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Programmatic Emergency Stabilization and Rehabilitation Plan

Final Environmental Assessment

Chapters 1-4

BLM

Alaska

Programmatic Emergency Stabilization and Rehabilitation Plan

Final Environmental Assessment

The proposed action is to implement this Programmatic Emergency Stabilization and Rehabilitation Plan (PESRP) and streamline the ES&R planning process.

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FINDING OF NO SIGNIFICANT IMPACT
(FONSI)
AK-930-EA-2006-06

Programmatic Emergency Stabilization and Rehabilitation Plan

FINDING OF NO SIGNIFICANT IMPACT

Based on the findings documented in Environmental Assessment AK-930-EA-2006-06 (EA), implementation of the Proposed Action for the BLM Alaska's Programmatic Emergency Stabilization and Rehabilitation Plan (PESRP) will not significantly affect the quality of the human environment. Therefore, in accordance with Section 102 (2) (C) of the National Environmental Policy Act of 1969, as amended, an Environmental Impact Statement is unnecessary and will not be prepared.

I base the above findings on the following:

Context: The context of the analyzed treatments occurs within an area already damaged by a wildfire event. These areas are in need of treatments to minimize the potential effects of the wildfire.

Intensity: The impacts of the treatments in relation to the existing condition of the fire damaged area are minimal compared to the impact of the fire disturbance.

1. Impacts that may be both beneficial and adverse. The proposed action would enable timely and cost-effective implementation of on-the-ground Emergency Stabilization & Rehabilitation (ES&R) treatments following a wildfire. The treatments described in the proposed action are designed to stabilize and rehabilitate areas disturbed by a wildfire and will result in improved control of erosion and invasive non-native plants and improved condition of travel corridors. The environmental assessment has considered both direct and indirect effects of the proposed action within the context of a fire disturbed area (EA, Chapter 3.0). These effects can be both adverse and beneficial. Areas that require treatments may have short term adverse effects caused by the treatment but these effects would be immeasurable compared to affects caused by the wildfire and would be beneficial in the long term.

Indirect effects of the proposed action will include wildlife habitat improvement, maintenance of ecosystem integrity and promoting native plant communities, and improved soil stability and water quality. Improving ecological conditions will enhance the quality of the human environment, and is not considered an adverse effect both in the short or long term. The adverse effects caused by the treatments are immeasurable and will be beneficial in the long term. The area where ES&R treatments will be implemented is anticipated to be very small in scale when compared to the very large planning area; thus, the potential adverse impacts from ES&R treatments are expected to be localized, temporary, and minor.

2. The degree to which the proposed action affects public health or safety. The purpose of ES&R is to address public health and safety after a wildfire. The ES&R actions and treatments are designed to protect the public from hazardous situations caused by the wildfire. Actions such as clearing a travel corridor to protect the public and users from a potential dangerous situation or erosion structures to prevent future hazardous erosion events are designed to reduce adverse impacts to public health and safety. The impacts of the treatments in context of the burned area are immeasurable and will benefit that public in the long term. Implementation of the proposed action will not result in potentially substantial or adverse impacts to public health and safety. The purpose of actions or treatments is to address public health and safety i.e. closures, structures (EA, Section 2.2.1).

3. Unique characteristics of the geographic area such as, proximity to historic or cultural resources, park lands, wetlands, wild and scenic rivers, or ecologically critical areas. Within the analysis area there exist many different Special Management Areas. Within the context of this analysis these unique areas are fire disturbed areas in need of treatment to minimize the potential effects of the wildfire. Treatments are designed to minimize effects to these unique areas. The effects of these treatments are immeasurable in context to the wildfire damage (EA, Section 3.10).

Further effects to cultural resources are avoided by conducting surveys prior to ground-disturbing treatments and if found will be avoided. Cultural sites damaged by the wildfire will be protected and stabilized and significant resources may be repaired to a pre-fire condition when feasible (EA, Section 3.3).

When Floodplains, Wetlands, and Riparian Zones are disturbed by wildfire, treatments are designed to minimize effects to these unique areas. The effects of these treatments are immeasurable in context to the wildfire damage (EA, Section 3.14).

When Wild and Scenic Rivers, Wilderness Study Areas and Areas of Critical Environmental Concern are burned by wildfire, treatments are designed to minimize effects to these unique areas. All treatments will adhere to policy and management criteria designed to protect special area values (EA, Section 2.2.2).

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial, highly uncertain, or involve unique or unknown risks. All ESR actions and treatments outlined in the EA are actions that could be implemented under normal conditions after a wildfire. These treatments have been shown to be beneficial to fire damaged areas in the long term and have not proven to be controversial in the past and are not expected to controversial in the future. Treatments that have the potential to be controversial are outside the scope of this analysis.

5. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration. The actions and treatments analyzed in the EA are normal practices that have a

long history of implementation. This programmatic document does not set a precedent for future actions that have significant effects. Any future projects that may have significant impacts are outside the scope of this document and would require a separate analysis.

6. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. This EA considered potential cumulative impacts of treatments in the context of the burned environment on all potentially affected resources. The documents cited and analysis disclosed in the EA support the finding that treatments will not cause significant cumulative effects on biological or physical resources, even when considered in relation to other actions. The effects of ESR treatments in relation to other past present and future actions are immeasurable (EA, Section 3.16).

7. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources. Within the context of this analysis these areas are fire disturbed areas in need of treatment to minimize the potential effects of the wildfire. Effects to cultural resources from ESR actions and treatments are avoided by conducting surveys prior to ground-disturbing treatments and if found will be avoided. If cultural resources cannot be avoided, further work will be undertaken to mitigate adverse affects to the site(s). Cultural sites damaged by the wildfire will be protected and stabilized and significant resources may be restored to a pre-fire condition when feasible (EA, Section 3.3).

Based on the analysis documented in the EA, the proposed action will not cause loss or destruction of significant scientific, cultural, or historical resources.

8. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973. T&E species and habitats are neither located in the fire-dependent ecosystems of the Interior nor adjacent to populated areas, where ES&R activities are unlikely to occur. In informal consultation with the U.S. Fish and Wildlife Service, it was concluded that no adverse effects to listed species or critical habitat are anticipated to occur as a result of activities carried out under the PESRP (EA, Section 3.12).

9. Whether the action threatens a violation of Federal, State, or local law for requirements imposed for the protection of the environment. The proposed action was developed in accordance with Federal, State and local Laws for the protection of the environment (EA, Section 1.4 and Section 1.5). The EA disclosed the effects of the proposed action on all critical and non-critical elements and it was determined the proposed action will not adversely affect any of the elements (EA, Chapter 3.0).

Julia Dougan 11/02/06

Julia Dougan, Acting State Director, Alaska Date

Executive Summary

The Programmatic Emergency Stabilization and Rehabilitation Plan (PESRP) and Environmental Assessment (EA) provides programmatic Emergency Stabilization and Rehabilitation (ES&R) guidelines for treatments to address normal year issues that occur after a wildfire disturbance. The purpose is to streamline the preparation of ES&R plans within the timeframes outlined in the BLM Burned Area Emergency Stabilization and Rehabilitation Handbook. The Proposed Action is to implement this PESRP and streamline the ES&R planning process. Under the No Action Alternative, individual EAs must be completed for each ES&R plan.

Emergency Stabilization actions are taken immediately following a wildfire incident and are completed within one year. They are intended to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to life or property resulting from the effects of a fire, and to repair/replace/construct physical improvements necessary to prevent degradation to critical biological or cultural resources.

Rehabilitation actions are non-emergency actions taken within three years of control of a wildfire to repair or improve wildfire damaged lands unlikely to recover to a pre-fire condition, or to repair or replace minor facilities damaged by fire.

ES&R treatments in the Proposed Action are designed to mitigate the effects of fire on already burned landscapes. The PESRP includes an analysis of the following treatments for impacts on important resources:

Erosion Control Treatments

Site and Seedbed Preparation, Seeding, Planting, Mulching, Check Dams, Silt Fences, Contour Tree Felling, Slash Spreading, Stream bank Armoring, and Cultural Site Stabilization and Protection

Invasive Non-native Plant Treatments

Early Detection and Manual Control

Travel Corridor Treatments

Trail Stabilization, Clearing, Temporary Closure, Repair of Facilities and Infrastructure

Although the scope of the PESRP is large, including all BLM lands in Alaska, the treatment area is limited to burned areas with threats to life, property, or cultural or natural resources. General effects of the Proposed Action are localized, temporary, and minor. The effects of the No Action are the same as the Proposed Action, but also include potential delays in the ES&R planning process that could lead to increased erosion, spreading of invasive non-native plants, and unsafe travel corridors. In both the long-term and short-term, the Proposed Action provides overall benefits to protect human life and property and critical biological and cultural resources.

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1.0 Purpose and Need for Action

1.1 Purpose

The purpose of this Programmatic Emergency Stabilization and Rehabilitation Plan (PESRP) is to streamline Bureau of Land Management's (BLM) emergency stabilization and rehabilitation (ES&R) plans, activities, and procedures. The PESRP is developed on an ecological and regional basis to describe potential ES&R treatments that could be implemented under normal conditions after a wildfire. An analysis of the potential environmental impacts of ES&R treatments is provided in the Environmental Assessment (EA).

1.2 Need for the Proposed Action

The PESRP would enable timely and cost-effective implementation of on-the-ground ES&R treatments following a wildfire. A PESRP anticipates typical post-fire conditions and is used to develop site-specific ES&R plans. A programmatic approach makes plan development and compliance with the National Environmental Policy Act (NEPA) more efficient, ensuring funding is received in a timely manner and ES&R objectives are accomplished with minimal time and cost.

1.2.1 Emergency Stabilization and Burned Area Rehabilitation Plan Development and NEPA Compliance

After a wildfire occurs, emergency stabilization (ES Plan) and burned area rehabilitation (BAR Plan) plans are prepared by an interdisciplinary team to mitigate the adverse effects of wildfire on public lands. The ES and BAR Plans are separate plans with distinct, site-specific ES&R *treatments* and *activities*. Treatments are efforts which result in on-the-ground projects, such as seeding, silt fence installation, or hazard tree clearing. Activities are tasks such as monitoring, plan writing, or administrative functions. Field Offices may provide standards and guidelines to fire suppression personnel that address stabilization and rehabilitation to combat the effects of suppression efforts. Actions taken by fire suppression personnel to meet these standards are funded with fire suppression funds and outside the scope of this EA.

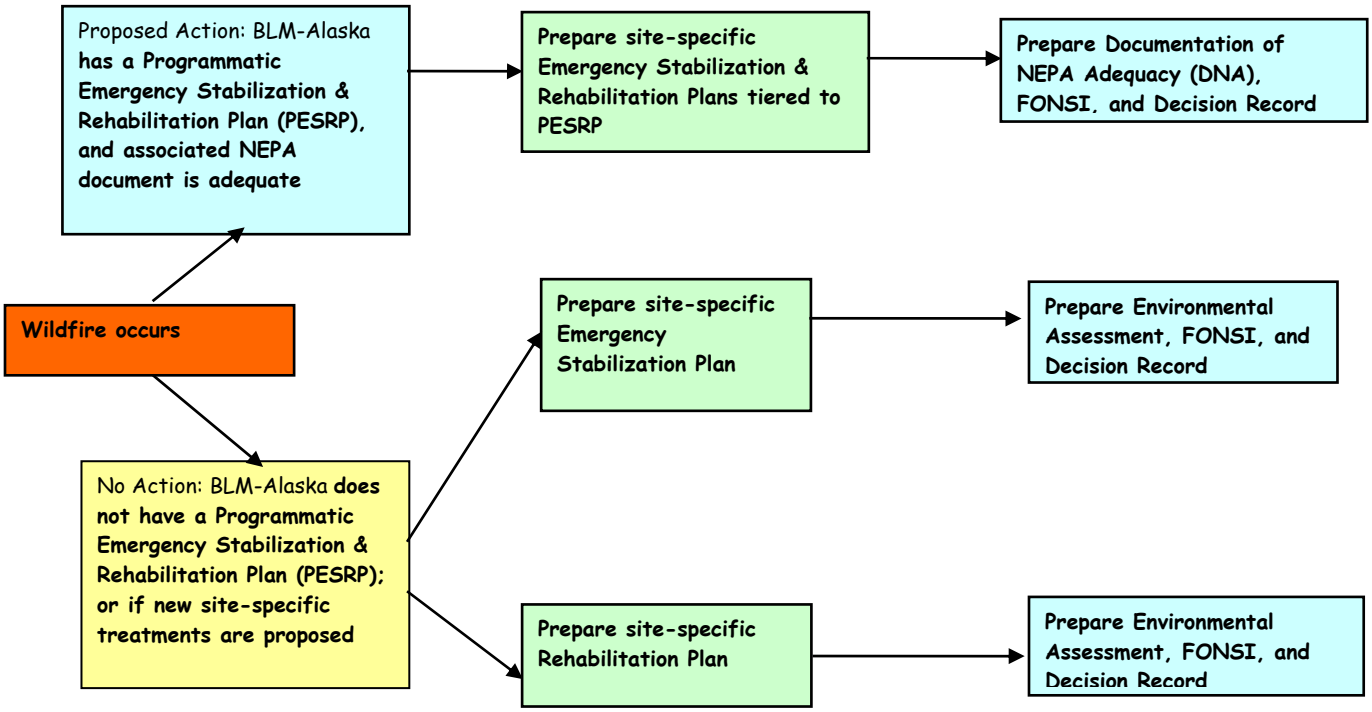
ES Plan- Emergency stabilization protection priorities are human life and safety, property, and unique or critical biological or cultural resources. Emergency stabilization treatments are initiated within one year of fire containment to minimize threats to life or property resulting from the effects of a fire; stabilize and prevent unacceptable degradation of natural and cultural resources; and repair, replace, or construct physical improvements necessary to prevent degradation of land or resources.

BAR Plan-Rehabilitation protection priorities are to repair or improve lands damaged directly by a wildfire and to restore or establish healthy, stable ecosystems in the burned area. Rehabilitation treatments are implemented within three years of fire containment to repair or improve lands unlikely to recover to a desired condition, and repair or replace minor facilities damaged by fire.

Given the urgent nature of ES&R protection priorities and time constraints for implementing such treatments, there is a need to streamline plan development. Figure 1.0 shows two possibilities for the ES&R planning process and NEPA compliance in terms of the No Action Alternative and the Proposed Action. With the Proposed Action, ES and BAR Plans would be

tiered to the PESRP. First, a documentation of NEPA adequacy (DNA) would be used to see if the actions proposed in the ES and BAR Plans are consistent with those analyzed in the PESRP. Second, a finding of no significant impact (FONSI) would be prepared if the site-specific ES and BAR plans had no significant impact on resources. Last, a decision record would be written stating that proposed actions of ES and BAR plans have been adequately analyzed in the PESRP, and there is no need for additional NEPA analysis. An ES or BAR plan containing any action not covered in the PESRP may require the development of a new EA to analyze the impacts of the new action. This programmatic approach reduces the repetitive preparation of individual EAs for ES and BAR Plans, saving time and costs.

Figure 1.1. The Emergency Stabilization and Rehabilitation Planning Process and NEPA Compliance Options with the Proposed Action and the No Action Alternative (USDI-BLM, 2006).



Burned Area Emergency Response Plans (BAER Plans)- BAER Plans are developed by interagency BAER Teams for complex wildfires involving multiple agency ownership or where preparation of ES&R planning is beyond the capability of local staff and where the values at risk are extremely high. In 2004, the largest recorded fire year in Alaska, a BAER Team developed a BAER Plan for 2004 fires (USDI-BLM Fairbanks District Office, 2004). The PESRP EA includes treatments identified in a BAER Plan.

1.3 Scope of the Analysis

The PESRP and EA would cover public lands administered by the Alaska Bureau of Land Management (BLM) (Map 1, page 65). BLM currently manages 86 million acres which includes land withdrawn for military purposes, lands selected for consideration for conveyance under the

Alaska Statehood Act 1958 (State-selected), the Alaska Native Claims Settlement Act 1971 (Native-selected), and the Native Allotment Act 1906. When conveyance is approved, the new land manager is responsible for ES&R decisions. Once all conveyances have been completed, BLM will manage approximately 65 million acres in Alaska. Other Federal, native, State, and private lands would not be considered in the PESRP.

Although the scope of the PESRP is large, wildfire history provides a reasonable basis upon which to predict future fires. ES&R activities will most likely take place on BLM lands in the Interior of Alaska, where wildfire has occurred over the last 55 years (Map 2, page 66). Of these areas with a previous fire history, treatments will be limited to burned areas with threats to life, property, or cultural or natural resources. In 2004, 6.5 million acres of private, local, State, and Federal lands burned, producing the largest recorded fire year in the modern history of Alaska. Of the approximately 2 million acres of BLM-managed lands that burned in 2004, 53 fires, ranging from 10,000 to 460,000 acres, were assessed for ES&R activities. In 2005, 1.4 million acres of BLM-managed lands burned, and 23 fires, ranging from 1,800 to 230,000 acres, were assessed for ES&R activities. ES&R activities are designed to offset impacts of recent fires and provide feasible treatments for future fire effects.

1.4 Conformance with Land Use Plans

All ES&R practices discussed in this PESRP EA are applicable to all BLM Alaska Lands and are consistent with the following planning documents:

- Central Yukon Resource Management Plan (RMP) 1986
- Fortymile Management Framework Plan (MFP) 1980
- Fort Wainwright RMP 1995, 2001
- Fort Greely RMP 1995, 2001
- Northeast National Petroleum Reserve-Alaska (NPR-A) Integrated Activity Plan (IAP) 1998, 2006
- Northwest NPR-A IAP 2004
- Northwest MFP 1982
- Southcentral MFP 1980
- Southwest MFP 1981
- Steese National Conservation Area RMP 1986
- Utility Corridor RMP 1991
- White Mountains National Recreation Area RMP 1986

These documents do not specifically address post-fire treatments for stabilization and rehabilitation; therefore, this plan does not contradict and is in conformance with the current land use plans (LUPs). These plans have been amended to update direction for wildland fire and fuels management (USDI/BLM, 2005). Stabilization and rehabilitation (Section 2.5.4 of the 2004 Environmental Assessment for BLM-Alaska Land Use Amendment for Wildland Fire and Fuels Management (Fire EA) is addressed in board terms and does not delineate the types of treatments applicable.

Concurrently, four new planning efforts have begun, with two in their final stages. Kobuk/Seward Peninsula RMP will replace the Northwest MFP. The Southcentral MFP will be

replaced with 2 new RMPs (East Alaska RMP and Ring of Fire RMP). A new RMP for the Bristol Bay Planning Area and a new IAP for South NPR-A will cover lands not previously addressed in land use plans. This proposed PESRP provides ES&R direction and guidance for these lands as they are updated in planning documents.

1.5 Laws, Regulations, Policies, and Guidance

Under either alternative, the BLM would comply with the planning constraints and processes imposed by laws, policies, and legal and regulatory agreements, both on this plan and any future site-specific plans that tier to it. The following is a list of the primary references. Additional sources are found in Appendix A of the 2004 BLM-Alaska Land Use Amendment for Wildland Fire and Fuels Management (Fire EA).

- Alaska National Interests Lands Conservation Act (16 USC 3101 et seq.) (ANILCA)
- Federal Land Policy and Management Act of 1976 (43 USC 1701) (FLPMA)
- Department of Interior 620 DM 3 – Burned Area Emergency Stabilization and Rehabilitation
- 2004 Alaska Land Health Standards and Guidelines
- BLM Land Use Planning Handbook H-1601-1
- BLM National Environmental Policy Act (NEPA) Handbook H-1790-1
- BLM Burned Area Emergency Stabilization and Rehabilitation Handbook H-1742-1
- Interagency Burned Area Emergency Response Guidebook, Interpretation of Department of the Interior 620 DM 3 and USDA Forest Service Manual 2523, Version 4.0, Final Draft February 2006.
- National Interagency BAER Team Standard Operations Guide, 2005

2.0 Alternatives Including the Programmatic Emergency Stabilization and Rehabilitation Plan

This chapter describes the No Action Alternative (continuation of existing methods for ES&R plan preparation and NEPA compliance) and the Proposed Action (implementing programmatic approach to ES&R treatments).

2.1 No Action Alternative

Under the No Action Alternative, there would be no programmatic document to streamline ES&R plans, policies, and procedures. For the purposes of this analysis, the No Action Alternative **does not** mean taking no responsive action following a wildfire. All of the same ES&R treatments in the Proposed Action could be implemented in this alternative, but there would be a difference in the **process**. The No Action would include all of the actions in the Proposed Action. The No Action Alternative would require a more lengthy process of plan preparation involving the preparation of individual EAs.

2.2 Proposed Action: Programmatic Emergency Stabilization and Rehabilitation (ES&R) Plan

The Proposed Action is a PESRP for all BLM-managed lands in Alaska (Map 1, page 65). ES&R activities will most likely take place on BLM lands in the Interior of Alaska, where wildfire has occurred over the last 55 years (Map 2, page 66). BLM-managed lands in the Copper River basin and treeless tundra areas of the Seward Peninsula do not usually see large fires. However large-scale warming trends could influence long-term rates and patterns of vegetation change (Kasischke, 1999; Rupp *et al.*, 2000), and in the future fire, and thus, ES&R treatments may become more common in those areas.

The Proposed Action describes typical post-fire ES&R treatments and provides guidance that would be used to develop site-specific ES and BAR plans following a wildfire. Having a PESRP that anticipates the treatments needed in typical post-fire conditions will assist BLM in providing timely and cost-effective implementation of post-wildfire treatments. Typical ES and BAR Plans would be tiered to the PESRP with NEPA documentation completed at the programmatic level. Without the implementation of the PESRP, individual EAs would be completed for site-specific ES and BAR plans. See Section 1.2.1 for description of ES and BAR Plan Development and NEPA compliance. The Proposed Action includes descriptions of possible ES&R treatments, applicable design features, and monitoring plans.

2.2.1 ES&R Treatments and Design Features

The PESRP recognizes that fire occurs naturally as a part of the Alaskan landscape, with many ecosystems capable of recovering from fire effects on their own. From an ecological perspective, fires are the result of vital disturbance processes in forests (Beschta *et al.*, 2004). After a fire event, qualified resource advisors assess the area for threats to life, property, or cultural or natural resources, in accordance with ES&R program objectives, priorities, and procedures (USDI/BLM, 2006). Depending on the needs of the post-fire environment, a variety of ES&R treatments may be recommended. The ecological costs and benefits to physical processes, biological diversity, and ecosystem functions would be considered before treatments are initiated. Field examination, vegetation inventory data, project files, monitoring data, standard

and required operating procedures, and professional knowledge would be used to determine needed treatments. All ES&R treatments will be designed to be overall improvements to an already burned landscape.

ES&R treatments analyzed in this EA are organized under the following categories: 1) erosion control, 2) invasive non-native plants, and 3) travel corridors. Many treatments can be implemented under both ES and BAR plans, depending on the intent and scope. Treatment types are often combined to provide the most effective set of stabilizing factors. Individual treatments have design features which are automatically implemented in order to avoid or reduce potential for environmental harm. ES&R treatments are subject to the standard and required operating procedures of the Land Use Plans (LUP) listed in Section 1.4.

Erosion Control Treatments

ES&R erosion control treatments include seeding and planting, ground cover (*mulching*, *erosion control mats*, and *slash* spreading), erosion barriers (*check dams*, *silt fences*, *contour tree felling*, and stream bank *armoring*), invasive non-native plant control, and cultural site treatments (site stabilization and protection) (Table 2.1). Erosion control treatments stabilize burned areas by preventing or reducing fire's effects on the landscape. These treatments foster recovery by providing provide soil cover and reducing erosion, restoring vegetation, trapping sediment to reduce stream sedimentation, and/or reducing water repellency and improving infiltration.

Table 2.1 ES&R Erosion Control Treatments

Seeding and Planting Treatments	
Site and Seedbed Preparation	Site and seedbed reparation is intended to reduce competition with undesirable species and to promote the germination and survival rates of desirable species Seedbed preparation includes hand work with rakes and rollers to ensure better seed to soil contact. In areas with pre-existing trails, tractors and all-terrain vehicles (ATVs) may be used. Tree falling or slash removal may be necessary prior to seeding.
Seeding	Seeding is intended to provide vegetative surface cover to minimize soil and wind erosion. Seeding methods include *broadcast*, *hydroseeding* and *drill seeding*.
Planting	Hand planting seedlings, saplings, and other plant materials would be used when seeding success is unlikely. Bare root stock or container stock are placed in hand dug holes at appropriate depth and spacing.
Ground Cover Treatments	
Mulching	Mulchin*g* provides immediate ground cover and protects soils from erosion, protects against nutrient and moisture loss during seeding establishment, and insulates permafrost. Mulching will be accomplished by aerial and ground application of hydromulch, straw, hay or other crop waste, woody material, pre-constructed mats, rock and other materials.
Erosion Control Mats	Erosion control mats reduce erosion from increased runoff and overland flow. Materials including coconut, wood, straw, or synthetics are contained in lightweight netting that lasts from several months to several years. Soil surface is cleared of obstructions and mats are secured to the ground and unrolled parallel to the direction of flow.

Slash Spreading	Slash spreading is designed to effectively reduce hill slope erosion by increasing ground cover with available onsite sub-merchantable trees or brush for slashing. Slash is spread by hand crews using chain saws to cut up onsite brush and downed trees into smaller pieces and spread the material over the ground. Slash spreading protects cultural resources from erosion and can camouflage the sites.
Erosion Barrier Treatments	
Check Dams	Straw bale and rock check dams temporarily store sediment and reduce erosion at peak flow by routing water through several small basins. Check dams involve hand work to excavate and secure straw bales and rock *gabions* across a channel.
Silt Fences	Silt fences are used to trap sediment and extend along an area expected to receive heavy soil movement. They are *geotextile* material attached by hand to wooden posts and firmly anchored below ground.
Contour Tree Felling	Placing or falling of trees will provide surface roughness, improve infiltration, and trap sediment. Downed logs, hand felled logs, or *straw wattles* are secured in a shallow trench on the contour of a slope. Crew and tools are transported to sites with helicopters or vehicles.
Stream bank Armoring	Stream bank armoring reduces the potential impact from increased peak flows by placing rocks or suitable materials by hand along the banks to deflect the erosional force of water. Vehicles may be used for the transportation of materials.
Cultural Site Treatments	
Cultural site stabilization, protection, and repair	Cultural site stabilization, protection, and repair prevents further damage to known cultural resources resulting from the effects of fire, by employing other erosion control treatments, removing destabilizing debris, law enforcement, covering, and repairing facilities to pre-fire condition.

Natural Recovery

Interior Alaska ecosystems are considered to be fire adapted with natural systems capable of recovering from the effects of fire. Northern boreal ecosystems evolved with fire as a natural occurrence (Shugart *et al.*, 1992), and boreal forests are characterized by a mosaic of different aged parcels that are. In some areas prone to animal or human disturbance, area closures may assist vegetation recovery. maintained by fire. In general, the fire adapted nature of the landscape and minimal human disturbance preclude the need for seeding and planting, except in areas where there may be a need to prevent slumping, permafrost damage, or in designated forest timber land management areas. Often, burned vegetation resprouts quickly after a fire (Figure 2.1). In some areas prone to animal or human disturbance, area closures may assist vegetation recovery.

Figure 2.1. Natural recovery of willow re-sprouting from roots after a burn (USDA/USFS, 2006).

Seeding and Planting

ES&R seeding and planting treatments are designed to introduce plants that will reduce the loss of soil, improve plant community, prevent invasive non-native plant establishment and reduce permafrost damage. Treatments include site and seedbed preparation, seed application, seed covering, improving seed to soil contact, post seeding soil firming, planting seedlings, saplings and other plant materials. Seeding and planting treatments may be combined with mulching or site protection treatments to minimize disturbance until plants can become established.

- *Site and Seedbed Preparation***.** Site and seedbed preparation could be used to promote the germination and survival rates of desirable species. Due to cost and logistical constraints associated with the remoteness of Alaskan fires little to no seedbed preparation is likely except on small accessible sites such as newly constructed staging areas. When seedbed preparation is conducted, it will likely be done by hand crews with rakes and rollers. In areas accessible by pre-existing trail or roadway, ATV's could be used. Some tree falling or slash removal may be necessary prior to seeding.

- *Seeding***.** Seeding methods in Alaska usually involve broadcast or hand application, rather than drilling methods. Broadcast seeding may be done by aircraft when a reasonable success rate is likely and supported by research. However, it is unlikely that aerial broadcast seeding will be undertaken by BLM due to current low success rates. Aerial broadcast seeding does not involve ground disturbance at the seeding site. Ground based broadcast seeding could be conducted by vehicle with a seed spreader, but is more likely to be done with a hydroseeder or by a hand held spreader. Broadcast seeding typically has a low rate of success unless the seed is covered and the soil is firmed. Hydroseeding offers the advantage of applying the seed with moisture and mulch to improve seed soil contact and germination potential. Seed may be sewn by *rangeland drill* on vehicle accessible sites where the slope is less than 30%, rocks and other obstructions are minimal, and the area has a high priority for vegetative cover. Rangeland drills do not require the extensive seedbed preparation needed for other drilling equipment. An alternative to this treatment would be hydroseeding.

- *Planting.* Hand planting seedlings, saplings, and other plant materials would be used when seeding success is unlikely, at high priority areas or when it is critical to establish vegetation quickly in order to stabilize erosive soils. Bare root stock or contained stock is typically used for shrub and tree species. Holes are hand dug and plant materials set at appropriate depth and spacing. The disturbance associated with hand plantings consists of the area within a 6-8" radius of the plant and foot traffic from the planter.

Ground Cover

- *Mulching.* Mulch is an organic covering, such as straw or wood chips, spread over the soil to retain moisture, insulate the soil, and reduce seed and soil loss. Mulch is beneficial in maintaining favorable moisture and temperature for seed germination and growth. Ironically, it can also be used to reduce weed seed germination and growth. Mulch may be used to replace some of the organic material that was removed by the fire and served to insulate the soil and underlying permafrost. Preventing permafrost degradation is critical to reducing erosion and protecting infrastructure. It can be beneficial in reducing

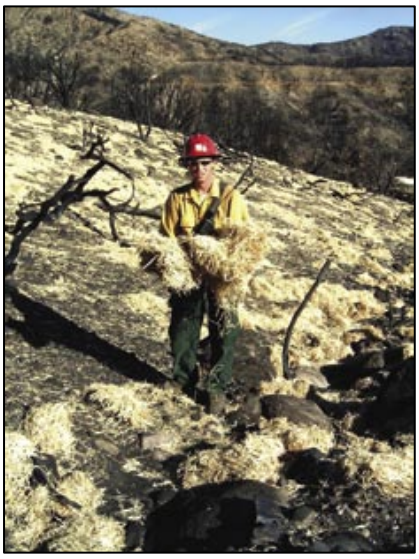
predation on seeds by birds, rodents and insects. Mulch is also used to protect soils by reducing rain drop impact and wind which lead to soil particle displacement (erosion). An additional benefit of mulch is that it breaks down to add nutrients and organic material to the soil.

- *Hydromulch.* Mulching includes application of hydromulch, straw, hay or other crop waste, woody material, pre-constructed mats, rock and other materials. Hydromulch is typically a mixture of fiber materials, soil stabilizers (*tackifiers* and seeds), and water that forms a smooth, dense mat on the soil surface. Hydromulch is typically applied by a hand held wand from a truck mounted spray unit to form a dense mat on the soil surface (Figure 2.2). Hydromulch can also be applied from aircraft in remote areas (Figure 2.3). Hay, straw and other crop residues can be applied by hand (Figures 2.4), from a truck or trailer mounted chopper/blower or by aircraft. All mulch material will be certified weed-free. Mulch is typically applied in contour strips or broadcast to achieve specific ground cover and depth.

Figure 2.2. Hydromulch is applied to form a smooth dense mat on the soil surface (USDA/USFS, 2006).

Figure 2.3. Hydromulch can be applied by helicopter in remote areas (USDA/USFS, 2006).

Figure 2.4. Hay, straw, and other crop residues being applied by hand (USDA/USFS, 2006).



- *Erosion Control Mats.* In areas of steep slopes where immediate stabilization is needed, erosion control mats may be installed. Erosion control mats reduce erosion from increased runoff and overland flow. Materials including coconut fiber, wood, straw, or synthetics are contained in lightweight netting that lasts from several months to several years. On occasion, rock or wire mesh (such as chainlink) may be necessary to hold the soil in place. The soil surface is cleared of obstructions and mats are unrolled parallel to the direction of flow and secured to the ground with stakes or staples.

- *Slash Spreading.* Slash spreading provides soil cover to moderate and high burn severity areas. Slash spreading is implemented by hand crews using chain saws to cut up onsite brush and downed trees into smaller pieces and spread the material over the ground. The treatment is designed to effectively reduce hillslope erosion by increasing ground cover with available onsite sub-merchantable trees or brush for slashing. Slash spreading protects cultural resources from erosion and can camouflage exposed artifacts otherwise targeted for illegal collection.

Erosion Barriers

Erosion barriers are designed to control erosion caused by high velocity of water moving over the soil, sediment flow, and variations in overland or channel flow. Installation of erosion barriers will control these erosional factors in burned areas by reducing uninterrupted slope length, increasing soil particle deposition, and improving opportunities for infiltration. Treatments designed to slow water movement on slopes include check dams, silt fences, and contour tree felling. Treatments offering stream channel protection include check dams (rock gabions or straw bales), and stream bank and stream bottom armoring.

- *Check Dams.* Check dams attempt to reduce post-fire erosional forces upon soil particles. Constructed from straw, log, or rock gabions these temporary structures lessen the erosion following fire by trapping sediment and slowing the velocity of sediment laden water entering streams from burned watersheds. The size, slope, and space between

dams determine the amount of material trapped. Straw bale check dams are a temporary erosion control measure built with straw bales depending on the size of the channel. Straw bale check dams are placed in ephemeral or intermitting channels with a moderate gradient to reduce siltation (Figure 2.5). Log check dams are constructed using burned trees within the fire area. Rock check dams are used when gradients are steeper and a rock source is near and this is the most feasible option to protect the resources at risk. Check dams are temporary and should be revisited and removed and replaced with long term erosion control measures designed specifically for the particular channel and slope.

Figure 2.5. Straw bale check dams are installed in ephemeral or intermitting channels (UDSA/USFS, 2006).

- *Silt Fences.* Silt fences are used to trap sediment and extend along an area expected to receive heavy soil movement (Figure 2.6). They are made from *geotextile* material attached by hand to wooden posts and firmly anchored below ground. Silt fences are temporary and should be revisited and removed and replaced with long term erosion control measures designed specifically for the particular channel and slope.

Figure 2.6. A silt fence, designed to monitor soil movement, installed across a recent burn and landslide (Guyer, 2006).

- *Contour Tree felling.* Contour tree felling is designed to reduce erosion by shortening slope length, providing surface roughness, improving infiltration, and trapping sediment. Downed logs, hand-felled logs, or *straw wattles* are secured in a shallow trench on the contour of a slope (Figure 2.7). Crew and tools can be transported to sites with helicopters.

Figure 2.7. Downed logs are used in contour tree felling to trap transported sediment (USDA/USFS, 2006).

- *Stream Bank and Stream Bottom Armoring.* Armoring is the placement of rock or other materials along the stream bank to reduce erosion. Stream bank armoring is prescribed to reduce erosion and sedimentation in stream channels. Armoring may include placement of boulders, riprap, or gabion baskets, and other natural materials. Stream bottom armoring may be desirable when a travel corridor crosses the stream and increased travel due to the burn is expected to increase damage to the streambed resulting in erosion, sedimentation and down cutting.

Sediment storage structures should be installed with recommendations from qualified experts, since failure of these structures could release stored sediment and cause additional to damage channels. Erosional barrier structures such as check dams should be used sparingly in small, ephemeral and naturally intermittent channels. Hillslope erosion control treatments that prevent sediment delivery to waterways are generally more effective (Robichaud *et al*., 2000; Rosgen, 1996). Straw bale check dams, gravel bags, straw wattles, and other structures that capture large material, allowing fine sediment to pass and decompose over time, would have the lowest potential for channel damaging failures. See the BAER catalog for more details on treatment effectiveness and guidance on treatment selection (USDA/USFS, 2006).

Cultural Site Stabilization, Protection, and Repair

Cultural site stabilization, protection, and repair prevent further damage to known cultural resources (including grave sites) resulting from the effects of fire. Stabilization of cultural sites may include low impact land treatments of broadcast seeding and planting, installation of erosion barriers, or removal of debris or hazards threatening site integrity or public safety. In addition to stabilization, the site should be protected against secondary impacts that result from wildfire, including illegal collection of exposed artifacts. Hand seeding or camouflaging a site would provide cover for cultural resources exposed by fire. Covering a site by spreading debris would protect historic sites exposed by erosion and against illegal artifact collection. Law enforcement from BLM Law Enforcement Rangers would be used to discourage illegal artifact collection. Significant facilities would be restored to pre-fire condition, when feasible.

Design features for erosion control are found in Table 2.2.

Table 2.2. ES&R Erosion Control Design Features
Seedbed preparation, application, and covering projects will run along the contours of the land to reduce erosion, whenever possible and practical.
Islands of unburned vegetation will not be seeded. Irregular boundaries of the burned area will be maintained.
Plantings will be consistent with known or anticipated changes in successional stages (e.g., trees would not be planted in areas that were previously treeless tundra).
Seed will be sown during the appropriate season to ensure seed stratification, germination, and establishment.
Species planted on burned areas must be in compliance with the Executive Order 13112 on Invasive Species
Seed mixtures will be formulated to benefit wildlife and Special Status Species habitats as appropriate.
All seed will be tested to ensure compliance with the State noxious-seed requirements recognized in the USDA Administration of the Federal Seed Act. All purchased seed must meet all requirements of: 1) the Federal Seed Act (7 USC 1551-1610), 2) the State seed laws where it will be delivered, and 3) Federal specifications JJJ-S-181. All seed will be tested for purity and germination to meet contract specifications and should be tested for invasive non-native seed, and identified by certified varietal tags and source identified tags to ensure the genetic origins of the parent plant material or the collection origin, as per the USDI and USDA Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook 6.3.2.3 Revegetation.
Plant materials will be selected and seed mixtures designed to best meet the objectives identified in the site-specific LUP and Alaska Land Health Standards and Guidelines. The use of native species is preferred to the use of non-natives. When non-natives are considered, a justification of why native plants will not work is needed. Contact the BLM-Alaska Vegetation Coordinator and State of Alaska Palmer Plant Materials Center to ensure proper native seed source.
Prior to implementing any projects involving mechanical seed bed preparation or planting, the area involved will be reviewed by a qualified archaeologist to determine if there are any conflicts with cultural resources. Projects may need to be redesigned so as to avoid impacting cultural resources.
Only certified weed-free materials will be used (straw, mulch, woody material, fiber mats, gravel, rock).
Prior to trenching, the area involved will be reviewed by a qualified archaeologist to determine if there are any conflicts with cultural resources. Projects may need to be redesigned so as to avoid impacting cultural resources.

Silt fences and other synthetic materials will be removed from the site and properly disposed of once grade stabilization is achieved.
On-site native materials collected for use in erosion control treatments will be limited to removal of woody debris or rock and would not impact riparian and fish habitat.
Bioenginnering techniques will be used when possible as a preferred erosion control method to retain important features of streams and rivers.
Before entering the project site, all vehicles and heavy equipment that disturb soil or are used off designated roadways will be cleaned of material that could contain weed seed or other plant material resources.
Treatments should be designed and installed with other Federal, State, and local watershed restoration experts to collectively solve erosion control problems at the local level. US EPA, US Army Corps of Engineers, State of Alaska Division of Environmental Quality, Alaska Soil and Water Conservation Districts, local watershed councils, and their partners are all organizations working with watersheds on a local level.
Work and travel within streams requires a Title 41 permit from the State of Alaska and a permit from the Army Corps of Engineers (Clean Water Act, Section 404). Project planning should include steps needed to obtain these permits and any associated NEPA processes.

Invasive Non-native Plants

Invasive species are defined in the Executive Order 13112, Invasive Species are defined as any species (or part of a species) that is alien to a particular ecosystem and whose introduction does or is likely to cause economic or environmental harm or harm to human health. One special class of invasive plants is “noxious weeds,” which are designated by State and/or Federal law. Alaska’s current noxious weed law was designed to assist agricultural producers and is currently being reviewed for update. Additionally, a grass roots organization, the Committee for Noxious and Invasive Plant Management (CNIPM), has been instrumental in developing the Alaska Exotic Plant Information Clearinghouse (AKEPIC) which contains over 140 species of non-native plants that have moved outside of the area they were planted to invade other sites. Some of these are capable of aggressively spreading and dominating a site.

There is a greater potential for invasive non-native plants to invade or increase after a wild fire disturbance. By managing for native species, patterns and processes of disturbance that produce and maintain diverse ecosystems are preserved (Beschta *et al.*, 2004). The objectives of invasive non-native plant treatments are to prevent non-native plants from colonizing and establishing in areas disturbed by fire or fire suppression activities. Treatments (Table 2.3) including early detection and control of non-native plant infestations within or adjacent to the burned area are critical in preventing the establishment of undesirable species and preserving native plant biodiversity.

	Table 2.3. ES&R Invasive Non-Native Plant Treatments
Detection	Invasive non-native plant detection efforts would focus on areas around known infestations of invasive non-native plants within and adjacent to the fire boundary as well as associated roads, dozer lines, water sources, and drainages. Inventory of these areas is done on foot with transportation to site by helicopter, truck, four wheeler, or other off road vehicles. Monitoring may include the installation of plot markers, typically by pounding a stake in the ground, hanging flagging tape, and minor trampling by workers.
Manual Control	Manual control of invasive non-native plants is used to physically destroy, disrupt growth, or interfere with the growth and reproduction of invasive non-native plants. These treatments are accomplished by hand, hand tool, or hand-held power tool and may include pulling, *grubbing*, digging, hoeing, tilling, cutting, mowing, mulching, and burning.

Early Detection. ES&R treatments for invasive and non-native plants include inventory and monitoring burned areas for non-native species. ES&R weed detection efforts would focus on areas around known infestations of invasive non-native plants within and adjacent to the fire boundary as well as associated roads, dozer lines, water sources, and drainages (Figure 2.8). Inventory would be done mostly on foot, but some instances may involve trucks, four wheelers, or other off road vehicles. . Monitoring may include the installation of plot markers, typically by pounding a stake in the ground, hanging flagging tape and minor trampling by workers.

Figure 2.8. A roadside infestation of the non-native white sweet clover adjacent to a burned area (Gronquist, 2006).

Control. Weed control treatments may include manual, mechanical, biological or chemical methods within and integrated weed control program (USDI/BLM, 2005). Integrated weed control considers the weed species of concern, the site and long term management of the site.

Chemical control methods (herbicide use) are beyond the scope of this PESRP. In instances where herbicides are deemed necessary for weed control, the environmental effects of these projects will be analyzed in separate NEPA document.

Manual treatments of invasive non-native plants are used to physically destroy, disrupt growth, or interfere with the growth and reproduction of invasive non-native plants. These treatments are accomplished by hand, handtool, or hand-held power tool and may include pulling, grubbing, digging, hoeing, tilling, cutting, mowing, mulching, and burning. Manual treatments would typically be used to control individual plants or small or isolated infestations. Larger infestations of invasive non-native plants are may be very difficult to control with manual treatments alone.

Design features for invasive non-native plants are found in Table 2.4.

Table 2.4. Invasive Non-native Plant Design Features

Vehicles and equipment will be cleaned and inspected prior to entering or leaving the project sites when operating in areas with weed infestations to prevent "hitch-hiking" seed transport.
Manual control (e.g. hand pulling, grubbing, and cutting) is preferred in all areas, particularly in sensitive areas, to avoid adverse effects to non-target species or water quality.
The disposal of invasive non-native plants will be in accordance with approved disposal methods. Methods include bagging and burning plants that have developed seeds and landfill disposal.
Where vectors for weed invasion exist on lands adjacent to BLM-managed burned areas but are not under BLM jurisdiction, cooperative agreements with other land owners should be pursued for control of non-native invasive plants.

Travel Corridor Treatments

Many trails managed by BLM in interior Alaska serve as critical travel corridors between communities that do not have all-weather roads, and primary transportation options are by dog sled, snowmachine, air travel, ATV, or river boats. ES&R treatments for trail and travel corridors are designed to mitigate the results of fire and ensure safe passage in winter and summer seasons when the use of trails is necessary. Given the severe weather conditions in Alaska, safe passage and emergency shelters is important in winter travel. Hazard trees, destruction of safety shelters, and loss of trail markers could become life threatening issues during travel on these trails. Water seeps created by fire-related thawing of permafrost could flood and making trails impassable. Culvert repair, removal, or replacement may be needed to restore proper drainage. ES&R treatments for travel corridors include trail stabilization, clearing, temporary closure, and repair of minor facilities (Table 2.5). Specific examples of some trail stabilization and temporary closure treatments are shown in Figures 2.9, 2.10, and 2.11.

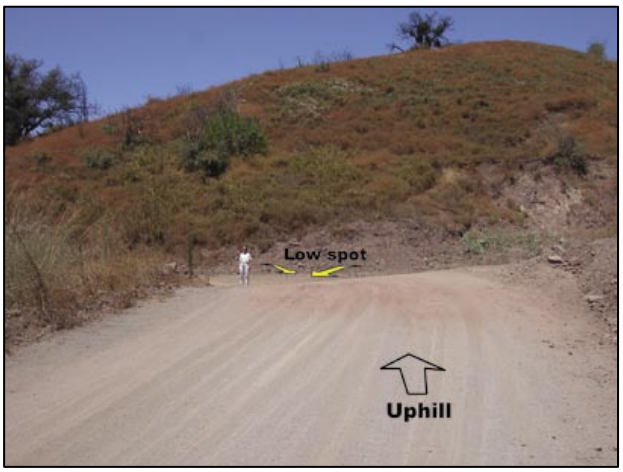
Trails will be restored to pre-fire condition. Improving trail beyond pre-fire conditions could change travel patterns, resulting in increased use of an area. Any trail work will comply with LUPs listed in Chapter 1.0.

	Table 2.5. ES&R Travel Corridor Treatments
Trail Stabilization	Trail stabilization reduces the adverse effects of increased runoff, erosion, and permafrost thawing. Methods include the use of water bars (rock, log, or rubber), armored stream crossings, rolling dips, trail hardening, and other means to provide safe passage in necessary seasons.
Clearing	Clearing of downed or standing hazard trees, debris, enabling safe passage along major winter trails and travel corridors.
Temporary Closure	Temporary closures to the public may exclude travelers in order to restore safe access and allow for recovery of burned areas. Closures would be coordinated with local communities. Treatments include installing fencing, gates, barricades, concrete barriers, warning signs, reflective trail confidence markers, and closure enforcement. Public notices or signs necessary to close trails, warn of potential floods, promote public safety, or otherwise assist with ES&R actions (e.g. directional, road, danger signs) may be posted.
Repair of Facilities and Infrastructure	ES&R treatments include the repair and replacement of facilities and infrastructure essential to public health and safety to pre-fire condition. Facilities, including shelters and campground, and infrastructure, including roads, trails, OHV or foot bridges, culverts, and others, would be repaired or reconstructed.

Figure 2.9. A log water bar is installed on a winter trail for trail stabilization (Cogley, 2006).

Figure 2.10. Warning signs for trails and travel corridors (Cogley, 2006).

Figure 2.11 Rolling dips are used to drain water effectively from road or trail surface and prevent concentration of water. This low spot or dip provides erosion relief by transporting water across the road to a designated and armored location (USDA/USFS, 2006).



Outside of BLM jurisdiction, the primary travel corridors in Alaska are the highways, managed by the Alaska Department of Transportation (AK DOT). In the interest of securing threats to life, property, and significant biological or cultural resources, BLM should work cooperatively with AK DOT to protect highways from mass wasting or debris flows that could destroy bridges or culverts and block access.

Design features for travel corridors are found in Table 2.6.

Table 2.6. Travel Corridor Design Features
Downed trees that create obstructions and pose a threat to trail users will be cleared. Only established trails on BLM-managed land with a history of significant use will be cleared by BLM ES&R crews. Clearing outside of BLM-managed lands is the obligation of the adjacent non-BLM land owner. Coordination with other land owners is encouraged to improve efficiency and more effectively restore safe access. Trails within Special Management Areas (SMAs) will be cleared to the extent described in the appropriate land use plan.
Burned Area Warning Signs will be installed at entry points and removed when hazards are no longer a threat to public safety.
Trail marking tripods and reflectors may be necessary to mark the trails and ensure safe travel.
Public and local governments will be notified as needed of closures.
Hazardous materials including toxic materials created or destabilized by fire (e.g. lead battery leaching as a result of being burned) will be stabilized or removed when they pose a significant threat to human health, safety, or biological or cultural resource degradation.
Woody debris and brush cleared from travel corridors will be broadly dispersed alongside the trail.
Downed or hazardous trees in and along the trail creating obstructions or posing safety threats to trail users may be removed.

2.2.2 Specific Design Features for Sensitive Resources

Special Status Species (SSS)

Proposed project locations would be screened for the presence of special status plants and animals or their habitat during plan development. If special status plant and/or animal populations or their habitats are known or suspected to occur in a site-specific project area, the area would be examined to determine if there is a need for rehabilitation treatments. Any necessary treatments would be designed in accord with policy, program, or LUP guidance for treatment activities including buffers and seasonal restrictions appropriate to the species involved. See Section 3.1.12 for SSS that might be encountered.

Riparian, Wetland, and Aquatic Habitats

Riparian, wetland, and aquatic habitats are important for maintaining hydrologic, geomorphic, and ecological processes in streams. These areas would require specific design features to maintain their function (Table 2.7).

Table 2.7. Specific Design Features for Riparian, Wetland, and Aquatic Habitat
Use of heavy equipment to repair facilities or to implement rehabilitation treatments would be limited.
Limiting off road vehicle or ATV access will be limited to designated crossings or work areas during installation of ES&R treatments to minimize disturbance.
Large woody debris (LWD) will be left undisturbed whenever possible. An alternative to removing LWD is repositioning it to better meet ES&R objectives.
When installing in-channel erosion control treatments, the use of on-site “soft material” (anchored rootwads, and natural vegetation) is preferred to “hard material” (rock) to better dissipate stream flow, protecting fish habitat.
Severely burned areas important for salmon spawning and rearing, particularly streams that are susceptible to slumping into streambeds would be monitored.
Work will be seasonally limited to minimize impacts to resources. For example, in-stream work will not be authorized when spawning fish are present and the use of heavy equipment will be permitted **only** when soils are sufficiently frozen to prevent damage from compaction.

Special Management Areas

Special Management Areas (SMAs), including Areas of Critical Environmental Concern (ACEC), Wild and Scenic River corridors (WSR), Wilderness Study Areas (WSA) and Research Natural Areas (RNA), burned would be treated to protect the values for which the area was established and in conformance with specific management directions in the existing LUPs and Activity Plans. ES&R treatments in SMAs are intended to: 1) maintain the suitability of proposed Wild and Scenic river segments for inclusion in the National Wild and Scenic River System, 2) protect and prevent irreparable damage to important historic and cultural sites, and areas with high scenic values, and 3) protect and maintain the outstanding qualities of fish and wildlife resources, or natural systems or processes that lead to the designation of ACECs, RNAs, and other SMAs. Design features for SMAs are found in Table 2.8.

Table 2.8. Specific Design Features for Special Management Areas
Emergency Stabilization in WSAs will be evaluated under the Bureau's Interim Management Policy and Guidelines for Lands Under Wilderness Review H-8550-1, appropriate Resource Management Plans, and the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook.
ES&R treatments for erosion control and vegetation rehabilitation will be conducted in a manner that will not impair the special values for which it was designated. Treatments will utilize the least intrusive tools and methods available to enhance or restore special values of the resources. In areas of where machinery is prohibited, hand tools will be used.
Protection fences will not be installed and ATVs or other vehicles will not be used within WSAs and other areas designated for the preservation of wilderness values.
Seeding and planting in SMAs will utilize native species, as required on all Alaskan BLM-managed lands.
Alternatives to ground disturbing seeding methods that are non-ground disturbing will be considered in SMAs following guidelines for historic trails.

Cultural Resources

Cultural site stabilization, protection, and repair prevent further damage to known cultural resources that result from fire. ES&R treatments to be used in cultural site stabilization, protection, and repair include treatments discussed in erosion control section above. Stabilization of cultural sites may include low impact land treatments of broadcast seeding and planting, installation of erosion barriers, or removal of debris or hazards threatening site integrity or visitor safety. In addition to stabilization, sites should be protected against secondary impacts that result from wildfire, including illegal collection of exposed artifacts. Hand seeding or camouflaging a site would provide cover for cultural resources exposed by fire. In addition, increased law enforcement could discourage illegal artifact collection. Significant cultural values would be restored to pre-fire condition, when feasible. Table 2.9 lists design features for cultural resources.

Table 2.9. Specific Design Features for Cultural Resources
ES&R activities would only be applied to known cultural sites. Activities do not include surveying an area for other cultural sites.
The Alaska State Historic Preservation Office or appropriate cultural resources specialist will be consulted before planning cultural site treatments.
Each emergency and planned ES&R activity will be reviewed by a qualified cultural resource specialist to assess potential impacts to cultural resources.
Erosion control measures would be used where they would not adversely affect associated sites, artifacts, or historic landscapes.
Guidelines and restrictions included in the Secretary of Interior's Standards and Guidelines for Archeology and Historic Preservation for evaluating the need for and method of protection and stabilization in designated Historic Districts will be reviewed. ES&R treatments involving the surface disturbance will have to be reviewed for potential conflicts with cultural resources. Compliance with Section 106 of the National Historic Preservation Act will be completed prior to implementing any such treatments.

2.2.3 Monitoring

ES&R treatments would be monitored and evaluated to ensure that they are properly implemented, effective, and maintained. Spring Assessments of previous fire season are no impact activities completed yearly to monitor fire effects and additional needs for ES&R treatments in preparation of ES&R plans. All ES&R plans would include monitoring in order to: 1) determine if plan objectives were met, 2) establish the need for additional treatments, 3) determine if treatments are implemented as planned, and 4) document results including effectiveness of treatments.

Monitoring methods may be qualitative or quantitative, and they would be commensurate with the level of treatment complexity and extent. Monitoring methods outlined in ES and BAR plans should establish quantitative thresholds defining success for the treatment. The methods used to monitor the treated area may include field observations, photographic plots, and/or vegetation sampling transects or plots. Monitoring guidance is included in 620 DM 3 and BLM Burned Area Emergency Stabilization and Rehabilitation Handbook H-1742-1. Photo-plot monitoring is the most likely method to be used in Alaska, accompanied by some vegetation sampling plots or transects. All of these methods include establishing a permanent point from which to photograph or sample. Short term disturbance includes installing a marker that can be relocated for the duration of the project and minor trampling by employees during the monitoring.

ES&R treatments for erosion control will be monitored for success and continued improvements to be made. Areas receiving seeding or planting treatments will be monitored to evaluate success of the treatment and to determine if additional restoration methods are needed. Monitoring will ensure that structures installed to prevent erosion will be removed when no longer needed. Cultural sites will be monitored to maintain adequate concealment and stabilization of sensitive sites. Soils would be monitored for additional permafrost thawing. ES&R treatments designed for the specific purposes of monitoring burned areas for invasive non-native plants are further discussed in Section 2.2.1. ES&R weed detection efforts would focus on areas around known infestations of invasive non-native plants within and adjacent to the fire boundary as well as associated roads, dozer lines, water sources, and drainages.

2.3 Comparison of the No Action Alternative to the Proposed Action

The No Action Alternative and the Proposed Action are **not** two different on-the-ground activities; rather they represent two different **processes** for ES&R planning. Figure 1.1 shows the differences in the ES&R planning process and NEPA compliance resulting from No Action Alternative and the Proposed Action. The Proposed Action takes a programmatic approach to ES&R Plan preparation by analyzing the potential effects of possible treatments in the PESRP. The Proposed Action would allow for a more streamlined process with future ES&R Plans being completed in a more timely, cost-effective manner. The No Action would result in a more lengthy process of plan preparation and NEPA compliance. See Section 1.2.1 and Section 2.2 for more detailed discussion of the ES&R planning process and NEPA compliance associated with the two alternatives.

3.0 Affected Environment and Environmental Consequences

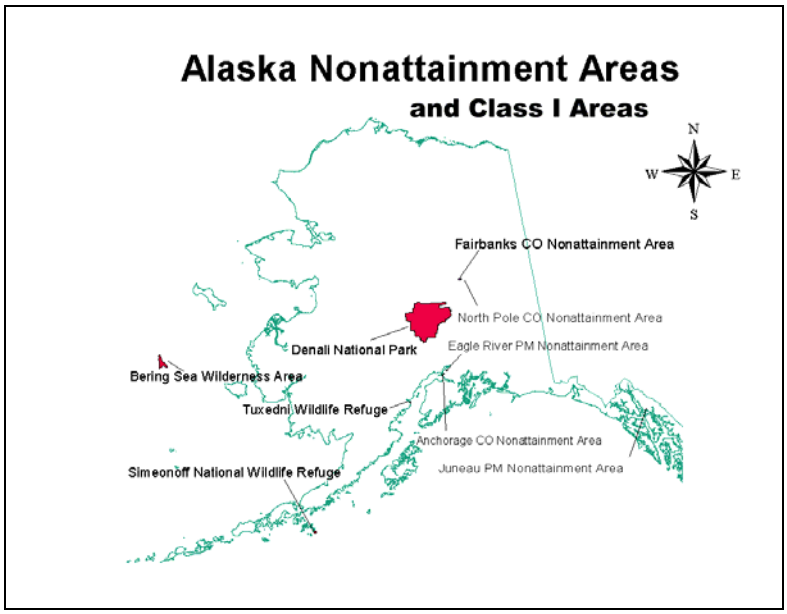
This chapter describes the environment to be affected by the alternatives and environmental impacts of the alternatives. For the purpose of this analysis, the affected environment is a burned area having undergone a number of effects from fire (i.e. loss of vegetation, standing dead trees, permafrost melt, increased erosion, disturbance or displacement of wildlife). The alternatives are analyzed for the environmental consequences of ES&R treatments that are applied to a post-fire landscape. Direct and indirect effects take into account that all applicable treatment design features and standard and required operating procedures from LUPs would be applied, already reducing the potential for certain environmental impacts. Appendix A lists the critical elements that must be considered in accordance with specific executive orders.

3.1 Air Quality

3.1.1 Affected Environment

Alaska has four *Class I Airsheds*. There are no BLM-managed lands near or adjacent to any Class I Airsheds. Fire on BLM-managed land may affect four *Areas of Non-Attainment*: three with carbon dioxide (CO) and one with particulate matter (PM) exceeding PM10 guidelines. The Fairbanks District Office has resource management responsibilities on lands near or adjacent to the Fairbanks and North Pole CO Non-Attainment Area. The Anchorage Field Office manages lands near or adjacent to the Anchorage CO and Eagle River PM10 Non-Attainment Areas. Figure 3.1 displays Alaska ClassI Airsheds and Non-Attainment areas.

Figure 3.1. Alaska Class I Airsheds and Non-Attainment Areas.



Fires are a source of CO and PM air pollutant emissions. Fire affect on air quality and visibility depends on many factors including amount and duration of emissions, wind speed and direction, atmospheric stability, humidity, weather system patterns, the scope and severity of fires, terrain, and the type and quantity of fuels burned. Prevailing winds and atmospheric circulation during periods when there are active fires on BLM-managed land may impact to the Class I Airsheds or populated areas.

Alaska Department of Environmental Conservation EC is responsible for declaring air episodes and issuing air quality advisories, as appropriate, during periods of poor air quality or inadequate dispersion conditions. During periods of wildfire activity the Multi-Agency Coordinating Group (MAC), a sub-group of the Alaska Wildland Fire Coordinating Group (AWFCG), addresses air quality and smoke management issues.

A U.S. Forest Service General Technical Report and the BLM Land Use Plan Amendment for Fire and Fuels Management provide further discussions of fire effects on air quality and emissions (USDA/USFS, 2002;USDI/BLM, 2005).

3.1.2 Environmental Consequences

No Action Alternative

Since the only difference between the No Action and the Proposed Action Alternatives is the streamlined approach to ES&R planning found in the Proposed Action, both alternatives would have the same environmental effects. There would be additional indirect effects associated with an increase in the cost and time needed to implement ES&R treatments. With the No Action Alternative, individual EAs may have to be prepared for ES&R treatments, adding an expense of hiring specialists to handle the workload, creating delays in individual EA preparation, and slowing the implementation of ES&R treatments. As a result, harmful effects on air quality would be prolonged and beneficial effects would be delayed.

Proposed Action

ES&R treatments will only occur in areas where the effects of fire have posed significant threat to human life, property, and critical biological or cultural resources. The impact of ES&R treatments is anticipated to be very small in scale when compared to the very large planning area; thus, the potential impacts from ES&R treatments on air quality are expected to be localized, temporary, and minor. Table 3.1 summarizes the direct and indirect effects of ES&R treatments on air quality. In all cases, these impacts would be on an already burned landscape. Impacts would be negligible, localized, and short-term.

Treatments	Table 3.1. Direct and Indirect of Effects of ES&R Treatments on Air Quality	
	Direct	*Indirect*
Erosion Control Treatments	Creating dust during installation of seeding and planting, ground cover, and erosion barrier treatments. Vehicles used for crew transportation or installation of treatment emitting particulate matter.	Revegetation and soil stabilization creating desirable groundcover needed to reduce future wind blown dust.
Invasive Non- native Plant Treatments	Increasing wind blown dust during implementation phase. Vehicles used for crew transportation emitting particulate matter.	No substantial indirect effects on air quality.
Travel Corridor Treatments	Vehicles used for crew transportation or installation of treatment emitting particulate matter.	No substantial indirect effects on air quality.

Erosion Control, Invasive Non-native Plant, and Travel Corridor Treatments

Erosion control, invasive non-native plant, and travel corridor treatments would all generate dust during implementation. Revegetation and invasive non-native plant control would increase wind blown dust during the implementation phases. Motor vehicles used to transport personnel and equipment would emit particulate matter and exhaust gasses into the local atmosphere. In all cases, these impacts would be negligible, localized, and short-term. Particulate matter emissions would be reduced upon completing treatment installation.

3.2 Aquatic Resources and Essential Fish Habitat

Essential fish habitat (EFH) is a term from the Magnusson Stevens Act which requires consultation with NOAA Fisheries on any action that may adversely affect EFH. Consultation for this EA is discussed in Chapter 4.0.

EFH includes those inland waters and substrate necessary for anadromous species spawning, breeding, feeding, or growth to maturity. Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by salmon and may include aquatic areas historically used by salmon where appropriate. Substrate includes sediment, hard bottom, structures underlying waters, and associated biological communities. Necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. Spawning, breeding, feeding, or growth to maturity covers a species' full life cycle.

BLM Alaska Land Health Standards and Guidelines for managing upland, riparian, wetland, and aquatic areas watershed function, ecological processes, and water quality and yield are available online and incorporated by reference (USDI/BLM Alaska Soil, Water, and Air Program Website, 2005).

3.2.1 Affected Environment

In Alaska, BLM manages approximately 96,000 miles of stream habitat that could support fish, which includes approximately 43,000 miles of habitat used by anadromous species. In addition, BLM-Alaska manages an estimated 2.6 million surface acres of lake habitat. This habitat ranges from high mountain lakes to lowland and tidal influenced lakes and ponds and small first-order tributaries to large rivers. Of the anadromous stream habitat under BLM management 98% is considered to be in natural or near-natural condition, and 2% is in fair to minimal condition (USDI/BLM 1996).

Fish species utilizing freshwater habitats include the following families: Salmonidae (salmon, trout, char, grayling, whitefish); Cottidae (slimy sculpin); Catostomidae (longnose sucker); Esocidae (northern pike); Petromyzontidae (lampreys); Gadidae (burbot); and Gasterosteidae (sticklebacks), and Umbridae (Alaska Blackfish). Much is known about the life history and habitat requirements of some of these species, and nothing is known about others. All of the species are important to the natural functioning of their associated ecosystems, and many species have socio-economic value to humans.

The habitat requirements for fish include a healthy, functioning aquatic ecosystem consisting of essential components of an aquatic community, as well as the proper physical and chemical attributes. The aquatic community consists of three main components: (1) aquatic plants (phytoplankton, periphyton, and rooted vascular macrophytes); (2) bacteria and fungi; and (3) consumers (invertebrates and fish, birds, mammals, amphibians). Physical and chemical attributes influencing fish abundance include water quality, water temperature, streamflow, water velocity, cover, substrate, energy flow and stream productivity, and riparian vegetation.

Fish species and aquatic fauna adapted to the cold water in Interior Alaska streams have been exposed to the indirect effects of wildfire for thousands of years. After fire, stream ecosystems and water quality may change. Biological oxygen demand may increase in streams in the burned areas, and physical habitat changes may be both negative and positive. Short-term increases in stream turbidity and siltation may occur in some anadromous fish streams. Fire can be generally considered to be beneficial to fisheries, by improving the nutrient input into the streams, addition of large woody debris, and potentially promoting evolution of less productive channel types into more productive channel types. Further discussion of the post-fire affected environment of fish habitat is found in Section 3.1.2 Proposed Action of the 2004 Fire EA (USDI/BLM, 2005).

3.2.2 Environmental Consequences

No Action Alternative

Since the only difference between the No Action and the Proposed Action Alternatives is the streamlined approach to ES&R planning found in the Proposed Action, both alternatives would have the same environmental effects. There would be additional indirect effects associated with an increase in the cost and time needed to implement ES&R treatments. With the No Action Alternative, individual EAs may have to be prepared for ES&R treatments, adding an expense of hiring specialists to handle the workload, creating delays in individual EA preparation, and slowing the implementation of ES&R treatments. As a result, harmful effects on aquatic resources and essential fish habitat may be prolonged, and beneficial effects may be delayed.

Proposed Action

ES&R treatments will only occur in areas where the effects of fire have posed significant threat to human life, property, and critical biological or cultural resources. The impact of ES&R treatments is anticipated to be very small in scale when compared to the very large planning area; thus, the potential impacts from ES&R treatments on aquatic wildlife are expected to be localized, temporary, and minor. ES&R treatments may have both direct and indirect effects on general aquatic wildlife. Direct and Indirect effects of ES&R treatments on Aquatic Resources and EFH are summarized in Table 3.2. With proper design, installation, and, in many cases, proper maintenance and removal of temporary treatments, the short-term impacts would be more than offset by long-term benefits of ES&R treatments.

Treatments	Table 3.2. Direct and Indirect of Effects of ES&R Treatments on Aquatic Resources and Essential Fish Habitat	
	Direct	*Indirect*
Erosion Control Treatments	On-the-ground activities during treatment installation temporarily increasing sediment levels.	Revegation leading to more rapid re-establishment of suitable riparian and aquatic habitat. Revegetation, ground cover, and erosion barriers improving water quality by maintaining bank stability, reducing sediment loads, maintaining low water temperatures, and diminishing the risk of post-fire flooding and landsliding.
Invasive Non-native Plant Treatments	Manual treatments would stop the spread of undesirable plant species from the initial area of disturbances that could eventually dominate a riparian area after fire.	Reestablishment of native vegetation, as a result of detection and removal of invasive non-native species. Re-establishment of desirable riparian species providing better soil and water protection, insect productions, stream canopy cover, bank protection, and large woody debris recruitment.
Travel Corridor Treatments	On-the-ground activities during treatment installation temporarily increasing sediment levels.	No substantial indirect effects on Aquatic Resources and Essential Fish Habitat.

Erosion Control Treatments

Erosion treatments have the potential to affect general aquatic wildlife. During installation of erosion control treatments, on-the-ground activities could temporarily (during construction) contribute to increased in-stream sediment levels. Long-term benefits include increased bank stability, reduced sediment loads and channel incising, and diminished risk of post-fire flooding and landslides. In-stream structures can interfere with important interactions among sediment flux, channel form, and erosion (Frissell & Nawa, 1992; Thompson, 2002), thus negatively affecting the maintenance and diversity of aquatic habitats. However, site-specific in-stream or sediment generating treatments upstream or adjacent to important aquatic species populations would be designed with consideration of design features in Section 2.2.2 and applicable LUP standard and required operating procedures, thus minimizing potential impacts to salmon spawning and rearing streams.

Invasive Non-native Plant Treatments

Invasive non-native plant treatments could stop the spread of undesirable plant species from the initial area of disturbances that could eventually dominate a riparian area after fire. Recovery of areas infested with invasive non-native plants and re-establishment of desirable riparian species would provide better soil and water protection, insect productions, stream canopy cover, bank protection, and large woody debris recruitment potential to benefit aquatic wildlife.

Travel Corridor Treatments

Installation of travel corridor treatments will have minimal affect on aquatic resources and essential fish habitat. On-the-ground activities could disturb soil and temporarily increase sediment levels. However, short-term effects would be limited to the area around travel corridors.

3.3 Cultural Resources

Cultural resources, including both historic and prehistoric archeological sites and paleontological resources are both addressed in this section.

3.3.1 Affected Environment

BLM-managed lands contain a wide variety of known cultural and related resources, encompassing both prehistoric and historic archeological sites and paleontological resources. Cultural resources include those related to both Native Alaskan groups, and Euroamerican settlers, explorers, and other visitors. A few examples of the more commonly encountered cultural sites in the Alaskan interior include log cabins and cabin ruins, prehistoric lithic or stone artifact scatters, cemeteries and gravesites, former community and roadhouse sites, and various travel routes including Native Alaskan trails, dogsled trails, and sled and wagon roads.

Although some surveys have been done and others are ongoing, only a relatively small portion of BLM-managed lands has been intensively investigated for cultural resources. BLM manages cultural resources under its internal manual procedures (BLM Manual Series 8100, Foundations for Managing Cultural Resources), the 1997 National Programmatic Agreement for Section 106 Compliance and its 1998 Implementing Protocol with the Alaska State Historic Preservation Officer.

Alaska has 229 federally recognized tribes that are sovereign, self-governing entities. The tribes have a government to government relationship with the United States, and the federal government has a trust obligation to protect the tribes' interests including protection of paleontological, cultural, and heritage resources. The proposed ES&R treatments and design features, including consultation with the tribes would meet these obligations.

The condition of cultural resources after a wildfire depends on the location of the resource with respect to the ground surface, the proximity to fuels that could provide a source of heat, the material from which a site's features and artifacts are made, and the temperatures to which artifacts are exposed. Threshold temperatures for damage to cultural artifacts manufactured from different materials, such as ceramic or stone, vary significantly.

After wildfire, surface or near-surface cultural materials may be damaged, destroyed, or remain essentially unaffected by fires, depending on the temperatures reached and the duration of exposure to that temperature. Wooden structures or wooden parts of stone structures are susceptible to fire and potential damage from suppression activities. Combustible artifacts lying directly on the ground surface could be damaged or destroyed. The ability to date noncombustible surface artifacts may be adversely affected if exposed to specific high temperatures. Subsurface resources are much less likely to be significantly affected by fire; however, they may be affected if excessive amounts of soil heating occur. Subsurface cultural resources are generally more subject to harm from construction of fire lines around planned fire boundaries than from the fire itself.

Fire affects historic and prehistoric resources differently than paleontolgical resources. When a fire sweeps through an area, historic and prehistoric sites are usually rather small discrete locations that suffer a variety of impacts related to the particular fire event, and paleontological sites do not suffer the same degree of damage from fire. For example, if an historic site (at least 50 years old) hasn't burned before, it is especially vulnerable since it may be composed of burnable materials and can as a consequence sometimes be virtually destroyed. Hence the resources most susceptible to damage usually are the most recent ones which have not been burned previously, such as standing cabins. Often paleontological sites are generally composed of types of rock most often less vulnerable to damage than archaeological sites made with wood. Paleontological sites are older that cultural sites (in Alaska no greater than about 14,000 years old) and have burned perhaps many times in the past. Evidence of such burning has been observed on several archaeological sites that have been excavated, apparently with no evidence of severe impacts from the fires. Further, paleontological resources are found in geologic formations that may be widespread and only partly exposed to the surface and the effects of fires. For this reason, ES&R treatments may not be as necessary with exposed fossils.

The heat, smoke and soot from fires can also damage cultural resources, especially prehistoric rock art, by causing *spalling*, which physically destroys the resource, or by obscuring the surface of the resource with smoke and soot. Smoke and soot can damage cultural resources by either increasing chemical deterioration or obscuring carvings and painted motifs.

3.3.2 Environmental Consequences

No Action Alternative

Since the only difference between the No Action and the Proposed Action Alternatives is the streamlined approach to ES&R planning found in the Proposed Action, both alternatives would have the same environmental effects. There would be additional indirect effects associated with an increase in the cost and time needed to implement ES&R treatments. With the No Action Alternative, individual EAs may have to be prepared for ES&R treatments, adding an expense of hiring specialists to handle the workload, creating delays in individual EA preparation, and slowing the implementation of ES&R treatments. As a result, beneficial effects to cultural resources would be delayed.

Proposed Action

ES&R treatments would have direct and indirect effects on cultural resources as summarized in Table 3.3. With proper design, installation, and, in many cases, proper maintenance and removal of temporary treatments, the short-term impacts would be more than offset by long-term benefits of ES&R treatments. Utilizing the expertise and supervision of a cultural specialist during cultural ES&R treatments would prevent harmful affects to cultural resources. The proposed sequence of steps would protect paleontological and cultural resources during ground disturbing treatments such as seedbed preparation, seeding, contour felling, and fencing to the extent practicable under the National Historic Preservation Act 1966, as amended: (1) desk review by a qualified archaeologist, (2) if called for by the desk review, a qualified archaeologist needs to conduct a field inventory to identify potentially significant cultural or paleontological resources, (3) if significant resources are identified, then either avoid the sites or, if avoidance is not possible, mitigate the adverse effects by consulting with the State Historic Preservation Officer (SHPO).

Treatments	Table 3.3. Direct and Indirect of Effects of ES&R Treatments on Cultural Resources	
	Direct	*Indirect*
Erosion Control Treatments	Preventing additional exposure of cultural resources by camouflaging an area with revegetation and spreading of slash and debris. Minimizing soil movement around and onto cultural resources following wildfire.	No substantial indirect effects on cultural resources.
Invasive Non- native Plant Treatments	No substantial direct effects on cultural resources.	No substantial indirect effects on cultural resources.
Travel Corridor Treatments	Protecting cultural resources from illegal collection of exposed artifacts by closing certain travel corridors.	Promoting access to exposed cultural resources by clearing and stabilizing travel corridors and repairing facilities.

Erosion Control Treatments

Erosion control treatments would benefit cultural resources. Direct effects from seeding and planting and cultural site treatments include promoting revegetation and preventing additional degradation or loss of cultural resources due to exposure and/or access. Seeding and planting, ground cover, and cultural site treatments would also benefit cultural resources by minimizing soil movement around and onto cultural resources following wildfire.

During cultural site stabilization, protection, and repair treatments would protect and preserve historical properties damaged by fire in the long-term. Any structural stabilization and rehabilitation of historical properties would be done under direction and supervision of cultural resource specialists.

Travel Corridor Treatments

Trail and travel corridor treatments including closures and patrols to prevent post-fire damage from livestock, vehicles, and people until sites are stabilized would protect cultural resources that are exposed due to loss of vegetative cover.

3.3.3 National Historic Preservation Act (NHPA) Section 106 Compliance

With regard to post-fire emergency stabilization and rehabilitation, the DOI has guidance in its Manual (620 DM 3) and BAER Handbook (USDA-USDI, 2002) and BLM has further internal guidance (Emergency Stabilization and Rehabilitation Handbook H-1742-1). Cultural sites that are damaged by fire and therefore at risk for further damage may be stabilized with ES&R activities. These activities are aimed at preventing further damage to cultural resources. All ES&R activities involving assessment, stabilization, or rehabilitation following containment of a fire may have the potential to affect known or unknown cultural resources, and are considered undertakings under Section 106 of the NHPA. Section 106 only applies to historic and archaeological sites 50 or more years old and not paleontological sites. As such, all ES&R activities need to be reviewed by qualified cultural resource staff for potential adverse impacts to cultural sites. This process is described in the Environmental Consequences section, above. Potential impacts to significant cultural resources from both emergency and planned ES&R actions taken by BLM will be avoided or mitigated through application of existing BLM policies and procedures. This involves following procedures in BLM's 1997 National Programmatic Agreement for Section 106 compliance which is implemented in Alaska by BLM's 1998 Protocol with the Alaska State Historic Preservation Office. Specifically in this regard, a qualified cultural resource specialist needs to review each emergency and planned ES&R action to assess potential impacts to cultural resources. This is a standard procedure for all “actions” occurring on BLM-managed lands.

3.4 Environmental Justice

Executive Order 12898 directs federal agencies to review the effects of proposed projects on minority or low income populations (U.S. Federal Register, 1994). This affects native populations in Alaska, where many villages have over 50% minority population. Projects will not consume natural resources, and little additional spending will result in project areas. Subsistence populations will be positively affected by stabilization and rehabilitation measures. Neither alternative would result in adverse effects or issues specific to any minority or low-income population or community.

3.5 Migratory Birds

Executive Order 13186 directs Federal agencies to protect migratory birds (U.S. Federal Register, 2001). According to Alaska Department of Fish and Game, 471 species of bird have been positively identified in Alaska (ADF&G, 2004). Most of these are migratory birds for which the Fish and Wildlife Service is responsible under international treaties and the Migratory Bird Treaty Act. Some of the birds stay in Alaska year-round. Most migrate to Canada, Central America, South America, Asia, or the lower 48 United States. In fact, birds from Alaska pass through virtually every other state in the U.S., including Hawaii, on the way to their wintering grounds. Maintaining migratory birds and their habitats in Alaska is clearly a matter of national and international significance (USDI/FWS, 2004).

Numerous species of raptors, waterfowl, and landbirds inhabit BLM lands. These species occupy a wide variety of habitats including tundra, shrubs, forests, coastal wetlands, ponds and lakes, and inland streams and riparian. Because migratory birds occupy a wide variety of habitats, it is difficult to generalize on habitat conditions. However, most of the BLM-managed land is in a natural state, permitted activities are minimal, and no specific threats to the quality of the habitat are known.

The affected environment and environmental consequences of ES&R treatments on birds are contained in Section 3.12 on Special Status Species, and Section 3.15 on Wildlife. Neither alternative would result in adverse effects to migratory birds.

3.6 Invasive Non-native Plants

3.6.1 Affected Environment

Invasive non-native plants are a priority at the local, State, and Federal level. Invasive species are defined in the Executive Order 13112 as any species (or part of a species) that is alien to a particular ecosystem and whose introduction does or is likely to cause economic or environmental harm or harm to human health (U.S. Federal Register, 1999). One special class of invasive plants is “noxious weeds,” which are designated by State and Federal law. Noxious weeds are generally considered to be exotic plants that negatively impact agriculture, navigation, fish, wildlife or public health. Alaska’s current noxious weed law was designed to assist agriculture produces and provides a list of noxious weeds regulated through seed laws (State of Alaska, 1987).

A grass roots organization the Committee for Noxious and Invasive Plant Management (CNIPM) has been instrumental in developing a ranked list of problematic weeds that will expand on the state noxious weed lists (CNIPM, 2006). The Alaska Exotic Plant Information Clearinghouse (AKEPIC) which contains over 140 species of non-native plants that have moved outside of the area they were planted to invade other sites. Some of these are capable of aggressively spreading and dominating a site.

Invasive plants known to occur in Alaska may provide an unwanted seed source adjacent to burned areas. New invasive plants arriving in Alaska may also impact fire intensity and occurrence. Inventories for invasive non-native plants on BLM-lands in Alaska are ongoing. In some of the contiguous western states, noxious and invasive plant spreading after wildfire contributes to hazardous fuel loads and alteration of burn intervals (USDI/BLM Arizona, 2003). Seeds or plant parts may be transported into relatively remote and undisturbed areas by fire crews, equipment aircraft, and dozers.

3.6.2 Environmental Consequences

No Action Alternative

Since the only difference between the No Action and the Proposed Action Alternatives is the streamlined approach to ES&R planning found in the Proposed Action, both alternatives would have the same environmental effects. There would be additional indirect effects associated with an increase in the cost and time needed to implement ES&R treatments. With the No Action

Alternative, individual EAs may have to be prepared for ES&R treatments, adding an expense of hiring specialists to handle the workload, creating delays in individual EA preparation, and slowing the implementation of ES&R treatments. As a result, the level of detection and control needed to stop the spread of invasive non-native plants would not be met.

Proposed Action

The objectives of invasive non-native plant treatment are to prevent non-native plants from colonizing and establishing in areas disturbed by fire or fire suppression activities. Early detection and control of non-native plant infestations within or adjacent to the burned area are critical in preventing the establishment of these undesirable species and preserving native plant biodiversity. Table 3.4 shows direct and indirect effects of ES&R treatments on invasive non-native plants.

Treatments	Table 3.4. Direct and Indirect of Effects of ES&R Treatments on Non-native Invasive Plants	
	Direct	*Indirect*
Erosion Control Treatments	No substantial direct effects on invasive non-native plants.	Reducing the likelihood of invasive non-native plant species to become established and out-competing native plants for available resources as a result of revegetation after seeding and planting, ground cover, and cultural site stabilization.
Invasive Non- native Plant Treatments	Stopping the spread of undesirable plant species from the initial area of disturbances after fire as a result of manual treatments and detection.	Maintaining ecosystem integrity and promoting native plant communities adapted to the natural fire regime with the removal of invasive non-native plants.
Trail and Travel Corridor Treatments	No substantial indirect effects on invasive non-native plants.	No substantial indirect effects on invasive non-native plants.

Erosion Control Treatments

Many of the proposed ES&R treatments for erosion control, including seeding and planting, ground cover, and cultural site stabilization, are designed to increase revegetation of burned areas with native or desired plant species. This will reduce the likelihood of invasive non-native plant species becoming established and out-competing native plants for available resources.

Invasive Non-native Plant Treatments

Invasive non-native plant treatments are exclusively designed to control weeds. Manual treatments and detection would stop the spread of undesirable plant species from the initial area of disturbances after fire. Removal of invasive non-native plants maintains ecosystem integrity and promotes native plant communities adapted to the natural fire regime.

Travel Corridor Treatments

Trail and travel corridor treatments would have minimal impact on invasive non-native weed treatments. Invasive non-native plants or seeds could be spread during activities associated with humans and machinery but this would be minimized with the use of design features.

3.7 Recreation and Transportation

3.7.1 Affected Environment

BLM-managed lands in Alaska provide a wide variety of summer and winter recreational opportunities. That includes numerous campgrounds and public use cabins, a visitor centers, and 11 areas part of the National Landscape Conservation System. Other special recreational use areas are included in the section on Special Management Areas.

Trails and roads, both winter and summer, are vital to the livelihood of people in the remote areas of Alaska. These trails and roads provide access to subsistence areas, establish corridors in which supplies are brought to remote villages, and allow reasonable transportation between villages. Other trails impacted are recreational in use, which provide access for dog mushing, hunting, hiking, and off-highway vehicle use. These trails can offer unique and special opportunities for local communities who may place high values on them.

Fire damage may change an area's value for transportation, wildlife viewing and other dispersed recreational uses. After fire, many of these trails may have extensive tree damage or kill with hazard trees that are likely to fall or have already fallen across these trails. Fire promotes vegetation and wildlife diversity, which can enhance recreation opportunities in the long-term. Firelines from suppression and burned over environments may provide additional access to the pubic and off-highway vehicles to areas adjacent to existing routes.

3.7.2 Environmental Consequences

No Action Alternative

Since the only difference between the No Action and the Proposed Action Alternatives is the streamlined approach to ES&R planning found in the Proposed Action, both alternatives would have the same environmental effects. There would be additional indirect effects associated with an increase in the cost and time needed to implement ES&R treatments. With the No Action Alternative, individual EAs may have to be prepared for ES&R treatments, adding an expense of hiring specialists to handle the workload, creating delays in individual EA preparation, and slowing the implementation of ES&R treatments. As a result, the detrimental effects on recreation and transportation would be prolonged and beneficial effects would be delayed.

Proposed Action

ES&R treatments will only occur in areas where the effects of fire have posed significant threat to human life, property, and critical biological or cultural resources. The impact of ES&R treatments is anticipated to be very small in scale when compared to the very large planning area; thus, the potential impacts from ES&R treatments on recreation and transportation are expected to be localized, temporary, and minor. ES&R activities will benefit recreation and travel corridors by promoting public safety with trail clearing and reestablishing ecosystem health with

soil stabilization. Direct and indirect effects of ES&R treatments on Recreation and Transportation are shown in Table 3.5.

Treatments	Table 3.5. Direct and Indirect of Effects of ES&R Treatments on Recreation and Transportation	
	Direct	*Indirect*
Erosion Control Treatments	Temporarily decreasing aesthetic properties of the landscape with on-the-ground activity associated with installation of seeding and planting, ground cover, and erosion control treatments. Improving access to recreation areas normally restricted by flooding or other erosion events.	Increasing use in other areas as a result of closures to protect cultural sites.
Invasive Non- native Plant Treatments	Promoting aesthetics by preventing the immediate spread and establishment of invasive non-native plants.	Increasing aesthetic integrity and recreational value of an area by removing undesirable plant species that might otherwise out-compete native plant communities.
Travel Corridor Treatments	Temporarily displacing users by restricting access or closing travel corridors. Reestablishing safe access otherwise impaired by the effects of fire by stabilizing and clearing travel corridors. Promoting public access and safety with the repair and/or reconstruction of damaged BLM recreation facilities.	Promoting recreational use due to repair of cabins and other facilities.

Erosion Control and Non-native Invasive Plant Treatments

Short-term and long-term impacts to recreation and transportation could occur in burned areas requiring erosion control treatments. The installation of erosion control structures and ground disturbance associated with revegetation could temporarily change aesthetic properties of the landscape valuable for recreational users. The temporary nature of these structures would be determined on a site specific basis, with thresholds for treatment effectiveness being set before installation. In turn, these structures could benefit transportation by redirecting or slowing surface water flow to prevent flooding normally restricting use of travel corridors. Closures to prevent resource damage such as scarring, accelerated erosion, damage to vegetation, and degradation of cultural sites, could temporarily discourage recreational use. In developed or high use undeveloped areas, this could result in reduced recreational opportunities and could result in increased use in other areas. By removing and preventing the spread of invasive non-native plants, species that might otherwise out-compete native plant communities would not become established in native plant communities. As a result, the aesthetic integrity and recreational value of native plant communities will be maintained.

Travel Corridor Treatments

Travel corridor treatments could impact recreation and transportation in some burned areas. ES&R treatments involving restricted or closed access to trails and travel corridors may temporarily displace users. Stabilization and rehabilitation of trail and travel corridors could accelerate a recovery of those values. Clearing of travel corridors could reestablish safe access otherwise impaired by the effects of fire. Repair and/or reconstruction of damaged recreation facilities would promote public access and safety by reestablishing minor structures damaged by wildfire.

3.8 Social and Economic Conditions

BLM-managed land in Alaska is predominantly remote and removed from human developments. The objectives of the ES&R actions are designed to protect resources, while lowering human risks. The No Action Alternative would result in added costs and delays in implementation of the PESRP and be harmful to the social and economic system. The Proposed Action would allow for more timely completion of ES&R activities and is therefore an enhancement to the social and economic system. Neither alternative would result in adverse effects or issues specific to social and economic conditions of the population or communities.

3.9 Soils

3.9.1 Affected Environment

Desired ecological conditions and goals for soil resources are contained in the BLM Alaska Statewide Land Health Standards (BLM, 2004). Soils vary across the state of Alaska based on location on the landscape and geomorphic process. Soil properties are important in determining their behavior and inherent limitations for selected land uses and for determining how they are affected by wildfire. Soils located on BLM-managed lands in Alaska have formed in a variety of climates and environments. A description of the influence Alaska's climates on soil formation is found in Section 3.2.3a and 3.2.3b of BLM-Alaska LUP Amendment for Wildland Fire and Fuels Management (USDI-BLM, 2005).

The dominant factor in defining soils in the planning area is the presence of permafrost. Permafrost is defined as a thermal condition where a material, including soil material, remains at or below 0º C for 2 or more years in succession (USDA, 1999). Permafrost varies in the fire-prone interior of Alaska from isolated masses to a continuous layer varying in thickness. During the summer a portion of permafrost-affected soils thaw, between the top of the permafrost (permafrost table) and the ground surface, forming a shallow unfrozen zone termed the active layer.

Physical characteristics of soils such as depth and texture; and different chemical properties such as reaction (pH) and nutrient content vary considerably over short distances. These characteristics are influenced by parent material, regional and local climate, slope, aspect, vegetation and surface stability. A broad statewide description of this variability is provided in the Exploratory Soil Survey of Alaska (Rieger *et al*., 1979). This document, as well as more detailed descriptions of smaller areas, is provided in published soil surveys and electronic data files provided on the U.S. Department of Agriculture web sites.

Wildfires are common to the boreal biomes of the State, especially the Interior portion, and to a lesser degree, south-central and western Alaska. The most widespread impacts of fire are on landscapes underlain by permafrost within the Interior portion where plant communities consist of stunted black spruce (*Picea mariana*) and larch (*Larix laricina*) woodlands on soils that are typically classified within the Typic Historthels and Typic Histoturbels soil taxonomic Subgroups of the Gelisol Order. The naturally occurring phenomenon of fire and post-fire succession is best described as a cycle of events on the landscape.

Following some wildfires, depending on burn intensity and loss of an insulating organic layer, the active layer increases in thickness and a portion or all of the permafrost may thaw. As permafrost thaws, a large volume of water can be liberated and either accumulates in depressions or runs off through surface or subsurface drainage outlets. Differential subsidence of the soil surface and slumping or sliding on steeper slopes can occur, depending on the ice content of the permafrost and the rate of thawing (Figure 3.2). The erosional impacts to burned areas may not be fully evident for 2-5 years after a fire (USDI/BLM-Northern Field Office, 2005). Gradually, in the absence of additional fires or disturbances, the moss-organic layer reestablishes and permafrost level returns to the pre-fire condition (Foote, 1983; Viereck, 1973). Return to the pre-burn state depends, in part, on the depth of the organic layer consumed by the fire and the rate of revegetation (Viereck and Dyrness, 1979). The pre-burn state returns as post-fire vegetation succession progresses and the organic mat reestablishes. Dyrness (1982) reported that, four years after burning in the black spruce type, thaw layer thickness increased threefold when one-half of the organic mat was consumed by the fire and fivefold when the entire surface was consumed and mineral soil exposed. Foote (1976) and Viereck (1973) agree that, in the black spruce type in Interior Alaska, the forest canopy, forest floor, and active layer thickness return to their original state within 50 to 70 years following fire. Of course, recovery of the permafrost to pre-fire condition depends on similar pre and post fire air temperatures.

Figure 3.2. Sliding occurring on a slope as a result of a fire.

Fire-influenced communities without permafrost are also present throughout Interior and Western Alaska; however, these are less extensive. Riparian white spruce (*Picea glauca*) forests along rivers support some of the most productive forests in Interior Alaska. Major soils are occasionally flooded and moderately well or well drained with slightly acidic to moderately alkaline reaction. Parent materials consist of stratified loamy alluvium of various depths over sand and gravel. These are classified within the Cryofluvents Soil Great Group. The high initial calcium, Subalpine woodlands of white spruce (*Picea glauca*) and dense stands of shrub birch scrub (*Betula glandulosa* and *Betula nana*) are found along the upper limits of tree growth at about 3,000 feet elevation on seasonally wet and well drained soils. Major soil taxa included are Cryaquepts, Eutrocryepts, and Dystrocryepts Soil Great Groups.

Within the Humid-Temperate climatic domain, wildfire is primarily restricted to the boreal portion in lowlands below about 2,000 feet within the Cook Inlet Lowlands of South-central Alaska. Wildfire within this region is most common where either well-drained or poorly drained soil conditions favor the establishment of dwarf black spruce woodland and forest. Permafrost does not form in these soils due to warm mean annual air temperatures. Well-drained soils are primarily Haplocryods and poorly drained soils that are classified within the Cryaquepts, Cryaquands, Cryohemists, and Cryosaprists taxonomic Subgroups.

3.9.2 Environmental Consequences

No Action Alternative

Since the only difference between the No Action and the Proposed Action Alternatives is the streamlined approach to ES&R planning found in the Proposed Action, both alternatives would have the same environmental effects. There would be additional indirect effects associated with an increase in the cost and time needed to implement ES&R treatments. With the No Action Alternative, individual EAs may have to be prepared for ES&R treatments, adding an expense of hiring specialists to handle the workload, creating delays in individual EA preparation, and slowing the implementation of ES&R treatments. As a result, the harmful effects on soils would be prolonged and beneficial effects would be delayed.

Proposed Action

ES&R treatments will only occur in areas where the effects of fire have posed significant threat to human life, property, and critical biological or cultural resources. The impact of ES&R treatments is anticipated to be very small in scale when compared to the very large planning area; thus, the potential impacts from ES&R treatments on soils are expected to be localized, temporary, and minor. With proper design, installation, and, in many cases, proper maintenance and removal of temporary treatments, the short-term impacts would be more than offset by long-term benefits of ES&R treatments. A summary of direct and indirect effects of treatments on soils is found in Table 3.6.

Treatments	Table 3.6. Direct and Indirect of Effects of ES&R Treatments on Soils	
	Direct	*Indirect*
Erosion Control Treatments	Minimally increasing erosion in the short-term as a result of temporary loss of vegetation during site and seedbed preparation.	Revegetation after fires restoring pre-fire erosion conditions. Stabilizing erosional forces leading to the recovery of native, riparian vegetation, thus reducing the risk of post-wildfire flooding and landsliding.
Invasive Non- native Plant Treatments	Increasing erosion in the short-term as a result of exposure of soil surface during the removal of undesirable plants.	Protecting soil erosion in the long-term by removing invasive non-native plants and promoting native plant communities adapted to the fire regime that burn at lower intensities.
Travel Corridor Treatments	Creating minimal ground disturbance and potential for erosion during human activity associated with trail stabilization, clearing, and facility repair.	Reducing erosion and improving soil conditions in trails lacking adequate drainage, and trails with previous drainage structures damaged by fire.

Erosion Control Treatments

Depending on fire intensity, some of the burned area soil can be exposed and prone to wind and water erosion. If surface runoff occurs before ground cover becomes re-established, erosion would occur. ES&R treatments would be prescribed on a site-specific basis. Seeding methods have a low probability for reducing erosion the first year because most of the benefits of the seeding occur after germination and root development. Therefore, the benefits of seeding are considered to be long-term. Once the area is rehabilitated and ground cover becomes re-established, soil erosion would be similar to that of the pre-burn landscape.

Site and seedbed preparation, seeding and planting and ground covering treatments, could have short-term impacts to the remaining vegetation and to the soil surface, such as increasing the rate of wind erosion in sandy soils or sealing the soil surface in clay soils. Broadcast and hydroseeding would have less short-term soil impacts than other mechanical methods used to prepare soil for seeding. Site and seedbed preparation methods exposing the soil surface, would have the highest short-term impacts. Despite a variety of potential soil impacts from the mechanical treatments, the long-term benefits from re-establishing perennial vegetation would quickly out-weigh the short-term disturbances because revegetation would provide long-term soil and water quality protection.

Invasive Non-native Plant Treatments

Invasive non-native weed control treatments have long-term and short-term effects on soils. Manual removal of undesirable plant species, resulting in temporary loss of vegetation, could create a minimal increase of erosion in the short-term due to exposed soil surfaces. Combining these treatments with ground cover techniques could lessen the impact of these treatments. In addition, controlling annual grasses and establishing native or desirable non-native vegetation would result in more natural fire cycles that are burning at lower intensities. As a result fires would be less damaging to soil and produce less erosion in the long-term.

Travel Corridor/Trails Treatments

The installation of trail stabilization and the reparation of facilities would temporarily disturb the soil. However, these treatments are designed to reduce trail erosion and promote public health in safety in the long-term. Trail stabilization treatments will have the most benefit to trails within or below high-burn severity, trails lacking adequate drainage, trails with potential to deliver sediment to streams, and trails where previous drainage structures are damaged by fire (2006, USDA Forest Service).

3.10 Special Management Areas

3.10.1 Affected Environment

BLM-Alaska manages several congressionally or administratively designated Special Management Areas (SMA) for their distinguished qualities.

The BLM in Alaska manages 10 areas that are part of the National Landscape Conservation System (NLCS) designated by Congress or the Secretary of Interior. One National Recreation Area (NRA) and one National Conservation Area (NCA) are managed to ensure their conservation, protection, and enhancement as nature conservancies. Six Wild and Scenic Rivers (WSR) are managed to preserve their free-flowing condition and to protect their value as outstanding scenic and recreational waters. The Iditarod National Historic Trail is managed to protect and preserve the routes and any historic artifacts. One Wilderness Study Area (WSA) has been designated by Congress to stay unchanged until Congress either designates it as National Wilderness or releases the area under protection of a resource management plan. Detailed descriptions of these areas are available from the BLM-Alaska website (USDI-BLM Alaska, 2003).

BLM-Alaska manages 42 Areas of Critical Environmental Concern (ACEC), listed in Appendix B. ACEC designations highlight areas where special management attention is needed to protect and prevent irreparable damage to important cultural, historic, and scenic values; fish or wildlife resources, natural systems or processes; or to protect human life and safety from fire hazards.

Other SMAs BLM-Alaska manages include special areas for recreation, wildlife habitat, research areas, and historic sites. These administrative designations are published in Federal Register Notices or are identified in Resource Management Plans and Implementation Plans. These areas include BackCountry Byways, National Recreation Trails, Special Recreation Management Areas, Watchable Wildlife Sites, Areas of Critical Environmental Concern (ACEC), National Research Areas, Outstanding Natural Areas, National Historical Sites, and Wild and Scenic Rivers. Other special areas legislatively designated in the National Petroleum Reserve-Alaska managed by BLM include Lake Teshepuk, Kaseguluk, Colville, Utukok, and Lake Todetonten.

The Affected Environment of Special Management Areas assumes that the areas described below have been burned by wildfire.

3.10.2 Environmental Consequences

No Action Alternative

Since the only difference between the No Action and the Proposed Action Alternatives is the streamlined approach to ES&R planning found in the Proposed Action, both alternatives would have the same environmental effects. There would be additional indirect effects associated with an increase in the cost and time needed to implement ES&R treatments. With the No Action Alternative, individual EAs may have to be prepared for ES&R treatments, adding an expense of hiring specialists to handle the workload, creating delays in individual EA preparation, and slowing the implementation of ES&R treatments. As a result, the harmful effects on SMAs would be prolonged and beneficial effects would be delayed.

Proposed Action

ES&R treatments will only occur in areas where the effects of fire have posed significant threat to human life, property, and critical biological or cultural resources. The impact of ES&R treatments is anticipated to be very small in scale when compared to the very large planning area; thus, the potential impacts from ES&R treatments on SMAs are expected to be localized, temporary, and minor.

SMAs would be evaluated on an individual basis, protecting the values and reasons for designation. ES&R treatment in SMAs would be consistent with the associated Land Use Plan of the area. Impacts of ES&R treatments in SMAs would be lessened by utilizing the PESRP design features in Section 2.2.2, and overall effects would not impact integrity of the special designation. Treatments would be developed and evaluated with guidance outlined in the Interim Management Policy and Guidelines for Lands Under Wilderness Review (IMP) H-8550-1 and the Interagency Burned Area ESR Handbook Version 2.0 (USDA and USDI, 2002). Direct and Indirect Effects of ES&R Treatments on SMAs are shown in Table 3.7

Treatments	**Table 3.7. Direct and Indirect of Effects of ES&R Treatments on Special Management Areas**	
	Direct	*Indirect*
Erosion Control Treatments	Temporarily decreasing aesthetic properties of the landscape with on-the-ground activity associated with installation of seeding and planting, ground cover, and erosion control treatments.	Protecting or improving water quality and wildlife habitat, which maintains unique values for which SMA was established.
Invasive Non- native Plant Treatments	Promoting aesthetics by preventing the immediate spread and establishment of invasive non-native plants	Protecting or improving water quality and wildlife habitat, which maintains unique values for which SMA was established.
Travel Corridor Treatments	Temporarily displacing users by restricting access or closing travel corridors. Reestablishing safe access otherwise impaired by the effects of fire by stabilizing and clearing travel corridors.	No substantial Indirect effects on SMAs.

Erosion Control Treatments

Seeding, planting, and mulching methods would result in some temporary loss of special values for which it was designated through short-term equipment use and loss of vegetation cover. Treatments should be designed to use the least intrusive and lowest impact methods of seeding, planting, and erosion barrier methods having no adverse effects on SMAs.

Erosion barriers would have a short-term visual impact to special designated values. Treatments which are constructed of synthetic materials, for example silt-fences, or which leave visual rows or uniform patterns of natural materials on the landscape, for example logs or fiber rolls, would have a short-term visual impact to special designated values until removal. When possible, erosion barriers would be constructed in an irregular pattern to minimize unnatural patterns across SMAs. These methods of erosion control would benefit the unique values of SMAs in the long-term by protecting, maintaining, or improving water quality and wildlife habitat.

Cultural site stabilization in SMAs would maintain the unique values of the site. Effects would be the same for treatments applied for erosion control. Impacts associated with reparation of structures to pre-fire condition and protection of sites against illegal collection would be short-term, with threats to site integrity removed when stabilization is achieved.

Invasive Non-native Plant Treatments

Control of invasive non-native plants could result in short-term loss of vegetative cover and minimal soil surface disturbance. Long-term effects would protect or improve native vegetation, maintaining the unique values of the designated SMA.

Travel Corridor Treatments

Travel corridor treatments would mostly beneficial effects when applied to SMAs. Trail stabilization, clearing, and repair of facilities would maintain access to SMAs with recreation use. Short-term impacts of on-the-ground activities associated with construction and clearing would be minimal. Temporary closure of SMAs to the public may be necessary in hazardous burned areas. Closures would be temporary and have short-term effects on recreational users.

3.11 Subsistence

3.11.1 Affected Environment

In Alaska, the term subsistence refers to contemporary hunting, fishing, trapping, and gathering practices, providing food, fuel, and other products on which many households rely for a significant portion of their livelihood. Under Title VIII of the Alaska National Interests Lands Conservation Act (ANILCA), the subsistence uses of rural Alaskans are granted a priority in the management of fish and wildlife on Federal public lands (ANILCA, 1980). The statute equally protects the subsistence practices of rural Alaska Natives and non-Natives. Subsistence represents a productive and highly valued component of the rural economy, where participation in the monetized economy is uneven, due to limited employment and income, along with high costs for imported goods.

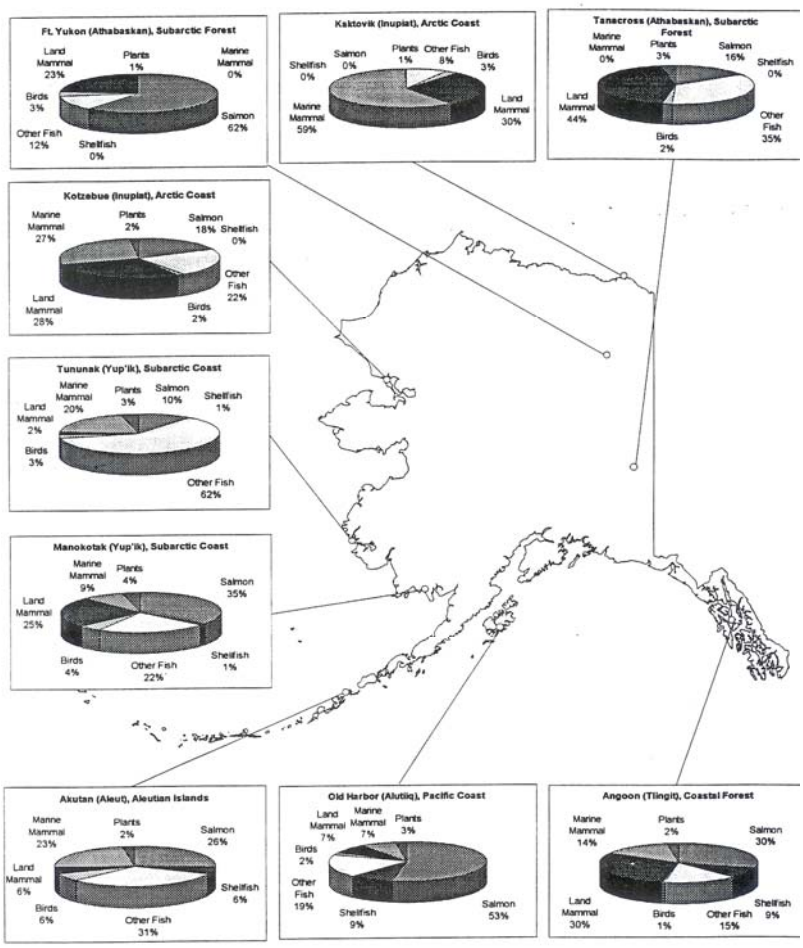
The vitality of contemporary subsistence activities is closely tied to healthy ecosystem processes. Productive hunting, fishing, and trapping depend upon healthy fish and wildlife populations, and

these in turn require intact, productive habitats. Ecosystems are dynamic, changing over time, and fire is a natural ecological process, to which flora and fauna have adapted. The subsistence way of life in rural Alaska incorporates a detailed knowledge of local climate, habitat, and fish and wildlife, including adaptive harvest strategies to respond to habitat change and resource population dynamics.

The demographic scale and economic productivity of contemporary subsistence production may be seen in the estimate that, as of the late 1990s, 120,000 rural residents harvest nearly 44 million pounds of wild food per year, or about 375 pounds per person per year. Rural Alaskans live in 270, generally small, relatively isolated, communities. The rural population is about equally Alaska Native and non-Native. The high level of production is paralleled by high rates of participation: nearly 83% of rural households harvest fish, and about 60% harvest wildlife. When sharing and redistribution are taken into account, about 95% of rural households consume fish, and 86% consume wildlife. Assuming costs replacement costs of $3 - $5 per pound, these subsistence foods represent a monetary value of between $131 million and $215 million per year (Wolfe, 2000).

One of the most important ecological dimensions of subsistence production is found in the species composition and seasonal cycle of subsistence harvests. These vary enormously from one region in Alaska to another, as a result of the diverse ecosystems involved. Arctic and Western coastal regions, for example, have access to marine mammals, but lower reliance on land mammals. Many coastal and riverine communities, from the Norton Sound south, have access to rich salmon resources, which make up a large component of total subsistence harvest. In more remote Interior communities, salmon are more limited or absent, so freshwater fish species are more important, as are the large mammals, including moose, caribou and bear. Several examples of the diversity in subsistence species composition across the state are shown in Figure 3.3. In rural Alaska as a whole, fish make up 60% of subsistence harvests, while land mammals constitute 20%, marine mammals 14%, birds 2%, shellfish 2% and plants 2% (Wolfe, 1996).

Figure 3.3. Wild Food Harvest Species Composition



The other significant ecological dimension of subsistence practices is the traditional subsistence use areas associated with each community. Over generations, each community has established a traditional range for its hunting, fishing and trapping activities. Effective and efficient subsistence harvest strategies are based on intimate knowledge of this range, including familiarity with a variety of ecological factors. In the cumulative stories developed over several generations and shared widely throughout a community, hunters can draw upon an intricate body of knowledge concerning weather and hydrological conditions, productive habitat zones, and animal natural history. Traditional place names provide a shared, highly detailed map of important locations throughout this range. Thus, hunters have a repertoire of probabilities about where animals will be concentrated at key times of the year, varying with changes in the weather, such as prevailing winds on the coasts, high water, early or late freeze-up and breakup, high snow depth, etc. The stories also provide examples of adapting harvest activities to these conditions. Included in this body of intensive ecological knowledge of the traditional use area are accounts of fire events and their impacts on habitat and wildlife. In the central Kuskokwim River area, for example, elders talk of a fire early in this century, after which moose became more common, and caribou declined as a key species (Brelsford, field notes, 1983-1986).

Maps of traditional subsistence use areas have been prepared for most rural Alaska communities as part baseline research by the Alaska Department of Fish and Game Subsistence Division (Fall, 1990). For many areas, researchers documented the lifetime use areas of elders in the community, extending back to the early part of the 20th century. Prior to the 1950s, in most parts of rural Alaska, Alaska Natives exploited their range through a series of seasonal settlements, including fish camps, trapping camps, and spring camps, with the specific pattern varying with the ecological zone. By the 1950s and 1960s, government policies emphasized the importance of school attendance and pressured families to remain year-round in the primary settlement, and people began to live more sedentary lifestyles. However, the advent of new transportation technology, including more reliable outboard motors and widespread use of snowmobiles, allowed people to continue to exploit nearly the entire traditional range from the central community.

Traditional socio-territorial patterns are diverse among Alaska Native societies, responding to ecological and social factors. Some species are available in high concentration near the communities, so the use area for fish, for example, is relatively compact. Other species are widely dispersed, and the traditional use area may extend more than a hundred miles from the community, typically along river or coastline transportation corridors. Depending on the overall concentration of resources, communities may be densely settled in an area, such as the Yukon-Kuskokwim Delta, or in Southeast Alaska. In these cases, traditional use areas may have portions that are perceived as reserved for the exclusive use of a community, and overlapping portions shared with adjacent communities. Alternatively, where resources are more sparsely distributed, communities may be more isolated with larger exclusive use zones.

Effect of fires and fire management upon subsistence are similar to impacts on plant community successional cycles and associated wildlife communities. Vulnerability to, and impacts of, fire differ between tundra and boreal forest communities. Intermittent fire frequency, with low intensity, would have moderate impacts, leaving patchy habitats and resetting successional cycles. Moose populations grow when fire displaces climax stage forests and willow thickets emerge with better browse. However, tundra fires can damage lichen, which takes many decades before returning to a stage of productive browse for caribou. A description of fire’s effects on plant and wildlife habitat, including species important for subsistence are found in the Section 3.13 on Vegetation and Section 3.15 on Wildlife.

Traditional use areas are also adapted to take into account localized declines or displacements in key species. These traditional ranges were large enough that community members would not hunt all portions in a year, so if some portion was subject to short-term impacts from fire, alternative zones were available within the overall traditional use area.

3.11.2 Environmental Consequences

No Action Alternative

Since the only difference between the No Action and the Proposed Action Alternatives is the streamlined approach to ES&R planning found in the Proposed Action, both alternatives would have the same environmental effects. There would be additional indirect effects associated with an increase in the cost and time needed to implement ES&R treatments. With the No Action Alternative, individual EAs may have to be prepared for ES&R treatments, adding an expense of

hiring specialists to handle the workload, creating delays in individual EA preparation, and slowing the implementation of ES&R treatments. As a result, the harmful effects on subsistence would be prolonged and beneficial effects would be delayed.

Proposed Action

One objective of ES&R treatments is to protect humans, including their subsistence lifestyle from sustaining harm as a result of wildfire. Beneficial impacts to subsistence from ES&R treatments are expected to both immediate and long term, with subsistence needs having a considerable influence on the selection of ES&R treatments. A summary of direct and indirect effects of treatments on subsistence resources is found in Table 3.8.

ES&R treatments will only occur in areas where the effects of fire have posed significant threat to human life, property, and critical biological or cultural resources. The impact of ES&R treatments is anticipated to be very small in scale when compared to the very large planning area; thus, the potential impacts from ES&R treatments on subsistence resources are expected to be localized, temporary, and minor. With proper design, installation, and, in many cases, proper maintenance and removal of temporary treatments, the short-term impacts would be more than offset by long-term benefits of ES&R treatments.

Given that traditional use areas are adapted to take into account localized declines or displacements in key species associated with the natural fire regime, ES&R treatments are not intended to compensate users for normal losses incurred in a fire adapted ecosystem.

Table 3.8. Direct and Indirect of Effects of ES&R Treatments on Subsistence

Treatments	*Direct*	*Indirect*
Erosion Control Treatments	Temporarily disturbing wildlife need for food, nesting, or cover during site disturbance from treatment implementation. Displacing mobile wildlife, altering predator pursuit behavior, and increasing re-sprouting of browse species from installing protective fences in erosion barriers and cultural sites. Degrading habitat needed for food, nesting, or cover until plants are established through seeding and planting and ground cover treatments. Temporary displacing important wildlife species during the human activity and on-the-ground disturbance. Protecting highways and travel corridors important to subsistence by installing erosion barriers.	Erosion control minimizing disturbance area and limiting the areas of primary succession that produce vegetation preferred by moose. Improving fish harvest for villagers in future years by off-setting adverse fire effects to spawning habitat. Providing palatable forage and habitat with revegetation for those species of wildlife dependent on late seral stage plant communities. Reducing the risk of post-wildfire flooding and landsliding. As a result, reducing availability of large woody material and coarse substrate important for cover and habitat for species.

Invasive Non-native Plant Treatments	Stopping the spread of undesirable plant species from the initial area of disturbances after fire, thus maintaining natural wildlife habitat.	Maintaining ecosystem integrity and improved natural wildlife habitat with the removal of invasive non-native plants.
Travel Corridor Treatments	Re-establishing access to allotments blocked by fire related tree blow down. Improving traveler safety during subsistence activity. Temporarily displacing wildlife from an area or a corridor adjacent to the cleared trail by increasing the number of disturbance events associated with human activity during trail stabilization, clearing, and facility repair.	No substantial indirect effects for travel corridor treatments.

Erosion Control Treatments

Erosion control treatments could have short-term and long-term affects on subsistence. Impacts to wildlife species are described in Section 3.15 on Wildlife. During revegetation treatments such as seeding, planting, and ground cover treatments, there would be a short-term period when associated habitat values for subsistence species would be low until plants are established. In the long-term, rehabilitation treatments could increase recovery time of moose habitat. Temporary displacement of important wildlife species could occur during the human activity and ground disturbance associated with the installation of erosion control treatments. Erosion barriers would protect highways and travel corridors important to subsistence from closure do to unstable or hazardous conditions. Grade stabilizers, check dams, contour tree felling, and streambank armoring could improve fishery conditions associated with fire related run-off and sedimentation effects. Erosion control treatments designed to restore pre-fire conditions of streams could improve fish harvest for villagers in future years by off-setting adverse fire effects to spawning habitat.

Invasive Non-native Plant Treatments

Impacts to important subsistence wildlife species important to subsistence are the same as described in Section 3.15 on Wildlife.

Travel Corridor Treatments

Most effects to subsistence are from beneficial travel corridor ES&R treatments. Trail stabilization and clearing will have short term and long term affects on subsistence. Access to allotments blocked by fire related tree blow down will be re-established. Stabilization treatments, closures, and repair of facilities would improve traveler safety along highways and travel corridors used in subsistence activities. Impacts associated with the displacement of important species due to installation of travel corridor treatments are described in Section 3.13 on Vegetation and Section 3.15 on Wildlife.

3.11.3 ANILCA 810 Evaluation
The ANILCA 810 Evaluation concluded no significant restrictions. Appendix C contains the full evaluation.

3.12 Special Status Species
BLM Manual 6840 provides policy and direction for the conservation of special status species (SSS) of plants and animals, and the ecosystems upon which they depend. Categories of SSS include: Species listed under the Endangered Species Act (ESA) as threatened and endangered species (T&E species), proposed, and candidate species; as well as state listed species and BLM sensitive species. Listed and proposed species may also have ESA designated or proposed critical habitat.

An endangered species is defined as species that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as a species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Sensitive species are those plants or animals that are known or suspected to occur on Federal lands and do not meet either the threatened or endangered criteria but have been determined to be rare or sensitive. They will be provided the same protection as that of a candidate species under the Endangered Species Act (ESA, 1973).

BLM Alaska Land Health Standards and Guidelines for managing upland, riparian, wetland, and aquatic areas watershed function, ecological processes, and water quality and yield are available online and incorporated by reference (USDI/BLM Alaska Soil, Water, and Air Program Website, 2005).

3.12.1 Affected Environment
The affected environment for SSS is a burned area and includes effects of wildfire on the Threatened and Endangered Species (T&E), State of Alaska listed species and BLM sensitive species. A description of fire's effects on plant and wildlife habitat are found in Section 3.13 on Vegetation and Section 3.15 on Wildlife.

T&E Species
Appendix D lists a brief description of the status and range of species in Alaska currently protected by the ESA. These species occur in areas of Alaska that are not BLM-managed lands or in areas that are not prone to wildfire. There are also a number of designated critical habitat areas in marine areas not under BLM jurisdiction. The short-tailed albatross does not use any terrestrial habitat in Alaska. The Aleutian shield fern is endemic to Adak Island, where there are no BLM lands on this island. The spectacled and Steller's eiders migrate through, and nest on, lands under BLM jurisdiction on Alaska's North Slope, but birds appear to favor areas close to ponds and small lakes that are generally subject to wildfire. Kittlitz's murrelet occurs in coastal habitats, where it would be unusual for a wildfire to occur. Section 3.1.12 of the 2005 Fire EA provides a more detailed description of status, range, and habitat (USDI/BLM, 2005).

State of Alaska Listed Species and BLM-Sensitive Species

Appendix E shows species listed by the State of Alaska as endangered. These species either inhabit marine environments not under BLM jurisdiction or inhabit terrestrial habitat not likely to experience wildfire. Alaska Department of Fish and Game Division of Wildlife Conservation provides more information on status, range, and habitat of these species (ADF&G, 2006). The BLM-Alaska sensitive species list (Appendix F) has been developed using guidance provided in the BLM 6840 Manual. It was derived using information gathered from the Alaska Natural Heritage Program, the Nature Conservancy, Alaska Department of Fish and Game, U.S. Fish and Wildlife Service and the National Park Service. The list includes only those species that have been determined to likely occur on BLM-managed lands in Alaska. Many of the species on this list are there because of a general lack of inventory; this list may be modified to exclude or add species in the future, as inventories are completed.

3.12.2 Environmental Consequences

ES&R treatments will only occur in areas where the effects of fire have posed significant threat to human life, property, and critical biological or cultural resources. The impact of ES&R treatments is anticipated to be very small in scale when compared to the very large planning area; thus, the potential impacts from ES&R treatments on SSS are expected to be localized, temporary, and minor. ES&R treatments would minimize any adverse impacts and maximize potential habitat enhancements when design features are applied and the site-specific conservation needs of special status species are considered. The selection of ES&R treatments would be based on BLM resource specialist recommendations and would be within the scope of appropriate Land Use Plans. Since specific design features include screening for the presence of special status plants and animals or their habitat during plan development, SSS locations would be avoided. Mitigation measures incorporated into site specific project plans would minimize impacts that would occur. Utilizing design features when implementing ES&R treatments and recognizing individual SSS needs would contribute towards the recovery of the SSS species and their habitats over time.

T&E Species

Based on currently available information, neither the No Action Alternative nor the Proposed Action would affect any T&E species or their habitats. Species and habitats are neither located in the fire-dependent ecosystems of the Interior nor adjacent to populated areas, where ES&R activities are unlikely to occur. The potential effects of ES&R treatments on spectacled eiders and Steller's eiders and their designated critical habitat is anticipated to be negligible due to the infrequency of fire in important molting, breeding, nesting, and wintering areas of these species. If wildfire were to occur and ES&R treatments ere warranted, fire damage is likely to render the habitat unsuitable, and the activities described in the PESRP would not adversely affect these species. A description of the ESA Section 7 compliance for the PESRP is described in Chapter 4.0.

State of Alaska Listed Species and BLM-Sensitive Species

ES&R treatments have potential to minimally affect sensitive species of terrestrial wildlife, fish and aquatics, and plants. Effects of erosion control, non-native invasive plant, and trail corridor treatments on special status species are the same as those described in Section 3.1 on Aquatic Resources and Essential Fish Habitat, Section 3.13 on Vegetation, and Section 3.15 on Wildlife.

3.13 Vegetation Resources

3.13.1 Affected Environment

The vegetation of Alaska can be classified into 19 classes. However, only general classes will be addressed in this analysis, along with knowledge and firsthand experience of resource specialists. Three general classes make up the affected environment: forestlands (Black Spruce Woodland Open/Closed Black Spruce Forest, Open/Closed White Spruce Forest, Mixed Coniferous/Deciduous Forest , Open/Closed Deciduous Forest, Coastal Boreal Transition Forest, and Northern Boreal Forest), shrub lands, and herbaceous communities (tundra and grasslands). More detailed descriptions of the affected environment of vegetation resources can be found in Section 3.2.5 of the 2005 Fire EA (USDI/BLM, 2005).

Northern boreal ecosystems evolved with fire as a natural occurrence (Shugart, et al. 1992), and future disturbance by wildfires is assured, regardless of management alternatives chosen. Species-specific fire effects on northern vegetation, including Alaska, have been compiled and summarized into the electronic Northern Rockies Interagency Fire and Aviation Management Fire Effects Information System. Information on fire effects in Alaska vegetation types can be found in a U.S. Forest Service General Technical Report (USDA/USFS, 2000).

BLM Alaska Land Health Standards and Guidelines for managing upland, riparian, wetland, and aquatic areas watershed function, ecological processes, and water quality and yield are available online and incorporated by reference (USDI/BLM Alaska Soil, Water, and Air Program Website, 2005).

3.13.2 Environmental Consequences

No Action Alternative

Since the only difference between the No Action and the Proposed Action Alternatives is the streamlined approach to ES&R planning found in the Proposed Action, both alternatives would have the same environmental effects. There would be additional indirect effects associated with an increase in the cost and time needed to implement ES&R treatments. With the No Action Alternative, individual EAs may have to be prepared for ES&R treatments, adding an expense of hiring specialists to handle the workload, creating delays in individual EA preparation, and slowing the implementation of ES&R treatments. As a result, the harmful effects on vegetation resources would be prolonged and beneficial effects would be delayed.

Proposed Action

ES&R treatments will only occur in areas where the effects of fire have posed significant threat to human life, property, and critical biological or cultural resources. The impact of ES&R treatments is anticipated to be very small in scale when compared to the very large planning area; thus, the potential impacts from ES&R treatments on vegetation are expected to be localized, temporary, and minor. Impacts during treatment implementation would include temporary ground disturbance. A summary of direct and indirect effects of treatments on vegetation resources is found in Table 3.9

Treatments	Table 3.9. Direct and Indirect Effects of ES&R Treatments on Vegetation	
	Direct	*Indirect*
Erosion Control Treatments	Disturbing remaining burned soil and vegetation with mechanical disturbance associated with treatment implementation. Minimally damaging any existing vegetation with application of hydromulching and hand seeding.	Ensuring vigorous future native plant community structure with the recovery of the remaining vegetation. Seeding suppressing natural regeneration result in possible changes in early and mid successional plant community diversity.
Invasive Non- native Plant Treatments	Stopping the spread of undesirable plant species from the initial area of disturbances after fire. Trampling any existing vegetation by crews performing control. This trampled vegetation could serve as temporary mulch and increase success of seeding.	Maintaining ecosystem integrity and promoting native plant communities adapted to the natural fire regime with the removal of invasive non-native plants.
Trail and Travel Corridor Treatments	Temporarily disturbing plant communities from site disturbance during treatment implementation.	Increasing natural recovery of vegetation by closing **t**rails and lowering visitor use.

Erosion Control Treatments

Seeding and planting, ground cover, erosion barriers, and cultural site stabilization may contribute to the recovery of the remaining vegetation and would benefit the future native plant community structure. Seeding, and seed covering, invasive non-native plant control, and off-road vehicle traffic associated with ES&R treatments could create some short-term impacts to the soil and remaining vegetation. Application of hydromulch and hand seeding would cause minimal damage to existing vegetation. The long-term effects would promote vegetation recovery.

The short-term detrimental effects of mechanical disturbance associated with seeding and planting would be minimized by the design features and would be vastly out-weighed by the long-term benefits such as enhanced site stability and vigor of the vascular plant community.

Other beneficial effects, although not the intended purpose for ES&R treatments, are expected to occur with the implementation of the Proposed Action. These effects include: 1)improving and restoring the biodiversity of native vegetation, 2)restoring quality of habitat for wildlife, 3)continuing the recovery of the natural fire cycle and native vegetation.

There is some evidence to suggest post-fire seeding suppresses natural regeneration and can result in indirect effects on early and mid successional plant community diversity (Robichaud *et al.*, 2000). Site-specific needs should be assessed before installing seeding and planting treatments. Specific design features for treatments help minimize environmental impacts.

Protection of re-vegetated or cultural sites with camouflaging would prevent further degradation to a site due to wildlife or human activity. Protection of sites until vegetation and soil is

established or stabilized would be beneficial. Some short-term vegetative impacts would be associated with the fence construction or reconstruction activity, primarily from off-road vehicle traffic and brush clearing. These impacts would be site-specific and minimal compared to the long-term benefits to revegetation and cultural site protection.

Invasive Non-native Plant Treatments

Invasive non-native plant control describes types of removal or control, for example, hand pulling, especially by volunteer crews can result in trampling of non target plants and soil disturbance. This kind of disturbance can be beneficial in creating a seed bed available for hand seeding of competing species (native) and improving seed soil contact by trampling. Trampled vegetation can also serve as a temporary mulch to prevent predation.
Inventory and monitoring are minimally invasive activities. Inventory does not involve any ground disturbance or changes to the ecosystem other than potential minor trampling of vegetation by foot. Monitoring may include the installation of plot markers, typically by pounding a stake in the ground, hanging flagging tape and minor trampling by workers. Inventory by truck, four wheeler or other vehicles that are operated off road may increase soil disturbance in the short term.

Travel Corridor Treatments

There would be minimal ground disturbance associated with machinery and human activity during the installation of travel corridor treatments such as trail stabilization, clearing, and repair of facilities. Trail closure would allow natural recovery of vegetation to occur more rapidly, due to a decrease in user access and associated disturbance.

3.14 Water Quality, Floodplains, Wetlands, and Riparian Zones

BLM-Alaska is obliged by national policy and guidance to consider effects on water quality, floodplains, wetlands, and riparian zones. The Clean Water Act of 1977, as amended by the Water Quality Act of 1987, provides national policy and mandates the control of non-point pollution. Agencies are directed to develop and implement programs to meet the goals of this act through the control of both point and non-point source pollution. Executive Order 11988 was enacted to “avoid to the extent possible the long-term and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.” Management considerations must comply with Executive Order 11990, Protection of Wetlands, which requires Federal agencies to minimize the destruction, loss, or degradation of wetlands while preserving and enhancing their natural and beneficial values on federal property. The order restricts most activities that could affect wetlands administered by the Federal government, including federal programs affecting land use.

Regional guidance ensures that future BLM land use plans and land management decisions are directed to incorporate statewide standards for maintaining and restoring the health of watersheds. BLM Alaska Land Health Standards and Guidelines for managing upland, riparian, wetland, and aquatic areas watershed function, ecological processes, and water quality and yield are available online and incorporated by reference (USDI/BLM Alaska Soil, Water, and Air Program Website, 2005).

3.14.1 Affected Environment

Watersheds and water resources are in relatively pristine condition in Alaska. Aquatic environments across Alaska are extremely variable, reflecting diverse geological settings, climates, disturbance histories, and past management. Water is relatively abundant in many areas and competing uses are few. However, water resources in some areas are relatively scarce. Precipitation is low in some regions such as the North Slope and eastern interior; groundwater resources are limited in other areas due to saline conditions or deep permafrost; and in winter, many rivers have little or no streamflow after freeze-up. Aquatic habitat types range from small, high-gradient montane streams to low-gradient large rivers such as the Yukon. Lakes, ponds, wetlands, estuaries, tidal marshes, and springs are all present across the planning area.

Management for high quality water, floodplains, wetlands, and riparian zones is a priority for BLM-Alaska lands. BLM manages more water bodies in Alaska than in the rest of the lower 48 combined (USDI/BLM Alaska Soil, Water, and Air Program Website, 2005). Approximately 12.6 million acres of wetlands (97% of national) and 107,600 miles of riparian (75% of national) are managed by the BLM in Alaska (USDI/BLM FY2004).Lands managed by BLM-Alaska contain approximately 96,000 miles of perennial streams, 2.6 million lake surface acres, and innumerable wetland areas (approximately 45% of Alaska is classified as wetlands).

Fire may cause extensive changes in a watershed leading to changes in natural water quality associated with the fire regime. These changes include burning of vegetation and litter, which releases plant nutrients and metals; heating of soils, which alters soil properties and flow paths; and post-fire erosion, which may increase turbidity and sediment loads. Further descriptions of fire effects on water quality can be found in Section 3.1.14 of BLM-Alaska LUP Amendment for Wildland Fire and Fuels Management (USDI/BLM, 2005). The impact that fire has on water quality is highly variable depending on the watershed size, stream size and flow regime, fire size, and local fire intensity and severity. Predominant water quality parameters related to the effects of fire are: 1) fine sediment deposition, 2) temperature increases due to solar heating when streamside canopy cover is removed, and 3) nutrient loading.

Wetlands and riparian areas in Alaska are generally more resistant to fire than the surrounding wildlands and, therefore, the effects of fire in those areas are often more limited. However, wetlands and riparian areas can and do burn, especially when high to extreme burning conditions exist. In some cases, the more pronounced disturbance effects can come from suppression efforts. A more detailed description fire effects on wetland and riparian areas is found in Section 3.1.15 of the BLM-Alaska LUP Amendment for Wildland Fire and Fuels Management (USDI/BLM, 2005). Large mechanized equipment and/or excessive use of smaller motorized vehicles can cause damage to wetland and riparian zones and underlying permafrost, but since riparian areas are often utilized by suppression resources as natural barriers to fire spread, heavy equipment use is usually quite limited. The use of retardant in riparian areas also can have detrimental effects.

3.14.2 Environmental Consequences

No Action Alternative

Since the only difference between the No Action and the Proposed Action Alternatives is the streamlined approach to ES&R planning found in the Proposed Action, both alternatives would

have the same environmental effects. There would be additional indirect effects associated with an increase in the cost and time needed to implement ES&R treatments. With the No Action Alternative, individual EAs may have to be prepared for ES&R treatments, adding an expense of hiring specialists to handle the workload, creating delays in individual EA preparation, and slowing the implementation of ES&R treatments. As a result, the harmful effects on water quality, floodplains, wetlands, and riparian zones would be prolonged and beneficial effects would be delayed.

Proposed Action

ES&R treatments will only occur in areas where the effects of fire have posed significant threat to human life, property, and critical biological or cultural resources. The impact of ES&R treatments is anticipated to be very small in scale when compared to the very large planning area; thus, the potential impacts from ES&R treatments on water, quality, floodplains, wetlands, and riparian zones are expected to be localized, temporary, and minor. The design features and LUP standard and required operating procedures for work in riparian areas and aquatic environments would minimize the affects to water quality, floodplains, wetlands, and riparian areas. With proper design, installation, and, in many cases, proper maintenance and removal of temporary treatments, the short-term impacts would be more than offset by long-term benefits of ES&R treatments. A summary of direct and indirect effects of treatments on wildlife resources is found in Table 3.10.

Treatments	**Table 3.10. Direct and Indirect of Effects of ES&R Treatments on Water Quality, Floodplains, Wetlands, and Riparian Zones**	
	Direct	*Indirect*
Erosion Control Treatments	Increasing infiltration and reducing runoff as a result of seedbed preparation and plantings. Increasing localized risk of erosion until seedings and plantings become established. Reducing overland flow, minimizing *rill*, and trapping of sediment that would otherwise be transported downstream. Transporting soil particles generated during mechanized treatment downslope to a stream.	Improving canopy cover and shade from revegetation efforts. Check dams and streambank armoring leading to the recovery of native, riparian vegetation, and, thus, reducing the threat to water quality from post-wildfire flooding and landsliding. Stabilizing streambeds and improving water quality.
Invasive Non- native Plant Treatments	Transporting soil particles generated during manual removal downslope to a stream.	Improving hydrologic function of the watershed as the site becomes re-vegetated with desirable species adapted to local soil and erosion conditions.
Trail and Travel Corridor Treatments	Increasing short-term runoff into streams from ground disturbance and vegetation removal associated with stabilizing and clearing of trails and repair of facilities.	Reduced erosion in trails lacking adequate drainage, trails with potential to deliver sediment to streams, and trails where previous drainage structures damaged by fire.

Erosion Control treatments

Specific effects of erosion control treatment on erosional factors influencing water quality, floodplains, wetlands, and riparian zones are discussed in Section 3.9.2 on Soils. Seedbed preparation and mechanical seeding generally result in increased infiltration and less runoff. Erosion barriers would have beneficial effects of minimizing erosion and post-fire sediment delivery to stream channels. Sediment detention structures, such as straw wattles, interrupt overland flow, reduce runoff energy, minimize rill, and trap sediment that may otherwise be transported downslope.

Other revegetation or erosion control treatments, such as riparian tree and shrub seedlings or herbaceous plugs plantings, would provide long-term canopy cover and shade streams from direct solar radiation. These treatments would also maintain and protect water quality by providing streambank stability.

Short-term indirect effects would occur if soil particles from mechanized treatment areas are transported downslope to a stream. Riparian and aquatic environments would see long-term benefits from land and channel treatments designed to stabilize soil, minimize rill and gully erosion, and protect streambanks.

Short term impacts associated with riparian or in-channel seeding, planting woody or herbaceous riparian species, willow wattles, whole tree felling, or silt fences include a localized risk of erosion until the site becomes revegetated. Bioengineering techniques would improve riparian and channel process in the long-term, maintaining channel stability and improving or protecting aquatic habitat.

Invasive Non-native Plant Treatments

Control of invasive non-native plants would maintain healthy watersheds by reducing competition and promoting the establishment of native species adapted to local soil and erosion conditions. Long-term indirect effects from invasive non-native plant treatments would also include improved hydrologic function of the watershed as the site becomes re-vegetated with desirable species.

Travel Corridor Treatments

Direct, short-term impacts to water quality, floodplains, wetlands, and riparian zones could occur during travel corridor treatments involving ground disturbance if sediment enters into a flowing stream. Effects of mechanical disturbance from road and trail stabilization or repair of facilities would be minimal and are designed to reduce trail erosion and promote public health in safety in the long-term. Also, most trail clearing is conducted in winter months when soils are frozen and would have minimal affect on water quality, floodplains, wetlands, and riparian zones.

Fences could be used in seeding, plantings, and travel corridor treatments to protect or close areas from wildlife or human use. Vegetative clearing associated with fence construction or reconstruction (primarily brush clearing) and planting, would increase susceptibility to erosion; however impacts would only be factors in the short-term until areas were re-vegetated.

3.15 Wildlife

Fire is a natural disturbance affecting a large portion of upland areas within mainland Alaska, particularly the northern boreal forest or taiga (Viereck, 1973). Wildlife communities of all areas of Alaska where fire is possible are responsive to the heterogeneity, size variation, and juxtaposition of habitats associated with the natural fire regime.

BLM Alaska Land Health Standards and Guidelines for managing upland, riparian, wetland, and aquatic areas watershed function, ecological processes, and water quality and yield are available online and incorporated by reference (USDI/BLM Alaska Soil, Water, and Air Program Website, 2005).

3.15.1 Affected Environment

Wildlife Habitat

In Interior Alaska, fire is the primary agent of change in the boreal forest. It is responsible for maintaining habitat heterogeneity in the large portion of mainland Alaska that is covered by a mosaic of coniferous and deciduous forest, shrub, meadow, and bog habitats. Higher elevations throughout the boreal forest contain dry tundra, whereas large coastal regions of western and northern Alaska are dominated by wet tussock tundra and wetlands.

In coastal area of the Alaska Peninsula, Gulf of Alaska, and Southeast Alaska natural fire is rare. The few accidental human-caused fires near the southern coast are usually contained within small areas by natural barriers such as water bodies and rocky outcroppings near ridge tops. As a result, fire is a minor influence on wildlife habitat in that region.

On the Arctic Slope, fire is rare and areas burned tend to be small. The role of fire in the tundra ecosystem is less important than in the northern boreal forest but nonetheless contributes to habitat heterogeneity. Most wildlife species inhabiting tundra and wetlands of the Arctic Slope are widely dispersed and occur at low densities, with the large mammals generally ranging over wide areas. Loss of habitat in relatively small burned areas within their range has little effect on them, although some species may take advantage of increased forage and seed production in recent burns. The infrequent, small fires that occur on the Arctic Slope will not meet all yearly habitat requirements of large species, and population responses will be less pronounced than in Interior ecosystems. However, fires may have an effect on the habitat of localized populations of small, sedentary species.

Generally, the effects of fire on habitat are more significant than the effects on existing animals (Viereck and Schandelmeier, 1980). Habitat changes determine the suitability of an area for future generations of animals. Fires may have a short-term negative impact on existing animals by displacing or sometimes killing them or by disrupting critical reproductive activities. However, populations are capable of quick recovery if suitable unburned habitat is available in areas adjacent to or within the burned area. The adverse effects that the immediate generation of wildlife may experience are usually greatly offset by the benefits accrued to future generations, since fire maintains a mosaic of vegetation types and age classes in the landscape that provides habitat for a wide variety of species. Herbivores are directly affected by changes in vegetative

cover and forage associated with fire, whereas predators respond indirectly to changes in both cover and abundance of their primary prey.

Wildlife Species

Primary wildlife species (Appendix G) analyzed in this document are species and habitats managed by state and federal agencies to provide for a sustainable harvest. A more detailed description of fire effects on large mammals, small mammals, furbearers, and birds is found in Section 3.2.7b of the Fire EA (USDI-BLM, 2005).

Fires result in changes to vegetation that influence wildlife distribution and site utilization by large mammals, small mammals, furbearers, and birds. Some species require fire disturbance to create habitat. Moose take advantage of the newly re-sprouted willows and deciduous trees and fast-growing herbaceous plants after a fire. In contrast, research has shown that caribou avoid the use of recent burns during the winter, due to decreased lichen abundance (winter forage) (Joly *et al*., 2003). Small mammals, such as yellow-cheeked voles often flourish after fires, creating large colonies in the partially burned duff and feeding on the young herbaceous vegetation of light to moderately burned areas (Swanson, 1996; Quinlan, 1978). Snowshoe hares thrive in the shrub and dense sapling stage that follows. The flush in abundance of these small herbivores provides increased food resource for both terrestrial and avian predators ranging from red fox and American martin to various species of owls and hawks. Fire-killed trees represent a readily available reservoir of insects for woodpeckers and a nesting medium for a wide variety of cavity-nesting birds.

3.15.2 Environmental Consequences

No Action Alternative

Since the only difference between the No Action and the Proposed Action Alternatives is the streamlined approach to ES&R planning found in the Proposed Action, both alternatives would have the same environmental effects. There would be additional indirect effects associated with an increase in the cost and time needed to implement ES&R treatments. With the No Action Alternative, individual EAs may have to be prepared for ES&R treatments, adding an expense of hiring specialists to handle the workload, creating delays in individual EA preparation, and slowing the implementation of ES&R treatments. As a result, the harmful effects on wildlife would be prolonged and beneficial effects would be delayed.

Proposed Action

ES&R treatments will only occur in areas where the effects of fire have posed significant threat to human life, property, and critical biological or cultural resources. The impact of ES&R treatments is anticipated to be very small in scale when compared to the very large planning area; thus, the potential impacts from ES&R treatments on wildlife are expected to be localized, temporary, and minor. Impacts during treatment implementation would include temporary ground disturbance and temporary displacements of individual mobile wildlife from local populations. With proper design, installation, and, in many cases, proper maintenance and removal of temporary treatments, the short-term impacts would be more than offset by long-term benefits of ES&R treatments. A summary of direct and indirect effects of treatments on wildlife resources is found in Table 3.11. The beneficial effects of biotic and abiotic resource

stabilization and rehabilitation efforts would increase incrementally overtime, providing both short and long-term habitat viability necessary to sustain various wildlife populations in the affected area.

Treatments	Table 3.11. Direct and Indirect of Effects of ES&R Treatments on Wildlife	
	Direct	*Indirect*
Erosion Control Treatments	Temporarily disturbing wildlife need for food, nesting, or cover during site disturbance from treatment implementation. Displacing mobile wildlife, altering predator pursuit behavior, and increasing re-sprouting of browse species from installing protective fences in erosion barriers and cultural sites.	Providing palatable forage and habitat with revegetation for those species of wildlife dependent on late seral stage plant communities. Reducing the risk of post-wildfire flooding and landsliding. As a result, reducing availability of large woody material and coarse substrate important for cover and habitat for species.
Invasive Non- native Plant Treatments	Stopping the spread of undesirable plant species from the initial area of disturbances after fire, thus maintaining natural wildlife habitat.	Maintaining ecosystem integrity and improved natural wildlife habitat with the removal of invasive non-native plants.
Trail and Travel Corridor Treatments	Increasing mobility of wildlife species by clearing travel corridors. Temporarily displacing wildlife from an area or a corridor adjacent to the cleared trail by increasing the number of disturbance events associated with human activity during trail stabilization, clearing, and facility repair.	Improving human access and human presence that could temporarily displace wildlife.

Erosion Treatments

During revegetation treatments such as seeding and planting, erosion barriers, and mulching, there would be a short-term period when associated habitat values would be low. Low vegetation density and temporary ground disturbance associated with these treatments could affect wildlife's need for food, nesting, or cover. However, given that the affected environment is a burned area, these pre-existing habitat values will already be low, and conditions will improve substantially following ES&R treatments. Once the burned areas are revegetated, new seasonal growth would provide palatable forage and a better diversity of native perennial grass, forbs, and shrub species. Over time, mosaics of mature shrubs and trees would provide suitable habitat for those species of wildlife dependent on late seral stage plant communities. Revegetation after fires greatly benefits moose because the herbaceous plants, shrubs and saplings on which they feed become more abundant in post-fire early seral communities. During installation, ground and air disturbing treatments would likely displace mobile wildlife, but long-term benefits of these treatments would offset these temporary impacts.

Treatments such as check dams, contour tree felling, and streambank armoring would benefit those species dependent on the recovery of vegetation in riparian areas. The recovery of native,

riparian vegetation would reduce the risk of post-wildfire flooding and landsliding that could impact availability of prey species and cover.

Revegetation with native species in addition to invasive non-native plant treatments would benefit most wildlife species in the long-term by maintaining ecosystem integrity and promoting continuation of the natural fire regime. Habitat for moose is generally improved for about 30 years following fire depending on the severity of the burn and other factors affecting plant succession. Moose primarily benefit from an increase in forage quantity, not quality. Forage quality and palatability is greatly improved initially, but declines quickly after the first growing season. Caribou generally avoid winter time use of burned areas for many years following fire (60-80 years), due to the removal and slow re-establishment of forage lichens (Joly *et al.*, 2003). However, caribou could be expected to utilize the flush of herbaceous growth (willow and blueberry leaves, sedges, flowering tundra plants and mushrooms) during the growing season if the burn location coincides with their range. Therefore, depending on their non-winter location, caribou may be temporarily displaced by on-going ES&R treatments.

Temporary protective fences and barriers blocking wildlife passage would be used as needed on treatments to promote natural recovery, retard erosion, and protect cultural sites. These short-term losses of habitat are expected to be offset by increased success of re-sprouting browse species. Fences and barriers could lead to temporary entrapment or collisions by wildlife. Creation of escape barriers may eliminate escape routes of prey animals as they attempt to escape from predators.

Travel Corridor Treatments

The clearing of trails through forested areas that were burned may minimally affect wildlife populations, both positively and negatively. A possible advantage of cleared trails associated with ES&R treatments includes the creation of pathways of least resistance for highly mobile wildlife species such as moose, caribou, bears, wolves, etc. However, trail clearing may increase human traffic in an area, thereby increasing the number of disturbance events and displacing wildlife. Stabilization and clearing of trails and repair of facilities may include a temporary increase in ground disturbance and human presence in an area that could temporary displace wildlife. However, established travel corridors would have a history of human use, and disruption to wildlife in those areas would be a regular occurrence.

3.16 Cumulative Effects

The proposed ES&R treatments in the Proposed Action are intended to increase the rate and success of re-establishment of native or desired vegetation in burned areas, decrease fire's effect of erosion, reduce the potential for the invasion and or spread of invasive non-native plants, protect and stabilize cultural sites, and provide for safe travel corridor access. All of these desired and anticipated effects of ES&R treatments would create long-term beneficial cumulative impacts for wildlife, vegetation, aquatic, and cultural resources. The cumulative improvements resulting from ES&R treatments would benefit subsistence and recreational users and would increase general public safety following fire events.

3.17 Mitigation

Measures to avoid and minimize the effects of ES&R treatments in the Proposed Action are represented in BLM Best Management Practices, LUP standard and required operating procedures, and the design features of ES&R treatments (see Chapter 2.0). Additional mitigation practices are not needed for the ES&R treatments.

4.0 Consultation and Coordination

BLM solicited internal and external issues to address during the development of alternatives for the Programmatic Emergency Stabilization and Rehabilitation Plan (PESRP) Environmental Assessment. Outreach efforts in the development of the PESRP included communication at the local, State, and Federal level. Minimal written and verbal public comment was received, and public comments were incorporated into the document. Consultations with U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration concluded the actions in the proposed PESRP would result in no adverse effect on listed species or essential fish habitat. The document was reviewed through both internal and external review processes. Comments received during public review will be incorporated in the decision document.

4.1 BLM Internal Issue Development

Internal issue development began with meetings with National ES&R Program Leads, Alaska State, District, and Field Office resource managers, planners, and staff. The focus of initial meetings was to develop the purpose and need for action (Chapter 1.0), identify potential resource issues, and determine the appropriate level of public outreach. Public outreach was scheduled to include a notice on the Alaska State Office NEPA register, a BLM news release, a public notice in the Anchorage Daily News, and scoping letters sent to 700 individuals, with more in-depth outreach possible if initial feedback was great.

BLM Alaska ES&R Coordinators held the following major meetings in which internal issues were discussed and developed. In addition to these, there were numerous informal meetings and phone conversations with the Planning staff at the Alaska State Office, Field Office staff members, and National ES&R Program Leads.

- April 6, 2006, Acting National ES&R Program Lead. The purpose and need of the PESRP was refined to explain how a programmatic approach to ES&R planning would result in timely and cost-effective implementation of ES&R plans, actions, and procedures. A timeline for the completion of the PESRP was determined. Critical issues were identified to include the importance of winter access, erosion issues near towns, and the need for invasive non-native plant treatments.
- April 11, 2006, Alaska State Office Resource Planners and Vegetation Specialist. The inclusion of herbicide treatment of invasive non-native plants as PESRP treatments was discussed. Appropriate level of public involvement was suggested to be determined by field offices, public affairs specialists, and experiences of similar planning efforts.
- April 13, 2006, Alaska Fire Service, Mary Lynch. Relevance of ES&R Program to non-BLM land owners was discussed. Based on low attendance of past public meetings on BLM fire issues, scoping letters were recommended as a main form of public outreach.
- April 14, 2006, Alaska State Office resource planners and Deputy State Director for Resources. The PESRP will not include chemical control of invasive non-native plants.

- April 17, 2006, Anchorage Field Office Field Office managers and staff. Attendees were introduced to the ES&R Program, the purpose and need for PESRP, and solicited for contributions in the review process.
- April 18, 2006, Glennallen Field Office Field Office managers and staff. Attendees were introduced to the ES&R Program, the purpose and need for PESRP, and solicited for contributions in the review process.
- April 26, 2006, Fairbanks District Office and Alaska Fires Service managers and staff. Attendees were introduced to the ES&R Program, the purpose and need for PESRP, and solicited for contributions in the review process.
- May 30, 2006, BLM Native Liaison, Brenda TakesHorse. Notification of tribes with scoping letters was determined to be appropriate if flexibility is given to response deadlines, due to priorities of subsistence use.

Important issues continued to develop at each stage of internal review. The PESRP EA was reviewed at the BLM State and Field Office levels. After internal review, the document was available for external review. Other local, state, and federal agencies and the public were invited to review the document.

4.2 Outreach Efforts

May 23, 2006: Public Notice on NEPA register published
June 9, 2006: 700 notices mailed to interested parties
June 9, 2006: BLM News release issued
June 12, 2006: Public Notice published in Anchorage Daily News
June 12, 2006: FWS Alaska ES&R Coordinator briefed
June 14, 2006: The Nature Conservancy briefed
June 17, 2006: NPS Alaska ES&R Coordinator briefed
July 18, 2006: Initiated ESA Section 7 consultation with Fish and Wildlife Service.
August 25, 2006: NOAA Fisheries/NMFS briefing and initiated consultation for EFH
October 3, 2006: NPS, FWS, State of Alaska, EPA, ADF&G, NOAA and public invited to comment on during public review of the PESRP.

4.3 BLM External Issue Development and Public Comment

A notice was published in the Alaska State Office NEPA Register on May 23, 2006, listing the NEPA document number and notifying the public that the plan was in progress. A June 9, 2006 news release and scoping letter inviting public participation in the development of issues was distributed to the media and mailed to more than 700 people on the BLM public affairs contact list including tribal and village councils, native corporations, other local, state, and federal land management agencies, environmental public interest groups, and individual contacts interested in fire management issues. Public comment periods were also advertised in the Public Notices section of the Anchorage Daily News on Monday, June 12, 2006.

Five people responded, via phone and written public comment, to the scoping letter and news release, providing comments for plan development. These individuals represented Unalakleet Native Corporation, Chalkyitsik Village Council, the City of Bettles, the Bureau of Indian Affairs, and The Nature Conservancy. Comments included concerns

for: 1) trail access being hindered by overflow, mudflow, and landslides, 2) protection of cultural grave sites, 3) communities affected by post-fire erosion of streams and rivers, 3) restoration interfering with natural succession after fire, 4) use of native plants in restoration, 5) reviewing the draft PESRP document and continuing to be informed of activities within the ES&R Program. Comments received have been assimilated into the proposed PESRP EA. The proposed PESRP EA was sent to interested parties for comment during the public review period. No public comment was received.

4.4 Endangered Species Act Section 7 Consultation

Section 7(a)(1) of the Endangered Species Act directs Federal agencies to consult with the U.S. Fish and Wildlife Service (FWS) on any action on public lands. Informal consultation was initiated with the FWS Endangered Species Branch at the Northern Alaska Ecological Services in Fairbanks, Alaska, regarding the ES&R treatments described in the PESRP. The FWS reply, included in the Appendix H, concluded that the Proposed Action (PESRP) would have no adverse effects to listed species or critical habitat as a result of activities carried out under the PESRP.

4.5 EFH Consultation

The consultation requirements of §305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA;16 U.S.C. 1855(b)) provide that Federal agencies must consult with the Secretary on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect essential fish habitat (EFH). An EFH Assessment (50 CFR Part 600.920) is required to discuss any adverse effects on EFH, if so determined.

BLM initiated informal consultation with National Oceanic and Atmospheric Administration (NOAA) for the effects of proposed treatments in the PESRP on Essential fish habitat (EFH) and determined that the PESRP has the potential to affect, but may not adversely affect Essential Fish Habitat. Thus, an EFH Assessment is not required. See Appendix I for a detailed description of EFH Consultation.

4.6 Public Review

The public was invited to review the PESRP EA during a 15 day public review period ending October 20, 2006. No public comment was received.

4.7 List of BLM Preparers

Project Lead

Ann Claerbout	ES&R Planner
Scott Guyer	ES&R Program Coordinator

Alaska Fire Service

Mary Lynch	Planning and Environmental Coordinator

Alaska State Office

Chuck Ardizzone	Subsistence Coordinator
Gene Ervine	Interpretive Specialist, Branch of Resources and Planning
Caron Gibson	Writer/Editor

Bruce Hollen	Wildlife and Threatened and Endangered Species Biologist
Mike Kasterin	Regional Economist
Bob King	Archaeologist
Lee Koss	Hydrologist
Jeanne Standley	Natural Resource Specialist, Vegetation Specialist,
Larry Standley	Hydrologist
Dennis Tol	Fisheries Biologist
Wayne Svejnohoa	Hazmat Specialist
Jerri Sansone	Realty Specialist
Curt Wilson	Supv Planner & Environment

Anchorage Field Office

Chuck Denton	Hydrologist
Jim Moore	Acting NEPA Coordinator

Central Yukon Field Office

Tim Craig	Wildlife Biologist
Kyle Joly	Wildlife Biologist
Howard Smith	Archaeologist

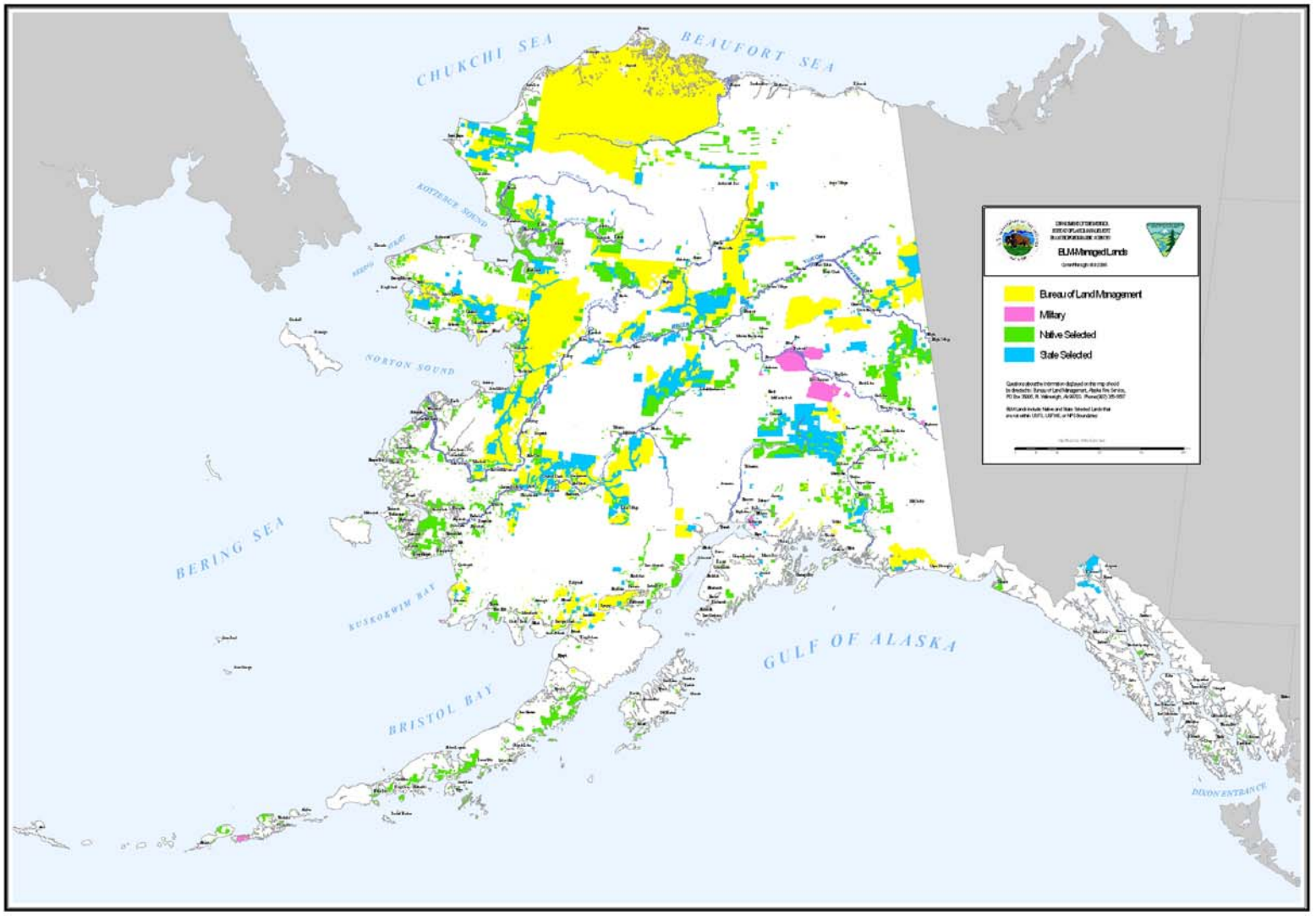
Eastern Interior Field Office

Colin Cogley	Outdoor Recreation Planner
Randy Goodwin	Outdoor Recreation Planner
Robin Mills	Archaeologist

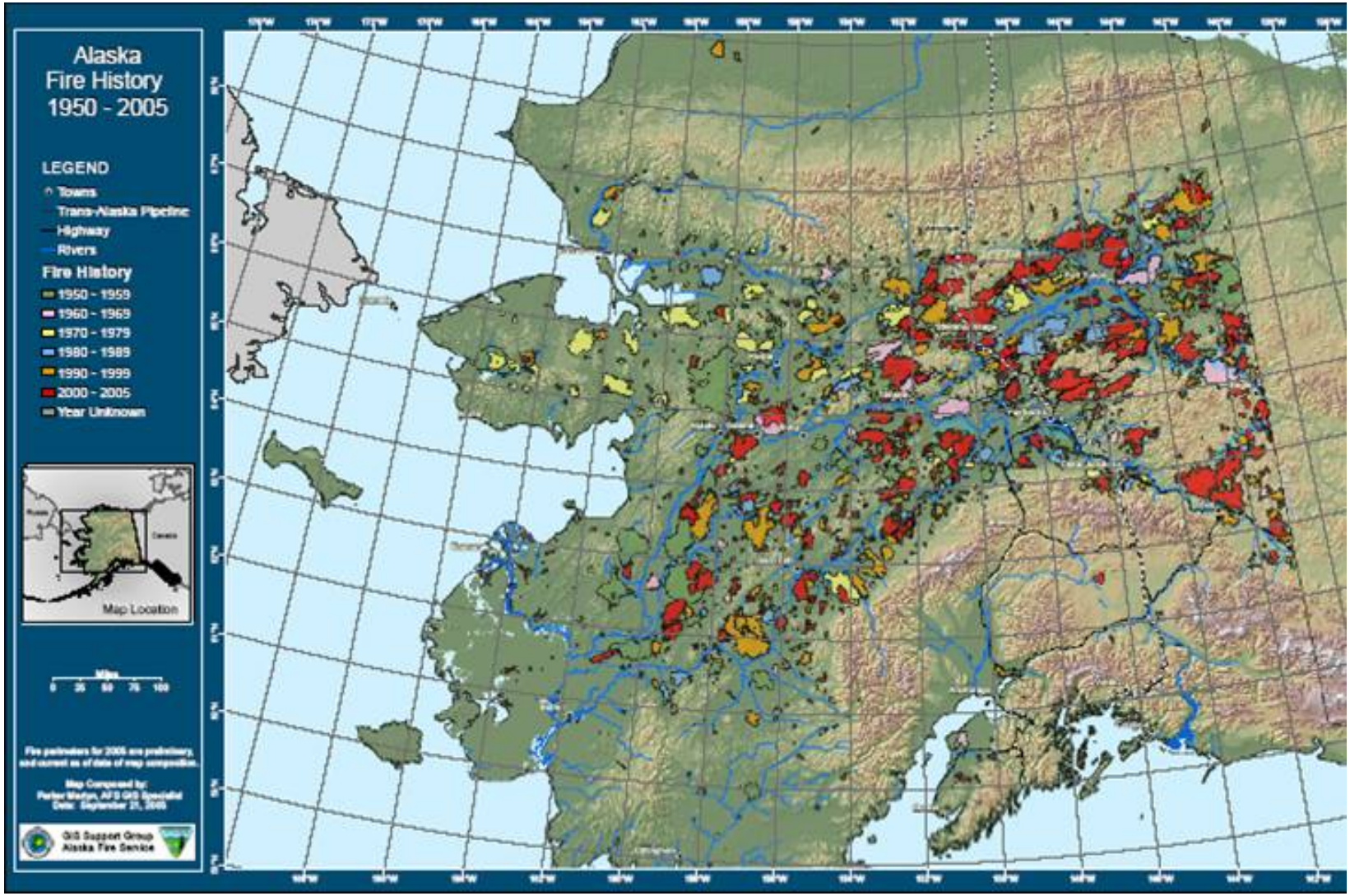
Glennallen Field Office

Bruce Rogers	Recreation Planner
Kari Rogers	Wildlife Biologist

Map 1. BLM Managed Lands in Alaska



Map 2. Alaska fires since 1950-2005 (Alaska Fire Service).



List of Acronyms

ATV All-terrain Vehicle
ACEC Area of Critical Environmental Concern
ADF&G Alaska Department of Fish and Game
AKDOT Alaska Department of Transportation
AKEPIC Alaska Exotic Plant Information Clearinghouse
AWFCG Alaska Wildland Fire Coordinating Group
BAER Burned Area Emergency Response
BAR Burned Area Rehabilitation
BLM Bureau of Land Management
CFR Code of Federal Regulations
CNIPM Committee for Noxious and Invasive Plant Management
CO Carbon Dioxide
DM Departmental Manual
DNA Determination of NEPA Adequacy
EA Environmental Assessment
EFH Essential Fish Habitat
EPA Environmental Protection Agency
ES Emergency Stabilization
ESA Endangered Species Act
ES&R Emergency Stabilization and Rehabilitation
FLPMA Federal Lands Policy and Management Act
FONSI Finding of No Significant Impact
FWS United States Fish and Wildlife Service
IAP Integrated Activity Plan
IMP Interim Management Policy
LUP Land Use Plan
LWD Large Woody Debris
MFP Management Framework Plan
MSA Magnuson-Stevens Fishery Conservation and Management Act
MAC Multi-Agency Coordinating Group
NCA National Conservation Area
NEPA National Environmental Policy Act
NHPA National Historic Preservation Act
NLCS National Landscape Conservation System
NOAA National Oceanic and Atmospheric Administration
NPR-A National Petroleum Reserve-Alaska
NPS National Park Service
NRA National Recreation Area
PESRP Programmatic Emergency Stabilization and Rehabilitation Plan
PM Particulate Matter
RMP Resource Management Plan
RNA Research Natural Area
ROD Record of Decision
SHPO State Historic Preservation Officer
SMA Special Management Area
USC United States Code
USDA United States Department of Agriculture
USDI United States Department of Interior
USFS United States Forest Service
WSR Wild and Scenic River
WSA Wilderness Study Area

Glossary

Activities (ES&R) are tasks such as monitoring, plan writing, or administrative functions.

Aerial broadcast distributes seeds on large areas where ground machines cannot operate efficiently. These are areas that are rugged and have a slope greater than 60%.

Areas of Non-Attainment are areas considered to have an air quality attribute that does not meet the National Ambient Air Quality Standards as defined in the Clean Air Act.

Armoring is an erosion control treatment where resistant material is placed along a stream bank or bottom to decrease likelihood of erosion.

Bioengineering is the use of coarse woody debris and other in situ stream bank materials for bank stabilization where erosion has occurred or is expected to occur. The use of these materials helps retain important features of streams and rivers and maintains a natural appearance in restored streams.

Broadcast seeding is the scattering of seed over the soil surface.

Check dams are small temporary dams constructed across a swale or drainage ditch.

Class I Airsheds are geographic areas designated under the Clean Air Act where only a very small amount or increment of air quality deterioration is permissible.

Contour tree felling or contour log terracing is dropping or arranging logs perpendicular to the slope to trap sediment and improve infiltration, prevent slope rilling, and replace woody material consumed by fire.

Design Features are guiding principles when implementing treatments to reduce impacts or enhance beneficial impacts of the proposed action

Drill seeding including rangeland drill and no-till drill, is typically used in open, relatively flat topography that has very few larger rocks (8 to 10 inch diameter).

Erosion control mats are either synthetic or organic, temporary or permanent material contained in lightweight netting placed on soil surface for erosion control.

Gabions are wire basket-like structures filled with rocks used in the fortification of a slopes or dams.

Geotextiles are synthetic permeable textile material used with soil, rock, or any other geotechnical engineering related material

Ground broadcast seeding, using a truck, ATV, or hand mounted “whirly-bird” seeder would be utilized in very specific situations. In this method, seeds are dispersed by

centrifugal force out of the seeder. Surface broadcasting of this nature would be used in areas that are too small (less than 10 acres) or are otherwise impractical for aerial seeding application.

Grubbing is the removal of roots and other vegetative plant parts from above- and below-ground to inhibit vegetative reproduction.

Hand Planting is used in very specialized situations and in limited quantity. Bare root stock or contained stock is typically used when it is desirable to establish specific species quickly within defined landscape positions. This method is usually limited to trees and shrub species. The disturbance associated with hand planting consists of the area within a 6-8" radius of the plant. There would be no mechanical equipment used with this application.

Hydroseeding is a method of sowing seed in a stream of water aimed at the ground to be covered. It is particularly useful for large-scale operations or land that is on a steep hillside.

Lop and Scatter is a hillslope treatment for erosion control where the limbs and branches of trees and shrubs (slash)are spread on a to provide protection from raindrop impact. If the branches and limbs are crushed or worked into contact with the soil surface, the slash would also help break up concentrated surface runoff and reduce erosion

Mulch (.mulching) is organic matter applied as a hillslope treatment for erosion control to retard overland flow and protect soil from raindrop impact and increase soil moisture holding capacity

Natural seedbed preparation is when no soil surface seedbed preparation is used. Seeding is performed directly into existing vegetation.

Raking is a hand method that may be used for seed cover on a very site-specific basis to improve seed to soil contact on small seeding projects

Rangeland Drill seeding can be used in a broad range of applications. The disturbance caused by drill seeding consists of small, 1-2" deep furrows dug at approximately 6-8" intervals. Seeds are dropped into these furrows from a seed dispersal tube placed directly above each furrow. The seeds are then buried with soil by a small chain which is dragged behind the furrows. This seeding method is typically used in open, relatively flat topography, which is fairly absent of larger rocks.

Rill is the removal of soil by concentrated water running through streamlets or headcuts.

Silt fences are temporary sediment barriers consisting of a filter fabric stretched across and attached to supporting posts and entrenched.

Slash consists of branches and other non-merchantable timber products that are by products from timber harvests or other forestry practices usually left on the forest floor.

Spalling is when cultural resources break up into chips or fragments, physically destroying the resource.

Straw Bales/Wattles are compacted units of straw that may be installed to trap sediment and improve infiltration and prevent slope rilling.

Tackifiers are typically used to anchor or glue mulch to increase effectiveness of erosion control. Tackifiers used in conjunction with straw mulch are extremely effective in bonding the straw to itself and the soil surface, thus resisting movement by water or wind.

Treatments (ES&R) are efforts which result in on-the-ground projects, such as seeding, silt fence installation, or hazard tree clearing.

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Appendix A
BLM-Alaska Critical Elements

Consideration of Critical Elements	Not Applicable or Not Present	Applicable or Present	Discussed in EA
Air Quality		X	X
Aquatic Resources and Essential Fish Habitat		X	X
Areas of Critical and Environmental Concern		X	X
Cultural Resources		X	X
Environmental Justice		X	X
Farm Lands	X		
Floodplains		X	X
Invasive, Non-native Species		X	X
Migratory Birds		X	X
Native American Religious Concerns		X	X
Subsistence		X	X
Threatened or Endangered Species		X	X
Wastes, Hazardous or Solid	X		
Water Quality		X	X
Wetlands/Riparian		X	X
Wild and Scenic Rivers		X	X
Wilderness		X	X

Appendix B
BLM-Alaska 42 Areas of Critical Environmental Concern (ACEC)

ACEC Name	Size (Acres)	Reason for Designation	ACEC Name	Size (Acres)	Reason for Designation
Box River Treeline RNA	11,200	Botanical, Geological	Tozitna Subunit South	61,120*	Fish & Wildlife
Redlands Lake RNA	3,700	Geological	Nulato Hills T&E Area	36,480	Fish & Wildlife
Arms Lake RNA	10,900	Geological	Dulbi-Kaiyuh Mountains ACEC	55,040	Fish & Wildlife, T&E Species
Ishtalitna Creek Hot Springs RNA	1,100	Geological (Hot Spring)	Galbraith Lake	56,000	Fish & Wildlife, Scenic, Botanical, Cultural Resources
McQuesten Creek RNA	3,990	Watershed	Jim River	200,000	Fish & Wildlife, Scenic, Recreation, Cultural Resources
Spooky Valley RNA	10,800	Botanical, Geological	Kanuti Hot Springs	40	Geological (Hot Springs)
Lake Todatonten Pingos RNA	640	Pingos (Geological)	Nigu/Iteriak	64,000	Geological, Cultural Resources, Scenic
South Todatonten Summit RNA	680	Pingos (Geological)	Nugget Creek	3,300	Fish & Wildlife, Geological
Hogatza ACEC	42,512*	Fish & Wildlife	Poss Mountain	8,000	Fish & Wildlife, Geological
Indian River Watershed ACEC	155,390	Fish & Wildlife	Snowden Mountain	28,000	Geological, Wildlife
Tozitna River Watershed ACEC	1,050,000*	Fish & Wildlife	Sukakpak Mountain	3,500	Geological, Botanical, Scenic
Kateel River Watershed ACEC	551,297	Fish & Wildlife	Toolik Lake	82,800	Natural System, Botanical
Gisasa River Watershed ACEC	272,656	Fish & Wildlife	West Fork Atigun	8,500	Fish & Wildlife, Geological
Inglutalik River Watershed ACEC	78,098	Fish and Wildlife	Limestone Jags	5,170	Geological, Wildlife, Botanical
Ungalik River Watershed ACEC	111,306	Fish & Wildlife	Mount Prindle	3,147	Wildlife, Botanical, Physiographic
Shaktoolik River Watershed ACEC	188,151	Fish & Wildlife	Serpentine Slide	4,274	Geological, Botanical
North River Watershed ACEC	88,932	Fish & Wildlife	Big Windy Hot Spring	160	Geological, Wildlife
Unalakleet River Watershed ACEC	241,269	Fish & Wildlife	Mount Prindle	2,800	Physiographic

Appendix B continued. BLM-Alaska ACECs

Sulukna River Watershed ACEC	10,240	Fish & Wildlife	George River	760,000	Fish & Wildlife
Galena Mountain Watershed ACEC	17,479*	Fish & Wildlife	Oskawalik River	184,000	Fish & Wildlife
Tozitna Subunit North	129,249*	Fish & Wildlife			

(Source: BLM AKSO, Planning)

Appendix C
ANILCA Section 810 Analysis of Subsistence Impacts

EVALUATION: Effect of Proposed Action on Subsistence Uses and Needs

Fisheries
The proposed action would not significantly reduce harvestable fisheries resources that are available for subsistence use. Erosion control, invasive non-native plant, and trail/travel corridor treatments are applied to very limited areas prioritized to increase protection of human life and property. Planned activities would have beneficial effects including more rapid re-establishment of suitable riparian and aquatic habitat; improved water quality, maintenance of bank stability, lowering of water temperatures, reduction of sediment loads, and diminished risk of post-fire flooding and land sliding.

Wildlife
The proposed action would not significantly reduce harvestable wildlife resources that are available for subsistence use. Any direct impacts would be localized, temporary, and minor. Minor impact during treatment implementation could include temporary ground disturbance and displacements of mobile wildlife. However, beneficial effects from ES&R activities would increase incrementally over a long period of time, resulting in improved habitat for key subsistence resources, such as moose and caribou, as the fire cycle returns to natural conditions. Most effects to subsistence are from beneficial trail/travel corridor ES&R treatments. Trail stabilization and clearing will have short term and long term affects on subsistence including improved safety and access to subsistence resources and allotments. These ES&R activities would not significantly reduce the availability of subsistence resources due to a decline in the population or amount of harvestable resources. These activities would not significantly reduce the availability of resources used for subsistence purposes due to alteration of their normal locations and distribution patterns; and the activities do not impose limitations on access to subsistence resources, including from increased competition for the resources.

Other Resources
The proposed action would not negatively impact and would benefit other harvestable resources such as wood, water, berries, or vegetation. Access to subsistence areas important for wood, water, berries, or vegetation, which have been blocked by fire-related tree blow down, will be re-established with ES&R treatments. Clearing of hazard and downed trees after fire will guard against forest diseases and improve forestry resources used for house logs. The ES&R treatments for erosion control would enhance water quality by minimizing erosion and post-fire sediment delivery to stream channels. Erosion control, including seeding and planting, ground cover, and erosion barriers, and non-native invasive plant treatments would promote increased biodiversity in native vegetation, restore quality of wildlife habitat, and protect sensitive plant and animal habitat.

Availability of Other Lands for the Purpose Sought to be Achieved
The PESRP addresses all BLM-managed land in Alaska, so there are no alternative BLM-administered lands available for the planned activities.

Appendix C continued. ANILCA 810 Evaluation

Other Alternatives that Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

The No Action Alternative would allow for the same ES&R treatments; however, the PESRP Environmental Assessment would not be utilized and individual EAs would have to be prepared for each Emergency Stabilization Plan or Rehabilitation Plan. The process of lengthy plan preparation may increase the likelihood of missing critical timelines that are necessary for effective implementation of ES&R treatments. There is no practical alternative that would further reduce or eliminate the use, occupancy, or disposition on subsistence uses and needs.

Finding

The proposed action will not significantly restrict subsistence uses. No reasonably foreseeable and significant decrease in the abundance of harvestable resources or in the distribution of harvestable resources, and no reasonably foreseeable limitations on harvester access have been forecasted to emerge as a function of the action that is analyzed in this document.

Appendix D

Species in Alaska currently protected by the Endangered Species Act 1973

Status*	Common Name	Latin Name	Range in Alaska
E	Short-tailed albatross	*Phoebastria albatrus*	Gulf of AK, Aleutians, Bering Sea Coast
E	Aleutian Shield Fern	*Polystichum aleuticum*	Adak Island
T	Spectacled Eider	*Somateria fischeri*	W. & N. Alaska (coastal)
T	Steller's Eider	*Polystica stelleri*	Southwestern, western & northern
T	Northern Sea Otter (southwest AK population)	*Enhydra lutirs kenyoni*	Aleutian Islands, AK Peninsula, Kodiak Island
C	Kittlitz's Murrelet	*Brachyramphus brevirostris*	Coastal waters southern & northwestern AK

*E = Endangered, T = Threatened, P = Proposed, C = Candidate

Appendix E
State of Alaska Endangered Species List

Eskimo curlew	*Numenius borealis*
short-tailed albatross	*Diomedea albatrus*
humpback whale	*Megaptera novaeangliae*
right whale	*Eubalaena glacialis*
blue whale	*Balaenoptera musculus*

Appendix F
BLM Sensitive Species List

Vertebrate

Common Name- Birds	**Scientific Name**
northern goshawk (Queen Charlotte)	*Accipiter gentilis laingi*
Tule white-fronted goose	*Anser albifrons elgasi*
marbled murrelet	*Brachyramphus marmoratus*
dusky Canada goose	*Branta canadensis occidentalis*
gray-cheeked thrush	*Catharus minimus*
olive-sided flycatcher	*Contopus cooperi*
trumpeter swan	*Cygnus Buccinator*
blackpoll warbler	*Dendroica striata*
Townsend's warbler	*D. townsendi*
harlequin duck	*Histrionicus histrionicus*
bristle-thighed curlew	*Numenius tahitiensis*
buff-breasted sandpiper	*Tryngites subruficollis*
Kittlitz's murrelet	*Brachyramphus brevirostris*
king eider	*Somateria spectabilis*
long-tailed duck	*Clangula hyemalis*
black scoter	*Melanitta nigra*
black guillemot	*Cepphus grille*
dovekie	*Alle alle*
red throated loon	*Gavia stellata*
black brant	*Branta bernicla nigricans*
red knot	*Calidris canutus*
black-tailed godwit	*Limosa limosa*
surf scoter	*Melanitta perspicillata*
Mckays bunting	*Plectrophenax hyperboreus*
marbled godwit	*L. fedoa*
Common Name –Animals	**Scientific Name**
Canada lynx	*Lynx Canadensis*
harbor seal	*Phoca vitulina*
Common Name- Fish	**Scientific Name**
Angayukaksurak char	*Salvelinus anaktuvukensis*
western brook lamprey	*Lampetra richardsoni*
Gulkana steelhead	*Oncorhynchus mykiss*
Kigliak char	*S. alpinus*
Clear Creek chum salmon	*O. keta*
Beaver Creek chinook salmon	*O. tshawytscha*

Appendix F continued. BLM Sensitive Species List

Botanical

Common Name- Plants	Scientific Name
Aleutian wormwood	*Artemisia aleutica*
purple wormwood	*A. globularia var. lutea*
yellow-ball wormwood	*A. senjavinensis*
Alaskan glacier buttercup	*Beckwithia glacialis spp. Alaskansis*
moonwort	*Botrychium ascendens*
Ogilvie Mountains Springbeauty	*Claytonia ogilviensis*
sessile-leaved scurvy grass	*Cochlearia sessilifolia*
Shacklette's catseye	*Cryptantha shacletteana*
Bering dwarf primrose	*Douglasia beringensis*
Aleutian whitlow-grass	*Draba aleutica*
Tundra whitlow-grass	*D. kananaskis*
Murray's whitlow-grass	*D. murrayi*
Ogilvie Mountains whitlow-grass	*D. ogilviensis*
Muir's fleabane	*Erigeron muirii*
Yukon wild buckwheat	*Eriogonum flavum var. aquilinum*
narrow-leaved prairie rocket	*Erysimum asperum var. angustatum*
Calder's bladderpod	*Lesquerella calderi*
Calder's licorice-root	*Ligusticum calderi*
Drummond's bluebell	*Mertensia drummondii*
arctic locoweed	*Oxytropis arctica var. barnedyana*
Kobuk locoweed	*O. kobukensis*
Alaska bluegrass	*Poa hartzii alaskana*
Yukon podistera	*Podistera yukonensis*
willow	*Salix reticulata spp. glabellicarpa*
Aleutian saxifrage	*Saxifraga aleutica*
mountain avens	*Senecio moresbiensis*
pear-shaped candytuft	*Smelowskia pyriformis*
	Draba micropetala
stipulated cinquefoil	*Potentilla stipularis*
ndding smaphoregrass	*Pleuropogon sabinei*
pymy aster	*Aster pygmaeus*
Hairy Lousewort	*Pedicularis hirsuta*

Appendix G
Primary wildlife species of Alaska

Large Mammals	Moose	*Alces alces*	
	plains bison	*Bison bison bison*	
	Roosevelt elk	*Cervus elaphus canadensis*	
	Sitka black-tailed deer	*Odocoileus hemionus sitkensis*	
	mountain goat	*Oreanmnos americanus*	
	muskoxen	*Ovibos moschatus*	
	Dall sheep	*Ovis dalli dalli*	
	barren ground caribou	*Rangifer tarandus grantii*	
	grizzly bear	*Ursus arctos*	
	black bear	*U. americanus*	
Small Mammals	northern flying squirrel	*Glacomys sabrinus*	
	tundra hares	*Lepus othus*	
	snowshoe hares	*L. americanus*	
	yellow-cheeked voles	*Microtus xanthognathus*	
	red squirrels	*Tamiasciurus hudsonicus*	
Furbearers	arctic fox	*Alopex lagopus*	
	coyote	*Canis latrans*	
	wolf	*C. lupus*	
	beaver	*Castor canadensis*	
	wolverines	*Gulo gulo*	
	lynx	*Lynx canadensis*	
	marten	*Martes americana*	
	least weasel	*Mustela nivalis*	
	muskrat	*Ondatra zibethica*	
	red fox	*Vulpes vulpes*	
Birds Waterfowl			
Gallinaceous birds		ruffed grouse	*Bonasa umbellus*
		spruce grouse	*Falcipennis canadensis*
		willow ptarmigan	*Lagopus. lagopus*
		white-tailed ptarmigan	*L. leucurus*
		rock ptarmigan	*L. mutus*
		sharp-tailed grouse	*Tympanuchus phasianellus*
Passerine birds		olive-sided flycatchers	*Contopus cooperi*
		yellow warbler	*Dendroica petechia*
		white-winged crossbill	*Loxia leucoptera*

Appendix G continued. Alaska Primary Wildlife Species

		three-toed woodpeckers	*Picus tridactylus*
		black-backed woodpeckers	*Picoides arcticus*
		pine grosbeak	*Pinicola enucleeator*
Raptors		northern goshawk	*Accipiter gentilis*
		sharp-tailed hawk	*A. striatus*
		boreal owl	*Aegolius funereus*
		great horned owl	*Bubo virginianus*
		red-tailed hawk	*Buteo jamaicensis*
		American kestrel	*Falco sparverius*
		northern hawk owl	*Surnia ulula*

Appendix H
Documentation Concluding Section 7 Consultation for the PESRP

United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Fairbanks Fish and Wildlife Field Office
101 12th Avenue, Room 110
Fairbanks, Alaska 99701
July 31, 2006

Ms. Ann Claerbout
Emergency Stabilization & Rehabilitation Planner
Bureau of Land Management
Alaska State Office
222 West 7th Ave., #13
Anchorage, Alaska 99513-7599

Re: Statewide Programmatic Emergency Stabilization & Rehabilitation Plan

Dear Ms. Claerbout:

Thank you for your letter regarding endangered and threatened species pursuant to Section 7 of the Endangered Species Act of 1973, as amended (Act). Based on your letter we understand that you are preparing a statewide Programmatic Emergency Stabilization and Rehabilitation Plan (PESRP) and Environmental Assessment for BLM managed lands in Alaska.

This plan would implement actions to stabilize areas, and prevent degradation of natural and cultural resources following a wildland fire incident. A list of treatment types that would be applied to different areas (land, channels, and trail / travel corridors) was enclosed with your letter.

As BLM manages lands throughout the State of Alaska this section 7 consultation considers all listed species in Alaska managed by the Service. Table 1 provides a brief description of these species, their status, and range in Alaska. There are also a number of designated critical habitat areas; however, as these are all marine they would not be affected by the proposed PESRP. The Service has reviewed the information provided in relation to each of the species listed under the Act with the following conclusions:

Appendix H continued. Section 7 Consultation

Short-tailed albatross (*Phoebastria albatrus*)
This endangered seabird does not use any terrestrial habitat in Alaska and hence no adverse affects to this species should occur as a result of actions proposed in the PESRP.

Aleutian Shield Fern (*Polystichum aleuticum*)
This endangered plant is endemic to Adak Island. There are no BLM lands on this island and hence no adverse affects are anticipated as a result of actions proposed in the PESRP.

Table 1 – Species in Alaska currently protected by the Endangered Species Act 1973, (As amended)

Status*	Common Name	Latin Name	Range in Alaska
E	Short-tailed albatross	*Phoebastria albatrus*	Gulf of AK, Aleutians, Bering Sea Coast
E	Aleutian Shield Fern	*Polystichum aleuticum*	Adak Island
T	Spectacled Eider	*Somateria fischeri*	W. & N. Alaska (coastal)
T	Steller's Eider	*Polystica stelleri*	Southwestern, western & northern
T	Northern Sea Otter (southwest AK population)	*Enhydra lutirs kenyoni*	Aleutian Islands, AK Peninsula, Kodiak Island
C	Kittlitz's Murrelet	*Brachyramphus brevirostris*	Coastal waters southern & northwestern AK

*E = Endangered, T = Threatened, P = Proposed, C = Candidate

Northern Sea Otter (*Enhydra lutirs kenyoni*) (southwest AK population)
A marine mammal, the northern sea otter does not occupy habitats in which wildland fires occur, hence, actions proposed in the PESRP are not anticipated to have an adverse effect on this species.

Spectacled Eider (*Somateria fischeri*) & Steller's Eiders (*Polystica stelleri*)
Although these sea ducks migrate through, and nest on, lands under BLM jurisdiction, the Service does not anticipate any adverse effects on these species resulting from activities proposed under the PESRP. These birds predominantly nest on tundra on Alaska's North Slope, and appear to favor areas close to ponds and small lakes. Generally this type of habitat is not subject to wildfire. Furthermore, if a wildfire were to occur it would most likely render the habitat unsuitable for listed eiders. Hence, any subsequent activities to protect the area from further degradation, and restore previous functions would not have negative effects.

Appendix H continued. Section 7 Consultation

Kittlitz's murrelet (*Brachyramphus brevirostris*)
As a candidate species, effects on this species are not generally assessed unless BLM requests a conference. However, it would be unusual for a wildfire to occur in the coastal habitats occupied by this bird. If a wildfire were to occur fire damage of a severity to warrant land stabilization and restoration is likely to render the habitat unsuitable, such that subsequent PESRP activities would not adversely affect this species.

As no adverse effects to listed species or critical habitat are anticipated to occur as a result of activities carried out under the PESRP preparation of a Biological Assessment or further consultation under section 7 of the Act is not necessary. This conclusion applies only to endangered and threatened species under our jurisdiction. It does not preclude the need to comply with other environmental legislation or regulations such as the Clean Water Act. Thank you for your cooperation in meeting our joint responsibilities under the Act. If you need further assistance, please contact Sarah Conn at (907) 456-0499.

Sincerely,

Ted Swem
Branch Chief,
Endangered Species

Appendix I
Essential Fish Habitat Consultation

The consultation requirements of §305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA;16 U.S.C. 1855(b)) provide that Federal agencies must consult with the Secretary on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect essential fish habitat (EFH). An EFH Assessment (50 CFR Part 600.920) is required to discuss any adverse effects on EFH, if so determined.

On August 23, 2006, BLM initiated informal consultation with National Oceanic and Atmospheric Administration. BLM shared the proposed treatments in the Programmatic Emergency Stabilization and Rehabilitation Plan (PESRP) and discussed their potential to affect EFH as listed below. NOAA recommended that the PESRP contain design features and list any other measures in place intended minimize the effects to EFH. Design features protecting EFH are listed in Chapter 2. In addition, a summary of required operating procedures (ROP) and stipulations in applicable Land Use Plans are intended to protect fish habitat (see below).

Determination
The Programmatic Emergency Stabilization and Rehabilitation (ES&R) Plan has the potential to affect, but **may not adversely** affect Essential Fish Habitat. Thus, an EFH Assessment is not required. However, the following ES&R treatments for erosion control, non-native invasive plant, and travel corridors are designed to reduce the impacts of natural fire events on fish habitat. Affects to fish habitat will be minimized by design features, required operating procedures, and stipulations.

Appendix I continued. Essential Fish Habitat Consultation

Summary of ROPs and Stipulations Protecting Fish Habitat in BLM-Alaska Land Use Plans

- Treatments to alter the vegetative composition of a site, such as seeding or planting will be based on the potential of the site and will retain or promote infiltration, permeability, and soil moisture storage; contribute to nutrient cycling and energy flow; protect water quality and fish habitat.
- Structural and vegetative treatment in riparian and wetland areas will be compatible with the capability of the site, including the system's hydrologic regime, and will contribute to maintenance or restoration of proper functioning condition.
- Riparian vegetation, if removed during operations, will be reestablished.
- Avoid stream crossings. When a stream must be crossed, the crossing should be as close to possible to a 90-degree angle to the stream. Stream crossings will be made at stable sections in the stream channel.
- Stream and wetland crossings shall be designed and constructed to ensure free passage of fish, maintain natural stream bedload movement and sediment transport, and minimal adverse effects to natural stream flow.
- To avoid additional freeze down of deep-water pools harboring over-wintering fish and invertebrates used by fish, rivers and streams shall be crossed at shallow riffles from point bar to point bar whenever possible.
- Use of tracked or off-road vehicles in fire suppression or management activities will be conducted in a manner that does not cause erosion, damage to riparian areas, degradation of water quality or fish habitat, or contribution to stream channel sedimentation.
- Utilize winter access whenever possible and avoid road or trail construction in wetlands.
- To reduce the possibility of ruts, vehicles shall avoid using the same trails for multiple trips unless necessitated by serious safety or superseding environmental concern.
- Travel up and down streambeds is prohibited.
- No road crossings shall be permitted in crucial spawning habitat, unless no feasible alternative exists and it can be demonstrated that no adverse effects will occur. State designated stream crossings should be used whenever possible.
- Bridges and culverts shall be large enough to accommodate or positioned to avoid altering the direction and velocity of stream flow or interfering with migrating, rearing, or spawning activities of fish and wildlife. Bridges and culverts should span the entire non-vegetated stream channel.
- New structures will be located away from riparian or wetland areas if they conflict with achieving or maintaining riparian or wetland function. Existing structures will be used in a way that does not conflict with riparian or wetland functions or be relocated or modified when incompatible.
- Refueling of equipment will not be conducted in riparian areas or within 500 feet of the active floodplain of any fish-bearing waterbody or within 100 feet from non-fish bearing waterbodies.
- Fuel drums will be stored a minimum of 150 feet from any water body.

Decision Record

for the

Programmatic Emergency
Stabilization and Rehabilitation Plan
for Alaska
Environmental Assessment

AK-930-EA-2006-06

Prepared by
Bureau of Land Management
Alaska State Office
Anchorage, Alaska

Julia Dougan, Acting State Director, Alaska

11/02/06

Date

Decision Record

for the
Programmatic Emergency Stabilization and Rehabilitation Plan
for Alaska
Environmental Assessment
AK-930-EA-2006-06

Decision: It is my decision to implement the Proposed Action of the Programmatic Emergency Stabilization and Rehabilitation Plan (PESRP), which was adequately analyzed in the attached Environmental Assessment # AK-930-EA-2006-06. The Proposed Action will ensure that all practicable means to avoid or minimize environmental harm are adopted.

Rational for the Decision: The Proposed Action facilitates the orderly and timely rehabilitation of burned areas by clearly delineating the procedures and treatments that meet one or more of the following criteria:

- Emergency stabilization to minimize threats to life or property resulting from the effects of a fire; stabilize and prevent unacceptable degradation of natural and cultural resources; and repair, replace, or construct physical improvements necessary to prevent degradation of land or resources.
- Rehabilitation to repair or improve lands unlikely to recover to a desired condition, and repair or replace minor facilities damaged by fire.

The treatments described in the proposed action are designed to stabilize and rehabilitate areas disturbed by a wildfire and will result in improved control of erosion and invasive non-native plants and improved condition of travel corridors. Long and short term benefits of the proposed action include improved soil stability and water quality, control of invasive non-native plants, and greater safety of travel corridors.

Alternatives: Two alternatives for post-fire emergency stabilization and rehabilitation are analyzed in the EA: the No Action Alternative and the Proposed Action. Under the No Action Alternative (EA, Section 2.1), there would be no programmatic document to streamline ES&R plans, policies, and procedures. Because the No Action would include all of the actions in the Proposed Action, the No Action Alternative would require a more lengthy process of plan preparation involving the preparation of individual EAs. The No Action Alternative may cause the delay of time-sensitive projects, leading to increased soil erosion, spreading of invasive non-native plants, and unsafe travel corridors.

The Proposed Action (EA, Section 2.2) describes typical post-fire ES&R treatments, applicable design features, and monitoring plans that would be used on ES&R plans following a wildfire on BLM-managed lands statewide. This alternative anticipates the treatments needed in typical post-fire conditions to assist the BLM in providing timely and cost-effective implementation of post-wildfire treatments.

I have decided to choose the Proposed Action to facilitate orderly and timely on-the-ground treatments that are consistent with the urgent nature of wildfire emergency stabilization and rehabilitation protection priorities. The PESRP analyzes the effects of possible treatments to be used in future ES&R activities, thereby streamlining the process of site specific ES&R planning.

Mitigation: Measures to avoid and minimize the effects of ES&R treatments in the Proposed Action are represented in current BLM land use plan standard and required operating procedures and design features of ES&R treatments (Table 1, attached). All practicable means to avoid or reduce environmental harm have been adopted, and additional mitigation practices are not needed.

Monitoring: ES&R treatments would be monitored and evaluated to ensure that they are properly implemented, effective, and maintained (EA, Section 2.2.3). Spring Assessments of previous fire season are no impact activities completed yearly to monitor fire effects and additional needs for ES&R treatments in preparation of ES&R plans. All ES&R plans would include monitoring in order to: 1) determine if plan objectives were met, 2) establish the need for additional treatments, 3) determine if treatments are implemented as planned, and 4) document results including effectiveness of treatments.

Public Participation: Public participation was solicited during issue development and review of the PESRP and EA (EA, Chapter 4.0). On May 23, 2006, a public notice announcing the project was posted on the Alaska State Office NEPA register. Through news releases distributed to more than 700 individuals and organizations including tribal and village councils, native corporations, other local, State, and Federal land management agencies, and environmental public interest groups, BLM invited public participation in development of important issues. On October 6, 2006, the PESRP EA and FONSI were made available for public and interagency review on the BLM website. The same contacts were notified of the 15 day review period. Comments received were incorporated into the final document.

Management Considerations: BLM policies, standards, and procedures used in the Burned Area Emergency Stabilization and Rehabilitation (ES&R) programs are tiered to the Department of the Interior (DOI) Departmental Manual 620 DM 3 Wildland Fire Management Burned Area Emergency Stabilization and Rehabilitation. The H-1742-1 Emergency Stabilization and Rehabilitation Handbook provides supplemental guidance relative to planning and implementing ES&R projects on public lands administered by the BLM. The PESRP contains a description of ES&R treatments that would be implemented under normal conditions in the event of a wildfire and documentation of potential treatment impacts. The decision to prepare a PESRP is based on size and diversity of the ecosystem involved, fire history (wildfire occurrence and size), resource values, and values-at-risk.

I have determined that the level of detail in the PESRP is appropriate and fulfills the Purpose and Need described in Chapter 1 of the EA and that the EA complies with the planning constraints and processes imposed by laws, policies, and legal and regulatory

agreements; and that the PESRP is consistent with current Alaska land use plans. The PESRP was prepared in compliance with the Federal Land Policy and Management Act of 1976 and the National Environmental Policy Act of 1969.

Alaska National Interest Lands Conservation Act (ANILCA), Section 810 Determination: ANILCA Section 810 requires that an evaluation be completed that includes findings on three specific issues: the effect of such use, occupancy, or disposition on subsistence uses and needs; the availability of other lands for the purpose sought to be achieved; and other alternatives that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. The ANILCA evaluation concluded that no significant effect on subsistence will result from the activities planned under the PESRP (EA, Appendix C).

Implementation: Based on the information detailed above. I have concluded that adopting the PESRP will meet national requirements and provide appropriate guidance and direction for the BLM's Emergency Stabilization and Rehabilitation program in Alaska. The Programmatic Emergency Stabilization and Rehabilitation Plan for Alaska, as identified as the Proposed Action in the EA, is effective upon my signature. This plan is consistent with all existing BLM land use plans and serves as interim guidance for all BLM-managed lands where land use plans have yet to be completed.

Appeals This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4. If an appeal is made, your notice of appeal must be filed in writing as a hard copy via United States Postal Service or other recognized letter carrier. The appeal must be addressed to the Alaska State Office, within 30 days of the date of service of this decision. The appellant has the burden of showing that the decision is adverse to you and in error.

If you wish to file a petition pursuant to regulation 43 CFR 4.21 (58 FR 4939, January 19,1993) or 43 CFR 2804.1 for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

(1) the relative harm to the parties if the stay is granted or denied;

(2) the likelihood of the appellant's success on the merits;

(3) the likelihood of immediate and irreparable harm if the stay is not granted; and

(4) whether the public interest favors granting a stay.

Table 1. Design Features for ES&R Treatments

Erosion Control Design Features
Seedbed preparation, application, and covering projects will run along the contours of the land to reduce erosion, whenever possible and practical.
Islands of unburned vegetation will not be seeded. Irregular boundaries of the burned area will be maintained.
Plantings will be consistent with known or anticipated changes in successional stages (e.g., trees would not be planted in areas that were previously treeless tundra).
Seed will be sown during the appropriate season to ensure seed stratification, germination, and establishment.
Species planted on burned areas must be in compliance with the Executive Order 13112 on Invasive Species
Seed mixtures will be formulated to benefit wildlife and Special Status Species habitats as appropriate.
All seed will be tested to ensure compliance with the State noxious-seed requirements recognized in the USDA Administration of the Federal Seed Act. All purchased seed must meet all requirements of: 1) the Federal Seed Act (7 USC 1551-1610), 2) the State seed laws where it will be delivered, and 3) Federal specifications JJJ-S-181. All seed will be tested for purity and germination to meet contract specifications and should be tested for invasive non-native seed, and identified by certified varietal tags and source identified tags to ensure the genetic origins of the parent plant material or the collection origin, as per the USDI and USDA Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook 6.3.2.3 Revegetation.
Plant materials will be selected and seed mixtures designed to best meet the objectives identified in the site-specific LUP and Alaska Land Health Standards and Guidelines. The use of native species is preferred to the use of non-natives. When non-natives are considered, a justification of why native plants will not work is needed. Contact the BLM-Alaska Vegetation Coordinator and State of Alaska Palmer Plant Materials Center to ensure proper native seed source.
Prior to implementing any projects involving mechanical seed bed preparation or planting, the area involved will be reviewed by a qualified archaeologist to determine if there are any conflicts with cultural resources. Projects may need to be redesigned so as to avoid impacting cultural resources.
Only certified weed-free materials will be used (straw, mulch, woody material, fiber mats, gravel, rock).
Prior to trenching, the area involved will be reviewed by a qualified archaeologist to determine if there are any conflicts with cultural resources. Projects may need to be redesigned so as to avoid impacting cultural resources.
Silt fences and other synthetic materials will be removed from the site and properly disposed of once grade stabilization is achieved.
On-site native materials collected for use in erosion control treatments will be limited to removal of woody debris or rock and would not impact riparian and fish habitat.
Bioenginnering techniques will be used when possible as a preferred erosion control method to retain important features of streams and rivers.
Before entering the project site, all vehicles and heavy equipment that disturb soil or are used off designated roadways will be cleaned of material that could contain weed seed or other plant material resources.
Treatments should be designed and installed with other Federal, State, and local watershed restoration experts to collectively solve erosion control problems at the local level. US EPA, US Army Corps of Engineers, State of Alaska Division of Environmental Quality, Alaska Soil and Water Conservation Districts, local watershed councils, and their partners are all organizations working with watersheds on a local level.

Work and travel within streams requires a Title 41 permit from the State of Alaska and a permit from the Army Corps of Engineers (Clean Water Act, Section 404). Project planning should include steps needed to obtain these permits and any associated NEPA processes.
Invasive Non-native Plant Design Features
Vehicles and equipment will be cleaned and inspected prior to entering or leaving the project sites when operating in areas with weed infestations to prevent "hitch-hiking" seed transport.
Manual control (e.g. hand pulling, grubbing, and cutting) is preferred in all areas, particularly in sensitive areas, to avoid adverse effects to non-target species or water quality.
The disposal of invasive non-native plants will be in accordance with approved disposal methods. Methods include bagging and burning plants that have developed seeds and landfill disposal.
Where vectors for weed invasion exist on lands adjacent to BLM-managed burned areas but are not under BLM jurisdiction, cooperative agreements with other land owners should be pursued for control of non-native invasive plants.
Travel Corridor Design Features
Downed trees that create obstructions and pose a threat to trail users will be cleared. Only established trails on BLM-managed land with a history of significant use will be cleared by BLM ES&R crews. Clearing outside of BLM-managed lands is the obligation of the adjacent non-BLM land owner. Coordination with other land owners is encouraged to improve efficiency and more effectively restore safe access. Trails within Special Management Areas (SMAs) will be cleared to the extent described in the appropriate land use plan.
Burned Area Warning Signs will be installed at entry points and removed when hazards are no longer a threat to public safety.
Trail marking tripods and reflectors may be necessary to mark the trails and ensure safe travel.
Public and local governments will be notified as needed of closures.
Hazardous materials including toxic materials created or destabilized by fire (e.g. lead battery leaching as a result of being burned) will be stabilized or removed when they pose a significant threat to human health, safety, or biological or cultural resource degradation.
Woody debris and brush cleared from travel corridors will be broadly dispersed alongside the trail.
Downed or hazardous trees in and along the trail creating obstructions or posing safety threats to trail users may be removed.
Specific Design Features for Riparian, Wetland, and Aquatic Habitat
Use of heavy equipment to repair facilities or to implement rehabilitation treatments would be limited.
Limiting off road vehicle or ATV access will be limited to designated crossings or work areas during installation of ES&R treatments to minimize disturbance.
Large woody debris (LWD) will be left undisturbed whenever possible. An alternative to removing LWD is repositioning it to better meet ES&R objectives.

When installing in-channel erosion control treatments, the use of on-site "soft material" (anchored rootwads, and natural vegetation) is preferred to "hard material" (rock) to better dissipate stream flow, protecting fish habitat.
Severely burned areas important for salmon spawning and rearing, particularly streams that are susceptible to slumping into streambeds would be monitored.
Work will be seasonally limited to minimize impacts to resources. For example, in-stream work will not be authorized when spawning fish are present and the use of heavy equipment will be permitted **only** when soils are sufficiently frozen to prevent damage from compaction.
Specific Design Features for Special Management Areas
Emergency Stabilization in WSAs will be evaluated under the Bureau's Interim Management Policy and Guidelines for Lands Under Wilderness Review H-8550-1, appropriate Resource Management Plans, and the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook.
ES&R treatments for erosion control and vegetation rehabilitation will be conducted in a manner that will not impair the special values for which it was designated. Treatments will utilize the least intrusive tools and methods available to enhance or restore special values of the resources. In areas of where machinery is prohibited, hand tools will be used.
Protection fences will not be installed and ATVs or other vehicles will not be used within WSAs and other areas designated for the preservation of wilderness values.
Seeding and planting in SMAs will utilize native species, as required on all Alaskan BLM-managed lands.
Alternatives to ground disturbing seeding methods that are non-ground disturbing will be considered in SMAs following guidelines for historic trails.
Specific Design Features for Cultural Resources
ES&R activities would only be applied to known cultural sites. Activities do not include surveying an area for other cultural sites.
The Alaska State Historic Preservation Office or appropriate cultural resources specialist will be consulted before planning cultural site treatments.
Each emergency and planned ES&R activity will be reviewed by a qualified cultural resource specialist to assess potential impacts to cultural resources.
Erosion control measures would be used where they would not adversely affect associated sites, artifacts, or historic landscapes.
Guidelines and restrictions included in the Secretary of Interior's Standards and Guidelines for Archeology and Historic Preservation for evaluating the need for and method of protection and stabilization in designated Historic Districts will be reviewed. ES&R treatments involving the surface disturbance will have to be reviewed for potential conflicts with cultural resources. Compliance with Section 106 of the National Historic Preservation Act will be completed prior to implementing any such treatments.