funding and estimated costs.
- Provisions for a test fire and recording the results.

A site specific training-initiated prescribed fire burn plan is required for each training-ignited prescribed fire. This plan will be developed by the training organization and approved by the WFPM prior to igniting any training-initiated prescribed fire. The only location that training-initiated prescribed fire will be allowed within JBER is within the range impact areas. No other locations are suitable for use of this designation. Training-initiated prescribed fire will not be allowed during "Extreme" fire danger. Only the WFPM or the ADoF Fire Management Officer (FMO) may designate a fire as a training-initiated prescribed fire. Fires must be designated as a training-initiated prescribed fire within four hours of ignition. No more than one training-initiated prescribed fire will be allowed within each impact area at any given time. Once developed, the pre-existing plan will be approved by the WFPM. The programmatic elements of the training-initiated prescribed fire burn plan shall include the following:

- General description of the area, history (including fire history), and map.
- Objectives to be achieved by the training-initiated prescribed fire and identification of acceptable outcomes.
- Required skills, qualifications and organization necessary to implement and manage the training-ignited prescribed fire program.
- Funding requirements.
- Program "Inform and Involve" actions both internally and externally. Include program planning as well as execution.
- Potential impacts of plan implementation including environmental, on/off site, socio-economic, and political impacts.
- Evaluation criteria to enable the WFPM or the ADoF FMO to make "go, no-go" decision, The criteria should include a risk assessment that considers, at a minimum, fire growth predictions; threat to life and property; smoke management concerns; local/regional/nation fire situation, including availability of resources; potential impacts on endangered species and plants; fire proximity to endangered species and plant boundaries; assessment of the amount of training-initiated prescribed fire that is acceptable and manageable; consideration of existing and predicted weather, fire behavior, and fuel conditions; and drought evaluation impact and/or effect, provision for daily revalidation, and timely decision by the WFPM.
- Identification of fuel treatment measures needed to reduce hazard fuels in support of the Army's prescribed fire program, including identification of areas or developments that need protection from fire.
- Process for development of a training-initiated prescribed fire plan.
- Process for monitoring and evaluating the training-initiated prescribed fire.
- Escaped Fire Situation Analysis and contingency plan.
- Identification of maximum allowable perimeter within range impact area.
- Monitoring actions to assure accurate and timely information on fire behavior, location, etc.
- Evaluation Plan for assessing outcome of the fire.

Some information will not be known until a training-initiated prescribed fire actually starts. Individual training-initiated prescribed fire burn plans shall also include holding actions necessary to keep the fire within prescription, fire projections using both "expected" and "most severe"" weather scenarios, an estimate of resource needs to manage the fire and cost estimates to manage the fire.

7.5.6 Prescribed Fire Organization

A NWCG qualified "Burn Boss," is a person experienced with local weather, fire behavior, fuels, and terrain conditions, shall personally supervise all burning operations. More complex burns may require an "Ignitions Boss" and a "Holding Boss." Every management-ignited prescribed fire requires the performance of the duties shown in these standard operating procedures. On

smaller or less complex projects, one person may perform more than one of the required duties. Larger or more complex projects will require more qualified people to perform necessary duties. An on-scene Burn Boss will determine, through the development of the training-initiated prescribed fire burn plan, the organization, expertise, and positions necessary to manage the prescribed burn training fire. The organization required varies with the size and complexity of each prescribed fire. In the event of an escape, use personnel qualified under National Interagency Fire Qualification Handbook standards (NWCG Guide 310-1) to accomplish the required suppression activity. The temporary use of personnel who do not meet these qualifications is not appropriate for prescribed fires that escape and are declared wildfires. At no time should there be any unqualified personnel on the fire line for a wildfire or prescribed fire.

The WFPM or the ADoF FMO will develop the prescribed fire burn plan for each management-ignited or training-initiated prescribed fire. The WFPM or the ADoF FMO will determine the complexity or number of prescribed fires necessary to meet training requirements. The Burn Boss is responsible directly to both the WFPM and ADoF FMO for implementation and coordination of the assigned prescribed fire activities. The WFPM and ADoF FMO shall coordinate and schedule the ignition and management of two or more management-ignited prescribed fires, or the management of a single training-initiated prescribed fire.

- Develop and implement the training-initiated prescribed fire burn plan on appropriate training-ignited fires.
- Coordinate personnel and equipment requirements, including resources called for holding actions and contingency action section of the burn plan.
- Ensure appropriate public notice is given prior to and during the prescribed fire activity.
- Coordinate prescribed burn projects to avoid exceeding holding and contingency capabilities.
- Monitor prescribed burn projects to ensure that all plan requirements are being met.
- Record and report costs and accomplishments and recommend improvements to the Wildland Fire Program Manager.

The Burn Boss has direct responsibility for on-site implementation of specific actions in strict compliance with the approved prescribed burn plan. The Burn Boss is accountable to the WFPM. The Burn Boss has the following responsibilities that cannot be re-delegated:

- Ensuring safety of personnel.
- Supervising all operations on the project site.
- Ensure that all prescribed fire burn plan requirements are met and that personnel are briefed before proceeding with ignition.
- Making the decision to proceed, accelerate, defer, or curtail operations based on attainment of the approved prescription criteria or lack thereof, including daily validation of prescribed criteria on multi-day projects.
- Ensuring that the fire prescription is met before proceeding with ignition.
- Ensuring that the forecast on site weather parameters are within prescription at the time of ignition and predicted to remain so during the expected life of the burn.
- Ensuring the availability of suppression resources in the event the prescribed fire escapes and is declared a wildfire.
- Controlling directly, or through supervision of Ignitions Bosses, the method, rate, and location of firing.
- Maintaining immediate and clear communications with the Ignitions Boss and Holding Boss at all times.
- Monitoring fire behavior and terminate operations if fire behavior or effects are not according to prescription.
- Accomplishing mop-up to predetermined standards in accordance with the prescribed fire burn plan.
- Certifying that the fire is out.

The Ignitions Boss reports to the Burn Boss. The Ignitions Boss will maintain control of the ignition sources, including aerial ignition, on the burn project at all times, ensure deployment, sequence, and timing of all ignition sources to meet project objectives, supervise assigned personnel and ensure their safety, maintain immediate and clear communications with the Burn Boss and Holding Boss at all times, and if aerial ignition is used, ensure that the aerial ignition pilot is briefed on the Job Safety and Health Hazard Analysis, with emphasis on aerial flight hazards.

The Holding Boss reports to the Burn Boss on management-ignited prescribed fires. On prescribed natural fires, the Holding Boss may report directly to the WFPM. The Holding Boss shall confine the prescribed fire within the planned area, take action

when fire exceeds, or has the potential to exceed, the planned area, confer with the Ignitions Boss, Burn Boss, WFPM, as appropriate, to match holding and contingency capability with firing sequence, supervise assigned personnel and ensure their safety and maintain immediate and clear communications with the Burn Boss, Ignitions Boss, or WFPM, as appropriate, at all times.

7.6 Fire Suppression Actions

The objective of fire suppression is to attack and suppress wildfires at minimum cost while protecting values at risk and minimizing the impacts from suppression activities. For purposes of this fire management plan, a wildfire is defined as a free burning fire requiring suppression action. Wildfire suppression is an emergency operation and takes precedence over all other operations, including training, with the exception of safeguarding human life. In some cases, a wildfire on JBER training lands can be controlled with a single attack response vehicle; in others, large numbers of firefighters, fire apparatuses, and equipment may be required. Because of this range of resource needs, fire suppression can be relatively simple and straightforward or extremely complex.

Suppression operations are undertaken on lands with fire management options of critical and full or as requested by the wildfire or land managers. Wildfire on lands with a fire management option of limited are regularly monitored. Suppression actions consist of using the following resources: fire engines, saws, hand tools, pumps, aircraft and backfiring.

7.6.1 Incident Coordination

Wildfire suppression follows the incident command system (Fireline Handbook, newest version). The Incident Commander is responsible for suppression and management of a wildfire. Wildfire suppression is conducted by the JBER FES Flight along with the Alaska Division of Forestry (ADoF) as part of an approved MOA. JBER FES will provide initial attack for wildfire on JBER and may request support of ADoF crews as required. The JBER Fire Chief, presently the WFPM, is responsible for all fires and must be informed of the status of new and ongoing wildfires. The Natural Resource office is the land manager (for the purpose of tracking and recording wildland fire events). The WFPM will inform Natural Resources of the status of new and ongoing wildfires, as conditions allow. ADoF maintains incident reports for fires on the lands used by JBER. Data from the reports shall be provided to Natural Resource office at the end of each calendar year in a digital format compatible with GIS protocols utilized on JBER. Natural Resources is responsible for ensuring the digital data layer is updated in the JBER GIS database annual and illustrated in the INRMP and presented at all annual pre-season meetings.

7.6.2 Fire Management Strategies

The Wildland Fire Situation Analysis (WFSA) is a systematic and documented decision process employed to determine the most appropriate suppression strategy for a particular situation. A WFSA is prepared when a fire: (1) escapes initial attack, (2) threatens to escape a fire management option into a higher management option, (3) warrants suppression actions but was not initially attacked due to resource shortages, (4) is beyond the capabilities of initial attack forces, or (5) fire and/or resource management objectives are not being met and a significant change in strategy/action is required (Alaska Interagency Wildland Fire Management Plan, newest version).

A WFSA is jointly prepared by the WFPM and suppression organization(s). The WFPM approves the WFSA and any revisions with concurrence of the land managers. It is incumbent upon both the land managers and the suppression organization that knowledgeable and qualified representatives are available to assist with preparing and reviewing the WFSA.

A WFSA identifies several alternative suppression strategies/actions within the constraints of the selected management option, which may range from commitment of resources until a fire is extinguished to routine surveillance. The alternatives are analyzed in terms of probability of success, environmental consequences, social and political considerations, and consequences of failure and cost. Selected suppression alternative must clearly identify the suppression objectives. Assigned Incident Commander and land managers must validate the WFSA to ensure the selected alternative is still achievable. When the selected alternative or fire/resource management objectives are not met, the WFSA must be re-written to determine new suppression strategy/action.

Escaped wildland fires may be placed under the management control of an appropriate level Incident Commander. Transfer of authority to the Incident Commander must be documented in a Limited Delegation of Authority. The need to place a natural

resource representative at the Incident Command Post or the suppression organization's headquarters will be at either the discretion of the affected agency or at the request of the suppression organization. An environmental and/or cultural resource management specialist may be assigned to the Incident Management Team to provide on-site assessment of potential resource impacts. Each agency will furnish expertise as needed (Alaska Interagency Wildland Fire Management Plan, newest version).

7.6.3 Special Considerations for Suppression

The Incident Commander needs to select suppression tactics commensurate with the fire's potential or existing behavior, yet leaving minimal environmental impact. Minimum impact suppression is an increased emphasis on suppressing a wildfire while minimizing the effects of suppression measures on the vegetation, soils, and watershed. Minimum impact suppression tactics will not over-ride considerations for safety or containment or control of the wildfire. However, they will be used to the maximum extent possible within these constraints.

Protection of the local environment will be considered in fire management strategies, particularly in the location of fuel breaks and control lines. Dozers are used as a means of last resort in fire suppression because of their potential impact on the environment. Dozer operators will be equipped and trained for wildland fire protection, trained in environmental sensitive issues relating to the use of dozers (i.e., long term effects of physical disturbance, potential introduction of invasive plants, erosion control, and location of endangered and threatened species populations), and given natural/cultural resource orientation prior to any work assignment.

Fire managers must be familiar with the long-term effects of physical ground/vegetation disturbance, potential of invasive vegetation introduction through the use of dirty equipment or the creation of invasion routes, creation of erosion problems, protection of cultural sites, and limitations on use of fire suppression chemicals (foam and retardant). The aerial use of chemical retardant, fire foam and saltwater will be weighed against the potential for fire damage to sensitive plants.

Use of aerial fire retardant near lakes, wetlands, streams, rivers, sources of human water consumption, and areas adjacent to water sources should be avoided to protect fish habitat and water quality. If feasible in these areas, the use of water rather than retardant is preferred. When the use of retardant is necessary, avoid aerial or ground application of retardant or foam within 300 feet of a waterway or wetland; application beyond 500 feet is preferred.

During fire suppression the Incident Commander will evaluate each and every suppression activity during planning and strategy sessions to see that they meet minimum impact suppression objectives, discuss minimum impact suppression tactics with overhead team during overhead briefings, ensure minimum impact suppression tactics are implemented during line construction as well as other environmentally destructive activities, and consult with environmental staff prior to implementing line construction in sensitive areas, providing time permits and proper personnel are available.

Whenever possible, a Red Card and/or Wildland Fire certified member of the environmental or cultural staff shall accompany hand crews constructing fire lines in previously undisturbed locations. Minimum impact suppression tactics shall be applied to ensure protection of high valued resources. Additional safety briefings are needed between heavy equipment operators and environmental/cultural staff if site reconnaissance is required.

7.7 Fire Detection and Reporting

All fires are reported to JBER FES via 911. Fires observed on the training ranges will be reported to Range Control on the Range Control frequency (FM 38.30). Range Control will in turn notify JBER FES. The JBER FES is responsible for notifying the ADoF of fire starts on JBER.

Monitoring is defined as the systematic process of collecting, recording and mapping of fuels, topography, weather, fire behavior, and fire effects data to provide a basis for evaluating and adjusting wildland fire management programs. Monitoring generally requires both on-the-ground and aerial observations. Although monitoring is usually associated with prescribed fire, land managers may elect to use agency personnel to collect fire effects monitoring data to assess the ecological impacts of the wildland fire.

The plan specifies that fires in limited management areas receive routine surveillance. Surveillance is defined as the systematic process of collecting, recording or mapping the fuels, topography, weather, fire behavior, and location of values to be protected to provide suppression agencies or land managers the information necessary to make the appropriate suppression action decisions on a wildland fire. Surveillance is generally conducted from aerial observations. The information also provides a chronological administrative history of the fire and suppression decisions.

7.7.1 Public Information

Wildfire progress monitoring is conducted by the BLM/AFS. Updates can be obtained on the web site http://fire.ak.blm.gov/. Updates for fires where suppression action is required can also be obtained by contacting the public information officer at AFS. The JBER Forester acts as a liaison with the wildfire incident command staff on an as-needed basis conveying land management concerns and providing institutional knowledge of the land. The JBER Forester also relays information from the wildfire command staff to the various installation directorates. This function is known as a resource advisor in the wildfire incident command system.

7.7.2 After-Action Review

At the end of each fire season, an interagency review of the fire plan implementation and fire suppression operations will be held with fire suppression personnel and land managers. Land managers and fire suppression personnel will be given the opportunity to identify plan implementation problems and operational concerns. People to be contacted for the end of season plan review include; JBER Natural Resources office; State of ADoF; JBER Fire Chief, and JBER-R Range Control. Examples of topics to be discussed include fire operation effects on cultural features, natural resources, smoke management, and the notification process during fires. In addition fuels management projects should be discussed and proposals made. Land manager comments on the fire management plan should be made at this time for the yearly update of the fire management plan.

Land managers should evaluate how the suppression organizations responded to the selected fire management options. Instances where actions other than the selected fire management option were initiated will be re-evaluated to determine if the selected fire management option is appropriate. If the land managers determine that an option change is necessary, they will request the change to the ADoF FMO, which will initiate the fire management option revision process.

7.7.3 Rehabilitation

Fire lines and camp areas 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. Fire lines will be monitored to ensure rehabilitation plans are followed and successful. Invasive species colonization and erosion control are some of the main items monitored after fires.

7.7.4 Fire Research and Monitoring

Wildfires are monitored for several years after a burn to determine vegetation response, identify erosion issues, and to determine if fire suppression actions have been adequately rehabilitated. Monitoring is conducted using a combination of aircraft flyovers, photo points, vegetation plots, and permanent fuel loading sample plots following procedures outlined by Brown (1976). Prescribe fires are monitored to determine if burn objectives are met, determine fuel loading, and identify rotational periods between burns. Prescribe fires are used as a tool to reduce fuel loading on ranges where the risk of wildfire limits military training opportunities. On representative wildfires and prescribed fires, plot-based vegetation sampling will be utilized to analyze vegetation change. Other monitoring projects could entail public response to fuel reduction projects adjacent to residential and urban interface areas.

7.7.5 Minimum Staffing Requirements

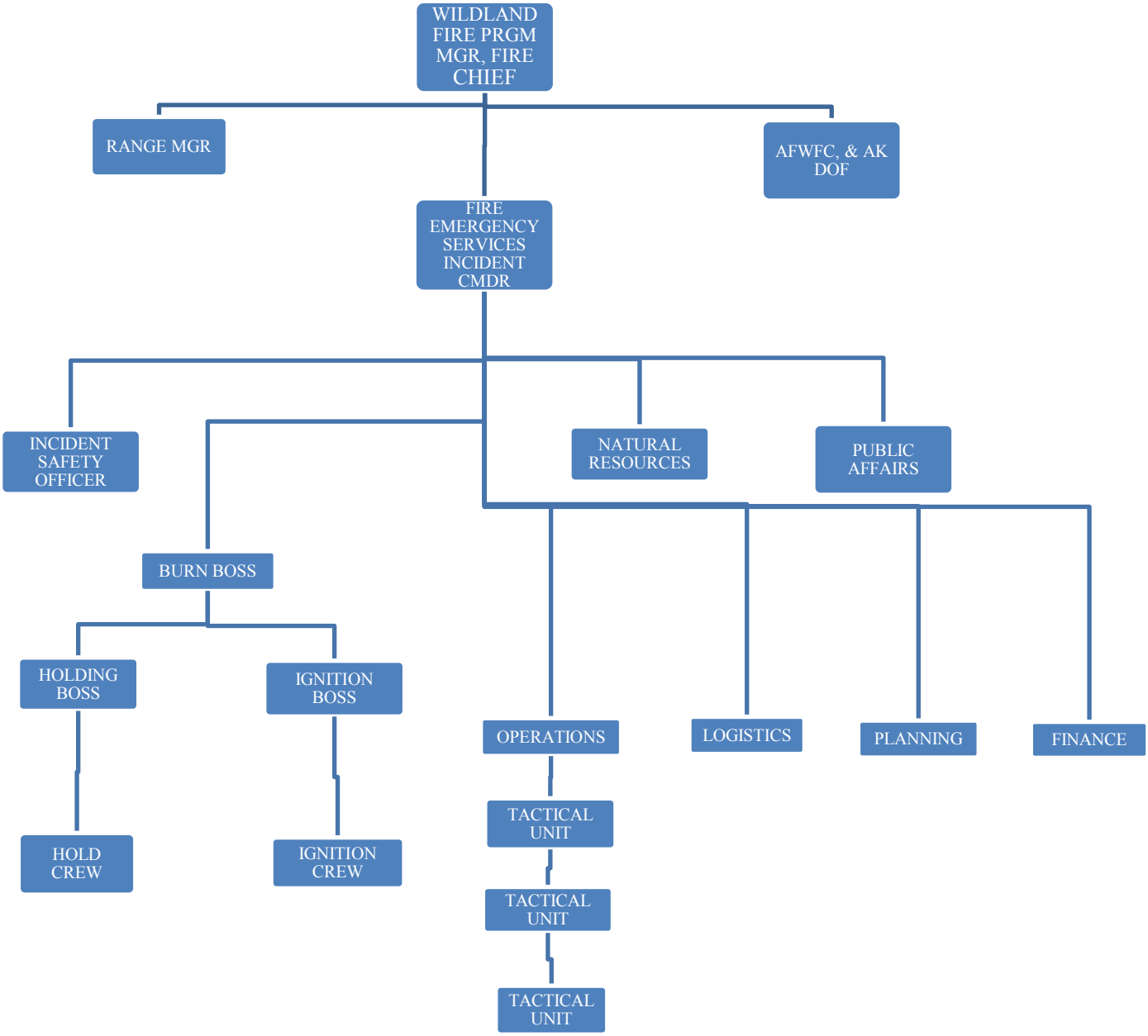
The JBER FES Flight and ADoF shall ensure that proper staffing requirements are in accordance with DoDI 6055.6, *Fire Protection Program*, and established manpower-staffing standards. Minimum staffing is based on the safety and complexity of the firefighting organization during initial attack and extended attack operations. Having a fully qualified and trained firefighting staff is an essential part of an effective suppression program.

JBER Directorate of Plans, Training Mobilization and Security will staff levels of qualified Range Control personnel required to oversee range operations and identify any fire starts on firing ranges and in training areas. JBER Natural Resources Element will staff sufficient numbers of professionally trained individuals to map fires, coordinate prescribed burns, map fuel loading, and update vegetation mapping.

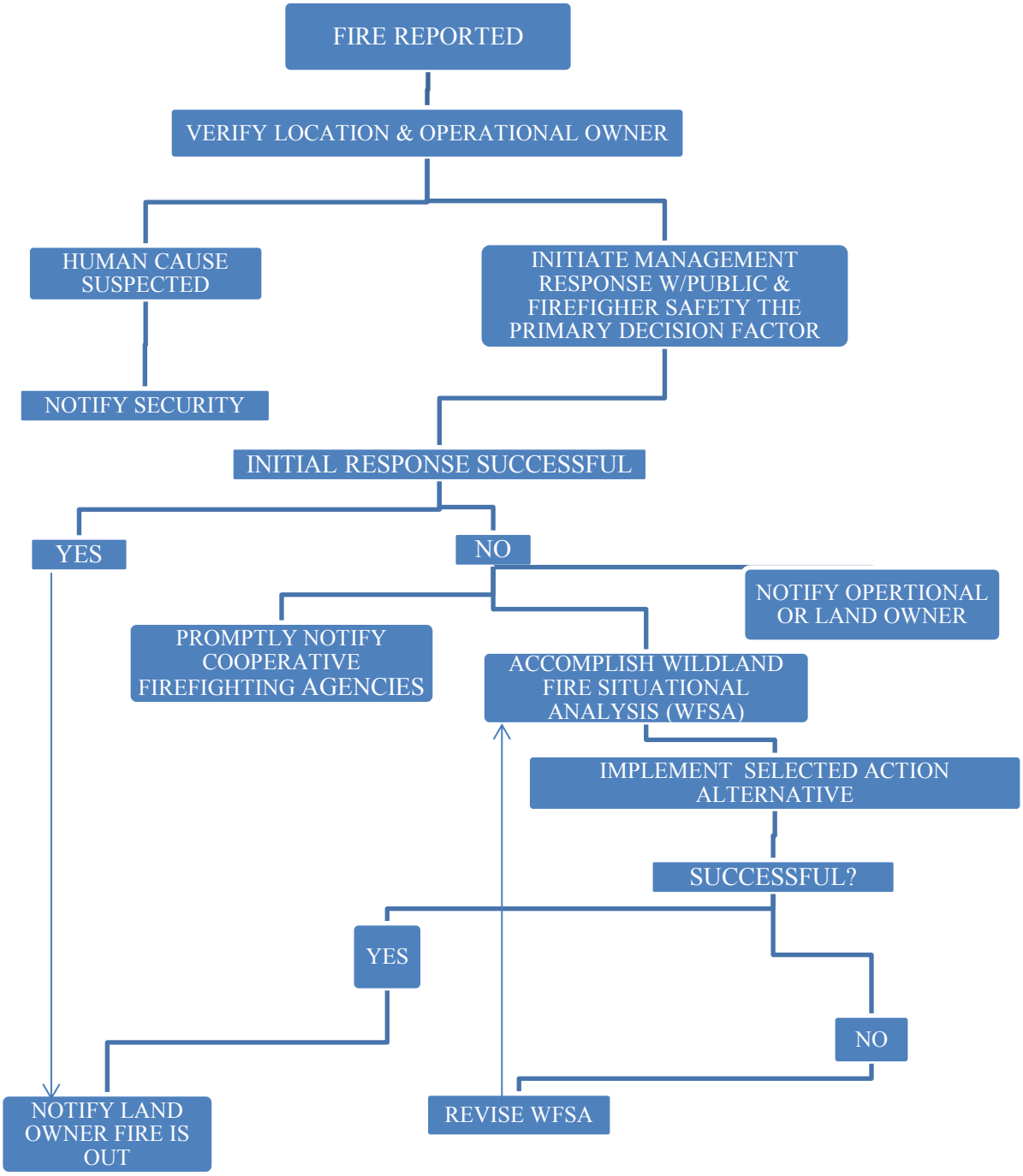
JBER FES staffs one Type III Wildland Engine, one Type VI Wildland Engine, and two Type I Tenders to provide initial attack capability on JBER. Additional structural firefighting apparatus/crews can be employed to augment capabilities in Urban Interface Areas.

8.0 FIGURES

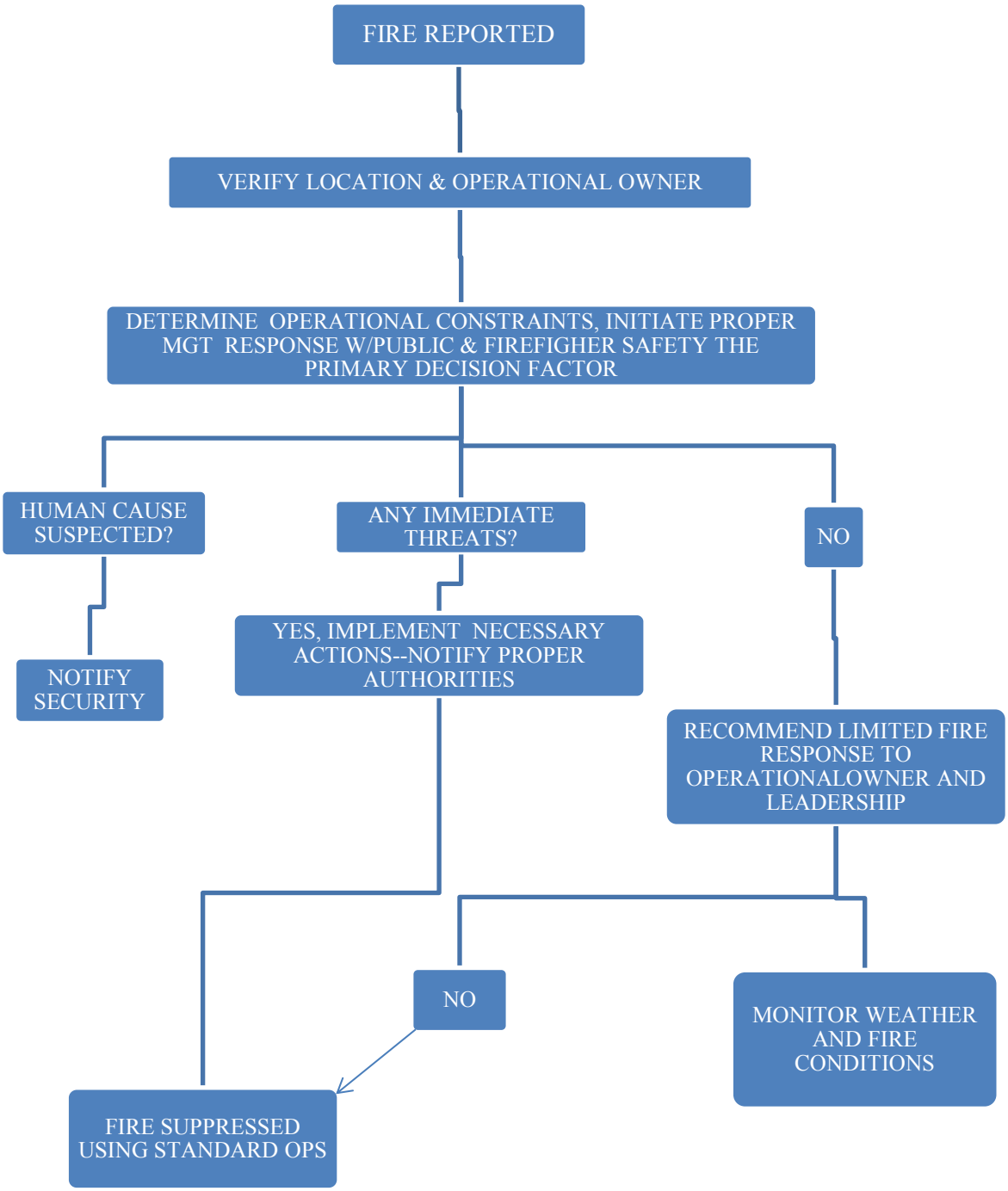
WILDLAND FIRE ORGANIZATIONAL CHART, Figure 1



OPERATIONAL DECISION CHART
CRITICAL OR FULL MANAGEMENT OPTIONS, Figure 2



OPERATIONAL DECISION CHART
LIMITED MANAGEMENT OPTIONS, Figure 3



9.0 REFERENCES

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2. United States Air Force Joint Base Elmendorf-Richardson Alaska, *Integrated Cultural Resources Management Plan*, 2012.

3. Department of Defense Directive 3025.17, *Military Assistance to Civil Authorities*. 1997.

4. Bureau of Land Management – Alaska, Wildland Fire Management Plan, Sep 2005.

5. 95th Air Base Wing Civil Engineer and Transportation Directorate Fire Protection Division and Environmental management Directorate Edwards Air Force Base, California. Wildland Fire Management Plan, August, 2008.

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7. Air Force Instruction (AFI)
   AFI 32-7064, *Integrated Natural Resources Management, 2004.*
   AFI-7065, Integrated Cultural Resources Management, 2004

8. *National Fire Protection Association (NFPA)*
   NFPA 1002*, Standard for Fire Apparatus Driver/Operator, Professional Qualifications. 2008*
   NFPA 1051, *Standard for Wildland Fire Management. 2007*
   NFPA 1143 *Standard for Wildland Fire Management*
   NFPA 1144 *Standard for Protection of Life and Property from Wildfire. 2002.*
   NFPA 1500 *Standard for Fire Department Occupational Medical Program for Fire Departments. 2003.*

9. National Wildfire Coordinating Group (NWGG), *Wildland Fire Qualification System Guide PMS 310-1. 2006*

10. *Alaska Interagency Wildland Fire Management Plan. 2010.*

11. The *Interagency Prescribed Fire Planning and Implementation Procedures Guide. 2008.*

12. *Interagency Burned Area Emergency Response Guidebook. Feb 2006*

13. *Interagency Burned Area Rehabilitation Guidebook. Oct 2006.*

14. *Federal Wildland Fire Management Policy*, (U.S. Departments of the Interior and Agriculture), 1995.

Flight Management Instruction 32-313. *Wildland Fire Management Program.* Sep 2013

15. *Review and Update of the 1995 Federal Wildland Fire Policy and Program.* (Interagency Federal Wildland Fire Policy and Program (U.S. Department of Agriculture, 1995)

16. Review and Update of the 1995 Federal Wildland Fire Management Policy. *National Wildfire Coordinating Group.* [Online], 2001.

17. Guidance for Implementation of Federal Wildland Fire Management Policy. *National Interagency Fire Center.* [Online], 2009.

18. *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS-484, 2013.

19 *National Wildfire Coordinating Group (NWGG Glossary of Wildland Fire Terminology*. PMS 205. 2001.

APPENDIX D

Material Safety and Data Sheet

MATERIAL SAFETY DATA SHEET

Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

Dow AgroSciences

GARLON* 3A HERBICIDE

Effective Date: 17-Nov-06
Product Code: 38321
MSDS: 004422

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Garlon* 3A Herbicide

COMPANY IDENTIFICATION:
Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW
Light purple-pink liquid, ammonia-like odor. May cause eye irritation with corneal injury. May cause skin irritation. Toxic to aquatic organisms.

EMERGENCY PHONE NUMBER: 800-992-5994

3. COMPOSITION/INFORMATION ON INGREDIENTS:

COMPONENT	CAS NUMBER	W/W%
Triclopyr TEA Salt	057213-69-1	44.4
Triethylamine	000121-44-8	3.0
Ethanol	000064-17-5	2.1
Balance		50.5

4. FIRST AID:

EYES: Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist.

SKIN: Wash skin with plenty of water.

INGESTION: Do not induce vomiting. Give one cup (8 ounces or 240 ml) of water or milk if available and transport to a medical facility. Do not give anything by mouth to an unconscious person.

INHALATION: No emergency medical treatment necessary.

NOTE TO PHYSICIAN: Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach & lower gastrointestinal tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest endotracheal/esophageal control if lavage is done. If burn is present, treat as any thermal burn, after decontamination. Exposure to amine vapors may cause minor transient edema of the corneal epithelium (glaucopsia) with blurred vision, blue haze & halos around bright objects. Effects disappear in a few hours and temporarily reduce ability to drive vehicles. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: 110°F (43°C)
METHOD USED: TCC
FLAMMABLE LIMITS
LFL: Not determined
UFL: Not determined

EXTINGUISHING MEDIA: Alcohol foam and CO_2.

FIRE & EXPLOSION HAZARDS: Toxic, irritating vapors may be formed or given off if product is involved in fire. Although product is water-based, it has a flash point due to the presence of small amounts of ethanol and triethylamine.

FIRE-FIGHTING EQUIPMENT: Use positive-pressure, self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: Contain small spills and absorb with an inert material such as clay or dry sand. Report large spills to Dow AgroSciences at 800-992-5994.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: HANDLING: Keep out of reach of children. Causes irreversible eye damage. Harmful if inhaled or absorbed through skin. Prolonged or frequently repeated skin contact may cause allergic skin reaction in some individuals. Avoid contact with eyes, skin, clothing, breathing vapor, or spray mist. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

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MATERIAL SAFETY DATA SHEET

Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

Dow AgroSciences

GARLON* 3A HERBICIDE

Effective Date: 17-Nov-06
Product Code: 38321
MSDS: 004422

STORAGE: Store above 28°F or agitate before use. Store in original container. See product label for handling/storage precautions relative to the end use of this product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINE(S):
Ethanol (ethyl alcohol): ACGIH TLV and OSHA PEL are 1000 ppm. ACGIH classification is A4.
Triclopyr TEA Salt: Dow AgroSciences Industrial Hygiene Guideline is 2 mg/M^3 as acid equivalent; Skin.
Triethylamine: ACGIH TLV is 1 ppm TWA, 3 ppm STEL, Skin. OSHA PEL is 10 ppm TWA, 15 ppm STEL.

A "skin" notation following the exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact. It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

EYE PROTECTION: Use chemical goggles. Eye wash fountain should be located in immediate work area. If exposure causes eye discomfort, use a full-face respirator.

SKIN PROTECTION: When prolonged or frequently repeated contact could occur, use chemically protective clothing resistant to this material. Selection of specific items such as face shield, gloves, boots, and apron or full-body suit will depend on operation.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use a NIOSH approved air-purifying respirator.

APPLICATORS AND ALL OTHER HANDLERS: Refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: Not determined
VAPOR PRESSURE: Not determined
VAPOR DENSITY: Not applicable
SOLUBILITY IN WATER: Miscible
SPECIFIC GRAVITY: 1.135 (68/68°F)
APPEARANCE: Light purple/pink liquid
ODOR: Ammonia-like odor

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Avoid sources of ignition if temperature is near or above flash point.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Any oxidizing agent. Consult manufacturer for specific cases.

HAZARDOUS DECOMPOSITION PRODUCTS: Nitrogen oxides and hydrogen chloride may be formed under fire conditions.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

EYE: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Vapor of amines may cause swelling of the cornea resulting in visual disturbances such as blurred or hazy vision. Bright lights may appear to be surrounded by halos. Effects may be delayed and typically disappear spontaneously.

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SKIN: Prolonged contact may cause skin irritation with local redness. Repeated contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage. Prolonged or frequently repeated skin contact may cause allergic skin reactions in some individuals. With the dilute mix, no allergic skin reaction is expected. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD_{50} for skin absorption in rabbits is >5,000 mg/kg.

INGESTION: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Swallowing may result in gastrointestinal irritation or ulceration. The oral LD_{50} for rats is 2,574 mg/kg (male) and 1,847 mg/kg (female).

INHALATION: Brief exposure (minutes) is not likely to cause adverse effects.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Effects have been reported on the following organs: liver and kidney.

CANCER INFORMATION: Triclopyr did not cause cancer in laboratory animal studies.

TERATOLOGY (BIRTH DEFECTS): Triclopyr did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother. Ethanol has been shown to cause birth defects and toxicity to the fetus in laboratory animal tests. It has also been shown to cause human fetotoxicity and/or birth defects when ingested during pregnancy.

REPRODUCTIVE EFFECTS: For triclopyr, in laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

MUTAGENICITY: For triclopyr and ethanol: in-vitro genetic toxicity studies were negative. For triclopyr: animal genetic toxicity studies were negative. For ethanol: animal genetic toxicity studies were negative in some cases and positive in other cases.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE:

MOVEMENT & PARTITIONING:
Based largely or completely on information for triclopyr. Bioconcentration potential is low (BCF <100 or Log Pow <3).

DEGRADATION & PERSISTENCE:
Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD >40%).
The 20-Day biochemical oxygen demand (BOD20) is 0.30 p/p.
Theoretical oxygen demand (ThOD) is calculated to be 0.75 p/p.

ECOTOXICOLOGY:
Material is slightly toxic to aquatic organisms on an acute basis (LC_{50} or EC_{50} is between 10 and 100 mg/L in most sensitive species).

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws and regulations.

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MATERIAL SAFETY DATA SHEET

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14. TRANSPORT INFORMATION:

U.S. DEPARTMENT OF TRANSPORTATION (DOT) INFORMATION:

For non-bulk shipments by land:
This material is not regulated for transport.

For bulk shipments by land:
COMBUSTIBLE LIQUID, N.O.S. (TRIETHYLAMINE, ETHANOL)/COMBUSTIBLE LIQUID/NA1993/PGIII

For shipments by air or vessel:
FLAMMABLE LIQUIDS, N.O.S. (TRIETHYLAMINE, ETHANOL)/3/UN1993/PGIII

15. REGULATORY INFORMATION:

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER	CONCENTRATION
Triethylamine	000121-44-8	3.0%

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard
A fire hazard

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
Ethanol	000064-17-5	NJ1 NJ3 PA1
Triethylamine	000121-44-8	NJ1 NJ3 PA1 PA3

NJ1=New Jersey Special Health Hazard Substance (present at > or = to 0.1%).
NJ3=New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%).
PA1=Pennsylvania Hazardous Substance (present at > or = to 1.0%).
PA3=Pennsylvania Environmental Hazardous Substance (present at > or = to 1.0%).

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

CATEGORY	RATING
Health	3
Flammability	2
Reactivity	0

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): This product contains the following substance(s) listed as "Hazardous Substances" under CERCLA which may require reporting of releases:

Chemical Name	CAS Number	RQ	% in Product
Triethylamine	000121-44-8	5000	3.0%

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RCRA Categorization Hazardous Code:
Triethylamine = U404

16. OTHER INFORMATION:

MSDS STATUS: Revised Section: 2, 3, 11, 12, 13, 15
Reference: DR-0121-6064
Replaces MSDS dated: 11/24/03
Document Code: D03-101-004
Replaces Document Code: D03-101-003

The Information Herein Is Given In Good Faith, But No Warranty, Express or Implied, Is Made. Consult Dow AgroSciences for Further Information.

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Weedone® LV6 EC Broadleaf Herbicide**
EPA Reg. No.: 71368-11
Synonyms: 2,4-D 2EHE; 2,4-D IOE; 2,4-Dichlorophenoxyacetic acid, Isooctyl (2-ethylhexyl ester); 2,4-D Ethylhexyl Ester
Product Type: Herbicide

Company Name: Nufarm Inc.
11901 S. Austin Avenue
Alsip, IL 60803

Telephone Numbers: **For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, Call CHEMTREC Day or Night: 1-800-424-9300**
For Medical Emergencies Only, Call 1-877-325-1840

Date of Issue: October 15, 2013 **Supersedes:** September 25, 2013
Sections Revised: 3

2. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance and Odor: Amber colored liquid with characteristic phenolic odor.
Warning Statements: Keep out of reach of children. CAUTION. Harmful if swallowed or absorbed through the skin. Causes moderate eye irritation. Avoid breathing vapors or spray mist. Do not get in eyes, on skin or on clothing.

Potential Health Effects:
Likely Routes of Exposure: Inhalation, eye and skin contact.
Eye Contact: Minimally irritating. Vapors and mist may cause irritation.
Skin Contact: Minimally irritating. Overexposure by skin absorption may cause symptoms similar to those for ingestion.
Ingestion: Harmful if swallowed. May cause nausea, vomiting, abdominal pain, decreased blood pressure, muscle weakness, muscle spasms.
Inhalation: Harmful if inhaled. May cause symptoms similar to those from ingestion.
Medical Conditions Aggravated by Exposure: Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

See Section 11: TOXICOLOGICAL INFORMATION for more information.

Potential Environmental Effects:
This pesticide is toxic to fish and aquatic invertebrates. Drift or runoff may be hazardous to aquatic organisms in water adjacent to treated areas.

See Section 12: ECOLOGICAL INFORMATION for more information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
2,4-Dichlorophenoxyacetic Acid, isooctyl ester	1928-43-4	87.3
Other Ingredients Including		12.7
Petroleum distillates	64742-47-8	

4. FIRST AID MEASURES

If in Eyes: Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
If Swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.
If on Skin or Clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.
If Inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.
Note to Physician: No specific antidote is available. All treatments should be based on observed signs and symptoms of distress in the patient. Overexposure to materials other than this product may have occurred. This product contains petroleum distillates. If large amounts, greater than 1 mg/kg body weight have been ingested, the stomach should be evacuated by gastric intubation with the aid of a cuffed endotracheal tube to prevent aspiration of petroleum distillates. After removal of stomach contents, wash stomach by instilling 30 to 50 grams of activated charcoal in 3 to 4 ounces of water through the stomach tube and again remove stomach contents. Avoid oily laxatives.

5. FIRE FIGHTING MEASURES

Flash Point: 218ºF (103ºC) Tag Closed Cup
Autoignition Temperature: Not determined **Flammability Limits:** Not determined

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.
Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.
Unusual Fire and Explosion Hazards: Containers will burst from internal pressure under extreme fire conditions. If water is used to fight fire or cool containers, dike to prevent runoff contamination of municipal sewers and waterways.
Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as hydrogen chloride and oxides of carbon and nitrogen.

National Fire Protection Association (NFPA) Hazard Rating:
Rating for this product: Health: 2 **Flammability:** 2 **Reactivity:** 0
Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.
Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.
Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.
Methods for Cleanup and Disposal: Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.
Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Handling:
Avoid breathing vapors or spray mist. Do not get in eyes, on skin or on clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/Personal Protective Equipment (PPE) immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. If pesticide gets on skin, wash immediately with soap and water. Remove PPE immediately after handling this product. Wash outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Storage:
Store in original container in a dry, secured storage area. Keep container tightly closed when not in use. Do not contaminate water, food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:
Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

Personal Protective Equipment:
Eye/Face Protection: To avoid contact with eyes, wear chemical goggles or shielded safety glasses. An emergency eyewash or water supply should be readily accessible to the work area.
Skin Protection: To avoid contact with skin, wear long pants, long-sleeved shirt, socks, shoes and waterproof gloves. When mixing, loading, cleaning up spills or equipment, or otherwise exposed to the concentrate, wear a chemical-resistant apron. An emergency shower or water supply should be readily accessible to the work area.
Respiratory Protection: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.
General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

	OSHA		ACGIH		
Component	TWA	STEL	TWA	STEL	Unit
2,4-D 2EHE	10*	NE	10*	NE	mg/m^3

*Based on adopted limit for 2,4-D NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Amber colored liquid with characteristic phenolic odor.

Boiling Point:	Not determined	**Solubility in Water:**	Emulsifiable
Density:	9.4 pounds/gallon	**Specific Gravity:**	1.124 @ 20°C
Evaporation Rate:	Not determined	**Vapor Density:**	Not determined
Freezing Point:	Not determined	**Vapor Pressure:**	Not determined
pH:	3.3 (1% solution)	**Viscosity:**	Not determined

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Chemical Stability: This material is stable under normal handling and storage conditions.
Conditions to Avoid: Excessive heat. Do not store near heat or flame.
Incompatible Materials: Strong oxidizing agents: bases and acids.
Hazardous Decomposition Products: Under fire conditions may produce gases such as hydrogen chloride and oxides of carbon and nitrogen.
Hazardous Reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:
Data from laboratory studies on this product are summarized below:
Oral: Rat LD_{50}: 1,380 mg/kg
Dermal: Rabbit LD_{50}: >2,020 mg/kg
Inhalation: Rat 4-hr LC_{50}: >5.12 mg/l
Eye Irritation: Rabbit: Minimally irritating
Skin Irritation: Rabbit: Slightly irritating
Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure.

Subchronic (Target Organ) Effects: Repeated overexposure to phenoxy herbicides may cause effects to liver, kidneys, blood chemistry, and gross motor function. Rare cases of peripheral nerve damage have been reported, but extensive animal studies have failed to substantiate these observations, even at high doses for prolonged periods.
Carcinogenicity / Chronic Health Effects: Prolonged overexposure can cause liver, kidney and muscle damage. The International Agency for Research on Cancer (IARC) lists exposure to chlorophenoxy herbicides as a class 2B carcinogen, the category for limited evidence for carcinogenicity in humans. However, more current 2,4-D lifetime feeding studies in rats and mice did not show carcinogenic potential. The U.S. EPA has given 2,4-D a Class D classification (not classifiable as to human carcinogenicity).
Reproductive Toxicity: No impairment of reproductive function attributable to 2,4-D has been noted in laboratory animal studies.
Developmental Toxicity: Studies in laboratory animals with 2,4-D have shown decreased fetal body weights and delayed development in the offspring at doses toxic to mother animals.
Genotoxicity: There have been some positive and some negative studies, but the weight of evidence is that 2,4-D is not mutagenic.

Assessment Carcinogenicity:
This product contains substances that are considered to be probable or suspected human carcinogens as follows:

	Regulatory Agency Listing As Carcinogen			
Component	ACGIH	IARC	NTP	OSHA
Chlorophenoxy Herbicides	No	2B	No	No

See Section 2: HAZARDS IDENTIFICATION for more information.

12. ECOLOGICAL INFORMATION

Ecotoxicity:
Data on 2,4-D 2EHE:

96-hour LC_{50} Bluegill:	>5 mg/l	Bobwhite Quail Oral LD_{50}:	>5,620 mg/kg
96-hour LC_{50} Rainbow Trout:	7.2 mg/l	Mallard Duck 8-day Dietary LC_{50}:	>5,620 ppm
48-hour EC_{50} Daphnia:	>5 mg/l		

Environmental Fate:
In laboratory and field studies, 2,4-D 2-ethylhexyl ester rapidly de-esterfied to parent acid in the environment. The typical half-life of the resultant 2,4-D acid ranged from a few days to a few weeks.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:
Pesticides wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law and may contaminate ground water. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Handling and Disposal:
Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this MSDS.

DOT
< 20 gallons per complete package
Non Regulated – See 49 CFR 173.132(b)(3) & 172.101 Appendix A

≥ 20 but < 119 gallons per complete package
UN 3082,Environmentally hazardous substance, liquid, n.o.s.
(2,4-D Ester), 9, III, RQ

≥ 119 gallons per complete package
UN 3082,Environmentally hazardous substance, liquid, n.o.s.
(2,4-D Ester), 9, III, RQ, Marine Pollutant

IMDG
UN 3082,Environmentally hazardous substance, liquid, n.o.s.
(2,4-D Ester), 9, III, Marine Pollutant

IATA
UN 3082,Environmentally hazardous substance, liquid, n.o.s.
(2,4-D Ester), 9, III, Marine Pollutant

15. REGULATORY INFORMATION

U.S. Federal Regulations:

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:
Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):
Immediate, Delayed

Section 313 Toxic Chemical(s):
2,4-D 2-ethylhexyl ester (CAS No. 1928-43-4)- 87.3% by weight in product

Reportable Quantity (RQ) under U.S. CERCLA:
Acetic Acid, (2,4-Dichlorophenoxy)- (CAS No. 94-75-7) 100 pounds

RCRA Waste Code:
Acetic Acid, (2,4-Dichlorophenoxy)- (CAS No. 94-75-7) U240

State Information:
Other state regulations may apply. Check individual state requirements.

California Proposition 65: Not listed.

16. OTHER INFORMATION

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes

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1. IDENTIFICATION

Product name:	**Quali-Pro® MSM Turf**
Chemical name of active ingredient(s):	Metsulfuron Methyl: methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl) amino]carbonyl]amino] sulfonyl] benzoate
Registrant/Manufacturer:	Makhteshim Agan of North America, Inc. 4515 Falls of Neuse Road, Suite 300 Raleigh, NC 27609 Phone: 919-256-9300
For fire, spill, and/or leak emergencies, contact Infotrac:	Phone: 1-800-535-5053
For medical emergencies and health and safety inquiries, contact Prosar:	Phone: 1-877-250-9291

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMMON NAME	CAS NO.	%	OSHA/ PEL	ACIGH/ TLV	OTHER	NTP/IARC/OSHA (Carcinogen)
Metsulfuron Methyl	74223-64-6	60	NE	NE	NA	None

NE = Not Established
NA = Not Applicable

3. HAZARDS IDENTIFICATION

PHYSICAL PROPERTIES

Appearance: Beige colored, small, longish granule
Odor: Non-characteristic, very mild odor

EMERGENCY OVERVIEW CAUTION. Hazards to Human and Domestic Animals. Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing.

PRIMARY ROUTES OF ENTRY: Skin and eyes.

SYMPTOMS OF EXPOSURE: May cause eye irritation with tearing, pain or blurred vision. Repeated dermal contact may cause skin irritation with itching, burning, redness, swelling, or rash.

HAZARDOUS DECOMPOSITION PRODUCTS: Will not occur.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: No specific conditions are known which may be aggravated by exposure to this product.

4. FIRST AID MEASURES

FIRST AID	
IF IN EYES:	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
IF ON SKIN OR CLOTHING:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
Have the product container or label with you when calling a poison control center or doctor or going for treatment. For medical emergencies involving this product, call Prosar at 1-877-250.9291.	

8-19-09

5. FIRE FIGHTING MEASURES

FLASH POINT: Not applicable.

FLAMMABLE LIMITS: LFL/UFL: Not applicable

EXTINGUISHING MEDIA: Water Spray, Foam, Dry Chemical, CO_2.

UNUSUAL FIRE, EXPOSURE AND REACTIVITY HAZARDS: Like most powders, under severe dusting conditions, this material may form explosive mixtures in air.

FIRE FIGHTING INSTRUCTIONS: Runoff from fire control may be a pollution hazard. Control runoff.

HAZARDOUS DECOMPOSITION PRODUCTS: Will not occur.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: Review FIRE FIGHTING MEASURES and HANDLING AND STORAGE sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

ACTION TO TAKE FOR SPILLS/LEAKS: Dike spill. Prevent material from entering sewers, waterways, or low areas. Shovel or sweep up.

7. HANDLING AND STORAGE

PRECAUTIONS TO TAKE IN HANDLING: Avoid breathing vapors or mist. Avoid breathing dust. Avoid contact with eyes, skin, or clothing. Wash thoroughly after handling. Wash clothing after use. Do not store or consume food, drink, or tobacco in areas where they may become contaminated with this material. Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

PRECAUTIONS TO TAKE IN STORAGE: Always use original container to store pesticides in a secured warehouse of strong building. Do not store near open containers of fertilizers, seeds, or other pesticides. Do not contaminate water, food or feed by storage or disposal.

STORAGE TEMPERATURE (MIN/MAX): Store below 140°C (284°F).

8.EXPOSURE CONTROLS/PERSONAL PROTECTION

THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION AND PACKAGING OF THE PRODUCT. FOR COMMERCIAL APPLICATION AND ON-FARM APPLICATIONS, CONSULT THE PRODUCT LABEL.

EYE PROTECTION: Protective eyewear or chemical safety glasses with side shields or chemical goggles.

SKIN PROTECTION: Long-sleeve shirt, long pants, shoes plus socks.

HAND PROTECTION: Chemical-resistant gloves.

RESPIRATOR REQUIREMENTS:

- **VENTILATION:** Whenever possible, adequate ventilation should be used to minimize the need for personal protective equipment.

ADDITIONAL PROTECTIVE MEASURES: Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

EXPOSURE GUIDELINES: Refer to Section 2.
ENGINEERING CONTROLS: Refer to product label.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Beige colored, small, longish granule
ODOR: Non-characteristic, very mild odor
DENSITY: 1.644 g/cm^3
pH: 4.02

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable at normal temperatures and storage conditions.
INCOMPATIBILITY WITH OTHER MATERIALS: None
DECOMPOSITION: Will not occur.
POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY/IRRITATION STUDIES

Acute Oral LD_{50} (Rat) : > 5,000 mg/kg
Acute Dermal LD_{50} (Rat): > 2,000 mg/kg
Acute Inhalation LC50 (Rat): > 5.3 mg/L (4 hr.)
Eye Irritation: Slightly irritating
Skin Irritation: Not irritating
Dermal Sensitization: Not a skin contact sensitizer.

Animal testing indicates that Metsulfuron Methyl does not have carcinogenic, developmental, reproductive or genetic effects.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL HAZARDS: Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not apply where runoff water may flow during periods of intense rainfall or to water-saturated soils, as off-target movement and injury may occur. Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Do not apply this product through any type of irrigation system.

AQUATIC TOXICITY:
METSULFURON METHYL

96 hour LC50 - Rainbow trout: > 150 mg/L
96 hour LC50 - Bluegill sunfish: > 150 mg/L
48 hour LC50 - *Daphnia magna*: > 150 mg/L

AVIAN TOXICITY:
METSULFURON METHYL

LD50 - Mallard Duck: > 2510 mg/kg.
LC50 - Bobwhite Quail: > 5620 mg/kg

13. DISPOSAL CONSIDERATIONS

PRODUCT DISPOSAL: Do not contaminate water supply, food, or feed by storage or disposal. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL: Dispose of product containers, waste containers, and residues according to label instructions and local, state, and federal health and environmental regulations.

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14. TRANSPORTATION INFORMATION

DOT CLASSIFICATION:
Not regulated

INTERNATIONAL TRANSPORTATION:
IMO (vessel): Not regulated

IATA (air): Not regulated

15. REGULATORY INFORMATION

SARA TITLE III CLASSIFICATION:
Section 302/304: Not applicable
Section 311/312: Acute Health Hazard
Section 313 chemical(s): Not applicable

CA PROPOSITION 65: Not applicable.

CERCLA REPORTABLE QUANTITY (RQ): Not Applicable

RCRA CLASSIFICATION: Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

TSCA: The ingredients of this product are listed on the TSCA inventory or are exempt.

16. OTHER INFORMATION

HAZARD RATINGS	NFPA	HMIS		
HEALTH:	1	1	0	MINIMAL
FLAMMABILITY:	1	1	1	SLIGHT
REACTIVITY:	0	0	2	MODERATE
			3	HIGH
			4	SEVERE

MSDS DATE: 8-19-09. Superseded version dated 8-2-07. Changes made to Sections 1, 4, 13 and 14.

The information contained herein is given in good faith and is believed to be correct, but no warrant, express or implied, is made. Consult Makhteshim Agan of North America, Inc. for further information.

APPENDIX E

Best Management Practices

APPENDIX B: BEST MANAGEMENT PRACTICES

Best Management Practice	Best Management Practice Description
Asphalt	Asphalt can be used as a structural material for erosion control much like reinforced concrete. It can be used at stream crossings or to reinforce specific erosion prone areas along roadways or within training areas.
Brush Barrier	Brush barriers are perimeter sediment control structures used to prevent soil in storm water runoff from leaving a construction site. Brush barriers are constructed of material such as small tree branches, root mats, stone, or other debris left over from site clearing and grubbing.
Check Dams	Check dams are small, temporary dams constructed across a swale or channel. Check dams can be constructed using gravel, rock, sandbags, logs, or straw bales and are used to slow the velocity of concentrated flow in a channel. By reducing the velocity of the water flowing through a swale or channel, check dams reduce the erosion in the swale or channel. As a secondary function, check dams can also be used to catch sediment from the channel itself or from the contributing drainage area as storm water runoff flows through the structure.
Chemical Stabilization	Chemical stabilizers, also known as soil binders or soil palliatives, provide temporary soil stabilization. Examples of chemical adhesives include anionic asphalt emulsion, latex emulsion, resin-water emulsions, and calcium chloride. Materials are sprayed onto the surface of exposed soils to hold the soil in place and protect against erosion from runoff and wind.
Cobble Drains	Cobble drains are typically installed underneath roads crossing sub-surface water flows to prevent fill material saturation and impairment. Cobble drains typically run to a downhill slope and are installed perpendicular to the road base. The outlet is left open.
Construction Entrances	The purpose of stabilizing entrances to a construction site is to minimize the amount of sediment leaving the area as mud attached to motorized vehicles. Installing a pad of gravel over filter cloth where construction traffic leaves a site can help stabilize a construction entrance. As a vehicle drives over the gravel pad, mud and sediment are removed from the vehicle's wheels and offsite transport of soil is reduced.
Construction Sequencing	Construction sequencing requires creating and following a work schedule that balances the timing of land disturbance activities and the installation of measures to control erosion and sedimentation, in order to reduce on-site erosion and off-site sedimentation.
(General) Construction Site Waste Management	Building materials and other construction site wastes must be properly managed and disposed of to reduce the risk of pollution from materials such as surplus or refuse building materials or hazardous wastes.
(Permanent) Diversions	Diversions can be constructed by creating channels across slopes with supporting earthen ridges on the bottom sides of the slopes. The ridges reduce slope length, collect storm water runoff, and deflect the runoff to acceptable outlets that convey it without erosion.
(Temporary) Diversion Dikes, Earth Dikes, & Interceptor Dikes	Earthen perimeter controls usually consist of a dike or a combination dike and channel constructed along the perimeter of a disturbed site. Simply defined, an earthen perimeter control is a ridge of compacted soil, often accompanied by a ditch or swale with a vegetated lining, located at the top or base of a sloping disturbed area.
Drainage Swales	A drainage swale is a channel with a lining of vegetation, riprap, asphalt, concrete, or other material and is used to intercept and divert flow to a suitable outlet. It is constructed by excavating a channel and applying the appropriate stabilization. They can be used to convey runoff from the bottom or top of a slope. For swales draining a disturbed area, the outlet can be to a sediment trapping device prior to its release.

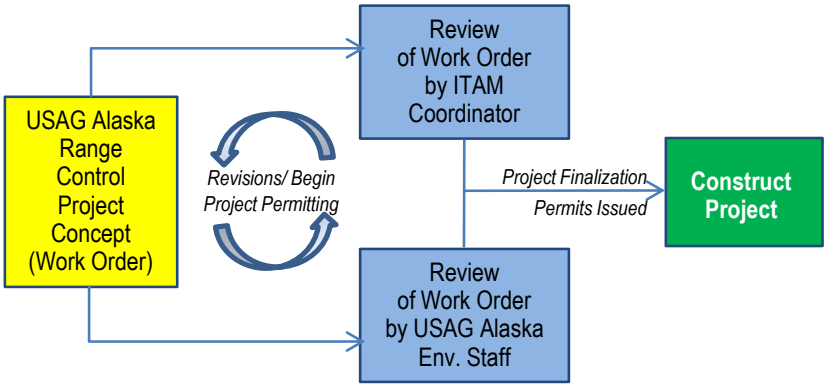
Filter Berms	A gravel or stone filter berm is a temporary ridge made up of loose gravel, stone, or crushed rock that slows, filters, and diverts flow from an open traffic area and acts as an efficient form of sediment control. A specific type of filter berm is the continuous berm, a geosynthetic fabric that encapsulates sand, rock, or soil.
Gabions	Gabions consist of coarse aggregates set in wire gabion baskets and are aligned in a terraced wall formation. They are installed to prevent non-desired fish passage between water bodies while maintaining water flow and to control erosive seasonal water flows.
Geotextiles	Geotextiles are porous fabrics also known as filter fabrics, road rugs, synthetic fabrics, construction fabrics, or simply fabrics. Geotextiles are manufactured by weaving or bonding fibers made from synthetic materials such as polypropylene, polyester, polyethylene, nylon, polyvinyl chloride, glass, and various mixtures of these materials. As a synthetic construction material, geotextiles are used for a variety of purposes such as separators, reinforcement, filtration and drainage, and erosion control.
Gradient Terraces	Gradient terraces are made of either earthen embankments or ridge and channel systems that are properly spaced and are constructed with an adequate grade. They reduce damage from erosion by collecting and redistributing surface runoff to stable outlets at slower speeds and by increasing the distance of overland runoff flow.
Grass-Lined Channels	Grass-lined channels convey storm water runoff through a stable conduit. Vegetation lining the channel reduces the flow velocity of concentrated runoff. Grassed channels usually are not designed to control peak runoff loads by themselves and are often used in combination with other BMPs, such as subsurface drains and riprap stabilization.
Grid Pavers	Cement or plastic grid pavers can be used to line ditches or stream bottoms where vehicles cross in order to control erosion, stabilize stream bottoms, and minimize rutting or shifting of material. Grid pavers also reduce storm water runoff, help prevent flooding, reduce non-point source pollution, reduce imperviousness of the area, and minimize site disturbance.
Land Grading	Land grading involves reshaping the ground surface to planned grades as determined by an engineering survey, evaluation, and layout. Land grading provides more suitable topography for buildings, facilities, and other land uses and helps to control surface runoff, soil erosion, and sedimentation during and after construction.
Log Cribbing	Log cribbing is an erosion control technique specifically used to retain soil or gravel firmly to its original place or to confine it as much as possible within the site boundary.
Mulching	Mulching is a temporary erosion control practice in which materials such as grass, hay, wood chips, wood fibers, straw, or gravel are placed on exposed or recently planted soil surfaces.
Preserving Natural Vegetation	The principal advantage of preserving natural vegetation is the protection of desirable trees, vines, bushes, and grasses from damage during project development. Vegetation provides erosion control, storm water detention, biofiltration, and aesthetic values to a site during and after construction activities.
Reinforced Concrete	Reinforced concrete can be used to control erosion at stream crossings, or to reinforce specific erosion prone areas along roadways or within the training areas.
Riprap	Riprap is a permanent, erosion-resistant layer made of stones. It is intended to protect soil from erosion in areas of concentrated runoff. Riprap may also be used to stabilize slopes that are unstable because of seepage problems.
Sediment Basins and Rock Dams	Sediment basins and rock dams are two ways to capture sediment from storm water runoff before it leaves a construction site. Both structures allow a shallow pool to form in an excavated or natural depression where sediment from storm water runoff can settle.

Sediment Trap	Sediment traps are small impoundments that allow sediment to settle out of runoff water. They are usually installed in a drainage way or other point of discharge from a disturbed area.
(Permanent) Seeding	Permanent seeding is used to control runoff and erosion on disturbed areas by establishing perennial vegetative cover from seed. It is used to reduce erosion, to decrease sediment yields from disturbed areas, and to provide permanent stabilization.
Silt Fence	Silt fences are used as temporary perimeter controls around sites where there will be soil disturbance due to construction activities. They consist of a length of filter fabric stretched between anchoring posts spaced at regular intervals along the site perimeter.
(Temporary) Slope Drain	A temporary slope drain is a flexible conduit extending the length of a disturbed slope and serving as a temporary outlet for a diversion.
Sodding	Sodding is a permanent erosion control practice that involves laying a continuous cover of grass sod on exposed soils. In addition to stabilizing soils, sodding can reduce the velocity of storm water runoff. Sodding can provide immediate vegetative cover for critical areas and stabilize areas that cannot be vegetated by seed. It also can stabilize channels or swales that convey concentrated flows and can reduce flow velocities.
Soil Retention	Soil retention measures are structures or practices that are used to hold soil in place or to keep it contained within a site boundary. They may include grading or reshaping the ground to lessen steep slopes or shoring excavated areas with wood, concrete, or steel structures.
Soil Roughening	Soil roughening is a temporary erosion control practice often used in conjunction with grading. Soil roughening involves increasing the relief of a bare soil surface with horizontal grooves, stair-stepping (running parallel to the contour of the land), or tracking using construction equipment.
Spill Prevention and Control Plan	Spill prevention and control plans should clearly state measures to stop the source of a spill, contain the spill, clean up the spill, dispose of contaminated materials, and train personnel to prevent and control future spills.
Stand Pipes	Stand pipes, also known as drop inlets, are used in areas where ponding water levels must be maintained without being allowed to overtop a road or pad. The height of a vertical pipe inlet is set at an elevation that maintains desired water levels, and a trash rack-rate assembly is typically installed on the top of the vertical pipe to prevent coarse debris from entering it.
(Temporary) Storm Drain Diversion	Temporary storm drain diversions are storm drain pipes which redirect an existing storm drain system or outfall channel to discharge into a sediment trap or basin.
Storm Drain Inlet Protection	Storm drain inlet protection measures are controls that help prevent soil and debris due to site erosion from entering storm drain drop inlets.
(Temporary) Stream Crossings	A temporary steam crossing is a structure erected to provide a safe and stable way for construction vehicle traffic to cross a running watercourse. The primary purpose of such a structure is to provide streambank stabilization, reduce the risk of damaging the streambed or channel, and reduce the risk of sediment loading from construction traffic.
Subsurface Drains	These are perforated pipe or conduit placed beneath the surface of the ground at a designated depth and grade. They are used to drain an area by lowering the water table. A high water table can saturate soils and prevent the growth of certain vegetation. Drains can help prevent soil from “slipping” down the hill.
Vegetated Buffer	Vegetated buffers are areas of either natural or established vegetation that are maintained to protect the water quality of neighboring areas. Buffer zones reduce the velocity of storm water runoff, provide an area for the runoff to permeate the soil, contribute to ground water recharge, and act as filters to catch sediment.

Wind Fences and Sand Fences	Sand fences are barriers of small, evenly spaced wooden slats or fabric erected to reduce wind velocity and to trap blowing sand. They can be used effectively as perimeter controls around open construction sites to reduce the off-site movement of fine sediments transported by wind. They also prevent off-site damage to roads, streams, and adjacent properties.

SOPs used during the project planning process and implementation of proposed projects includes:

- USARAK garrisons will continue implementing INRMP principles during design, construction and operation of range projects to help maintain natural resource sustainability.
- USARAK garrisons will continue using environmental limitations overlays to protect vulnerable habitats when siting range projects to avoid construction in sensitive areas and to indicate areas where maneuver training is and is not allowed.
- USARAK garrisons would continue to follow existing chain of command procedures regarding range project development. The standard procedures would be modified to include the Routine Range Project National Environmental Policy Act (NEPA) Assessment Checklist (Appendix D):



- If the checklist indicates that the project may not fall within the scope of this PEA, USAG FRA and USAG FWA Environmental (NEPA) staff would determine what appropriate level of NEPA analysis should be performed prior to funds being spent on construction.
- USARAK garrisons' contractors would continue to be supplied the *Environmental Concerns for Construction and Renovation Projects Package* upon contract award. This package outlines environmental guidelines and construction site management issues that the contractor must adhere to during project construction and requires contractors to prepare an Environmental Protection Plan (see Appendix F).
- USARAK garrisons will continue management and monitoring of its rangelands including natural and cultural resources as outlined in the INRMP, ITAM program and ICRMP.
- For those projects involving range construction and rangeland use, USARAK garrisons will continue to coordinate with local Soil and Water Conservation districts for siting of range projects in regards to soil suitability for proposed uses and for determining appropriate soil retention measures.

BMPs used during the project planning process and implementation of proposed projects include:

- To the extent possible, alignment of new roads, access trails or utility corridors would take advantage of existing roads and pathways.
- Site fingerprinting, which involves clearing and grading only those areas necessary for building activities and equipment traffic could be used during site planning.
- BMPs for construction site waste management, control of allowable non-storm water discharges, education and awareness training, material management, minimize offsite vehicle tracking of sediments, sanitary/septic disposal, waste disposal, site stabilization, and structural controls to prevent erosion contained within Appendix C3 of the *USARAK Integrated Training Area Management Five Year Management Plan and Range and Training Land Assessment Protocol FY2006-2010*.

Soil Resources	Soil stability is important for maintaining sustainable range use for Soldier training and for protecting surface water resources, wetlands, fisheries, vegetative cover and wildlife habitat. Soil stability can be managed through project design and construction staging, site restoration and ongoing monitoring of operations.

SOPs to avoid soil erosion include:

- During the range project planning phase, USARAK garrisons review project site soil types to determine: 1) constructability and suitability of soils for intended uses, 2) presence of permafrost or highly erodible soils, 3) the potential need for structures or practices to prevent erosion (i.e., grading or reshaping the ground to lessen steep slopes, shoring excavated areas).
- USARAK garrisons would continue to implement Dust Control Plans which includes BMPs for reducing wind erosion and promoting site stabilization during and after demolition, construction, earthmoving, excavating, stockpiling and transport activities.

BMPs to prevent or control soil erosion include:

Project Design

- Avoid permafrost and highly erodible soils whenever possible.
- Maximize footprint disturbances within areas of existing or previously disturbed soils.

Construction Staging

- Control dust emissions during construction on site per Garrison Dust Control Plans to include: pre-grading planning, pre-grading watering, pre-grading watering, chemical stabilizers, wind fencing/sheltering, wind awareness, cover haul vehicles, reduced speed limits/vehicular trips during construction.
- When working in permafrost, minimize the footprint of the disturbed area, and in areas of temporary disturbance provide vegetative cover as soon as possible following disturbance.
- Tree and vegetation removal activities would preferably occur during winter months when soils are frozen. Hand clearing or use of hydro-axe to clear vegetation located within sensitive soils during non-winter months.

Site Restoration

- Seed and fertilize, as necessary, the area immediately following construction to aid in the establishment of protective vegetative cover. Manual planting or geotextiles, as necessary, would be used in areas susceptible to higher wind erosion to aid in the establishment of protective vegetative cover.
- Restoration of disturbed areas by implementing industry standard BMPs and techniques as detailed in the ITAM program.
- Monitoring and rehabilitation efforts of Range and Training Land Assessment (RTLA) and Land Rehabilitation and Maintenance (LRAM) components of the ITAM Program to determine effects of training on soils and adjust training use.

Operations

- Minimize impacts caused by off-road vehicle use by timing, as much as is practical, and schedule training activities to coincide with the times of the year during which the lands are more resilient. For example, snow-pack would minimize the impacts to soils and permafrost compared to spring break-up when soils are more susceptible to erosion.
- Improve existing trails and roadways to increase the resiliency and capacity for the land to absorb traffic. Improvements would include stormwater management control such as incorporation of vegetated swales adjacent to improved trails and roadways to manage sediments and runoff.

Surface Water and Floodplains	Section 404 of the Clean Water Act (CWA) regulates activities which directly affect surface water resources and National Pollution Discharge Elimination

	System (NPDES) regulates activities affecting surface water quality. Surface water quality and floodplain integrity can be managed through project design. Buffer zones reduce the velocity of storm water runoff, provide an area for the runoff to permeate the soil, contribute to ground water recharge, and act as filters to catch sediment both during construction and from ongoing operations.

SOPs to be used for activities within or adjacent to surface waters and floodplains during project design and construction include:

- USARAK garrisons will comply with Executive Order (EO) 11988 *Protection of Floodplains* to minimize adverse Section 404 resources and floodplains impacts during project siting and range operations. For future projects not identified in this PEA, the Army will prepare a supplement to this programmatic document in the event of a proposal to locate the project within a floodplain or a wetland. The supplemental document will include a Finding of No Practicable Alternative (FNPA).
- USARAK garrisons will maintain natural or established vegetation riparian buffers for projects located near surface water and floodplains to protect the water quality.
- USARAK garrisons will prepare and adhere to Storm Water Prevention Plans per Code of Federal Regulations (CFR) 40 Part 122 *National Pollutant Discharge Elimination System*.
- USARAK garrisons will prepare grading plans for projects involving earthmoving and grading activities that establish drainage patterns and how runoff velocities affect receiving waters. Components of this plan will be used to manage runoff and sedimentation from construction sites by identifying proximity to surface water resources and erosion and sediment control measures to prevent runoff and sediments from reaching receiving waterbodies.

BMPs activities to be used within or adjacent to surface waters and floodplains include**:**

Project Design

- Preserve natural vegetation as a permanent control measure to minimize erosion potential and protect water quality especially in areas characterized by floodplain, wetland, stream banks, steep slopes, and other areas where erosion controls would be difficult to establish, install, or maintain.
- Avoid designing roads and trails in the general direction of preferential water and maintain raised trailbeds to minimize concentrated surface water flows during flooding events.
- Design drainage to accommodate snowmelt runoff and rainfall potential to prevent erosion and formation of gullies.
- Design, construct and maintain bridges to allow unrestricted flow.
- Use trenchless utility crossing technology (i.e., directional drilling) below streams and set back from the stream bank by at least 100 feet.

Construction Staging

- Avoid placing litter, construction materials and debris, and construction chemicals within proximity (typically 75 feet) to surface waters or flood-prone areas to prevent pollutant discharges.
- Keep all construction staging, fueling, and servicing operations at a minimum of 100 feet from surface waters to prevent unintentional contamination and keep spill kits on hand in case of spills to reduce response time.
- Avoid placement of temporary material storage piles within the 100-year floodplain during the rainy season unless the following conditions are met: (1) storage does not occur when flooding is imminent; and (2) if storage piles consist of erosive material, they would be covered with plastic tarps (or something similar) and surrounded with compost berms or other erosion control devices.
- Work excavation equipment from an upland site (e.g., the top of the bridge or culverted road crossing) to minimize adding fill into waters of the U.S.

- Install culverts during low flow periods. Where significant flow is present, acceptable techniques to isolate the construction site from stream flow include channel bypasses, temporary flumes, sheet pile or sandbag walls, water filled coffer dams, or pumping the stream flow around the work site.
- For dry-ditch crossings, complete streambed and bank stabilization before returning flow to the waterbody channel.
- Spoil, debris, piling, cofferdams, construction materials, and any other obstructions resulting from or used during construction shall be removed upon project completion.

Sediment Management

- Control sediment transport and prevent sedimentation into surface waters during construction through slope stabilization, maintaining 75-foot vegetative buffers, revegetation, use effective filters or barriers such as filter fabric fences and straw bales, fiber matting, stormwater retention/detention basins and settling ponds, drainage control, trenches and water bars, waterproof covers over material piles and exposed soils, avoiding work during heavy precipitation, use of fill free from fine material, and other appropriate measures.
- Pump sediment laden water resulting from construction activities into a settling basin or an area where it can be naturally filtered, before it reenters the stream.
- Closely monitor all construction sites to evaluate sediment control and stormwater and pollution management practices, inspect for potential damage, and to detect and correct future changes in drainage patterns to prevent impairment of surface waters and alternation of surface hydrology.
- If sediment escapes the construction site, off-site accumulations of sediment would be removed at a frequency sufficient to minimize off-site impacts.
- Construct dams with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner).

Stormwater/Surface Water Flow Management

- Place velocity dissipation devices at discharge locations and along outfall channels to provide a non-erosive flow velocity and maintain the hydrological regime of the receiving water.
- Structures, pipes, or associated fill should not impede flood or surface water flows.

Post Construction Riparian Restoration

- Restored stream bank, lake shore, or coastline affected by the work to pre-existing contours and stabilize.
- Restoration and revegetation of streambank and shoreline habitat should utilize the most up-to-date bioengineering techniques and use of biodegradable materials when feasible and practicable (i.e., Streambank Revegetation and Protection: A Guide for Alaska (Muhlberg and Moore 1998)). Techniques may include, but are not limited to, brush layering, brush mattressing, live siltation, and use of jute matting and coir logs to stabilize soil and re-establish native vegetation.

Operations

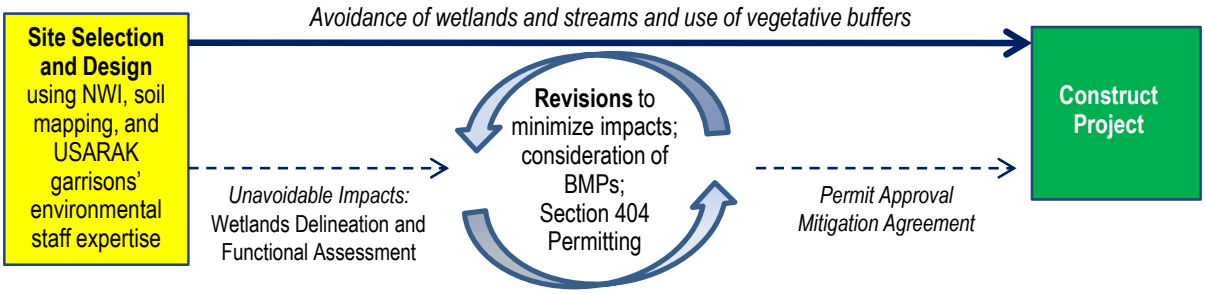
- Employ Spill Pollution Prevention and Countermeasure Plan (SPPCP) measures including proper handling and disposal of substances to prevent spills and effectively address cleanup strategies before potential spill contaminants could reach water resources by measures such as keeping spill kits nearby sites using these substances.
- Follow BMP guidance contained within the Army Small Arms Training Range Environmental Best Management Practices (BMPs) Manual to support the selection and implementation of management methods for erosion or lead migration issues from munitions (bullets) based on site-specific use and environmental characteristics to improve the environmental quality and insure the long-term sustainability of essential training areas.

Wetland Resources	Wetlands resources occur throughout USARAK garrisons' rangelands and are vital in maintaining water quality, aid in flood control, and provide wildlife habitat. These resources are also regulated by Section 404 of the Clean Water

	Act. Wetland impacts can be avoided through project design, during construction staging and from ongoing monitoring of operations. Temporary impacts to wetlands can be addressed through site restoration.

SOPs to be used for activities involving wetlands during project design and construction include:

- Preparation of a FNPA to justify unavoidable impacts to wetland resources and submitted with the Section 404 permit.
- Project planning and the Section 404 permitting process:



BMPs to be used for activities involving wetlands include:

Project Design

- Narrow/confine trail widths in sensitive wetland habitats or when possible, widen trails to the upland direction to avoid wetland impact.
- Maintain natural drainage patterns by the installation of culverts of adequate number and size to prevent flooding or excessive drainage of adjacent wetlands.
- Use trenchless utility crossing technology (i.e., directional drilling) below wetlands.
- Conduct a functional assessment of wetlands within the project study area to provide a means of rating wetlands and to facilitate the prioritization of impact avoidance and minimization measures. The functional assessment would be used to identify appropriate mitigation during the Section 404 permitting process to replace wetland functions lost from unavoidable impacts.

Construction Staging

- Clearly identify project limits in the field (e.g., staking, flagging, silt fencing, use of buoys, existing footprint for maintenance activities, etc.) prior to clearing and construction to ensure avoidance of impacts to waters of the U.S. (including wetlands) beyond project footprints.
- Limit construction staging and extra work areas at least 50 feet away from wetlands.
- Conduct vegetation clearing activities during the winter months within wetland areas when soils are frozen to avoid impacts to sensitive wetland soils.
- Use of a hydro-ax during vegetation clearing within wetlands to reduce impacts to hydric soils and low-lying vegetation.
- Place temporary fill in wetlands on geotextile fabric laid on top the existing wetland grade, especially during non-frozen conditions.
- Separately stockpile wetland topsoil and organic surface material such as root mats from overburden and return material to the surface of restored wetland sites.
- Disperse load of heavy equipment by working in frozen or dry ground conditions, employing mats when working in wetlands or mudflats, and using tracked rather than wheeled vehicles, so that the bearing strength of the soil is not exceeded.
- In peat wetlands, systematically removing the natural vegetative mat (with root masses intact) prior to construction, storing it in a manner to retain viability (usually frozen or hydrated), then replacing it after re-contouring the ground following construction, with final contours within 1

foot of adjacent undisturbed soil surfaces after 1 growing season and 1 freeze/thaw cycle. For minor utility projects where no imported bedding or backfill material is used (e.g., "plowed in" cables or small utility lines installed with ditch-witches), simple restoration to pre-work contours and appropriate revegetation shall suffice.

Post Construction Riparian Restoration

- Stabilizing of all disturbed areas resulting from project construction using native vegetation to minimize erosion and subsequent sedimentation of wetlands and streams.
- Restore temporarily disturbed wetlands to original grades using stockpiled wetland topsoils and plant native vegetation.

Operations

- Avoid training and maneuver activities in wetlands, especially during non winter months.

Vegetation	Vegetation provides erosion control, stormwater detention, biofiltration, habitat for wildlife and aesthetic values to a site during and after construction activities. Areas of preserved vegetation can also process higher quantities of storm water runoff than newly seeded areas, does not require time to establish, has a higher filtering capacity than newly planted vegetation, reduces storm water runoff by intercepting rainfall, promotes infiltration, lowers the water table through transpiration, provides buffers and screens against noise and visual disturbance, provides a fully developed habitat for wildlife and usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation. Retention of vegetation can be managed through project design and during construction staging. Monitoring of ongoing operations and site restoration helps maintain vegetative cover and overall health.

SOPs to be used for activities regarding vegetative cover during project design and construction include:

- USARAK garrisons will continue vegetation management within its ranges, including invasive species monitoring and management per the INRMP and ITAM. This will help prevent the spread of invasive species from routine maintenance, upgrade, and construction activities, and would serve to manage existing timber resources.
- To the extent possible, USARAK garrisons will continue to preserve natural vegetation (protection of desirable trees, bushes, and grasses) from damage during project development.
- For those projects affecting salvageable timber, USARAK garrisons will continue to make available usable timber salvaged from range projects that cannot be sold in a timber sale to the public at no cost.
- Use site fingerprinting, which involves clearing and grading only those areas necessary for building activities and equipment traffic could be used during site planning and concentrate development in areas where past development has occurred.

BMPs to be used to help mitigate impacts:

Project Design

- Consideration of vegetation preservation during project planning to maintain ecological functions described above, particularly in floodplains, wetlands, stream banks, steep slopes, and other areas where erosion controls would be difficult to establish, install, or maintain.
- Review ecotype mapping within the project area to determine if the project has the potential to be located within the preferred habitat of a rare plant species.
- Utilize previously disturbed areas before open meadow and open meadow before forested areas.
- Clear only land needed for building activities, range operations and vehicle traffic needs.
- Retain as much vegetation as possible to provide cover, concealment, and realism for training.

- Retain 75-foot vegetation buffer areas along either side of ephemeral and intermittent streams or other specifically designated areas and a 100-foot buffer along Essential Fish Habitat (EFH) streams to prevent surface water quality impairment.

Construction Staging

- Clearly mark trees and areas for preservation and protect from ground (root) disturbances around the base of the tree.
- Restrict nailing of objects (signage) to trees during building operations.
- Avoid placement of fill dirt within the limit of preserved areas and during final site cleanup, barriers around preserved areas and trees should be removed.
- Implement invasive species prevention measures during construction activities such as washing of construction equipment prior to on-site construction activities and require gravel pits to be free of invasive species to prevent introduction and spread of invasive species.

Vegetation Preservation Considerations

- Tree vigor: Preserve healthy trees that will be less susceptible to damage, disease, and insects.
- Tree age: Older trees are more aesthetically pleasing as long as they are healthy.
- Tree species: Preserve tree species well-suited to present and future site conditions. Preserving a mixture of evergreens and hardwoods can help to conserve energy when evergreens are preserved on the northern side of the site to protect against cold winter winds and deciduous trees are preserved on the southern side to provide shade in the summer and sunshine in the winter.
- Wildlife benefits: Choose tree species that are preferred by wildlife for food, cover, and nesting.
- Drainage patterns: Following natural contours and maintaining preconstruction drainage patterns would prevent alteration of hydrology and the potential die-off of preserved vegetation.

Site Restoration

- Revegetate areas disturbed during project construction as soon as possible with native grass or other appropriate vegetation, preferably in the same growing season as the disturbance to prevent erosion and maintain habitat integrity.
- Revegetate areas that are not recovering naturally through the LRAM Program to prevent erosion and maintain habitat integrity.
- Monitor mitigation efforts to ensure goals are reached, and initiate additional measures required to meet restoration goals.
- Monitor to determine extent of invasive species presence on Army lands in Alaska and continue collaborative invasive species management efforts with local area agencies and entities.

Operations

- Restrict vehicle traffic trails and roads as practical and still meet training mission requirements.

Wildlife and Fisheries	Wildlife and fishery resources are abundant within USARAK garrison range lands. These resources are essential to subsistence and recreational hunting and fishing and are also regulated through the Migratory Bird Treaty Act (MBTA), Endangered Species Act (ESA), the Fish and Wildlife Coordination Act, Bald and Golden Eagle Protection Act, Magnuson-Stevens Fishery Conservation and Management Act, and the State Anadromous Fish Act. Wildlife and fisheries management can be considered during project design and during the timing of construction staging. Monitoring of ongoing operations and site restoration helps maintain overall sustainability and health of these resources.

SOPs to be used to maintain biodiversity and local wildlife and fisheries populations during project design, construction, and operations include:

- For those projects affecting or adjacent to surface waters, USARAK garrisons will refer to the State Anadromous Fish Catalogue to determine presence of anadromous streams near

construction areas and all projects will conform to any conditions required by State officials, such as vegetation buffers or other appropriate measures.

- In the event that a Proposed Action could adversely affect Essential Fish Habitat, appropriate consultation with the National Marine Fisheries Service would occur, and projects will conform with all conditions imposed by National Marine Fisheries Service (NMFS) officials.
- For those projects affecting anadromous streams, all design and unavoidable construction activities affecting anadromous waters will be accomplished in accordance with Alaska Statutes AS 16.05.871 - AS 16.05.901.
- For those projects involving vegetation removal, to the extent possible, USARAK garrisons will obtain permission from the USFWS when necessary to remove bird nests, including partially completed bird nests. In addition, construction activities will avoid clearing of grass, scrub land, and forested areas between 1 May to 15 July to minimize impacts on migratory birds. Prior to initiating any project, construction sites will be surveyed to determine the presence of eagle nests. Should any be found, USFWS officials will be consulted as to whether construction may occur on the intended site, and whether measures are required to minimize adverse impacts to eagles.
- For those activities involving firing or Soldier training activities, continue to limit firing within 4,921 feet (1,500 meters) of bison and prohibition of disturbance to bison by Soldiers during training events (Donnelly Training Area [DTA] only).
- Avoid siting projects in higher functioning habitats such as riparian areas or those containing rare or sensitive species.

BMPs to be used to maintain biodiversity and local wildlife and fisheries populations include:

Project Design

- Culverts installed in fish bearing streams would have a width that is at least 120 percent of the ordinary high water width of the stream and should be bedded 20 percent of the diameter.
- Sufficient depth of flow and appropriate water velocities for fish passage would be provided in culvert installations. A minimum of 8 inches (200 mm) of depth would be maintained. Depending upon the grade of the culvert and/or its length, downstream set pool or install baffles within the culvert to achieve the 8 inches 200 mm minimum depth throughout the culvert may be necessary.
- The natural contour of the stream should be followed for culvert installation.
- Activities that include the construction and maintenance of intake structures must include adequate fish screening devices to prevent the entrainment or capture of fish.
- Directional boring vaults/junction boxes or pads will be provided further than 100 feet (30.5 meters) (measured from ordinary high water [OHW]) of anadromous fish streams.
- Restrict activities in breeding areas for migratory waterfowl, spawning areas, or areas of concentrated shellfish populations.

Construction Sequencing

- Avoid vegetation clearing during the USFWS Region 7 guidelines for South-central and Interior Alaska (1 May through 15 July) as described in the 2007-2011 INRMP to avoid impacts to migratory birds.
- Where required, obtain State permits to erect a fish barrier of netting, both upstream and downstream of the crossing, to prevent fish from entering the work area.
- Move stranded fish found in the dewatered channel downstream.

Site Restoration

- To the maximum extent practicable backfill material shall consist of the excavated material and shall be returned to the hole in the same place on the vertical stratum from which it was excavated. As a contingency, use clean gravel or native cobbles for the upper 1-foot of trench backfill in all waterbodies that contain fisheries.

Operations

- Continue to cooperatively manage the Delta Bison Herd with ADFG to ensure sustainment of the military mission and the health of the bison population.
- Continue planting of blue grass in designated areas south of DTA's training areas to help bison move away from training areas in a safe, non-harassing manor.
- Continued monitoring of effects of military training on select wildlife species (especially herd animals and waterfowl) and fisheries during vital seasons such as breeding, rearing of young, and migration.
- Continue annual moose, bison, and caribou surveys in partnership with ADFG and swan surveys with the U.S. Fish and Wildlife Service.
- Continue development and implementation of an information and education program for personnel using USARAK lands.
- Continue compliance with Federal and state laws and regulations relating to fish and wildlife conservation or management.
- Use of bear-proof containers and bear-resistant dumpsters to reduce incidence of bear-human interaction area (live fire training disruption and Soldier safety) on the small arms ranges.

Land Use, Energy and Utilities	Army Regulation (AR) 210-21, *Army Ranges and Training Land Program*, and the associated *Generic Methodology for the Range and Training Land Program*, dated September 1998, guide overall range planning for establishing current requirements and utilization levels for available training assets and provides a near- and long-term project plan for training, public works, and environmental planners. Land use compatibility and availability of existing energy and utilities should be considered during project site selection and project design.

SOPs to be used during project design to avoid land use conflicts and consider energy and utility aspects of proposed projects include:

- Planning of proposed new facilities and upgrades should follow AR 210-20 (*Real Property Master Planning for Army Installations*).
- Siting of facilities and activities (including ground maneuver) to avoid sensitive areas as much as possible. This includes activities that generate noise, dust, and other nuisance factors.
- Areas open to the public would be separated from active mission areas (using appropriate buffers, fencing, designated access restrictions or recreational use tracking procedures).
- Project planners will avoid placing permanent facilities or ground disturbing activities in sensitive habitats or ecological areas, when practicable.
- Project planners will site facilities in a manner that maximizes the use of existing utility infrastructure.
- Completion of the USAG Alaska Range Project Checklist to determine increases of energy and utility requirements on a project-by-project basis. Where increases of energy demand is likely, have project planners incorporate measures to reduce or offset emissions during project planning, construction and operations in compliance with EO 13423.

BMPs to be used during project design to avoid land use conflicts and consider energy and utility aspects of proposed projects include:

- Encourage sustainable building and development practices (e.g., implementation of the Leadership in Energy and Environmental Design rating system as a guide for projects).
- Should incorporate stormwater management retention devices in the development of parking lots, plazas, and walkways to decrease amount of runoff and to filter out oil and other potential hazardous substances which could occur within parking runoff.

- Prior to new construction, project planners should coordinate with other construction managers of new projects and notify users and operators of existing utilities if an existing utility system needs to be temporarily out of service during construction activities.
- During construction, limit the shut-off of existing utilities to off-peak usage period.

Public Access, Recreation and Subsistence	The Sikes Act has opened numerous military lands to recreation, including portions of USARAK garrisons' rangeland. In addition, subsistence activities occur throughout USARAK garrisons' rangeland as protected through the Alaskan National Interest Lands Conservation Act. Public access, recreation, and subsistence can be considered during project design and operations to manage project affects to USARAK land users.

SOPs to be used to avoid impacts to public access, recreation and subsistence activities during operations include:

- Continued assessment and management of subsistence resources for all users per guidelines outlined in the INRMP.
- Continued establishment of government-to-government relationships with Alaska Native tribes whose interests may be significantly affected by USARAK activities. This would ensure efficient and effective communication between both leadership and staff members of tribal governments and USARAK.
- Continued implementation of the U.S. Army Alaska Recreation Tracking System (USARTRAK) automated check-in phone system. This would provide information regarding daily closures and should greatly simplify the public access process.

BMPs to be used to avoid impacts to public access, recreation and subsistence activities include:

Project Design

- Determine the placement of access gates to allow for maximum continued recreational use and to maximize public safety.
- Determine the placement of bridges in areas that will not inhibit existing publically-used low-water crossings.

Operations

- Continued implementation of recreational vehicle use policies, per the INRMP. The INRMP outlines specific actions to maintain and improve public access and recreation opportunities on USARAK lands.
- Continued monitoring of recreational usage of each training area through the USARTRAK phone system. This would inform USARAK and ADFG regarding use patterns, which should improve management for public access and recreation.
- Continued maintenance of kiosks at all primary entrances to recreational areas on USARAK lands and provision of visitor maps and information. Information kiosks can help users quickly identify areas designated for recreational use, as well as the times and locations of military activities.
- Increased use of signs and other public notification measures to increase public awareness of dangers of military training.
- Continued use of advanced public notification of military training activities likely to restrict the use of Alaska Army lands for recreational, subsistence, and other uses.

Wildfire Management	Range projects and operations have the potential to cause unintentional wildfire starts. Wildfire prevention can be administrated during operations through adherence to existing management plans and agreements and management of the landscape.

SOPs to be used which avoid unintentional wildfire starts include:

- Compliance with training exercise regulations and wildfire prevention as stipulated by USARAK Range Regulation 350-2, *Training*, and continued update and implementation of Integrated Wildfire Management Plans developed by USARAK.

BMPs to be used to avoid unintentional wildfire starts include:

- Continue on-going actions to prepare the landscape for potential wildland fires (i.e., prescribed burns and thinning to restore ecosystem functions to fire and to reduce future fire severity).
- Continue to utilize the fire danger rating system to reduce the likelihood of a fire by limiting military activities when certain thresholds of wildfire risk are reached.
- Have available an Initial Attack Response Team during military training activities during high and extreme fire danger to provide a rapid initial response to potential wildfires in the area.
- Continue to implement INRMP and IWFMP.
- Prepare a burn plan and detailed parameters for when burning can take place.

Cultural Resource Management	USARAK garrisons contain a variety of resources protected under Section 106 of the National Historic Preservation Act.

SOPs to be used which avoid impacts to cultural resources include:

- Continued implementation of ICRMPs which help maintain cultural resource sustainability and provides guidance on the best methods for compliance with cultural resources management responsibilities.
- Further development of Army Alternate Procedures to further identify methods of maintaining cultural resource sustainability into the future.
- Exempted Undertakings and Categorical Exclusions – Undertakings involving cultural resources that fall under the following Programmatic Agreements or Program Alternatives are considered exempt or categorical exclusions, requiring no further review from USARAK CRM or SHPO and include:
  - Program Comment for Capehart Wherry Era (1949-1962) Army Family Housing.
  - Program Comment for Army Cold War Era Unaccompanied Personnel Housing (1946-1974).
  - Program Comment for World War II and Cold War Era Ammunition Storage Facilities (1939-1974).
  - Program Comment for World War II and Cold War Era (1939*1974) Army Ammunition and Production Facilities and Plants.
  - Nationwide Programmatic Agreement for World War II Temporary Buildings.
- Continue to curate discovered artifacts with Federally-certified museums in accordance with the NHPA.

Project Design

- Continued coordination with the USAG Alaska Cultural Resources program during site planning.
- USARAK CRM continued coordination and consultation with the Alaska SHPO to identify any adverse impacts and mitigation requirements.

Construction

- Continue notifications to the USAG Alaska Cultural staff in the event of inadvertent discovery of cultural resources (artifacts, etc.) during range construction.

Operations

- Continued coordination with the USAG Alaska Cultural Resources program during changes of range operations.
- Continue notifications to the USAG Alaska Cultural staff in the event of inadvertent discovery of cultural resources (artifacts, etc.) during range operations.
- Conduct systematic monitoring of archaeological sites that are eligible for listing on the NRHP.
- USARAK CRM staff would review all repairs and other projects planned for historic structures and buildings.

BMPs to be used to avoid impacts to cultural resources during project design, construction and operation includes:

- Initiate and continue consultations with Alaska Native tribes to identify and evaluate Traditional Cultural Properties (TCPs) that may be present on military managed lands in Interior Alaska.
- Survey unsurveyed areas and evaluate resources identified during survey. Those resources determined to be National Register of Historic Places (NRHP) eligible will be treated according to NRHP and the Secretary of the Interior's Standards for Archaeological Documentation and Preservation, as well as applicable Alaska state standards for archaeology. This would not apply in areas that have not been previously surveyed, except in those areas which fall under Army-wide exemptions for undertakings due to an imminent threat to human health and safety as presented in the Army Alternative Procedures (AAP; Section 4.1, Army Wide Exempted Undertakings) which include:
    - In-place disposal of unexploded ordinance.
    - Disposal of ordinance in existing open burning/open detonation units.
    - Emergency response to releases of hazardous substances, pollutants, and contaminants.
    - Military activities in existing designated SDZs.
- Sites that are currently identified, but have not been evaluated for NRHP eligibility will be treated as NRHP eligible sites; until such time that they are evaluated for NRHP eligibility. Once evaluated, sites determined to be NRHP eligible will be treated according to NRHP and the Secretary of the Interior's Standards for Archaeological Documentation and Preservation, as well as Alaska state standards for archaeology.
- Avoid cultural sites during design utilizing information gathered from on-the-ground surveys.
- Curation of archaeological material recovered per Memorandum of Agreement between USARAK and the University of Alaska Museum.
- Continued development and implementation of an information and education program for personnel using USARAK lands and the public. This would enhance the conservation of cultural resources on USARAK lands.
- Continued evaluation of NRHP eligibility of archaeological sites potentially impacted by placing ranges in use.

Noise	Noise control is regulated under the Noise Control Act of 1972. To assess military-related noise effects, the U.S. Army Center for Health Promotion and Preventive Medicine has developed noise zones which consider noise levels along with sociological considerations and compatible land uses. Noise control can be considered during both the planning and construction phases for range activities.

SOPs to be used which avoid impacts from noise during project design and planning include:

- Noise generation of the planned use of any given project would consider siting based on the Installation Noise Management Plan noise contours and compatible noise zones.
- Any activity generating a new type of noise source (i.e., new equipment or technologies) which could change existing noise contours or be in conflict with Installation Noise Management Plans would undergo CHPPM noise modeling to detect any potential changes to existing noise conditions.
- Continue to maintain an active noise management program to protect present and future operational capabilities of range land training. This includes continual evaluation of noise impacts that may be produced by ongoing and proposed Army actions/activities, maintenance of a noise complaint management program and minimization of noise impacts and annoyance to the greatest extent practicable.

BMPs to be used to avoid impacts from noise during construction include:

- Adjust construction schedules within areas of sensitive noise receptors to reduce impacts.
- Ensure construction equipment with internal combustion engines have mufflers which are well maintained.
- Operate construction equipment at lower speeds and increase spaces between equipment.
- Set-up noise barriers or enclosures such as plywood or lead-vinyl curtains for particularly noisy operations near very sensitive receptors.

Human Health and Safety	USARAK garrisons have a proactive system to address human health and safety issues and to prevent injury or harm to Soldiers and civilians resulting from range construction projects and range operations.

SOPs to be used which avoid impacts to human health and safety include:

Project Design

- As necessary, at the earliest time after the project planning charrette, USARAK garrisons perform a UXO site survey to determine the extent of the ordnance contamination to aid in the design of the range and minimize intrusive work in portions of the range which are highly contaminated with ordnance and to determine the correct ordnance response actions.
- During predesign site studies and investigations, if ordnance contamination is suspected, UXO safety support for UXO avoidance becomes mandatory during topographic surveying, geotechnical investigation, and other on-site operations that require gathering design data.
- Hazardous waste generation associated with building demolition should be identified in advance, and proper abatement planned as part of the project. These hazards include, but are not necessarily limited to asbestos, lead (primarily in paint), PCBs and glycol.

Construction

- During the range construction, ordnance may be found in the area. Inert practice ordnance may also be encountered. If UXO contamination is encountered, work within the immediate area will cease and Range Control will notify the Installation's Explosive Ordnance Disposal (EOD) team.

- If there is a probability of UXO contamination, only UXO-qualified personnel can conduct any type of ordnance handling or disturbance work.
- All hazardous material spills would be reported to the Directorate of Public Works Environmental Office as well as the U.S. Army Corps of Engineers or DPW project manager using the DPW Oil and Hazardous Substances Spill Notification form.
- Any project that involves excavation or movement of soils must include field screening for petroleum (plus any other identified contaminants). Soils registering less than 20 parts per million (ppm) are considered clean and may be reused on site or transported to the Post landfill for cover. Soils screening 20ppm or higher must be follow USARAK contaminated soil policies.
- Each project would be evaluated to determine whether an Air Quality Control Permit (AQCP) is required prior to commencing construction. An AQCP is typically required for projects that involve the addition of new air emission sources (e.g., boilers, generators, fire pumps, painting & degreasing operations, fuel storage & loading) and for projects that involve the modification of existing air emission sources (e.g., landfill expansion and non-routine maintenance at the power plant). The evaluation includes determining if the project conforms to the requirements and emission caps established by USARAK garrisons' current Title V operating permits and assesses the need to obtain a permit modification.

Operations

- All hazardous material spills would be reported to the DPW Environmental Office as well as the COE or DPW project manager using the DPW Oil and Hazardous Substances Spill Notification form.

BMPs to be used to avoid impacts to human health and safety during construction and operation include:

- Store and use all hazardous materials (e.g., paint, solvents, fuel, etc.) in such a manner as to prevent spills and releases. Storage areas are subject to inspection by DPW Environmental Office.
- All underground storage tanks (USTs) installed within USARAK garrisons will conform to 40 CFR 280, 18 Alaska Administrative Code (AAC) 78 and applicable Army guidance. USTs will be double wall steel with cathodic protection (anodic, not impressed), provided with spill and overfill protection, and interstitial leak detection. Fuel lines will be double wall Enviroflex, or equal.
- All aboveground storage tanks (ASTs) installed on Army property will conform to 40 CFR 112, as well as applicable ADEC and Army guidance. In general, all ASTs will be either double wall or vaulted tanks, with containment on all four sides. All tanks will be tapped on the top only, and be provided with spill and overfill prevention and leak detection.
- Noise generation of the planned use of any given project would consider siting based on The Installation Noise Management Plan noise contours and compatible noise zones.

APPENDIX F

State Historic Preservation Office

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 673D AIR BASE WING
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

RECEIVED
MAY 15 2014
OHA

MEMORANDUM FOR ALASKA DEPARTMENT OF NATURAL RESOURCES
OFFICE OF HISTORY AND ARCHAEOLOGY
ATTENTION: MS. JUDITH E. BITTNER

MAY 7 2014

FROM: 673 CES/CEIEC
6346 Arctic Warrior Drive
JBER AK 99506

SUBJECT: Range Training Area Wildland Fire Management

1. Joint Base Elmendorf-Richardson (JBER) proposes No Historic Properties are Affected for the burning of grasses and alders that have encroached on previously archaeological surveyed firing ranges in Tab 1. This vegetation presents a wildfire danger during range training exercises therefore necessitating preemptive measures. An environmental assessment for this action is being conducted and will include a public comment period and Native consultation.

2. As shown on the maps in Tab 1, it is necessary to exceed some of the surveyed boundaries to adequately prevent wildfire danger due to the new types of tracer ammunition being used. An archaeological survey of the additional acreage shown by red lines outside the current range area is not feasible due to unexploded ordnance danger. Historical aerial photos of the ranges east of the Glenn Highway show it as previously disturbed.

3. If you have any questions, please contact Mr. Jon Scudder, 673 CES/CEIEC, at 384-6648.

Brent Koenen
BRENT A. KOENEN, GS-13, DAF
Chief, Environmental Conservation

Tab 1
Range Training Area Maps

No Historic Properties Affected SAb
Alaska State Historic Preservation Officer
Date: 5.30.2014 File No.: 3130-1 R Air Force
Please review: 36 CFR 800.13 / A.S. 41.35.070(d)

3/31/15

3130-1R USAF

RECEIVED

MAR 25 2015

OHA

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 673D AIR BASE WING
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

SENT BY E-MAIL
DATE 3/31/15

MEMORANDUM FOR ALASKA DEPARTMENT OF NATURAL RESOURCES
OFFICE OF HISTORY AND ARCHAEOLOGY
ATTENTION: MS. JUDITH E. BITTNER

MAR 25 2015

No Historic Properties Affected MWV
Alaska State Historic Preservation Officer
Date: 3/31/15 File No.: 3130-1R USAF
Please review 36 CFR 800.13 / A.S. 41.35.070(d)

FROM: 673 CES/CEIE
6346 Arctic Warrior Drive
JBER AK 99506

SUBJECT: Range Training Area Wildland Fire Management Survey Clarification

1. In May 2014, Joint Base Elmendorf-Richardson (JBER) sent a letter to your office concerning a determination that No Historic Properties are Affected for conducting prescribed burns on military live-fire ranges where grasses and alders had encroached on areas where archaeological surveys have already been conducted. Your office concurred with this determination in 2014. These areas have been burned periodically throughout the past 30 years and JBER conducted prescribed burns in many of these areas in 2014 to reduce fuel loads and the danger of a wildfire erupting during live-fire training exercises. JBER intends to conduct prescribed burns again in 2015 and has submitted another environmental assessment (EA) for public review. The EA the Air Force adopted in 2014 was developed by the Army for the Integrated Natural Resource Management Plan and we felt it necessary to develop a standalone EA specific to wildland fire prevention activities at JBER.

2. As part of the review of the EA, the JBER legal office felt it necessary that the Air Force clarify a statement in the letter we sent to your office in 2014 regarding potential unexploded ordnance (UXO) and archaeological surveys in areas outside those typically burned as part of routine range maintenance. There are no known or visible UXO that we are currently aware of in these areas, but there is potential to find UXO in the subsurface that would present a danger to anyone conducting intrusive investigations. It is DoD policy to not allow intrusive work in areas with potential UXO unless the sites have been shown to be clear of UXO. These boundary areas are covered with willows, alders and successional stages of trees typical of the Alaskan landscape and it isn't feasible to conduct geophysical studies in these areas to determine subsurface conditions without causing substantial disturbance to the sites.

3. In addition, our predictive model shows that these previously disturbed areas have a low potential for the discovery of archaeologically significant artifacts. For these reasons, the Air Force does not intend to conduct archaeological surveys in these boundary areas prior to conducting prescribed burns in 2015. These prescribed burns are absolutely necessary to support military training and to significantly reduce the risk to the public due to potential wildfires.

4. I apologize for taking your time with what is a minor clarification, but our legal office felt it necessary for a legally sufficient administrative record regarding this EA. Request your office

2015-00645

concur that no additional consultation is necessary to meet our Section 106 requirements under the National Historic Preservation Act. If you have any questions, please contact Mr. Jon Scudder, 673 CES/CEIEC, at 384-6648.

MARK PRIEKSAT, GS-13, DAF
Chief, Environmental Element

Attachments:
1. 2014 Submittal/Approval Regarding Range Training Area Wildland Fire Management
2. 2015 Draft EA for Wildland Fire Prevention Activities at JBER

APPENDIX G

Mississippi Fire Incident Summary

Mississippi Fire

AK-MID-000117

Photo Courtesy: Terry Anderson

Executive Summary

August, 2013

Alaska Type 1 IMT

Tom Kurth, IC

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AK IMT Executive Summary for the Mississippi Fire

Incident Overview

May 30 – August 10

The Mississippi Fire was discovered during an aerial reconnaissance flight on May 30, 2013 at 9:10 am. The fire was one acre in size and smoldering in black spruce. It was located within the Limited Fire Management Option. The fire was determined to be human-caused, but due to its location within a military restricted area, no investigation took place and it was placed in monitor status.

By July 13, the fire had grown to 1,208 acres, but remained well within the Military restricted zone and the Limited Fire Management Option. It was not until a Chinook wind event on August 8 and 9 pushed the fire to the north out of the military restricted area and onto State Full Fire Management Option lands that values became threatened. With the fire at 33,833 acres, a Type 3 organization was put in place on August 8 to protect structures at Rainbow Lake and to begin assessing additional values at risk. The Alaska Type 1 Incident Management Team was placed on order. By the time the IMT was in-briefed in Fairbanks at 1800 on August 10, a burn-out at Rainbow Lake had been completed and dozers had begun to build line around the community of Whitestone.

August 11

At the time the Alaska Type 1 IMT assumed command of the fire on August 11th at 0800, the fire had grown to 40,841 acres. The Team set up an Incident Command Post at the Deltana Fairgrounds as fire personnel continued the process of identifying values at risk and prepping structures. Interagency Hot Shot Crews, Type 2 Initial Attack Crews, and Smokejumpers were engaged in triage and structure protection at the Richardson Clearwater, Southbank, and Rainbow Lake areas. Dozerline construction around the community of Whitestone was completed. Air resources including Military rotor-wing aircraft and CL-215s were used to slow fire spread to the north. Active fire behavior, lack of access to Military Restricted Areas (impact zones), and hot, dry, windy weather hindered operations. Strong morning inversions limited aviation activities. Numerous structures along the Tanana River and Clear Creek, Military assets in the 100 Mile Creek area, the Alaska Pipeline, Big Delta, Delta Junction, and Fort Greely were all at risk. Dense smoke threatened public safety on the Richardson Highway. Active wind driven fire spread was observed with running, spotting, and active backing and flanking.

August 12

On August 12, a Structure Protection Group was formed to assess and protect communities along the Richardson Highway including private cabins, Tenderfoot, Spengler Road, and Shaw Creek in case the fire spotted across the Tanana or Delta Rivers. Dozers remained staged at Whitestone farms in order to support a potential burnout operation. Properties on the west and south side of the Tanana River (including Whitestone farms, homes of the Southbank, Richardson Clearwater, and Rainbow Lake) required access by boat or helicopter, further complicating operations and logistics. The US Air Force initiated a "Red Flag" Exercise within the R2202B Restricted Area along the southwest fire flank. Despite this, air attack was still able to estimate the fire's proximity to military observation points in this area. The fire was largely burning in the 1998 Carla Lake fire scar and had grown to 52,539 moving the fire more northeasterly and east.

August 13-15

Between August 13 and August 15, the fire progressed north, east, and west influenced by primarily northwest winds, high temperatures, low relative humidity, and dry fuels. Heavy morning inversions slowed fire progression and hindered morning aviation activities. The IMT continued to develop structure protection, and ordered additional firefighting resources and equipment to support protection of values at risk. Type 1 and Type 2 hand crews, CL-215s, CL-415s, Military Chinook and Blackhawk helicopters, Type 2 and Type 3 helicopters, boats, burnouts, and hoselays were used to accomplish this. On August 13, Operations recognized an opportunity to improve an existing road between the Delta River and the fire's northeast corner. A plan was developed to conduct an aerial burnout in advance of a predicted Chinook that, in conjunction with handline around the fire's northern edge, would secure the communities of Whitestone and Southbank. On August 14, dozers advanced to the fire's edge and crews plumbed the road in preparation for burning. On August 15, burnout of the dozer line from Whitestone farms westward towards the fire's edge was initiated. Additional crews were added to support the burnout and mop-up operation, while Type 1 crews secured the northern edge of the fire using direct tactics, in anticipation of the Chinook predicted for the next day. Evacuation contingency planning for Delta, Ft. Greely, and Big Delta was initiated by a specialist from Division of Homeland Security who arrived on August 14.

August 16 -18

By August 16, the fire had grown to 64,601 acres pushed by warm, dry, and windy weather and CFFDRS indices in the high to extreme values. The predicted south wind event did not develop, so crews were able to continue to secure the northern most section of the fire using direct tactics and burnout operations. A public meeting was held at the Delta Community center at 1900 and community members expressed support for the burnout operation. Management constraints associated with anadramous fish resources in Clearwater Creek and the Delta River were identified and integrated into tactical operations. The IMT loaned Tok Area a strike team of engines, a Type 2 helicopter, and several overhead after they experienced extreme fire behavior on the Tetlin Junction Ridge fire that posed a threat to values at risk in the Alaska Highway corridor. These resources returned by end of shift on August 17th. Another public meeting was held in Delta at the community center at 1900.

By August 18, the fire had grown to 67,711 acres as it continued to smolder in areas of hardwoods, and creep in tundra and spruce. Over 500 people from multiple federal, state and local agencies, Tribes, and the local community were engaged in the effort to manage the fire. Rain moderated fire behavior and provided opportunities for ground forces to secure the northern fire edge, limiting the spread of fire towards values at risk at the fire's head. An existing road running west from the fire's edge to Delta Creek was improved as a contingency measure. If necessary, aerial burning could be conducted from the road in order to restrict northerly movement of the fire towards identified values while allowing continued spread to the west, south, and southwest on military lands. There remained a long-range low probability of threat to the values along the Tanana and Delta until a true season ending event occurred. However, the threat to values along the highway corridor was greatly reduced and the task force of engines patrolling the Richardson Highway areas was released.

August 19-21

From August 19th - 21st, over .73 inches of rain fell in the fire area, significantly moderating the potential for fire spread. Mop-up remained difficult however, due to the extreme drought code values and deep burning. Multiple crews remained in place to secure direct line and mop up along the dozer line, while crews from the Lower 48 were released. The direct fireline on the north edge of the fire was tied-in to the completed west dozer line on August 21st, providing

19% containment of the fire perimeter. The 8-mile dozer walk-down along the edge of the winter road extending from the fire's west flank to Delta Creek was completed. The two IHC crews were released. A suppression repair plan was developed and distributed to Agency Administrators for review.

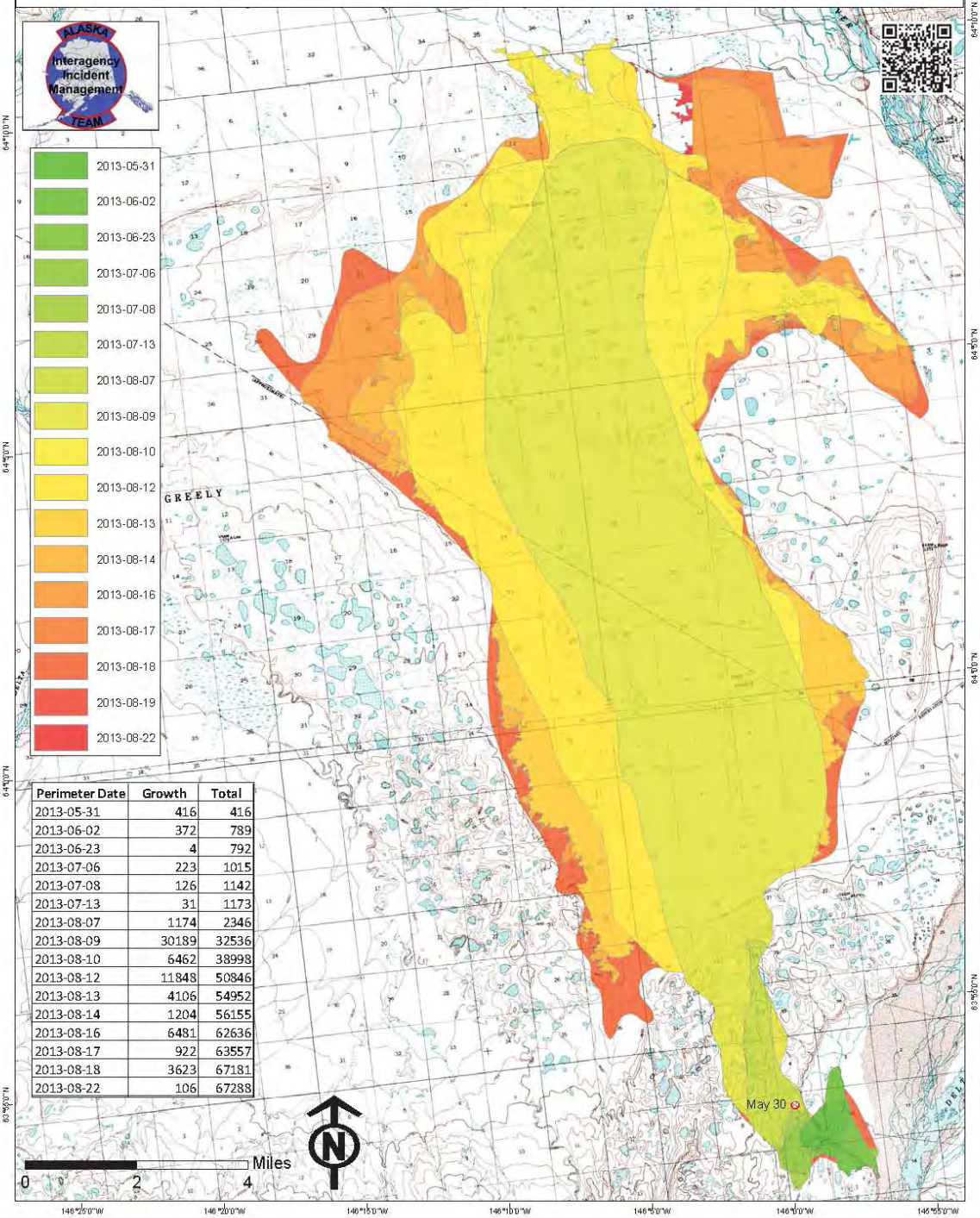
August 22-26

With additional cool and rainy weather in the forecast, and with little additional opportunities available for direct action due to restrictions on military lands, demobilization of resources began in earnest on August 22. Structure protection equipment was removed from all values. Mop up was completed and the suppression repair plan was finalized. Crews completed some preliminary repair work designed to deter spruce beetles and were demobilized. Preparations were made to transition command of the fire back to the Military Zone. Several personnel were identified to remain in place after the departure of the IMT. They will coordinate repair efforts by receiving and storing seed and fertilizer, and by facilitating mobilization of an excavator after the Delta River drops to a safe level. With equipment in place, a short crew from the local area will be hired to complete repair operations. The IMT transferred command back to the local unit on August 26th.

Incident Objectives

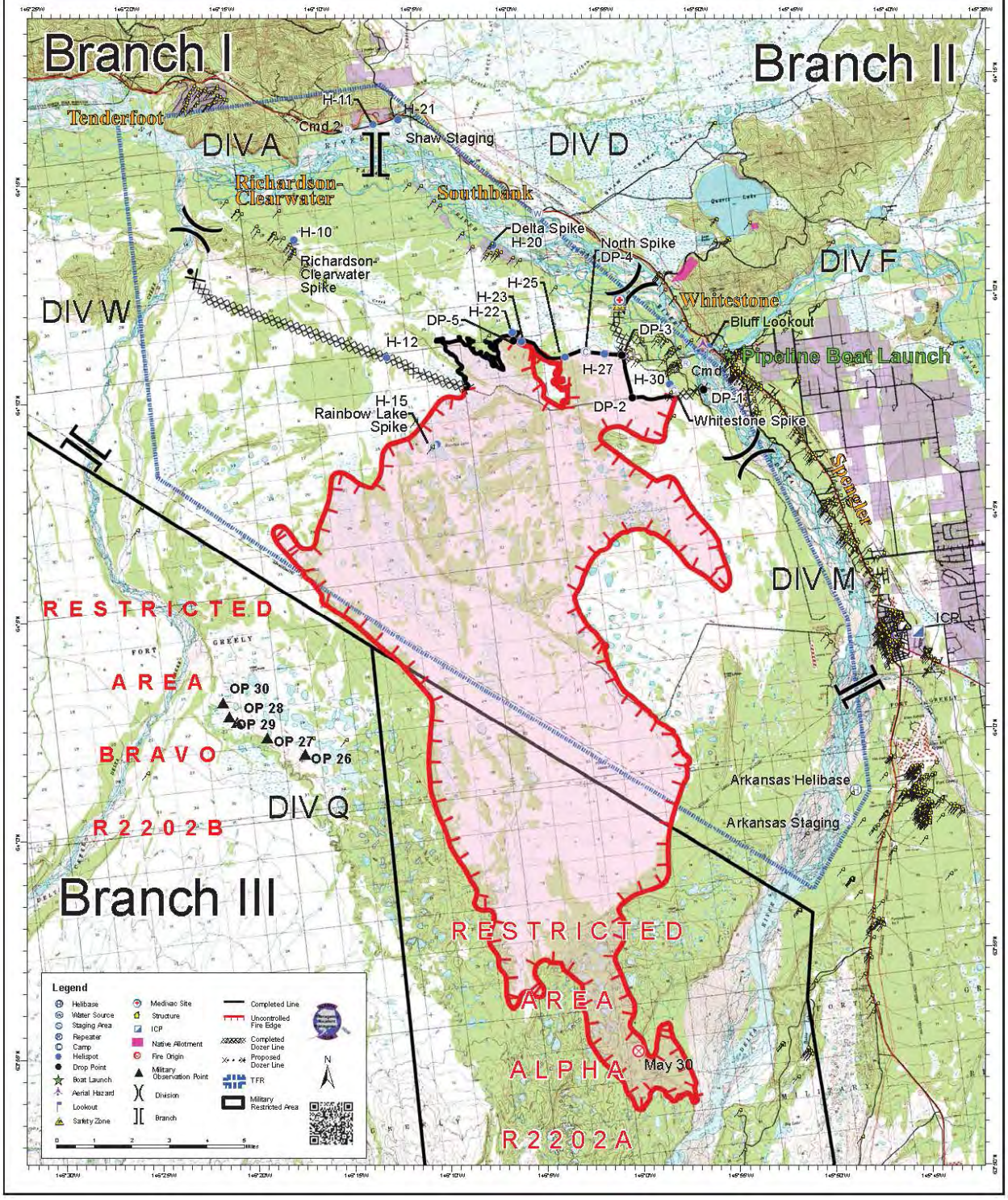
- Provide for the safety of the public and firefighters by implementing sound risk management and hazard mitigation practices.
- Provide protection for values at risk to include:
    - Inhabited structures and businesses
    - Recreational cabins, and seasonal structures
    - Military assets in the 100 Mile Creek area
- Keep fire south of the Tanana River and west of the Delta River.
- Evaluate protection of timber resources on the east side of the fire along the Delta River.
- Protect anadromous fish habitat in the Richardson-Clearwater and Delta River drainages from the effects of fire as well as from the effects of fire suppression efforts.
- Prepare and disseminate public information for media, community, and stakeholders.
- Manage cost containment strategies while meeting outlined objectives.

Mississippi Fire AK-MID-117 Fire Progression May 31 - August 22 2013



Perimeter Date	Growth	Total
2013-05-31	416	416
2013-06-02	372	789
2013-06-23	4	792
2013-07-06	223	1015
2013-07-08	126	1142
2013-07-13	31	1173
2013-08-07	1174	2346
2013-08-09	30189	32536
2013-08-10	6462	38998
2013-08-12	11848	50846
2013-08-13	4106	54952
2013-08-14	1204	56155
2013-08-16	6481	62636
2013-08-17	922	63557
2013-08-18	3623	67181
2013-08-22	106	67288

Mississippi Fire AK-MID-117 Day Shift August 24, 2013 67,288 Acres

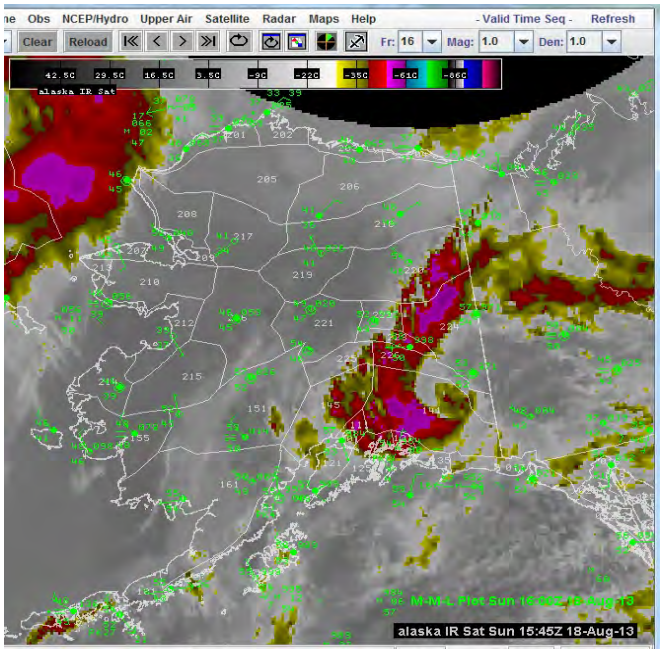


Fire Weather Summary

Strong south flow aloft, between high-pressure ridging over the Yukon, and a low over the Eastern Bering Sea, the so-called “Chinook” pattern, dominated the fire area the week previous to the Team’s arrival. This caused the majority of the fire’s acreage gains. South winds of 25-40 mph occurred on the 8th and 9th, with temperatures in the 70s F, and minimum RH’s 20-25%.

High pressure ridging to the east weakened the next several days; under lighter south flow aloft, the diurnal up/down valley circulation dominated the fire area. Light south-southwest winds therefore occurred in the mornings, and west-northwest winds in the afternoons. Smoke loading increased as a result over the fire, from it, and the upstream Caribou Creek fire, which shaded the area, keeping temperatures slightly cooler, and RH’s 5-10 % higher than would otherwise be expected. Maximum temperatures at this time were generally in the upper 60s-mid 70s F, with minimum RHs in the 40-50% range.

This pattern held until Saturday the 17th, at which time an upper-low moved into the Gulf of Alaska. In the easterly circulation around this, a disturbance moved into the eastern Interior from the Yukon.



Clearing and instability ahead of this feature (temps. warmed into the mid-70s F) allowed thunderstorms to develop the evening of the 17th, which moved over the

fire after 1900 hours. No strong winds were observed with these over the fire, and no ground strikes, but it is estimated that about .18 rain fell in the next three hours, as the weakening thunderstorms slowly moved over and dissipated in place.

Sunday the 18th was a transition day between weather systems, with the remains of the "easterly wave" over the fire area providing cool, cloudy conditions. Temperatures in the mid-60s F and minimum RHs near 50 percent occurred. On Monday the 19th, a strong low pressure trough began moving into Interior Alaska from the northwest. A band of showers ahead of this brought about .10 of rainfall to the fire in the late morning hours, but clearing afterward allowed temperatures to warm into the lower 60s F, and RH's to drop to 45-50%. On Tuesday the 20th, the cold front associated with the incoming low pressure trough hung up just to the west, near Fairbanks (which received over .60 rain), until late afternoon, at which time rainfall increased, and an estimated .40 fell over the fire area. The fire continued to receive a pattern of partly cloudy days with intermittent rain, lowered day and night temperatures, and relatively high humidity with good night time recovery.

Fire Behavior

Topography

The fire is located on alluvial deposits from the Delta River, starting at 1700' to the final fire terminus to the north at 650' elevation, with little topographic uniqueness. Several large drainages to the south exist, with upper elevations surpassing 11,000'. Frequent Chinook events occur in the fire area reflecting funneling due to these features

Fuels

Primary fuels carrying the fire were Boreal Spruce (C2), Standing Grass (O1b), and Mixed Hardwoods (M2, 25% conifer, 75% mixed wood). Fuel bed's orientation on this river plain are in a South-North alignment, reflecting the same orientation of glacial and river deposits.

Fire indices and spread

The fire started on May 30, 2013 with the duff moisture code as moderate and drought code as low. The fine fuel moisture code at this time was extreme; however initial spread was limited to about 280 acres. Over the next several weeks the fire showed minimal fire behavior and growth.

With weeks of high temperatures and low relative humidity's, fuels conditions in the fire area were ripe for a spread event. The alignment of high to extreme Fire Weather Indices (record setting drought code) and a Chinook wind event resulted in 16 miles of northward progression over a 2 day period. After the winds shifted to a normal flow, fire spread decreased significantly.

After the Alaska IMT assumed responsibility for the fire, growth was limited to westward movement in grasses and Black Spruce. The eastern edge of the fire had a large finger push from west to east during a small wind event. Further acreage gains were from firing operations securing the north and northeast perimeter. By August 19th, moderating weather with light precipitation reduced fire spread to smoldering and creeping in deeper duff layers.

Fire spread for this event is typical for the Delta area, where Chinook winds increase in probability from August 1st into November. Future fires will almost certainly be defined by similar alignment of fuel conditions, Fire Weather Indices, and Chinook winds.

Incident Commander

Mobilization

On August 8, the Alaska Type 2 (Black) Team was notified of an assignment to the Birch Creek Fire in the Upper Yukon Zone. The short team was in-briefed on Friday, August 9, 2013 and departed mid-morning for Central, Alaska. While en route on the 2½-hour drive from Central to Fairbanks, the Mississippi fire, administered by the Military Zone, was prioritized by AK MAC over Birch Creek, and the Team was reassigned to it in a Type 1 configuration. The initial challenge for the IC was to notify team members of the change in both complexity and venue, and to select additional roster members while en route from Central back to Fairbanks with limited communications options.

The AICC Overhead Desk was instrumental in facilitating "pool" selection and coordination of the Type 1 roster, however the communications issues resulted in some notification delays. The Nixle emergency notification system provided a

quick and effective instant messaging for mobilization. However, the Nixle message was pushed to all members of the IMT pool and initially caused confusion regarding who exactly was on the roster. This was remedied with a follow-up email, and calls by Section Chiefs.

Several Team members were already embedded in the suppression activity as part of the initial attack response, and in order to accelerate the mobilization, members of the Logistics Section and Operations Section were asked to report directly to the incident. The remaining team members on the original Type 2 order attended the Fairbanks in-briefing, allowing additional team members, some of whom were arriving from the L48, time to travel without delaying the transfer of command.

Delegation, WFDSS, and Incident Objectives

Overall, the Delegation provided the IMT with clear direction. Daily meetings with Administrators and stakeholders helped to keep the IMT focused on objectives. The main objective for the IMT was to protect values at risk to the north of the fire. This included the Richardson-Clearwater, South Bank, and Whitestone communities including an estimated 126 structures. A strong south Chinook wind during the initial phase of the mobilization posed the potential for spotting across the Tanana River that would threaten the communities of Delta, Big Delta, Fort Greely and the Tenderfoot subdivision as well. By keeping the fire south of the Delta and Tanana Rivers, the IMT indirectly provided protection for these communities. Several military sites west of the fire were slated for protection, and some consideration was given to protection of the timber to the east of the fire, though neither the timber nor the military sites were ever directly threatened, and contingencies developed to protect them were not implemented.

On August 13, a decision was made to take advantage of a window of opportunity in advance of another predicted Chinook event and to move from a defensive posture and begin taking direct action on the fire. Selection of a suitable anchor point and limited available resources complicated this decision to ‘seal’ the northern edge of the fire with direct and indirect attack. An existing road between the Delta River and the fire was improved with dozers and vegetation along its edge was walked down in preparation for an aerial burnout. The Division of Lands was made aware of the change in tactics as the operation was commencing, and heavy equipment was used according to DNR policy, a copy of which was made available to the Branch Director.

On August 16, a facilitated meeting was scheduled to revisit the Wildland Fire Decision Support System (WFDSS) decision and determine whether it remained valid. The IMT presented Agency Administrators with a draft strategic plan that outlined three strategic options for moving forward. A verbal agreement was reached to move forward with a strategy that combined direct and indirect line construction and aerial firing as needed to complete operations on the northern edge and develop a contingency line to the west.

During the meeting, the IMT was made aware of water bodies in the fire area that have been identified by the Alaska Department of Fish and Game (ADF&G) as important for the spawning, rearing, or migration of anadromous fishes, known as "cataloged" waters. Cataloged waters in the Mississippi Fire area include the lower two miles of the Delta River as well as the Tanana River including its side channels and clear-water tributaries. In general, any flowing waters north of the northwest-southeast trending scarp, approximated by the 1000-foot contour line, were to be considered high value fish habitat. The IMT agreed to take no additional actions that might threaten the fishery, and to mitigate any damage that may have occurred before they were aware of the area's value. A resource advisor from the local area was assigned to evaluate existing work, assist with planning ongoing work, and to develop a suppression repair plan to address any issues. The facilitated format of this meeting provided an excellent venue for bringing Agency Administrators together with the IMT and developing incident strategies that meet each of their needs.

Despite a delay in publishing of the WFDSS decision that resulted from this meeting, the IMT immediately implemented changes to its strategy and tactics based on the new information it presented. A week after the meeting the decision was still unsigned, and some Agency Administrators expressed concern that the document no longer represented the current status of the fire and that much of the work it outlined had already been completed. They requested amendments to the decision to reflect these changes. It is difficult to obtain all the signatures required to publish multi-jurisdictional WFDSS decisions and delays are common. The disjointed format of WFDSS decision documents makes them difficult to review, especially by inexperienced users. It is the position of the IMT however; that the published decision should reflect conditions as they were at the time the decisions were actually made during the facilitated review; not at the moment all electronic approvals are obtained. This topic should be discussed

further at the incident closeout, and may be deserving of discussion at the Fall Fire Review.

Safety

Staffing

The SOF2 from the Birch Creek Type 2 IMT order attended the Fairbanks inbriefing on 8/10 and managed the Safety function until the arrival of the IMT SOF1(t) on 8/12. A fully qualified SOF1 was not available from within the pool and was ordered through ROSS, arriving at the incident on the 8/14. Line safety officers (SOFR) were needed and ordered on 8/12, but these orders were UTF'd and never filled. We were able to find individuals assigned elsewhere on the fire with SOFR and SOF2 qualifications and reassigned them as Safety Officers in Divisions with less experienced crews.

Risk Management Analysis

A new Risk Management Analysis (RMA) process was implemented on this incident. The process has been used by other IMTs, and was introduced to the Alaska IMT on the 2012 Trinity Ridge Fire. The new format integrates the traditional 215a with a hazard and mitigation matrix, and is designed to encourage all IMT members to participate in the safety process. The Planning Section assisted with the production of daily large display forms for the tactics and planning meetings. Although challenging initially, buy-in from the ICs and IMT C&G members helped the Safety Team adapt quickly to the format. A risk management segment was incorporated into 1300 C&G meetings in order to allow participation from all Sections. The majority of feedback from the Team was very positive. Input was solicited from Division Supervisors as well. Tabloid sized copies of the completed RMA were distributed, and one Division did provide good suggestions.

First on Scene Protocols

An error in the Team's "First on Scene Protocols", published in the IAP, was discovered several days into the incident. Safety staff worked with the Medical and Communications Units, and outdated language was replaced with the IRPG insert for pg. 49 (the "nine step" Dutch Creek recommendations).

In addition to LCES and hazards associated with extreme fire behavior, which were addressed throughout the duration of the incident, the following specific safety concerns were addressed by the IMT:

Boat Operation

The Safety Team quickly recognized the potential hazards/risks that the heavy reliance on boat operations presented. After working with Logistics/Ground support, a system for manifesting passengers was implemented. Boats were placarded with easily visible weight and occupancy limits. E numbers were also displayed.

Driving Safety

Busy highway traffic including Military Convoys also became an immediate concern. Ground Support provided signage on the Richardson Highway to warn citizens of fire traffic. Electronic message boards were put in place in the school zone due to community concern over increased fire traffic.

ATV Operation

Numerous ATVs were operated on this incident. The Safety Team recommended mitigation measures for their use, and obtained IC approval. The following mitigations were implemented:

- All ATV operators must have approval from their Division Supervisor.
- All Operators must have a current Agency ATVO certification.
- All operators must adhere to PPE requirements outlined in the Red Book.

Team SOP's will be revised to further address ATV safety.

Medical

As of end of shift on 08/21/13, there were six reportable injury/illnesses. Two resulted in lost time. The other four included two hand cuts from improper use of Pulaskis, and one insect bite infection.

Total personnel hours worked to date are 80,895 hours.

Liaison

The Liaison Officer [LOFR] arrived at the incident on August 11 and was briefed by the Type 3 organization's Public Information Officer. After assuming incident duties, the LOFR began making contact with various cooperating and assisting agency representatives in the Delta, Big Delta and Fort Greely area.

Cooperators Meetings

Beginning on Monday August 12, daily 1100 cooperators meetings were held in the LOFR office at ICP. A teleconference number was established so interested agency representatives from Fairbanks and Anchorage could also attend. In addition to the daily meetings, an email list of local cooperators was used to provide real time updates on changing conditions such as burnout operations and community meeting schedules. IMT Command and General staff members regularly contacted the LOFR to assist in resolving issues related to use or coordination with assisting agency resources [i.e. Army helicopters, facilities, etc.]. When necessary, the LOFR made contact with the appropriate cooperator point of contact via email or direct phone call to resolve or address agency specific issues.

Evacuation Contingency Planning

The lack of formal government structure [i.e. no borough government] in the majority of the area threatened by the fire presented challenges for coordinating the development of contingency plans for evacuation. The initial mention of an evacuation plan in the incident planning process caused some confusion for the local public and military, who misinterpreted evacuation contingency planning as preparation for an imminent evacuation. The distinction was clarified at a Public Meeting and the Alaska Division of Homeland Security and Emergency Management provided a Technical Specialist to assist in coordinating various local agencies with evacuation contingency planning. After clarifying the scope of the evacuation plan objective [fire 117 specific and not generic for future use] local agencies were successful in developing a written plan that they believed met the IMT objective and the needs of the community.

Department of Defense Coordination

Another challenge was clarifying the different chains of command between various Department of Defense military branches either impacted or interested in

the fire. Inquiries regarding fire operations and impacts were received from military officials from Ft. Greely in Delta Junction, Ft. Wainwright and Eielson Air Force Base in Fairbanks, and Joint Base Elmendorf-Richardson (JBER) in Anchorage. Within the Army, Ft. Greely operations and personnel are in a separate chain of command than Ft. Wainwright lands and operations. Once these chains of command and responsibilities were clarified, the LOFR was better able to direct questions to appropriate Army points of contact and resolve issues in a timelier manner. Assisting and cooperating agency representatives expressed their appreciation that the Alaska IMT had a designated point of contact that provided 24/7 access to the Team during the incident.

Information

Significant Events

The Section's immediate mission as part of the IMT mobilization on August 10 was to reinforce the single PIO1 who had been temporarily stationed at Delta Area Forestry to deal with a deluge of requests for information from the public. Wind driven fire was running north toward the Richardson Highway, with significant numbers of structures in its path. There were huge smoke impacts on traffic on the Richardson Highway. A PIO2 from the Stuart Creek incident drove down to help out while the IMT got in place.

The IMT arrived with a Lead PIO1 and one additional PIO2. Two additional PIO2s were on order, but those orders ultimately were filled out of the Eastern GACC and they did not check in at the incident until August 13. On August 14, the Section also obtained a "loaner" PIO2 from the Joint Information Center (JIC) in Fairbanks; this individual remained attached to the incident until August 20. The PIO2 from Stuart Creek was ultimately reassigned as a PIO1 on Mississippi.

Once the fire slowed in intensity, additional public awareness developed as burnout operations west of Whitestone took place. The incident remained high on the local public's radar for several days running.

Challenges

The Information Section did not have computers/Internet access for nearly 48 hours after arrival at the ICP at Delta Fairgrounds. The Lead PIO is EFF, not a regular government employee, and thus carries no government computer upon mobilization.

Delta has a local weekly newspaper. The only voice media available in Delta Junction is a small, low-power FM radio station operated by the students at the Delta High School. There was little other media interest in the incident and thus no one to tell the story to a statewide public audience.

The LOFR, the IC, and 3 SOFs were initially collocated with Information. This was crowded and distracting for all. Safety and the IC decided early on to move to another location shared with Operations/Air Ops.

Upon mobilization, the Lead PIO1 stood up the Alaska Virtual Operations Support Team (VOST). Efforts to maintain contact with the VOST leader got lost in the shuffle. A better way to stay in touch with the VOST needs to be developed, but the Lead PIO also needs to supervise this function more closely.

Two vocal members of public became upset with the amount of water that was being scooped from Quartz Lake by the CL-215s for use in the initial stages of the fire. The Lead PIO1 conferred with ADFG (Regional Supervisor, Sport Fish Division) and had someone calculate the effects of suppression related water use. Assuming the lake was not being recharged at all by rain or springs, the operation could have reduced the water level by as much as 0.7 millimeters over the course of the incident.

Successes

Orders for PIO personnel ultimately ended up being filled from the Eastern GACC. While this often can be a problem in terms of "Western" experience, the personnel who filled these orders were not just qualified, they were experienced and a tremendous asset.

Most of the Section's focus was on community relations. The actions taken proved effective. Community acceptance of the IMT and the firefighting operations took place early on. For example, extensive burnout operations on August 16 did not cause significant alarm despise the sudden appearance of a very large convection column clearly visible from Ft. Greely north to Salcha on the Richardson Highway.

Information shared an office with the LOFR. This allowed for close coordination and communication.

Information staff arranged for both public meetings to be broadcast live over the local station, FM 95.5 KDHS-LP. This allowed residents who lived out away from town or who did not want to travel in the smoke, to listen to the meetings on their radio.

An external bulletin board was established at the local grocery store (IGA.) During periods of fire activity or significant fire operations such as burnouts, this location was staffed as an Information "kiosk." When it became extremely busy and popular, as many as three PIOs staffed the kiosk at one time.

Lessons Learned

Incident updates probably should be electronically transmitted in PDF format, as opposed to a Word document. This precludes (or at least, complicates) other recipients from making changes and then distributing an altered document.

When distributing updates via email, the "group" of recipients should be in the Bcc section, not the To section to avoid forcing recipients to scroll through a long list of names prior to reading the email content.

On future assignments, look for a local radio station willing to broadcast public meetings live. It's a great way to get the word out to even more people.

Operations

Initial Strategy: Point Protection

The initial strategy implemented by the IMT was to provide point protection for the structures along Clearwater Richardson Creek area, South Bank, Whitestone Farm community, and the surrounding area. Crews were mobilized to these areas, and structure protection equipment was deployed.

The Tenderfoot subdivision, Shaw Creek, Quartz Lake, Big Delta, Delta Junction, and Fort Greeley were identified and assessed for structure protection needs. This work was accomplished by a task force of engines and overhead. No equipment was ever deployed.

The Observation Points west of the fire were monitored by air assets. An evaluation point was identified between the fire and the values. If the fire reached this point, the Army would be notified that values that can be moved should be relocated. Aviation resources from the IMT and the US Army would be deployed to relocate and protect structures as appropriate.

The timber stands east of the fire were not immediately threatened. If the fire began to move in the direction of the timber stands, aviation assets would be deployed to limit its spread.

Initially this strategy had a high probability of success and allocated suppression effort commensurate with the values at risk, given the fire behavior, weather, and resource availability at the time. However, uncertainty about the timing of a fire-ending event, and the likelihood that another Chinook event could push the fire across the Tanana River and threaten the above-mentioned communities and the Richardson Highway led the IMT to consider alternate strategies.

Secondary Strategy: Combination of Direct and Indirect

With point protection in place to protect the values at risk south of the Tanana River closest to the perimeter, the IMT began looking for opportunities to secure the fire and reduce the time spent on the incident. A favorable weather forecast with reduced fire behavior, as well as availability of additional resources allowed consideration of a strategy that included a combination of direct and indirect line supported by burn-out.

North Flank

Indirect line on an existing road was constructed from the dozer line at Whitestone Farms west to the fire's edge. Crews then went direct on the northern-most edge of the fire, working from the end of the dozer line to the west. An additional indirect contingency dozer line was constructed from the northwest edge of the fire west along an existing winter road/dozer line to the Little Delta River. Burnout of the eastern dozer line was conducted. Burnout of the western contingency line was not needed, and did not occur. This strategy halted the fire's progression northward and secured the values at risk to the north of the fire, including the Richardson-Clearwater Creek, South Bank, and the Whitestone Farms.

West Flank

Tactics for the Military Observation Points remained the same.

East Flank

An optional component of this strategy included active protection of timber values to the south of the Whitestone Farm. This option would have required improvement of an existing logging road running south from the farm as well as some additional new dozer line to tie in to the Delta River at the southern end of

the stand. This would have required additional heavy equipment and crews to implement. Given the current weather pattern and fire behavior this operation was never initiated.

Successes

Having a full Operations staff allowed the section to protect the values at risk, go direct on the fire when given the opportunity, and develop a Strategic Risk Assessment. This assessment was helpful during the WFDSS evaluation process and gave fire managers several options to meet the objectives of the incident. At the same time, the Operations section developed Management Decision Points and a map that identified time frames required for the updating of evacuation watches and warnings, as well as time frames required to initiate structure protection.

During the incident the Tetlin Jct. Ridge fire made a run towards the Alaska Highway. Given the success of the direct line and burnout option, the IMT was able to make their Engine task force available to Tok Area on Saturday, August 17 in order to assist with the Tetlin Jct. Ridge fire for 48 hours.

Air Operations

Helibase positions were filled through resource orders and from the AFS overhead pool. The helibase was established on military land south of Delta. Two Division of Forestry exclusive use Type 2 helicopters and one CWN helicopter were assigned to the fire; other AFS helicopters were loaned to the incident as needed. Heavy air tankers, CL-215s, and military Chinooks and Blackhawk helicopters were also used. Air Attack platforms were borrowed from the overhead pool until a dedicated platform was assigned. A TFR was established and adjusted once to cover the helibase, and to include Quartz Lake, which was being used as a water source for the CL-215s. It was adjusted again to accommodate military operations on restricted areas and to eliminate the lake area so pipeline patrols could resume. Two Safecoms were generated: one for a slingload released too high, and the other for a chip light. Air operations personnel participated in statewide conference calls discussing locations and needs for aviation resources.

A high level of coordination with the U.S. Air Force was required to de-conflict airspace with “Red Flag” exercises August 13 – 23. To manage TFRs, AICC already had an Air Space Coordinator (Gary Rose) in place. With his input, Team Air Operations Branch, and USAF input (Maj. David Miller), were able to determine

air space corridors, frequencies, operational parameters, and time frames. This close coordination permitted simultaneous operations. Military rotor aircraft were available from Ft. Wainwright in order to supplement incident aircraft, and were designated for the protection of military assets including observation posts, targets, and electronic emitters to the southwest of the fire. This allowed agency aviation resources to be focused on identified values to the north of the fire.

Air Tanker Cost:	20.54 flight hours	49,910 gallons	$218,807
CL 215s:	35.57 flight hours	191,800 gallons	$231,329
Type 2 Helos:	44.8 flight hours		$100,802
Type 3 Helos:	32.2 flight hours		$85,456
Air Tactical:	48.6 flight hours		$96,614

Planning

Mobilization and Staffing

The Planning Section mobilization for the Mississippi fire was relatively smooth despite a couple of issues associated with the IMT Pool System, and with the mid-mobilization change-up from a Short Type 2 IMT for Birch Creek to a Long Type 1 IMT for Mississippi.

Two rostered GISS positions went unfilled in Alaska and were sent to the Lower-48 while the Alaskans that the Plans Chief intended to fill those slots ended up filling two additional orders not placed by the Team. This resulted in the unintentional filling of three GISS orders. The fourth order was caught and cancelled before a fill, and incident complexity ended up warranting a three GISS shop.

All Planning Section Units were fully staffed. The Section carried eight trainees, six of whom were Alaskans. The incident provided an excellent training environment.

Resource Advisors

Suppression Repair was primarily coordinated by Mike Reggear from Delta Area Forestry. Mike participated in the strategic meeting on August 16 where repair needs were initially identified and thereafter served as the IMT's point of contact for repair concerns. Mike spent several days in the field collecting repair data and

coordinated with Agency Administrators and subject matter experts to develop a suppression repair plan for the incident.

A resource advisor from the Military Zone was also available for questions related to military managed land.

Situation Unit

The Situation Unit was comprised of a SITL, FBAN, and IMET. A GISS, and a GISS (t) arrived the following day, as well as a SITL(t) that moved over from Resources. A second fully qualified GISS arrived on August 13. A PSC2 ordered for the incident prior to the team mobilization arrived on August 13. He was initially used as a field observer and eventually took over the Situation Unit.

The rapid development and ongoing improvement of Situation Unit products can be attributed to assistance from the Upper Yukon/Tanana Zone (provided initial remote GIS support), the Operations Section, the Unit's Field Observer, and Resource Advisors from the military and Delta Area Forestry. Some of these had local knowledge and access to local documents and spatial data used for resource management and previous fires (especially Carla Lake). AICC Predictive Services staff and the NWS provided products after the FBAN and IMET demobed on August 21. The AICC ArcIMS and Predictive Services website provided one-stop shopping for links to weather forecasts, RAWS data, fire indices, and spatial data that proved invaluable to Situation Unit personnel.

The original fire perimeter (8/11) was acquired from the UYT GIS shop. Fire perimeters were updated throughout the incident using aerial GPS missions and NIROPS IR data. Helibase personnel assisted in perimeter mapping missions.

Unit Successes

The GIS shop was staffed with three GIS Specialists. A lead GISS was designated as the editor/data manager, while the other two mainly produced maps, and managed structure and known sites data. The GIS shop was able to assist Tok Area with map production for the Tetlin Jct. Ridge upon request.

It was also beneficial to have an IMET and FBAN in place, especially during the critical incident timeframes.

A Quick Response Code (QR) was attached to maps and IAPs to provide a link to geo-referenced PDF maps to personnel with mobile devices. The technology was very useful for making digital products available to a wider audience.

There were limited Known Sites Data for the areas of concern when the IMT arrived. Structure protection data was collected by operations personnel and the Field Observer and provided to the Situation Unit; including GPS locations, hand drawn maps and some additional site data. An index and 42 inset maps were created and provided to Military Zone and Delta Area. Spatial data was provided to the Northern Region GIS shop for inclusion in the statewide Known Sites Database.

Infrared data was provided to the incident through a DoD satellite and processed through NIROPS. Although the satellite IR was sometimes limited by cloud cover and some occasions unavailable due to AK MAC prioritization, it proved to be a valuable asset when available.

Demobilization Unit

The Demobilization Plan for the Alaska IMT was prepared on August 11 and signed by the team on August 15, 2013. All releases of resources and equipment were processed through UYT Expanded Dispatch at Alaska Fire Service. All "Actual Demob" forms, created in I-Suite were emailed regularly to expanded dispatch in batches, and copies of the 221s (plus all air travel) were kept for the documentation box. Flight requests were emailed to Expanded Dispatch and flight itineraries were then emailed back to the Demob Unit Leader at the ICP.

Successes

Expanded Dispatch was very helpful and cooperative in making this an easily handled incident. There was excellent communication between the two groups.

Challenges

The travel agency's after hours desk would only process emergency demobs on the weekend, leading to some delays in demobing excess personnel. This problem was not resolved. All flight requests were processed on weekdays.

Training Specialist

Ten trainees were rostered with the IMT. Additional trainees were ordered or reassigned at the fire.

Number of Trainees by section and agency:

Agency	Command	Ops	Aviation	Plans	Logistics	Finance	Total
USFS	1	0	2	0	0	0	3
BLM	0	17	0	1	4	0	22
BIA	0	0	0	0	0	0	0
NPS	1	2	1	2	0	0	6
FWS	0	3	0	3	0	0	6
STATE	5	8	5	3	4	0	25
TOTAL	7	30	8	9	8	0	62

NUMBER OF TRAINEES WITH THE FOLLOWING RATINGS:

__**26**_ 1. The individual has successfully performed all tasks for the position and should be considered for certification.

__**33**_ 2. Opportunities were not available for all tasks (or all uncompleted tasks) to be performed and evaluated on this assignment. An additional assignment is needed to complete the evaluation.

__**0**__ 3. The trainee did not complete certain tasks for this position in a satisfactory manner and additional training, guidance, or experience is recommended.

__**0**__ 4. The individual is severely deficient in the performance of tasks for the position and additional training, guidance, or experience is recommended prior to another training assignment.

__**3**__ 5. Other:____Unknown_____

Remarks:_____

Logistics

ICP was established at the Deltana fairgrounds in Delta Junction. The fairgrounds were an excellent location for ICP. There were several buildings and a large area of land available for use as well as electricity on site. This facility would make an excellent location for future ICPs.

The main supply unit was established on the Arkansas Range at Fort Greely Army Base. There was adequate covered storage with potential for expansion and telephone and electricity onsite. Range control personnel made daily contact with the supply unit to ensure their needs were being met.

Successes

ICP was fully operational by the end of the first shift due to the fact that electricity, tables and chairs were available in many of the fairgrounds buildings.

Supply's proximity to the helibase made deliveries for sling loads easy to manage.

Ordering had a great working relationship with the Buying Team and Expanded Dispatch. Everyone had a very positive attitude. Open lines of communication between Ordering, Expanded, and the Buying Team made the Supply Unit effective in accomplishing their goals.

Using an EMT from a crew as a line EMT under the Medical Unit met immediate staffing needs and increased medical coverage for crews that were spiked out.

Acquisition of UTVs for line EMTs gave them the mobility that they needed to interact with the crews on the line and address any medical issues in a timely fashion. This reduced the need for lengthy transports to camp for minor issues that could be effectively addressed on the line, and increased productivity of crews based in spike camps.

A local catering service, the Chocolate Gypsy, was used to feed overhead and crews at ICP. Whitestone Farm's fed crews and overhead at the large Whitestone Spike camp. Both caterers did an outstanding job providing healthy, nourishing meals to overhead and crews. Their use is recommended on future assignments.

The mobile shower service, Cameron Equipment, was located at ICP and enabled the IMT to provide showers for crews prior to their demob.

The use of a mobile dual-fuel truck (diesel and unleaded) allowed for the efficient delivery of fuel for boats, dozers, and other vehicles. Refilling of fuel drums on-site eliminated the need for transporting drums from Fairbanks.

The IMT used the State's RapidComm mobile communications unit. This allowed for instant Internet connectivity, telephone lines, and radio patching. It allowed the Communications Unit to deploy two NIFC repeaters and patch them together with the normally non-compatible federal repeater. It was setup instantly and provided connectivity and phones for the IMT by the morning following travel.

Challenges:

Coordinating the logistics functions among several large spike camps, staging areas and ICP was a difficult task, made successful by assigning RCDMs, BCMGs and EQPMs to these established areas. These personnel were instrumental in coordinating the movement of supplies and personnel, and provided for field equipment accountability and repair.

Supply deliveries early in the incident were delayed due to lack of a vehicle and driver from AFS Transportation. Mechanical problems with several of the rental trucks also caused delivery delays. The turnaround time for delivering supplies and equipment was improved thanks to extra drivers and vehicles provided by the warehouse, Buying Team, and those assigned to the incident. Once the buying team was in place and an ordering cycle for supplies and local purchase items was established, all items were delivered in a timely manner.

Delayed communication from the MAC Group and/or AICC on crew movement and assignments caused some confusion between Expanded and Ordering when the incident was trying to cancel and/or fill crew orders. All was resolved.

Due to the high water levels in the Delta River, the transport of the D9 dozers from the fireline back to Delta has been delayed. The dozers have been released from the incident and will be moved at the contractor's expense after the river waters drop and a crossing permit is obtained.

Finance

The Finance Section managed the Mississippi Fire and all of its resources within one functional database. All known resources were accurately tracked and their cost information reported daily to the Incident Agency.

Interaction with the local unit was facilitated by the presence of the Incident Business Advisor who arrived within a couple days of the Alaska IMT being assigned to the fire. The initial interaction was between the Finance Chief and Deputy, and the Agency Administrator, Aleshia Purcell.

The Agency sent out a local resource to work with the EQTR Judy Gau to sign up as much equipment as possible prior to the IMT arrival; however, much of the Initial Attack equipment was already out on the line, so it was not possible to gather the information initially. The Finance and Logistics sections worked continually throughout the assignment to collect the resource information and get agreements in place prior to their demobilization.

The Southwest Buying Team, with BYUT Leader Mark Hosteller, took the lead of managing the Land Use Agreements used by the Incident. The LUAs included:

- Deltana Fair Grounds – Used as ICP
- Whitestone Farms – Used as the main base camp, and included a variety of items which the Whitestone Farms personnel provided to support the incident objectives.
- Bill Allen and Cheryl Schikora – Spike camp, supply staging, and landing strip for H-10 Helispot. CLOSED: 8/21/13
- Richard Gardner – Used for a spike camp and supply depot. CLOSED: 8/21/13

There was a request by local resident, Tracy Morphis to be paid for the use of her property along the Tanana River. This was used as a “coyote” spike camp initially by the Chena IHC and then the White Mountain T2IA for 2 nights each. This was during the time that they were doing structure protection on her cabin and property. Upon further consideration, Ms. Morphis decided that she and her husband did not want to claim compensation for the protection of their property. An envelope was created and placed with the other LUAs for documentation purposes.

The IMT understood, after speaking to the BUYT Leader on 8/14 that the LUA for the Whitestone Farms property, used as a Base/Spike Camp, was being worked on and finalized by the BUYT. However, on 8/22 the IMT received a call asking for a copy of the LUA (this was five days before the IMT was scheduled to demobilize). An initial start to the agreement was done and presented to the BUYT Lead Hostetler to perform the “pre-inspection” when he went to Whitestone Farms to work on facility agreements (connex box, mobile building, generators, etc.).

However, the Whitestone LUA must have been misplaced in the processing of other documents.

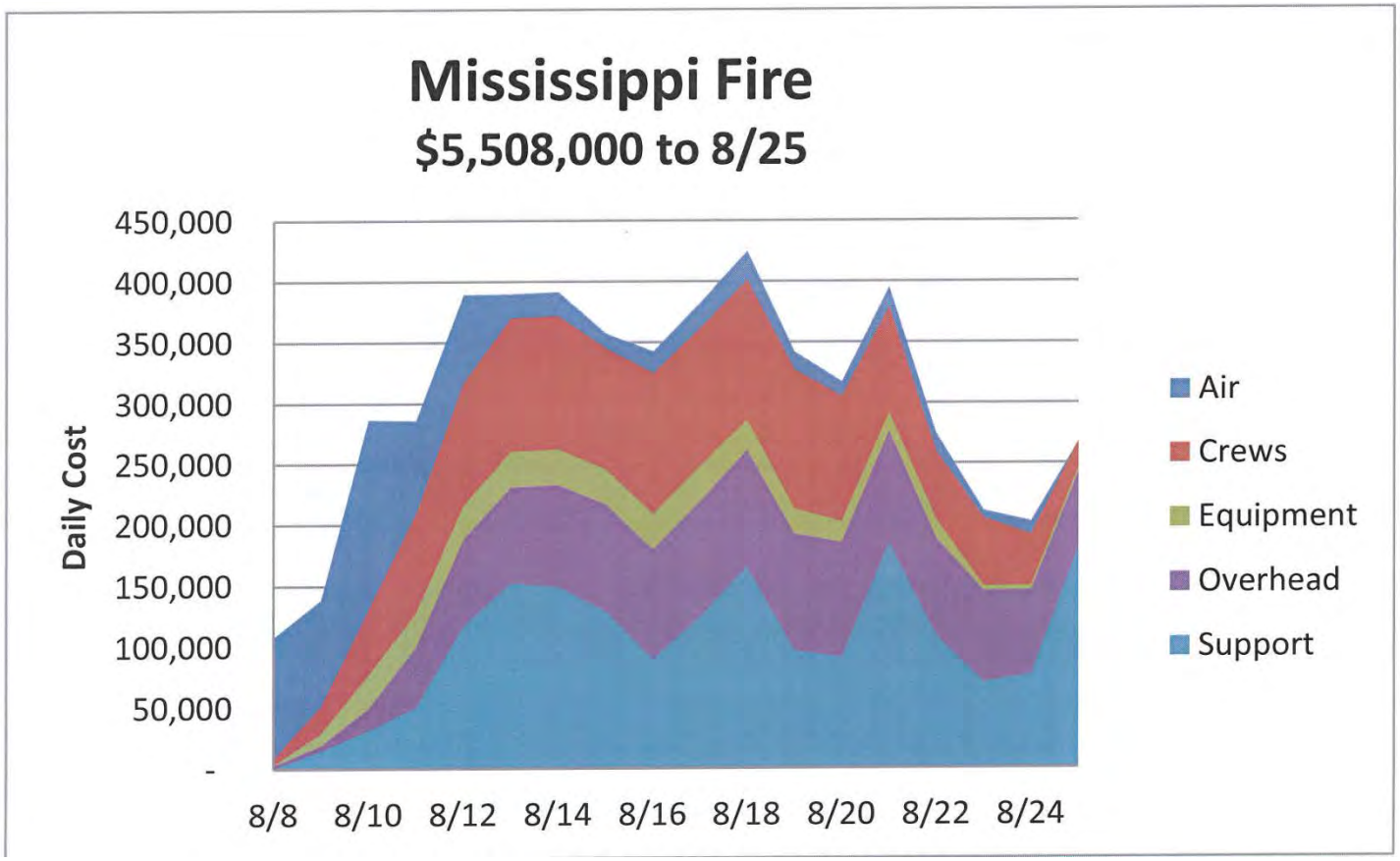
The BUYT processed the majority of the Service and Supply orders for the IMT. All documentation for these types of payments should be available within the Buying Team's documentation package for the Mississippi Fire.

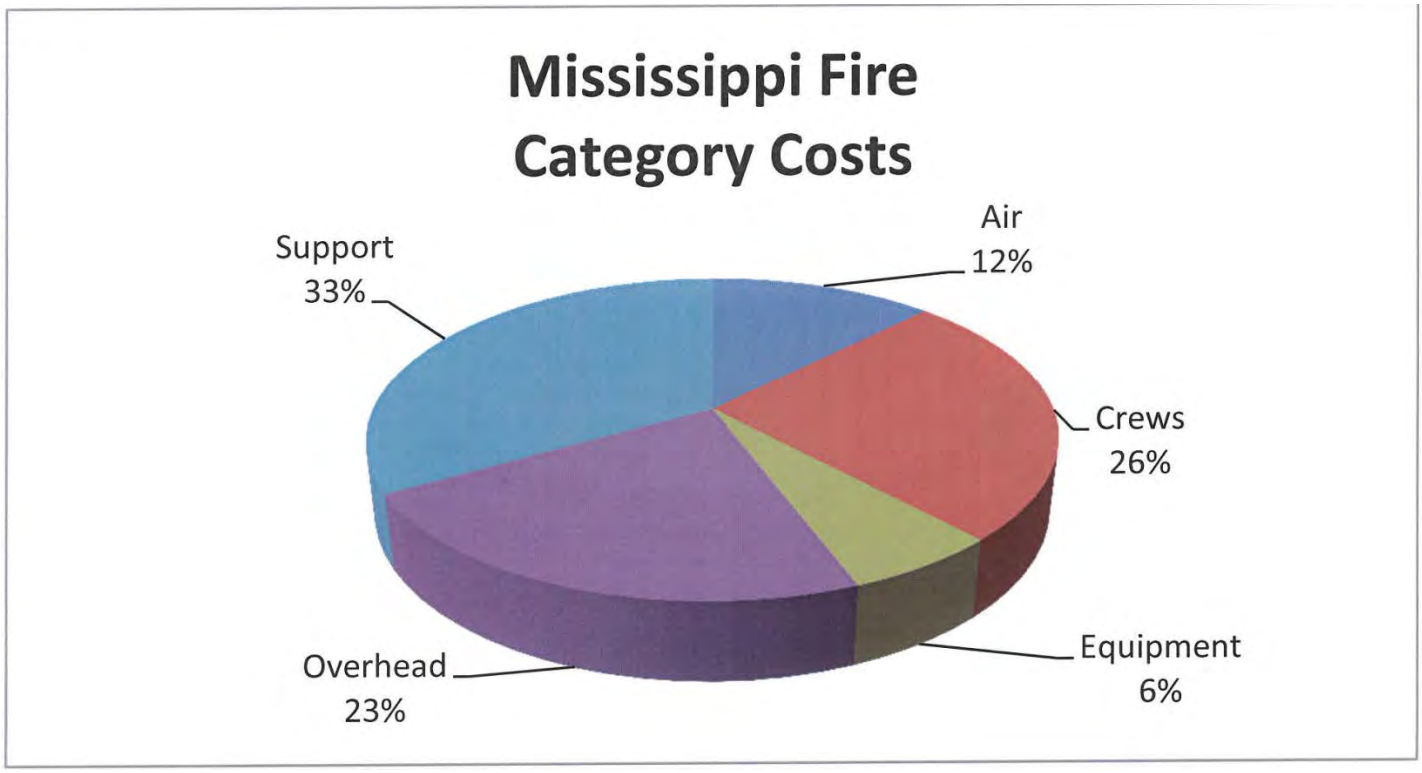
Two boats used during initial attack were released prior to the IMT taking over the fire. These were owned by Ted Morphis and John Nusbaumer. Both boat operators were paid directly from Aleshia Purcell at the Alaska Fire Service. No invoices were captured or maintained within the Finance Final Fire Package.

During initial attack, there were three dozers hired and driven across the river to Whitestone Farms. They were all demobed on 8/22; however the equipment was stuck on the Whitestone Farms side of the river due to high water levels. As a result, it was not possible to get them across the river at the time the IMT demobilized. A couple options were discussed with the Logistics and Operations sections (i.e., Army Corp of Engineers building a temporary bridge, Chinook Helicopter to lift them each over the river, waiting out the higher water, etc.). After speaking to the representatives from Green and Sons and also Whitestone Farms, they do not intend to charge the fire for the time that the dozer is located across the river. They will "wait" until the river goes down and then drive the equipment across.

There were only six injury claims for the incident; two involving lost time; with a total of 80,895 total man-hours (as of 8/25/13). To date there have been 9 claims for loss or damage turned in. Additional claims may be submitted after the team demobilizes.

The total cost of the incident as of 8/25/2013 is $5,508,000.


Mississippi Fire
$5,508,000 to 8/25
Daily Cost
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
-
8/8
8/10
8/12
8/14
8/16
8/18
8/20
8/22
8/24
Air
Crews
Equipment
Overhead
Support


Mississippi Fire
Category Costs
Support
33%
Air
12%
Crews
26%
Equipment
6%
Overhead
23%

APPENDIX H

Hundred Mile Fire Incident Summary

100 Mile Creek Fire

AK-MID-000100

Photo Courtesy: Donna Thompson

June 10 – June 20, 2014

Alaska Type 1 IMT

Tony Doty, Incident Commander

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Key Decisions

The following key decisions were identified in the IMT In-briefing and implemented prior to mobilization of the IMT:

- The Alaska Type 1 IMT was ordered when complexity increased.
- The decision was made to go direct when weather conditions changed.
- The decision was made to use crews to hold line instead of heavy equipment.

Daily updates to the Military Zone FMO created a discussion forum on IMT progress toward meeting and implementing the direction and objectives in the Delegation of Authority and WFDSS. The IMT provided a Transition Plan to relay these key decisions to the Type 3 organization with whom they transitioned. Other key decisions were documented and implemented as part of the June 14 WFDSS Decision. Specific key decisions related to the objectives they addressed are documented in bullets below.

Incident Objectives

Throughout most of the IMT's tenure on the fire, the incident objectives were to:

1. **Implement a sound risk management process that maintains the highest regard for firefighter and public safety.**
    - The IMT deployed no ground resources on military lands due to concerns about UXO.
    - A DoD Shadow Unmanned Aerial System (UAS) was deployed to monitor the Military portion of the fire in order to reduce risk and costs.
    - The southern portion of the fire on military lands was allowed to burn into natural barriers in order to avoid unnecessary exposure of firefighters to risk.
    - Air Operations coordinated with the Air Force in order to deconflict Red Flag Exercise and Incident airspaces.
2. **Protect values at risk, including infrastructure at military observation points, structures along the Richardson Clearwater River, permitted cabins, Southbank residences and timber resources on State lands.**
    - Burnouts around the military observation points were completed prior to the IMT's arrival at the incident. The IMT continued to monitor the sites aerially with the assistance of the Shadow UAV.
    - Assessment resources from the 100 Mile Fire did extensive mapping, inventory, and protection layout for authorized cabins on State lands and structures in the Richardson Clearwater and South Bank areas. This information has been made available to the Military Zone of AFS and Delta Area Forestry in electronic format.

- Direct tactics on the northern edge of the fire limited damage to timber resources identified by the Alaska Division of Forestry.
- Structure assessment data and Known Sites data for structures in the fire area was collected, updated, and provided to AFS and Delta Area.

3. **Minimize fire spread to the north on State lands and contain the fire east of Delta Creek and west of the 2013 Mississippi burn.**
    - Hand crews, supported by aerial resources, constructed and secured direct saw line east from Delta Creek along the northern edge of the fire, and tied in to the Mississippi burn on the west.
    - NIROPS IR and aggressive mop-up standards were used to reduce the potential for a Chinook event later in the season to threaten the northern containment line.
4. **Protect anadromous fish habitat in the Richardson Clearwater and Delta River drainages from the effects of fire as well as from the effects of fire suppression efforts.**
    - Although the use of dozers was discussed at the in-brief, the IMT was able to meet objectives with hand-line and saw-line. There was no line constructed nearer than 2.5 miles to waters identified in the anadromous catalog.
    - The winter road, which had been widened with 'walk-down' during the 2013 Mississippi fire, required no further improvement for use as a contingency line.
    - Contingency structure protection pump sites were identified in the Richardson-Clearwater but were never used. All pump sites were prepared and equipped in accordance with the Statewide Fish Habitat Permit FH14-SW-0002.
    - The IMT ordered a Resource Advisor to validate the Incident Suppression Repair Plan.
5. **Effectively communicate timely and accurate fire information to residents, media, and stakeholders.**
    - Community meetings were held and information boards were established in Delta Junction.
    - Inciweb and the IMT Facebook page were maintained by the incident.
    - The IMT Liaison Officer initiated a meeting with the Delta City Council and maintained key contacts with military personnel at Fort Greely.
    - The IMT coordinated with the Alaska Department of Fish and Game regarding bear issues.
6. **Work with agency administrators to integrate cost management strategies into strategic and tactical decisions consistent with risk management, values, and social factors.**
    - The southern portion of the fire on military lands was allowed to burn into natural barriers in order to avoid unnecessary exposure of firefighters to risk, as well as to reduce costs.
    - Direct handline tactics on the northern edge of the fire, instead of the use of heavy equipment, lowered suppression costs and greatly reduced the need for costly suppression repair.

Incident Overview

The 100 Mile Creek Fire was declared on May 13 at 15:30 when a one acre spot from the Oklahoma Prescribed Fire became established north of 100 Mile Creek in the Donnelly Training Area, near Delta Junction. A Type 3 organization was established to manage the fire. Over the next few weeks, personnel worked to hold the fire on military lands and protect military assets in its path. On June 4th, due to the discovery of UXO, all resources disengaged from direct line construction on military lands and began to scout fireline north of the Military/State Lands boundary. By June 6th, crews had established spike camps and initiated construction of indirect line north of the fire on State lands beyond the threat of UXO. This line would extend from Delta Creek on the west to the 2013 Mississippi fire on the east. Military personnel also arrived that day in preparation of UAS operations in support of the fire.

On June 7th, the fire was pushed north by low RH values coupled with south winds, causing it to escape the military restricted area and burn onto State Full Fire Management Option lands and threaten numerous values. The fire burned to the indirect line and slopped over in several places where it was held with the help of retardant tankers, CL-215s, and helicopters. SMJs were inserted into the Richardson-Clearwater area to begin structure assessment. By June 8th, the fire had grown to 19,543 acres with 290 personnel assigned. The complexity surpassed the capacity of a Type 3 organization and the Alaska Type 1 IMT was ordered. The following day, most of the IMT members gathered in Fairbanks for the June 10th 0800 in-briefing.

The fire was 5% contained when the Alaska Type 1 Incident Management Team assumed command of the fire on June 11th. The team set up ICP at the Delta Fairgrounds. SMJs were in the process of assessing and prepping structures. Crews supported by air resources took advantage of moderated weather and fire behavior to begin constructing direct fireline. Lack of access into military restriction areas (impact zones) hindered operations on the southern portion of the fire. Structures in the Richardson-Clearwater area and military assets in the 100 Mile Creek area remained at risk. Creeping and occasional torching were observed, especially in the northeast and southeast corners of the fire. Two jet-loads of crews from the L48 had been ordered, and one arrived that day and was helicoptered into the fire area. A public meeting was held at 1800 in Delta.

On June 12th, the second jet-load of crews arrived from the L48 and was inserted. At that time, a total of 623 resources were engaged in the management of this fire. The fire had grown to 21,046 acres and the northern portion of the fire receiving full suppression was approximately 50% contained. Low relative humidity and gusty winds tested areas of completed line. Crews supported by helicopters and CL-215s continued to make good progress securing line and began mop-up activities. The OP sites on the south end of the fire were monitored by air in coordination with the military. Structure assessment expanded to include homes in South Bank along the Tanana River.

Between June 13th and June 15th, the fire progressed in areas of black spruce, mostly on the southeast end of the fire. Smoldering was observed throughout the interior in hardwood stands. Weather was generally intermittently cloudy skies with gusty winds, isolated showers, and a few thunderstorms. On June 13th, 0.1 to 0.2 inches of precipitation helped to moderate fire behavior. Crews supported by

helicopters continued to secure line, burn out pockets of fuel, and mop-up adjacent fuels. The Clearwater Structure group reported additional values at risk discovered during assessments. NIROPS IR was acquired for the entire perimeter, including the military restricted lands. This information, combined with a GPS mapping mission, showed the fire had grown to 21,846 acres. Two low-value military assets were reported as destroyed and another public meeting was held in Delta. As of June 15th, 72% of the State portion of the fire was reported as contained.

On June 16th, a low pressure system in the Gulf of Alaska brought winds from the south, gusting to 40 mph, over the fire. These winds were anticipated and caused a Red Flag Warning to be issued by the National Weather Service earlier in the day. Along with the winds came a severe drop in relative humidity. Between the early morning hours when the wind began picking up and late afternoon, humidity dropped 60 percentage points, finally reaching around 23%. This weather event was similar to the weather that moved the fire rapidly north on Saturday, June 7th, but this time crews and CL-215s were able to hold the fire at established control lines. After several loads, the aircraft were diverted to help control a new lightning fire on Chena Hot Springs Road. The only place that the fire spread was on the southeast flank. Growth in this area is limited by the fire scar from the 2013 Mississippi Fire and posed no threat to values. The windy day proved to be a good "test" for suppression efforts. It also exposed heat in several interior islands of fuel that were subsequently targeted for mop-up by the IMT.

On June 16 100% containment of the portion of the fire on State lands was achieved. With little additional opportunities available for direct action due to restrictions on military lands, and with additional cool and rainy weather in the forecast, demobilization of resources began in earnest. Structure protection was removed from all values. The first jet-load of L48 crews was released. A READ was assigned from Tok Area Forestry and began work on the State lands Suppression Repair Plan. The fire encompassed 23,270 acres with 403 personnel assigned.

On June 17th, smoldering fire behavior picked up around 1600 due to strong pre-frontal winds. Group torching was observed in unburned spruce islands, and increased activity was indicated by smoke visible on the southeast end of the fire. Crews continued to strengthen and mop-up the northern line. The second jet-load of L48 crews and additional overhead were released. The Resource Advisor continued with his fireline repair assessment. The portion of the fire on military lands continued to be monitored from the air. An IR mapping report did not show any increase in fire size; all identified heat sources were interior. A member of the Alaska Management Team Search and Rescue shadowed the IMT.

From June 18th – 19th, more than 3.0 inches of rain was recorded over the fire area, significantly decreasing fire behavior. Additional crews were demobilized and the Type 1 IMT prepared to transition to a Type 3 organization. The suppression repair plan for work on State Lands was completed. One crew was left in place to strengthen the north line and begin suppression repair work. As of June 19th, the fire had burned 23,270 acres; 16,407 on military, and 6,863 on State lands. The IMT transferred command to a Type 3 Organization on June 20th. Full containment (100%) was achieved on the portion of the fire on State lands; however, containment of the military portion is not expected until a season-ending event

occurs. There remains a long-range low probability of threat to the values on State lands north of the fire.

Personnel from multiple agencies, Tok Area Forestry, US Air Force, US Army, Department of Defense, and National Weather Service assisted with fire management efforts. Infrared detection by a DOD satellite supplemented aerial mapping and helped to identify hotspots and areas of heat on the fire. The US Army Taskforce Wolverine, Shadow UAS Command Center originally set up with the Type 3 Organization at Arkansas Helibase. They re-located to the Alaska Type 1 IMT ICP on June 13th. Their Unmanned Aerial System (UAS) was used to provide heat source information and images of the OP sites in the Military Restricted Area.

The US Air Force initiated its "Red Flag" Exercise within the R2202 Restricted Area on Monday, June 16th. Aircraft associated with the exercise operated in the area throughout the remainder of the IMT's tenure. Deconfliction of incident and exercise airspace was achieved through the use of an airspace coordinator, and there were minimal impacts to incident aviation operations.

Fire Weather

Summary

Dynamic weather dominated the weather pattern the week before deployment. The majority of the fire's acreage gains occurred May 31st and June 7th. The conditions of May 31st were that of a strong Chinook wind, bringing strong winds and very low relative humidity to the area. A series of weather systems moved over the area the first several days of June, bringing occasional light rain to the area and occasionally gusty winds. June 7th saw low relative humidity values into the upper 20s to lower 30s which combined with strong southeast winds to result in another day of substantial fire growth.

The dynamic weather pattern continued as the Alaska Type 1 IMT arrived at the ICP Tuesday afternoon June 10th. An upper level low had moved into the Gulf of Alaska, and southeasterly to easterly flow brought moisture and lift from the Yukon west into the area. A wetting rain fell Wednesday June 11th with most of the incident receiving around 0.25" of rain. West winds developed and peaked at 11 mph with gusts to 20 mph at the Oklahoma RAWS. Scattered showers were common in the morning and in the afternoon, with one shower in the afternoon over the fire producing a cool, weak outflow toward the ICP.

A dry and calm day Thursday the 12th gave way to increasing winds Thursday night into Friday the 13th, with strong winds out of Isabel Pass to 35 mph. Lighter winds with gusts to 20 mph over the fire itself brought humidity values down into the 20s by early afternoon. Increasing cloud cover and somewhat unexpected shower development with easterly flow resulted in rainfall accumulations to 0.02" on the northeast side of the fire and 0.11" on the south side.

Another wave moved into the area Saturday morning the 14th and brought another round of light showers. High pressure ridging moved south toward the fire area and resulted in abrupt clearing from north to south during the mid-morning hours. By 1300 Saturday cumulus clouds were already

developing along the thermal trough just to the north of Big Delta, and thunderstorms had developed by 1500 and were moving south and west across the area. Most of the area received a decent wetting rain nearing 0.20 to 0.25". However, the portable RAWS on the northeast side of the fire only received 0.01" in the afternoon with the showers and thunderstorms.

Sunday the 15th began warm and sunny, but cumulus clouds were already forming into light showers before midday. A mid-level cap, or warm stable layer in the mid-levels of the atmosphere, prevented showers from developing into thunderstorms. The precipitation that resulted brought no more than a trace across the area.

Monday the 16th brought the most critical fire weather conditions of the deployment. Red Flag conditions developed around noon as strong south winds out of Isabel Pass and southeasterly gap winds out of the Tanana Valley combined to bring gusts generally around 25 mph to the fire area, with higher gusts along the Delta River and near the Helibase to 45 mph. Winds diminished to 20 mph in gusts during the mid- to late evening hours, but humidity values remained below 30 percent through midnight before recovering towards the morning of Tuesday the 17th to around 60 percent.

Tuesday the 18th was another critical weather day, but not as severe as Monday, with winds gusting from the east and southeast as high as 20 to 25 mph, but with minimum humidity values bottoming out near 30 percent. More severe conditions did occur closer to Isabel Pass, where gusts were 30 to 40 mph. As the afternoon progressed, clouds began to thicken from the south and east as a strong upper level low formed over SE Alaska near the Alcan border and began moving toward the area. Light rain developed around 1900 and continued through the evening. The upper level low began to stall just to the north and east of the fire Tuesday night into Wednesday the 18th.

Moderate rain developed in the early morning hours Wednesday, falling at rates of 0.1"/ hr for several hours. This moderate rain lessened somewhat late in the morning but continued steady into the afternoon hours. 24-hr rainfall totals as of 1900 on the 18th had reached 1.43 inches at AK Portable #3 on the north side of the fire, 1.30 inches at Oklahoma, 1.74 Delta Junction/Fort Greely Airport and just under 2 inches at ICP.

Rainfall is expected to continue steadily through Thursday the 19th with little change in intensity, ending overnight Thursday night. Friday the 20th has the potential to be warmer and relatively dry, with scattered showers. More showers are expected Saturday the 21st into Sunday the 22nd, with winds increasing from the south Saturday night through Sunday night and becoming gusty at times.

Fire Behavior

Summary

Topography

The fire is located on alluvial deposits from the Delta River and Delta Creek. In general the fire slopes gently to the north, starting at 1500' at the south end down to the low spot at the northeast corner at 1050' elevation. There is a hill that protrudes 200-250 feet above the flats at the north end of the fire. Many pothole lakes at the south end of the fire and a string of pothole lakes near the north end of the fire break up the vegetation. The eastern Alaska Range to the South has peaks in the 12-13,000 foot range with Mt. Hayes being the tallest at 13,832 feet. Isabel Pass is a feature that frequently funnels Chinook winds from the south into the Delta River Drainage

Fuels

Primary fuels carrying the fire were black and white spruce (C2), tundra grass (O1b), and mixed hardwoods (M2, 50% conifer, 50% hardwood). Spruce along Delta Creek and the Delta River are caked with silt and it appears to have a fire retardant effect, making the thresholds for burning much higher than spruce away from the river corridors.

North of the fire is the primary area of concern as the majority of the fuels are the black spruce that exhibit the most extreme fire behavior in Alaska. To the east of the fire, most of the fuels were consumed in the 2013 Mississippi fire and are not in a burnable state until vegetation returns. To the southeast of the fire, the Oklahoma range prescribed fire removed vegetation and created a large fuelbreak for the year. To the southwest of the fire, the fuels are mostly brush, hardwoods, and tundra broken up by the pothole lakes with a few small stands of spruce mostly limited to the riparian edge along water bodies. To the west, the fire is bordered by Delta Creek with lingering stringers of silt laden spruce between the fire and Delta Creek.

Fire Weather Indices and Spread

The incident started on May 13, 2014 when spot fires from the Oklahoma Range prescribed fire were converted to a wildfire. The spot fires did not grow much until May 31 when wind and dry conditions caused the fire to move over the Op road where firefighters had attempted to slow spread by conducting a burnout earlier. An additional large acreage growth occurred on June 7 on a dry, but not particularly windy, day after firefighters were forced to forego direct attack efforts due to the presence of unexploded ordnance (UXO). The table below highlights index values and 1400 weather observations for the Oklahoma (OKL) remote weather station (RAWS) on days when large spread events that were not planned burnouts occurred.

Date	Air temperature F	Relative Humidity %	Wind Speed MPH	Precipitation inches	Fine Fuel Moisture Code (FFMC)	Duff Moisture Code (DMC)	Drought Code (DC)	Initial Spread Index (ISI)	Buildup Index (BUI)	Fire Weather Index (FWI)
06-19	53	80	2	1.17	17.3	4.5	221.7	0	8.5	0
06-18	46	94	5	1.15	18.9	9.5	304.3	0	17.6	0
06-17	65	33	8	0	89.8	25.8	408.7	7.9	44.6	17.8
06-16	70	27	12	0	87.9	22.4	402	8.4	39.3	17.4
06-15	67	45	9	0.26	67	18.1	394.8	1.2	32.5	2.3
06-14	66	44	13	0.19	73.6	26.6	410.4	2.1	45.7	5.8
06-13	65	30	9	0	88.8	36.1	418.6	7.5	59.4	19.8
06-12	63	27	6	0	80.7	32.5	411.9	2	54.3	6.3
06-11	52	54	5	0.25	53.3	29	405.4	0.4	49.2	0.6
06-10	60	46	5	0	78.6	45.7	422	1.5	71.9	5.8
06-09	56	69	2	0.12	61.8	43.3	415.8	0.5	68.7	1.5
06-08	68	42	8	0	91.2	53.7	417	9.7	81.2	27.9
06-07	73	17	8	0	93.9	50.4	410	14.2	77.1	35
06-06	68	28	6	0	89.4	45.2	402.5	6.4	70.6	19.3
06-05	62	50	12	0	81	41.2	395.5	3.4	65.4	11.3
06-04	61	38	5	0	64.4	38.9	389.1	0.8	62.2	2.5
06-03	47	81	3	0.48	26.6	36.1	382.8	0	58.4	0
06-02	41	91	10	0.1	57.8	72.3	425.4	0.8	101.4	3.9
06-01	51	37	3	0	91.1	89.8	421.1	6.4	117.2	25
05-31	60	18	17	0	92.7	87.9	415.8	25.1	115	60.1
05-30	60	41	13	0	90.4	84.3	410.6	13	111.4	39.4
05-29	69	25	5	0	92.2	81.7	405.4	8.8	108.6	30
05-28	68	25	6	0	91.7	77.4	399.3	8.9	104.3	29.8
05-27	60	33	5	0	89.6	73.3	393.2	6.1	100	22.4
05-26	61	33	3	0.01	89.2	70.3	388	4.9	96.8	18.7
05-25	49	57	9	0	87.5	67.3	382.7	6.2	93.5	22
05-24	59	25	2	0	90.6	66.1	378.6	5.5	92	19.9
05-23	55	34	5	0	88.8	62.9	373.5	5.4	88.5	19.2
05-22	51	29	10	0	87.9	60.5	368.8	7.1	85.8	23.1
05-21	54	31	7	0	83.1	58.3	364.5	2.9	83.3	11.5
05-20	45	51	8	0.09	68.9	55.9	359.9	1.2	80.5	4.9
05-19	45	48	12	0	81.2	63.9	356.2	3.4	88.3	13.6
05-18	48	39	17	0.12	73.4	62.8	352.5	2.8	86.9	11.5
05-17	65	34	6	0	91.5	80	354.5	8.6	102.3	28.8
05-16	66	27	11	0	91.4	76.6	348.8	12.8	98.9	37
05-15	63	21	6	0	90.6	72.8	343	7.6	95.1	25.4
05-14	57	23	4	0	83.3	69	337.5	2.3	91.3	10.2
05-13	42	88	11	0.08	65.9	65.9	332.6	1.3	88.2	6.1
05-12	69	18	5	0	93.6	74.3	329.2	10.8	95	32.3
05-11	64	21	6	0	92.2	69.7	323.1	9.5	90.5	29
05-10	53	27	10	0	89.9	65.7	317.4	9.5	86.6	28.3

Figure 1: Oklahoma RAWS (OKL) Fire Weather Indices 5/10-6/19

Winds out of the south, spotting across existing firelines, and a lack of ability for firefighters to engage the fire (due to high winds or UXO concerns) are common factors on fire growth days on the 100 Mile Creek Fire. Historically, fire growth is associated with Chinook wind events in the fire area and all historic large fire perimeters in the area show a strong tendency to grow to the north as a result. Fire growth on 6/7 was not associated with particularly strong winds for the area and that is likely why

firefighting efforts were successful in an area with a fuel type change and many lakes lined up to break up fuel continuity.

The Alaska Type 1 Team assumed command on Wednesday June 11. From that time to June 17 potential for fire spread to the north existed, especially during high wind and low RH days on June 16 and 17. Firefighter suppression efforts were successful in halting the fire's spread to the north for the entire assignment until June 18 when a significant multiple-inch rain event occurred. Observed fire behavior varied, but included smoldering, torching, group torching, and small runs through the crowns of spruce stands. Where the fire was free to burn in a 150 acre stand of spruce near the SE corner of the fire, crown-fire was observed on June 13. Otherwise, the fire activity was mostly confined to interior islands of fuel and isolated areas of heat along the south, southeast and western perimeter where fuel type and fuelbreaks limited fire's ability to spread.

Notable Successes

Putting the portable RAWS near the area of concern on the north of the fire really allowed us to understand the weather, fuels, and fire behavior at the place where it mattered.

Significant Challenges and Resolutions

The incident meteorologists did have trouble ordering helium (for use in launching a radiosonde via balloon) through the ordinary channels. After a couple days of questions, the issue was resolved. The answer to the issue was to use Google to find a vendor in Fairbanks (Air Liquide). There were no other challenges of significance.

Command

Incident Commander

Mobilization

On June 7, the Alaska Type 1 Incident Management Team (IMT) was notified of an order for a long team to transition from a Type 3 organization on the 100 Mile Creek Fire in the Military Zone. Two weeks prior to the order, the Type 1 IMT had been unable to meet the criteria to field a national team and was statused as unavailable on the national Type 1 IMT rotation due to numerous primary members being assigned with Rob Allen's Alaska Type 2 IMT on the Funny River Fire in Soldotna, Alaska. The Type 1 IMT had originally been requested for a Monday, June 9 delivery, however the timing of the Funny River Fire's demob required numerous Type 1 IMT members to have mandatory days off prior to the 100 Mile Creek mobilization. Subsequently, the IC and Section Chiefs were unable to notify many alternates, which delayed the original request time by one day. The AICC Overhead Desk was instrumental in facilitating "pool" selection and coordination of the Type 1 roster; however, the timing of the Funny River demob and communications issues with IMT members resulted in some roster lapses and notification delays.

Many IMT members were already embedded in the 100 Mile Creek suppression activity as part of the Type 3 organization. Additional IMT operations and logistics section personnel were instructed to proceed directly to the fire in advance of the IMT to supplement the Type 3 organization and prepare for

the IMT's arrival. The remainder of the IMT was in-briefed on Tuesday, June 10, 2014 and arrived at the 100 Mile Creek ICP (Deltana Fairgrounds, Delta Junction, Alaska) that afternoon.

Delegation of Authority and Transfer of Command

The US Army Garrison - Fort Wainwright, the BLM - Alaska Eastern Interior Field Office, and BLM - Alaska Fire Service - Military Zone issued a Delegation of Authority for management of the 100 Mile Creek Fire to Incident Commander, Tony Doty. The delegation provided the IMT with clear direction and the IMT transferred command with the Type 3 organization at 0600 AKDT on June 11th. The main focus was to protect values at risk on State and private lands north of the fire, including residential areas in the Richardson Clearwater, South Bank, Clear Creek, and Whitestone communities; three communication towers within the northeastern portion of the Planning Area; recreational cabins; anadromous fish habitat; and timber stands. Military assets including Observation Points, Impacts to Red Flag Exercise, and additional Impact Areas west to Delta Creek and south of the current fire perimeter were also at risk. The Delegation transferred responsibility for adhering to the objectives, requirements, and courses of action as established in the Wildland Fire Decision Support System (WFDSS) Decision approved on June 10.

WFDSS

The initial WFDSS and revised WFDSS were adequate to determine the concerns and requirements of published signers. The WFDSS required the IMT to work with the assigned Resource Advisor(s) (READ) to coordinate concerns regarding federally protected species, cultural and natural resources, and critical military infrastructure/assets. Initial attempts to obtain a READ were unsuccessful; however, a READ was eventually assigned on June 16.

The WFDSS projected cost in the IMT's original decision was expected to exceed the threshold of $4.5M. On June 13, a meeting was held to adjust the WFDSS decision. Based on the mobilization costs and the anticipated suppression activities required to meet the objectives, the threshold was increased to $8.5M. The revised WFDSS decision was approved on June 14.

Significant Events

Significant events that occurred during the IMT's tenure on the fire included:

- The US Air Force, International Red Flag Exercise which began on June 13 over the southern half of the fire.
- The US Army Task Force Wolverine, Shadow Unmanned Aviation System (UAS) was able to provide imagery in support of requested reconnaissance. Imagery was geo-tagged with "hover-over" capability for use on AVENZA mapping apps for Android and iOS. The UAS Operational Base relocated to 100 Mile ICP to increase coordination in order to provide surveillance products to the IMT.
- Beginning June 16, the IMT provided ICS mentoring opportunities for the Alaska IMT-Search and Rescue.

Dozer Use

The original fire area was located entirely in military land within AFS jurisdiction. Based on ICS 209 data and fire progression, the perimeter was estimated to be 9,397 acres with limited activity. The potential use of dozers to attempt to limit spread to the north onto State lands was discussed with State of Alaska DNR representatives. However, dozer access onto military lands did not seem feasible, and the fire was not moving, so the idea was dropped. On June 7th, a wind event pushed the fire into State land, the Type 1 Team was activated, and the discussion for heavy equipment use for fire suppression again took place between agency representatives. The IMT chose instead to employ hand crews to secure a saw line, establish access, and eventually meet mop-up standards. This was accomplished using 24 crews from both the Lower 48 and Alaska. The end result was minimum environmental damage and elimination of suppression repair needs along the established containment perimeter.

In order to address future concerns, the military, AFS, and State officials should discuss the potential for a fuel break between lands that are used for military training and ordnance activity and state lands valued for timber. This fuel break could best be constructed in winter using heavy equipment on frozen soils when damage would be minimized and access would be maximized.

Known Sites

Known sites collection for the Planning Area was outlined in the original delegation. The area of interest included values on State and private lands including the Richardson Clearwater, South Bank, Whitestone, and permitted cabins. Most of these assets had been previously identified during the 2013 Mississippi Fire. Assessment resources from the 100 Mile Fire did extensive mapping, inventory, and protection layout of the Richardson Clearwater area. This information has been made available to the Military Zone of AFS and Delta Area Forestry in electronic format.

Timber Resources

Delta Area and the State of Alaska's Division of Forestry valued timber resources north of the fire perimeter between $1 and $600 million. This wide discrepancy of values made for uncertainty in planning for suppression tactics. Overall, the Delta Area showed no timber sales projected within their five-year schedule for the area immediately north of the fire and east of Delta Creek. Fire crossing over Delta Creek would have far reaching consequences into the timber inventory identified. In addition to the immediate objective of minimizing acres to preserve values to the north, keeping the fire east of Delta Creek remained a priority throughout the duration of IMT involvement.

Human Resources:

Human Resource issues were solved within the immediate Command and General Staff without the addition of a specialist. There were no unresolved issues.

Safety

Summary

There were Three SOFRs (line safety) assigned to the Type 3 organization when transition occurred on June 11, 2014. The Team had two SOF1s and one SOF1 Trainee. Two additional SOFRs were ordered,

and one SOF2. They were assigned to the spike camps. On the first day of the fire a male black bear was shot and killed in Division "E" by one of the shooters assigned to the fire. The appropriate paperwork and the hide and skull were turned in to Alaska Dept. of Fish and Game, and paperwork turned in to the BLM Safety Officer for the District. Another Bear was shot and killed on 06/16/14. As before, all appropriate paperwork, along with hide and scull, were processed. There was one bear shot, but not killed, on 6/17/14 in Division G.

There were a total of 8 reportable injuries. There were 15 visits to the Clinic in Delta, and 259 visits to medics and the ICP medical unit. There was one vehicle accident.

Some unexploded ordnance (UXO) was discovered by the Type 3 organization prior to the arrival of the Type 1 Team, but crews were directed to avoid those areas. No additional ordnance was discovered after the Type 1 Team took control of the fire.

Notable Successes

The Alaska IMT briefed all the incident personnel on the risk management analysis process and sent field size copies of the form to the field for verification of the hazards and the mitigations associated with the incident. We did receive a limited number of forms back, and they did have positive feedback for the process.

Significant Challenges and Resolutions

The definition of an ICS-209 reportable accident was discussed at length by the IMT. The user guide definition is unsatisfactory. The IMT agreed eventually that only "Lost-time" injuries (those injuries where at least one full day of work beyond the day of injury is lost) would be reported.

Liaison

Summary

The Liaison Officer arrived on the incident after the IMT had been in-briefed. The Incident Commander, Tony Doty, and Deputy Incident Commander, Tom Kurth briefed him and brought him up to speed on the current status of the fire and any cooperator issues. The Liaison was co-located with Safety and the PIO staff. He made contacts with various local entities, including City Council members, local citizens, the local Fire Chief, members of the military from Fort Greely, the Alaska Department of Fish and Game, and Department of Natural Resource employees, with most being the Division of Forestry, Alaska Fire Service, and the Deltana Corporation. The Liaison attended team planning meetings and twice daily command and general staff meetings, as well as public meetings facilitated by the PIO.

Notable Successes

- From the beginning of the Liaison's first tour with the team he was treated with mutual respect. More importantly many team members went out of their way to be friendly, welcoming and helpful.
- Being collocated with the PIO was very efficient. This kept from duplicating efforts where the two functions tended to overlap. The PIO was a long standing team member and familiar with

local issues and individuals. He was very helpful in getting the Liaison Officer up to speed on these important matters.

- The Liaison was able provide an objective "outsider's" review of the WFDSS decision.
- The Liaison was also able to review and give input to the IMT's "Incident Within an Incident Plan" with the Team Safety Officers.
- He also coordinated with the Alaska Department of Fish and Game on behalf of the Safety Officers in regard to a bear kill.
- The Liaison officer attended the Morning Weather Briefing and State Forestry and Alaska Fire Service Operations briefing with the IC and Deputy IC. This improved coordination with Delta Area Division of Forestry and provided opportunities to discuss issues pertinent to the Liaison function.

Significant Challenges and Resolutions

This fire being the result of an escaped prescribed burn on the military impact area has the potential to be controversial. The Liaison coordinated requests for information about this and the Prescribed Burn Plan with the BLM Military Zone FMO and requesting party. This issue has the potential to continue into the future.

Information

Summary

The IMT was deployed with just a Lead and PIO2(t.) These personnel arrived in Delta and went directly to City Hall to establish contact with the City Clerk. In addition to getting contact information for most city officials, they reserved the Community Center for the evenings of June 11 and June 13 for community meetings. After establishing the location of the Information Center at the new ICP, they proceeded to visit the established ICP/Helibase and a number of local businesses and agency offices. The incident Info Center operation proceeded smoothly, albeit staffed at a bare minimum. A PIOF(t) checked in later the first evening. With little fire movement or smoke in town, the section was able to concentrate on keeping the community informed of fire operations. Traplines, both internal and external, were established and maintained. A separate bulletin board that featured TFR information was set up at the Delta Airstrip to help the general aviation community. Most electronic media work was handled by the Zone PIO in Fairbanks since it took time to set up computers and internet in the Info Section. The Lead briefed the Zone PIO several times each day. The Lead briefed the AFS Public Affairs Officer only on specific developments requested.

Notable Successes

- The Community Meetings were very effective for sharing information about the fire and how the IMT was managing it. The fact that few people showed up was interpreted to be a measure of the comfort level of people in Delta and the surrounding communities and, once again, their trust in the Alaska IMT.
- The section furnished newspapers to firefighters staying in spike camps that otherwise had no access to bulletin boards or other information sources.

- Having Information co-located with the Liaison Officer is a logical match.
- Having just a PIO2(t) and PIOF(t) for staff on a Type 1 incident would ordinarily be a risky endeavor. In this case the PIO2(t) was an experienced team member normally deployed as a Medic and the PIOF(t) was an experienced Ops person. They both did an exceptional job and helped the section to excel.
- Having the Zone FMO or AFMO at the community meetings added a lot to the team's credibility in terms of explaining the management of the fire to the public.
- Development of a Communication Strategy was simplified by resurrecting the one from the Mississippi fire last fall and altering just a few details.
- The Team Facebook page and akfireinfo.com were useful for getting the word out. The Info Section launched their Virtual Operations Support Team (VOST) as the team deployed. It was successfully used as a monitoring device and to push a limited amount of information. The Team PIO and the Zone PIO did most of the posting on the IMT Facebook page. Inciweb was also employed.

Significant Challenges and Resolutions

- Having the Safety Officers co-located with the Information Center is not a good idea. In this case there were no significant problems, but the first time there are public visitors in the Info Center and the SOFs get a confidential radio call or begin a medevac, there could be very serious repercussions.
- Having a PIO back in the Zone Office to facilitate electronic communications and media inquiries works well. However,not having the PIO1(t) located with the team, or at least within the chain of command, is not particularly productive. It is suggested that a PIO be assigned to the Zone Office, but that the Info trainee be with the team at the ICP.
- The FEMA-compliant ICS-209 seems unnecessarily complicated and convoluted from a public information perspective. It makes the collection and distribution of facts and statistics about the fire much more difficult to interpret to the public and media.
- The suppression strategy of containing only part of the fire perimeter and then publishing a percentage of how much of the "to be contained" perimeter is completed is very confusing to the public and even cooperators. This will result at some point in showing that the fire is "100% contained" when in fact at least half of the fire perimeter has absolutely no control line on it due to UXO concerns.
- Once again it was challenging to explain to Quartz Lake homeowners that use of the lake for the scoopers was not detrimental to the fishery there. It is suggested that local fire managers meet with Quartz Lake homeowners during the off season to discuss the use of water from this source.

Operations

Summary

Several members of the Operations Section were dispatched directly to the incident on June 10 to shadow the Type 3 organization on the shift prior to transition. Two members of the Type 3 organization were incorporated into the Alaska IMT Operations Section in overhead positions, allowing for a seamless transition. The Type 3 organization had already established sound tactics; the additional Divisions and overhead assisted in building a more manageable span of control.

The 100 Mile Creek Fire made significant acreage gains and demonstrated extreme fire behavior on June 7, 2014, but by June 9, cooler weather and diminishing winds provided the opportunity for direct attack of the fire. Anchor points were established on the East and West flanks of the fire using the 2013 Mississippi fire scar on the east and the Little Delta Creek to the west. Crews were inserted into five spike camps along the northern perimeter to decrease the need for daily helicopter shuttles and increase line production. Air tankers, scoopers and bucket operations were used to check unstaffed fire line until ground resources could be inserted.

The Alaska Type 1 IMT was successful in containing the 100 Mile Creek Fire because of their understanding of suppression operations in Alaska and experience working with Alaskan resources. They were quick to adjust staffing and operational configuration to proceed into Divisions E, G, P, and Clearwater Structure Group while continuing to protect and monitor fire activity in the military restricted divisions. The team maximized suppression efforts to get the job done quickly and adjusted their workforce as inclement weather aided suppression efforts. They had good communication with line supervisors, which aided in efficient remote logistics and line production to complete work assignments and demobilize unnecessary resources.

Air Operations

Summary

The Type 3 incident had a fully functioning Type 1 helibase with seven helicopters; one heavy, three mediums and three lights. Communications had been established using IA frequencies. A large TFR had also been established over the fire area.

As per the in-brief, the USAF Red Flag exercise was scheduled to begin between June 6 and June 13 and run through the last week in June. Doug Gibbs had done considerable work to establish coordination with hosting military branches and had them all present at the in-brief. Aircraft deconfliction was a major concern throughout the incident. On June 11 an Airspace Coordinator was ordered for the incident; this position acted as a liaison with the Air Force, Army, and Range Control. In addition to the Red Flag exercise, there was an Army Shadow UAV group conducting operations in conjunction with the fire (BLM–AFS) providing the incident with thermal imaging.

With the exception of the smokejumpers being supported by boat on the north end of the fire, the incident was totally supported by helicopters. At peak operation there were three mediums, one heavy and three light helicopters providing fire suppression, as well as logistical support, for over 400 personnel in remote spike camps. A night medevac helicopter was maintained throughout the incident.

Notable Successes

- Trainees were used in all positions from HECM to the ABOD
- Implementation of an Airspace Coordinator
- Proactive coordination through the zone with the military prior to the IMT taking over
- Provided helicopter support for over 400 personnel on the incident logistically and tactically
- No intrusions into the TFR
- Vigilant interactive and coordination with the military throughout Red Flag
- Successfully coordinated with the Army's Shadow UAV group and produced heat signature products
- Flew UAVs in both day and night operations
- Operated UAVs south of the restricted area while fire aviation operations were being conducted to the north
- Only five vehicles assigned to the helibase

Significant Challenges and Resolutions

- Potential airspace conflicts/Established an Airspace Coordinator, kept lines of communication open with local military personnel, i.e. range control, radio commo during flight ops.
- UAV program/Work in progress. Possible resolutions: work with UAV group prior to deployment; identify fire personnel to be assigned to the group to guide them in producing usable products for the incident.

Planning

Summary

The IMT shifted the incident Planning Cycle to align better with the burn period. The Operational Period ran from 0800-2400, with an 0900 Operational Briefing. The shift allowed operational resources to work later into the evening when there was still active fire behavior without compromising their 2:1 work to rest ratio.

Situation Unit

The Situation Unit assumed responsibility for the ICS 209s, fire weather forecasts, and incident map products on June 11th, 2013. The Unit was comprised of a SITL, GISS, FBAN, IMET and IMET(t), as well as

a SITL(t) that moved over from the Type 3 organization. A second fully- qualified GISS arrived on June 12th. Both SITLs and helitack personnel were able to complete Field Observer activities, so no additional personnel were ordered.

The rapid development and ongoing improvement of products can be attributed in part to the GIS assistance from AFS, including data layers and pre-built projects, as well as AK IMT records from the Mississippi fire in 2013. Additional information was provided by Military zone personnel, resource specialists during the in-brief, Military Resource Advisor Dan Reece, and Tok Area Forestry Resource Advisor Peter Talus.

The original fire perimeter (6/11) was provided by the Type 3 organization. The fire perimeter was updated multiple times throughout the incident using a combination of GPS data from aerial reconnaissance and IR information (NIROPS). Helibase personnel assisted in perimeter mapping missions.

Current status:

Fire Number	Fire Name	Acres	Containment
00100	100 Mile Creek	23,270	100% of 41% to be contained

Notable Successes

The external drives from the Plans kit and supplied by the PSC1(t) assisted the unit by providing data from the Mississippi fire that occurred one year prior. Initial supplies for the Situation Unit GIS were low. The Palmer warehouse supplied additional paper and ink that was surplus from a previous fire. The plotter (HP T1100PS) performed better overall than other plotters, so the second one was not needed. Utilization of a high speed 11x17 printer/copier was extremely efficient for field map products and removed the need for a separate 11x17 printer.

A Quick Response Code (QR) was developed by the IMT GISS to provide geo-referenced PDF maps to those with smart phones and iPads. The technology was very useful for making digital products available to a wider audience.

A Structure Protection Guide and water handling inventory was developed from maps and equipment lists provided by the SMJ assigned to the Clearwater Group. The Guide is intended as a quick reference for future incident managers and suppression resources and provides initial water handling equipment needs and a structure protection design. Information they gathered will also be used to update the Known Sites database for the Richardson-Clearwater and Southbank areas.

Infrared data was available free to the incident through a DOD satellite and processed through NIROPS. The SITL and SITL(t) were able to request IR through normal channels, and products were uploaded to the NIFC ftp site. The satellite IR was limited by cloud cover, but still useful until Palm IR could be organized. Satellite IR was displayed on a map (including coordinates, if requested) that was supplied to operations personnel.

Significant Challenges and Resolutions

A full day without Internet service was mitigated by use of the IMT RapidCom, Kit Mi-Fis, and individual's mobile hotspots.

The Situation Unit found that a minimum of 2 GISS should be ordered to cover early morning IR information as well as late night map updates that come in post planning meeting and/or from line resources.

There were several issues with the new ICS-209 system, including:

- The system was extremely sluggish when working over slow Internet connections on the first few days of the incident. Without DSL it may be necessary to submit printed reports.
- A bug in the Illness/Injury reporting block that incorrectly counts previous totals on printed versions of the report.
- Known time zone issues with the reporting period fields led to a report being posted a day into the future. The subsequent report also had to be dated incorrectly, as the system would not allow correction or double posting to a period.
- Formatting of PDF reports is poor.

Gabriella Branson and Hudson Plass at AICC were extremely helpful with ICS 209 issues. It is suggested that blank paper and electronic copies be carried by the SITL as a contingency plan for reporting.

The detailed WFDSS Decision document developed by the Agency could easily have derailed the incident Planning Section with a large workload. The Agency ordered a Strategic Planner to develop this document and the incident Planning Section workload was not an issue. This should become standard practice if "Extreme WFDSS" is required in the future.

The plotter arrived without paper and extra ink. Without assistance from the Palmer warehouse, the Situation Unit would not have been able to produce maps for the incident in a timely manner. When the plotter is ordered, it should come with a several-day supply of paper, ink cartridges, and print heads. The case should be checked for supplies before it is shipped to an incident. A standard GIS/SIT Unit initial order has been created and will be included with the IMT initial order in the future.

The "Known Sites" data continues to be a moving target. The Known Sites database housed on the AICC webpage is different than layers that were provided by State Forestry GIS personnel. All known sites data updates and structure protection data collected by the fire are being provided to

1.) AFS - Military Zone (email, hard-copy, and on Documentation Package hard-drive)

2.) Delta Area Forester (email, hard-copy)

3.) AWFCG GIS Committee State Forestry Representative (email)

4.) AWFCG GIS Committee AFS Representative (email)

Working with the US Army UAS group proved challenging. The products are potentially valuable, but the missing link seems to be an interpreter that has the technological/GISS skills to transform the information into something more consumable by the IMT and field resources.

Resources Unit

The Resources Unit was staffed with two fully qualified RESLs and one Alaska trainee RESL. Using the I-Suite database, the team checked-in and entered data for over 624 personnel, provided daily IAPs and resource tracking reports.

Notable Successes

The IAP and ICS 209 email contact list was centrally maintained by the RESL (t) on the plans@alaskaimt.com Gmail account. This proved to be an efficient means of maintaining a single list that was accessible by everyone in the Planning Section. In addition, many regular contacts are now stored on the site and will be available to the IMT on other incidents.

Significant Challenges and Resolutions

The original copy machine order was not specific enough and was filled with a copier that was inadequate for IAP production. Plans and Logistics worked with the Buying Team to replace the copier, and added the necessary specificity to the IMT initial order to avoid similar problems in the future.

Demobilization Unit

The Demob Unit formed June 11, 2014, established their goals, set up their workspace, and prepared the Demobilization Plan and assisted Check-In, Resources and Documentation until demobilization started.

Notable Successes

Effective preparation of information needed to expedite Demob, and the interworking relationships with the Resource Unit and the cooperation of all Sections, greatly aided prompt and efficient demobilization.

Significant Challenges and Resolutions

- The Type 3 team had significant personnel still not checked-in, which created a challenge overcome by much leg work.
- There were no working phone or fax lines for four days, causing difficult communications between the unit and Expanded Dispatch and resulting in the use of personal cell phones with no ability to fax or email. Use of a personal cell phone hot-spot and a personal notebook computer for emailing worked with limited success because of limited data time allowed by the carrier.
- Several Resources attempted to check-in without red cards, claiming they had not been issued their cards for the year. The home units had assured them they would not be needed. These were Alaska resources. They were compelled to contact their home unit and have these cards issued and faxed to Check-In. They were qualified for their ordered positions.

Documentation Unit

A Documentation Unit Leader arrived on the 100 Creek Fire on June 12, 2014 and located the Records Retention Kit that had been ordered by the team and was on location in the Plans Shop. The DOCL began organizing the records for the incident following the National guidelines for Records Management and retention. All folders were labeled and placed in their proper sequence in the bins provided with the kit. A labeled box was placed in the Planning Shop for the daily collection of documentation. The collection box was emptied several times a day and the contents were filed, using the National format.

The Incident Documentation Package* prepared by Alaska IMT1 (IC-Doty) will be provided to the Alaska Fire Service at the Closeout Meeting on Friday, June 20, 2014 at 1500. Other agencies such as USFS, Military, etc. needing any documentation contained in this package have agreed to coordinate requests through Alaska Fire Service at:

Alaska Fire Service (AK9F1600)
P.O. Box 35005
Fort Wainwright, AK 99703
Attn: Fire Management Office
Phone: 907-356-5875

*The final Finance Package is managed by the Finance Unit.

Notable Successes

Having the Records Retention Kit on-site in the Plans Shop very early in the incident was great in facilitating the establishment of the documentation package from the beginning.

There were many organizations and agencies cooperating on this incident. The cooperation of these entities in sharing one set of documentation, as opposed to producing several sets, is commendable.

Significant Challenges and Resolutions

A signed copy of the Delegation of Authority was not made available to the IMT until 6/12. The original Delegation was misplaced at the Zone.

Computer Technical Specialist

Notable Successes

The ISuite database that transitioned to us was in excellent shape. The previous team did an excellent job, attributed to the fact that they had just attended an ISuite course .

Significant Challenges and Resolutions

A shortage of extension cords and power strips slowed the setup of computers. Additional power supplies should be part of the pre-order when the team gets called.

There was some difficulty in getting phone lines, fax lines, and internet, which made it extremely difficult to produce products expected from all sections. Getting an order in sooner may aid in getting

critical services in a timely manner. Attributing factors would be knowing where and when you are going to need said services.

There was some issue with ordering the correct copier to create IAPs. In the future the team should be more specific when requesting printers to produce IAP, prints booklets, number of pages printed per minute,, collate, staple, scan, etc. It may be helpful to explain why these functions are necessary.

Training

There were a total of 51 trainees on the fire working in various Sections and originating from various agencies as summarized in the table below:

100 MILE FIRE TRAINEE COUNT

		Command	Finance	Logistics	Operations	Plans	
ALASKAN RESOURCES	BLM	2	2	3		1	
	FS	1			13		
	AK		2	1	18		
	NWS					1	
RESOURCES FROM OUTSIDE ALASKA	BLM				1		
	FS				1		
	BIA	5					
TOTALS		**8**	**4**	**4**	**33**	**2**	**51 Total Trainees**

Logistics

Summary

The logistics section had very few challenges on this assignment. All units were staffed appropriately and no critical positions were left unfilled. The Deltana Fairgrounds was a great location for ICP, with electricity on site and plenty of room for expansion if required. The use of the caterer, Chocolate Gypsy, made the feeding of crews and overhead convenient and flexible, providing both in camp meals, packaged meals to helibase and sack lunches. Ground support was supplied an adequate number of vehicles and support was provided for additional vehicles as required for demob and backhaul of supplies. The logistics daily conference call helped to keep transportation, expanded, buying team, Agency administrator and the Type1 team all on the same page. The agency business advisor made several visits to camp and was available to solve any issues. Two SECMs were assigned night shift for security at camp and helibase. There were no reportable security issues on this incident.

Communications Unit

Notable Successes

No significant issues were encountered with Communications on this fire: the initial Type 3 communications net was modified for Type 1 Team requirements and continued to be used throughout the incident.

The double Air Link installed provided good AM coverage for both fixed wing and rotor wing flight contact and following.

No complexities with medical transports were encountered.

Significant Challenges and Resolutions

Due to the lack of adequate local high areas for repeater locations, coverage of the fire was marginal in places, but limitations were mitigated through Lookouts, Larsen antennas, and optimizing locations when line personnel encountered difficultly accessing the Command system.

Supply Unit

Notable Successes

The Type 3 organization had a good amount of supplies in place for contingencies. In addition, the initial order by the Type 1 team was received quickly. The Type 2 cache van was ordered; however, supplies in the van were not needed and the van was returned unopened. There were no critical shortages on this incident and all supplies were received in a timely manner.

During the transition period back to Type 3, additional vehicles were sent daily as needed.

Significant Challenges and Resolutions

There are no unresolved issues in the supply unit.

Medical Unit

The 100 Mile Creek Fire Medical Unit consisted of a medical unit office at the ICP staffed by 1 MEDL and 1 AEMT. Spike camps were staffed with AEMT.

ICP medical unit was staffed daily from 0730-2400 and available for urgent medical needs 24/7. There were a total of 13 non-emergencies. 104 visits to the medical unit were documented. These were taken from all medics in the field.

The Medical Unit consisted of 1 MEDL, 4 AEMF and 2 AEMT

LifeMed and Guardian flight both had a staffed medevac fixed wing in Fairbanks and could respond to Delta Jct. within 45 minutes to 1 hour.

Notable Successes

- 2 new line EMTs were assigned for training opportunities.
- Contacts established and Inspection of a new local clinic in Delta Jct.

Significant Challenges and Resolutions

Communication flow from the team to AFS and from AFS to the team regarding patient status was problematic at times. The team is working with AFS for communication flow within the team and between the team and Agency dispatch for future assignments. There are no unresolved issues at this time.

Facilities Unit

Notable Successes

ICP was established at the fairgrounds in Delta Junction. The fairgrounds were an excellent location for ICP as there were several buildings available for use and a large area of land. The biggest success was that the camp was operational by the end of the first shift due to having electricity, tables and chairs in many of the Fairground buildings. Additionally, two FACLs arrived on the incident Tuesday afternoon and were able to commence ICP set up immediately. The team did not have to wait for many of the essential supplies to arrive as the Type 3 team already had most in stock and those supplies that were ordered arrived in a timely manner.

Significant Challenges and Resolutions

There are no unresolved issues

Food Unit

Notable Successes

- Ordering, coordination and distribution of Fresh Food boxes went extremely well due to the coordination among the Helibase, Supply and Food unit personnel.
- The ice and water procurement from the local store was convenient and was adequate for the needs.
- The caterer provided meals and sack lunches on site, allowing for last minute changes and the ability to accommodate crews mobilizing and demobilizing.

Significant Challenges and Resolutions

- The MFSU contract was not readily available at the start of food service. This made it difficult for the FDUL to determine what the contract requirements were.

Resolution-Prepare a pre-season blanket contract and post on the AICC web page.

- The MFSU contract differs between the State and AFS as well as from the National contract. This makes it difficult for the FDUL to determine performance measures required of the caterer and makes it difficult for the caterer to know what is expected of them.

Resolution-Both Agency's contracts should be similar in wording and suggest using the National contract as a guide. Several suggestions were made to the contracting officer and amendments were made to the contract.

- The catering company neglected to test their potable water.

Resolution-Water was tested by the FDUL. However, this needs to be done prior to the startup of operations in the future.

Ground Support Unit

Notable Successes

Ground Support at 100 Mile Creek Fire had a very good working relationship with AFS transportation section. AFS transportation was eager to assist with all incident transportation requests. Demobilization of the crews was coordinated between the two transportation units and was a well-orchestrated timely demob. AFS ground support had all the vehicles the team required upon mobilization. This enabled the team to depart for the incident from AFS in an orderly and timely fashion. No additional vehicle requests were required as the 25 vehicles were sufficient for the team's needs.

Significant Challenges and Resolutions

The team is working on additional check-in requirements for personnel who arrive with vehicles. The ROSS records often times have vehicles listed that are not assigned to the team. This makes tracking of vehicles that are the team's responsibility challenging.

Finance

Summary

The Finance Section managed the 100 Mile Creek Fire and all of its resources within one functional database. All known resources were accurately tracked and their cost information reported daily to the Incident Agency.

Interaction with the local unit was facilitated by the presence of the Incident Business Advisor who was assigned at the same time the Alaska IMT arrived.

The AFS Finance Section provided a thorough inbriefing and provided appropriate documentation. Land Use Agreements were already in place for the Team to use. The LUAs included:

- Deltana Fairgrounds – Used as ICP for T1 team. LUA completed AFS Finance.
- Shaw Creek Boat Owner's Association Launch – staging of AFS vehicle and boat trailer
- Bill Allen – Smokejumper Staging and helipad on Clearwater Creek
- Lion's Den – Logistics and Operations Work Station

These four LUAs will be closed when the Team demobilizes. The Type 3 organization will be moved to the Arkansas Helibase. There was no damage to any of the properties.

A quality Finance package was given to the Team Finance from the Type 3 organization. I-Suite was being used on the Type 3 incident, and personnel transitioned to the Type 1 organization.

A BUYT was located in Fairbanks, and all purchases and agreements were made by the BUYT. BUYT costs were provided daily for inclusion in the daily COST summary.

The Military provided UAV services for the incident, operating on night shift until June 13, 2014, and then transitioning to day shift. Military personnel camped at ICP to staff the unit. Meals were provided, but the personnel charged their time to their military unit.

There were a total of six Injury/Illness Claims. There is one potential claim, i.e., Deltana Fairgrounds. Documentation is in the files. The majority of the Injury / Illness cases were transported to Fairbanks for treatment, at the request of the MEDL. Injury / Illness log is in the Finance package.

The total cost of the incident as of June 19, 2014 is $8,069,080.

Time Unit

Notable Successes

The I-Suite database was current when the Team accepted command of the Incident. At the height of the incident there were 23 T1, T2IA and T2 crews assigned to the fire, smokejumpers staged at Clearwater Staging area, and miscellaneous personnel. The crews were spiked out, so time was delivered to camp from staging. Incident personnel were diligent in staying current on their time.

Cost Unit

Notable Successes

Cost was kept current and reports were prepared for IBA. The supply cost per person was adjusted, based on documentation provided by AFS Cache. The significant cost for supply was fresh food boxes for all of the crews spiked out on the fire.

Procurement Unit

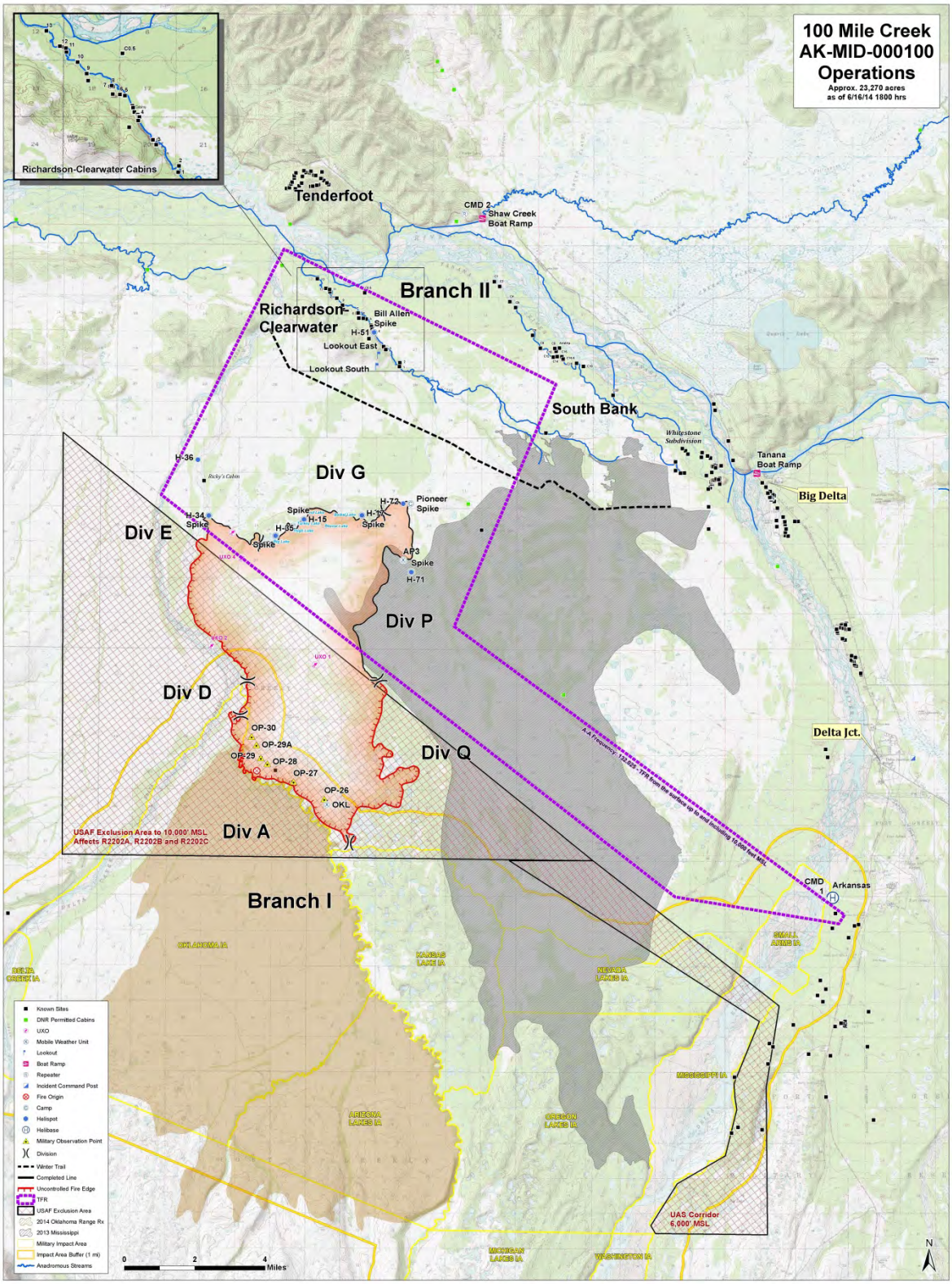
Notable Successes

There were very few contracted resources. Besides the LUAs, there were rental cars, a potable water truck, gray water truck, and logistical support resources, i.e., porta-potties, dumpsters, handwashing units.

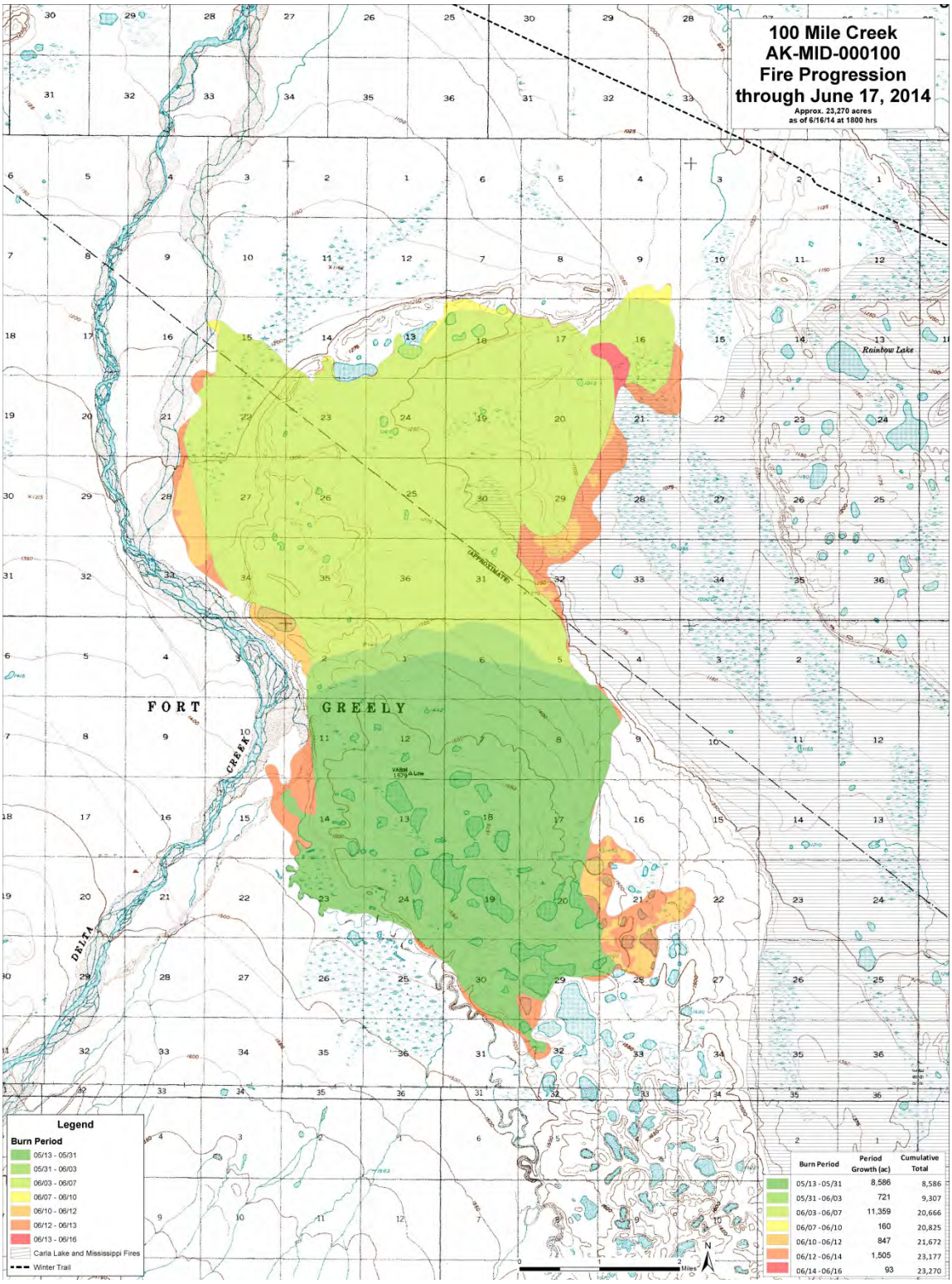
Significant Challenges and Resolutions

There was some question as to who was paying the invoices, whether it was the BUYT or one of two individuals at ASF. IBA provided answers so proper paperwork could be provided with payment packages.

Appendix A: Operations Map

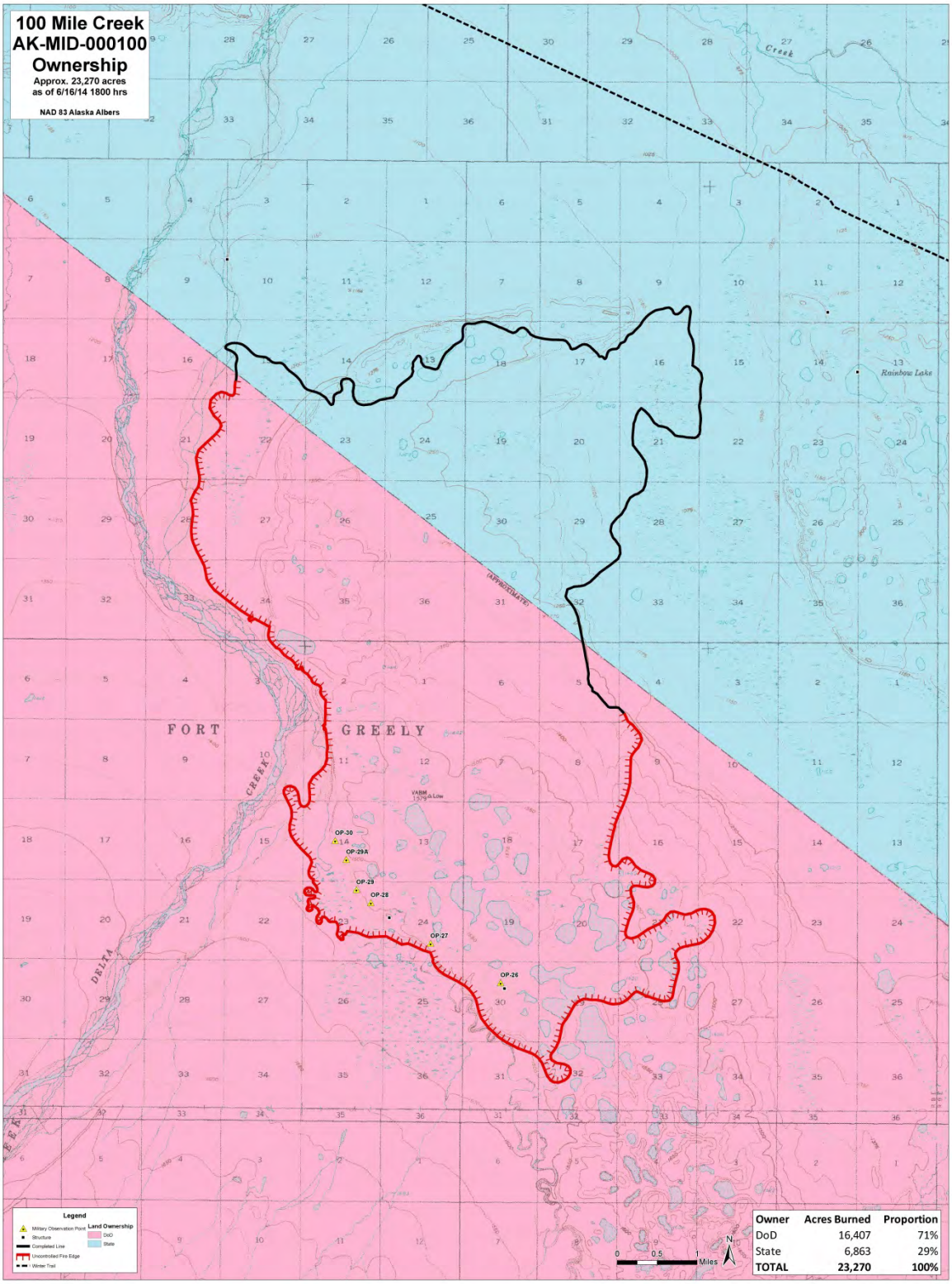


Appendix B: Progression Map



Burn Period	Period Growth (ac)	Cumulative Total
05/13 - 05/31	8,586	8,586
05/31 - 06/03	721	9,307
06/03 - 06/07	11,359	20,666
06/07 - 06/10	160	20,825
06/10 - 06/12	847	21,672
06/12 - 06/14	1,505	23,177
06/14 - 06/16	93	23,270

Appendix C: Ownership Map



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ALASKA
INCIDENT MANAGEMENT
TEAM