Fire Management Plan

Prepared For:

United States Department of the Interior
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I. Introduction

a. Purpose and Need:

The Fire Management Plan is designed to implement and achieve goals and objectives set forth in the Washakie, Grass Creek, and Cody Resource Management Plans.

The Wyoming Northern Zone of the Bureau of Land Management (BLM) currently lies within the Big Horn Basin Fire Planning Unit. The Big Horn Basin Fire Planning Unit consists of the Big Horn National Forest, Shoshone National Forest, Wind River Indian Reservation Bureau of Indian Affairs, Bighorn Canyon National Recreation Area and the Northern Zone Bureau of Land Management.

The Wyoming Northern Zone of the Bureau of Land Management (BLM) is responsible for managing approximately 3,345,000 acres of public lands, and the majority of Bureau of Reclamation land in the Big Horn Basin of Wyoming. Elevation varies from around 3,700 ft at the Big Horn Canyon Recreation Area to 11,000 ft at the upper end of Owl Creek in the South Western part of the Zone. The climate and precipitation vary with elevation, ranging from arid with 3 in. of precipitation in the valley bottom, to moister sub-alpine conditions with 22+ in. of precipitation. The majority of precipitation occurs in winter and spring; summers are generally warm and dry with intermittent thunderstorms. The fire history for 1992 to 2003 shows 71 human-caused ignitions and 118 lightning-caused ignitions.

The current fire management policy includes Appropriate Management Response (AMR) of wildfires for all lands within the Northern Zone.

This FMP is also needed to comply with the 2001 Federal Wildland Fire Management Policy (FWFMP). The policy directs BLM Field Offices to have an FMP for all areas with burnable vegetation.

"Fire Management Plans are strategic plans that define a program to manage wildland and prescribed fires based on an area's Resource Management Plan (RMP). An FMP must provide for firefighter and public safety; include fire management strategies, tactics, and alternatives; address values to be protected and public health issues; and be consistent with resource management objectives, activities of the area, and environmental laws and regulations" (FWFMP, 2001).

Major guiding principles of the FWFMP are:

- **Firefighter and public safety is the first priority in every fire management activity**.
- **The role of fire as an essential ecological process and natural change agent will be incorporated into the planning process.**
- **Fire Management Plans, programs, and activities support land and resource management plans and their implementation.**
- **Sound risk management is a foundation for all fire management.**

- **Fire management programs and activities are economically viable, based on values to be protected, costs, and land and resource management objectives.**
- **Fire Management Plans and fire management activities are based upon the best available science.**
- **Fire Management Plans and fire management activities incorporate public health and environmental quality considerations.**
- **Federal, state, tribal, local, interagency, and international coordination and cooperation are essential.**
- **Standardization of policies and procedures among federal agencies is an ongoing objective.**

b. The FMP complies with the following Laws, Regulations, Policies, and Plans:

Absaroka Front Habitat Management Plan (1988)
Archaeological Resources Protection Act (ARPA; 1979)
Brokenback Diversity Unit Analysis (1996)
Clean Air Act (CAA; 1970)
Cody RMP and EIS (1988)
BLM Prescribed Fire Management (2000)
Bighorn Basin Invasive Species Management Plan
Endangered Species Act (ESA; 1973)
Federal Land Policy and Management Act (FLPMA; 1976)
Federal Wildland Fire Management Policy (FWFMP; 2001)
Final EIS Vegetation Treatment on BLM Lands in Thirteen Western States (1991)
West Slope, Grass Creek and Rattlesnake Mtn. Forest Management Activity Plans
Grass Creek RMP and EIS (1996)
Interim Management Policy and Guidelines for Lands Under Wilderness Review (1995)
National Historic Preservation Act (NHPA; 1966)
National Environmental Protection Act (NEPA; 1969)
National Fire Plan (NFP), including the Cohesive Strategy (2000), and the 10 Year Comprehensive Strategy Implementation Plan (2002)
Washakie RMP and EIS (1986)
West Slope Habitat Management Plan (1984)

This FMP is an adaptive document and will enable managers to respond to changing resource conditions. For example, an area currently identified as high priority for suppression and implementation of hazardous fuels reduction may be reprioritized in the future after successful mitigation treatments. An interdisciplinary team will conduct an annual review to ensure that the plan accurately reflects current resource conditions and priorities. Information gained through monitoring will be used to evaluate and improve fire management strategies.

c. Collaborative Processes Used to Develop This Plan:

The development of the Big Horn Basin FPU was accomplished by the Big Horn Basin Fire Planning Committee. The Big Horn Basin Fire Planning Committee consists of Chuck Russell NZ BLM FMO, Dave Sisk Shoshone NF FMO, Galen Roesler Bighorn NF FMO, and Tom

Corbin Regional BIA FMO. The planning committee has established a charter to outline responsibilities, goals and a timeline to implement landscape Fire Planning Analysis and Budget Tool.

The Northern Zone FMP was developed by an interdisciplinary team consisting of fire and resource specialists. The team is comprised of a mix of fire staff and natural resource specialists from the Worland and Cody field offices.

The Northern Zone FMP is based source documents that include the, West Slope Habitat Management Plan (1984), Absaroka Front Habitat Management Plan (1988), Brokenback Diversity Unit Analysis (1996), Washakie RMP (1986)**,** Cody RMP (1988) and Grass Creek RMP (1986).

The purpose of the team is to identify resource issues and areas of concern to be used in delineating landscape level geographic areas for fire management administration. Resource issues considered by the team include erodable soils; noxious weeds and invasive non-native plant species; special designation areas; wildlife habitat; threatened, endangered, and sensitive species and habitat; fish habitat and riparian areas; forest products; cultural resources and tribal treaty rights; visual quality; recreation and historic sites; fire ecology and occurrence; and socio-economic issues relevant to the community. Wildland-urban interface areas are also identified by the team. These issues were identified by a process that included a series of interdisciplinary, inter-agency, and government-to-government consultation.

d. Authorities

United States Department of the Interior Manual 910

Bureau of Land Management Manual 9200

2001 Update of the Federal Wildland Fire Management Policy

Healthy Forest Restoration Act of 2003

Office of Fire and Aviation Instruction Memorandum 2002-038. Interim Guidance for Completion of Fire Management Plan Revisions Using the Interagency Template, Attachment 1

Washington Office Instruction Memorandum 2004-007. Land Use Plan and Implementation Plan Guidance for Wildland Fire Management

e. Reviewers and Preparers of the Plan:

Reviewers:

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II. Relationship of FMP to Land Management Planning and Fire Policy:

a. National Fire Plan, Fire Management Implementation Plan for the BLM administered public lands in the State of Wyoming and the 2001 Federal Wildland Fire Policy.

This FMP has been written to comply with the objectives of the NFP (National Fire Plan), Fire Management Implementation Plan for the BLM administered public lands in the State of Wyoming, and the 2001 Federal Wildland Fire Policy. The template used to develop this plan was provided by the Office of the BLM Director of Fire and Aviation to ensure consistency in fire management planning (IM OF&A 2003-038). Following this process enables wildland fire management goals and components to be coordinated across administrative boundaries on a landscape basis. The Interagency FMP template states that bureau or agency fire management decisions must be consistent or compatible across administrative lines, thus complying with a key principle of the NFP.

"The National Fire Plan is a long-term investment that will help protect communities and natural resources, and most importantly, the lives of firefighters and the public. It is a long-term commitment based on cooperation and communication among federal agencies, states, local governments, tribes and interested publics. The federal wildland fire management agencies worked closely with these partners to prepare a 10-Year Comprehensive Strategy, completed in August 2001" (NFP, 2000).

The NFP emphasizes:

- **Firefighting:** Maintain a cost-effective level of preparedness in firefighting and prevention.
- **Hazardous Fuels:** Invest in projects to reduce fire risk with focused effort in wildland-urban interface (WUI) areas.
- **Restoration/Rehabilitation:** Rehabilitate fire-damaged wildlands and restore high-risk ecosystems.
- **Community Assistance:** Work with communities to reduce the risks of catastrophic fire.
- **Accountability:** Establish and maintain a high level of accountability including oversight reviews, progress tracking, and performance monitoring.

b. Washakie RMP (1986), Cody RMP (1988), Grass Creek RMP (1996):

The FMP implements all relevant resource and fire management direction found in the Washakie RMP (1986), Cody RMP (1988), and Grass Creek RMP (1986).

c. Desired Future Conditions to be obtained through Fire Management

The desired future conditions of the lands managed within the Northern Wyoming Zone are based on findings from the three Resource Management Plans; Grass Creek, Washakie, and Cody RMPs, as well as the Northern Wyoming Zone RAMS (Risk Assessment Mitigation Strategies) Plans. An interdisciplinary team used this information together with NFP direction to identify priority vegetation types with historic fire regimes, where present day fire and fuels management could help shape and achieve these desired future conditions.

In addition, current national fire management policy addresses the use of fire and other fuel treatments as change agents for ecosystem sustainability. These change agents serve to reduce the threat of catastrophic fire and the risk associated with suppressing these fires to firefighters and the general public.

Through fuels treatments, the composition of forested land, rangeland, and their associated riparian systems should more closely mimic their natural range of variability. These ecosystems will be more likely to function in a healthy manner and should be less susceptible to catastrophic changes, including accelerated fire regimes.

The desired future conditions described for the plant communities below are based on a cumulative review of the three land use plans in the zone and the Wyoming Guidelines for Managing Sagebrush Communities with Emphasis on Fire Management, November 15, 2002. They serve as a basis for fire and fuels management planning. Management actions which result in plant communities that are different from the desired future conditions described here should have a rational basis and be well documented.

Basin Grassland/Shrub Communities

The desired plant community is dominated by Wyoming Big Sagebrush. At the landscape scale the desired seral stages are;

- 10% in early seral with 0-5% canopy cover
- 25% mid seral with 5-15% canopy cover
- 40% late seral with canopy greater than 15%
- Generally the remaining 25% of the landscape is dominated by rock out crop and shallow soils which does not historically carry fire

The above mix of seral stages should be maintained in a temporal and spatial mosaic. Vertical structure of the sagebrush community should be considered for wildlife species of importance. A healthy under story of cool season grasses and forbs is also desirable.

Invasive non-native species such as cheat grass is not desired in the plant communities.

Wyoming Guidelines for Managing Sagebrush Communities with Emphasis on Fire Management (11/15/02) WY IB 2003 – 009 will be utilized to establish management direction.

Foothills-Mountain Grassland/Shrub Communities

The desired plant community is dominated by Mountain Big Sagebrush. At the landscape scale the desired seral stages are;

- 10% in early seral with 0-5% canopy cover
- 25% mid seral with 5-20% canopy cover
- 40% late seral with canopy greater than 20%
- Generally the remaining 25% of the landscape is dominated by rock out crop and shallow soils which does not historically carry fire

The above mix of seral stages should be maintained in a temporal and spatial mosaic. Vertical structure of the sage brush community should be considered for wildlife species of importance. A healthy under story of cool season grasses and forbs is also desirable.

Where this plant community occurs in higher elevations less than 40% late seral Mountain Big Sagebrush may be acceptable

Invasive non-native species such as cheatgrass is not desired in the plant communities.

Wyoming Guidelines for Managing Sagebrush Communities with Emphasis on Fire Management (11/15/02) WY IB 2003 – 009 will be utilized to establish management direction.

Woodland Communities

On shallow soils the desired plant community is dominated by limber pine and juniper woodland communities. Where these woodland species occur on deeper soils the desired plant community is the same as the foothills-mountain grassland/shrub communities.

Ponderosa Pine / Lodgepole Pine / Mixed Conifer / Deciduous Communities

Structurally diverse stands with endemic levels of native insects and diseases are desired. These stands should be capable of withstanding drought, low intensity fire, and other natural stress factors while maintaining long-term resistance and resilience to the subsequent insect and disease attacks.

The spread of native invasive species, such as juniper, should be minimal in areas historically dominated by other species. Non-native invasive species, such as cheatgrass or Russian olive, are not desirable.

Aspen clones, across the landscape, should be structurally diverse and have a representative composition of all seral stages from suckers to mature trees. Individual clones should progress through their successional stages uninhibited and at maturity regenerate before clone vigor is significantly decreased. It is desirable to maintain or enhance the acreage and vigor of aspen clones.

Desired stand composition and stocking would be consistent with site-specific objectives for resource management.

Riparian Communities

Riparian communities should be dominated by native riparian vegetative species that facilitate and enhance the storage and release of water through the system. These vegetative species should be representative in composition, and structurally diverse. These communities, in general, should be wet and fairly resistant to fire.

Invasive Species

Prevention measures for noxious and other invasive species will be part of all fire related activities. Weed risk factors and prevention practices will be part of the Resource Advisors recommendations to Incident Management and Fire Rehab teams. All off-road equipment will be cleaned (power or high-pressure cleaning) of all mud, dirt, and plant parts before moving into relatively weed-free areas at moderate or high-ecological risk. (Does not apply to service vehicles that will stay on the roadway traveling frequently in and out of the project area.) Equipment cleaning sites will be monitored for weeds and treated if they are established. Maintain helibases, camps and staging areas in a weed-free condition. Prescribed fires will be planned so as to avoid ignition and burning in areas at high risk for weed establishment or spread due to fire effects. During fire rehabilitation, disturbed soil in relatively weed-free areas at moderate or high risk to weeds will be monitored and reseeded if necessary. Further guidance is found in the resource management plans covering this fire management zone.

III. Wildland Fire Management Strategies:

a. General Management Considerations:

i. Overview of Fire Management Program:

The Northern Zone has developed a Wildland Fire Management Program consisting of 4 components: Appropriate Management Response Suppression, Prescribed Fire, Non-fire Fuels Treatment, and Rehabilitation. Whenever possible, implementation procedures will follow interagency guidelines developed to standardize fire management planning. The program is governed by the following principles, derived from the Cody RMP, Washakie RMP, Grass Creek RMP, RMP Amendments, and current NFP guidance.

- **Manage fire and fire suppression activities so as to minimize risks to public and firefighter safety.**
- **Suppress all undesired fires in a cost-effective and prudent manner to protect the public, private property, and cultural, historic, recreational, or ecological resources.**

- **Protect and/or maintain municipal watersheds and special status species and habitats.**
- **Consider the economic effects of alternative fire management practices. Promote local involvement and economic benefits from fuels reduction programs.**
- **Continue to collaborate with local partners to assess WUI areas, update existing mitigation plans, and implement a prevention and education program.**
- **Maintain interagency cooperation to facilitate coordinated fire management activities across administrative boundaries. This includes utilizing the Interagency Standards for Fire and Aviation Operations (Red Book).**
- **Fire management activities will emphasize the maintenance and restoration of native plant species and communities.**
- **Fire management objectives and activities will support BLM fire policy (National Fire Plan, Fire Management Implementation Plan for the BLM administered public lands in the State of Wyoming and the 2001 Federal Wildland Fire Policy) and Zone management plans, analyses, and assessments.**

ii. Field Office Considerations:

The Northern Zone currently has interagency cooperative agreements with the Big Horn National Forest, Shoshone National Forest, Wind River Indian Reservation and Big Horn National Recreation Area. Fire suppression operations are coordinated by an interagency dispatch center, the Cody Interagency Dispatch Center (CDC).

The Northern Zone will continue interagency and local cooperation to set priorities for fire management planning, preparedness, prevention, suppression, fire use, restoration and rehabilitation, monitoring, research and education. Furthermore, this interagency cooperation will ensure accountability by instituting meaningful performance measures and monitoring results.

b. Fire Management Goals:

As stated in the Washakie, Grass Creek and Cody Resource Management Plans, objectives include:

- Protect resource values, property and human life from loss due to wildfire
- Use prescribed fire to meet other resource management objectives (i.e. wildlife habitat or range condition)

The intent of this FMP is to recommend fuel treatments and suppression tactics in order to achieve RMP objectives.

Fire management goals outlined in this FMP conform to NFP goals, as specified in the 10-year Comprehensive Strategy (USDA, USDI, 2001).

The primary goals of the 10-year Comprehensive Strategy are:

- **Improve prevention and suppression**
- **Reduce hazardous fuels**
- **Restore fire-adapted ecosystems**
- **Promote community assistance**

Condition class is a description of ecosystem health defined in the Cohesive Strategy as follows:

- **Condition Class 1**. For the most part, fire regimes in this Fire Condition Class are within historical ranges. Vegetation composition and structure are intact. Thus, the risk of losing key ecosystem components from the occurrence of fire remains relatively low.
- **Condition Class 2**. Fire regimes on these lands have been moderately altered from their historical range by either increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified on these lands.
- **Condition Class 3**. Fire regimes on these lands have been significantly altered from their historical return interval. The risk of losing key ecosystem components from fire is high. Fire frequencies have departed from historical ranges by multiple return intervals. Vegetation composition, structure, and diversity have been significantly altered. Consequently, these lands verge on the greatest risk of ecological collapse.

Fire regimes are generalized descriptions of the role fire plays in an ecosystem. They are characterized by fire frequency, predictability, seasonality, intensity, duration, and scale (patch size), as well as regularity or variability.

A coarse-scale landscape level assessment of condition class for the Northern Zone based on University of Wyoming GAP data (1994), ground truthing, RAMS data, and expert input, is shown in Attachment 2. Currently, 90% of vegetation communities within the Northern Zone are in Condition Class 2 and 3. The effect of implementing resource management objectives identified in this document will be to move more of the Northern Zone area towards Condition Class 1 and 2 than current landscape level analysis shows. The movement of high priority, high condition class areas to a lower condition class are one of the key performance measures identified in the 10-year Comprehensive Strategy Implementation Plan (2002).

c. Wildland Fire Management Options:

In the application of all fire management options and activities, ecosystem sustainability including its interrelated ecological, economic, and social component will be realized on a continual basis.

Suppression:

This plan will guide the Northern Zone in employing a flexible suppression strategy based on safety and resource management considerations identified in the Cody RMP (1988), Grass Creek RMP (1996), and Washakie RMP (1986). It will also enable the Northern Zone to prioritize suppression in the case of two or more fires burning simultaneously. An interdisciplinary team has identified areas of specific resource concern where immediate suppression will be the appropriate response. We also identified areas that will be lower priority for suppression. These

have been incorporated into the Fire Management Unit (FMU) descriptions found in Section IIId. In addition, a Wildland Fire Situation Analysis (WFSA) will be produced for all wildland fires that transition into extended attack (Type 4 going to Type 3).

General Management Guidelines for Suppression:

- **All ignitions will be managed using AMR.**
- **Priorities will be firefighter safety, the protection of life and property, and maintenance of resource values.**
- **Suppression efforts in all WSA's shall emphasize maintenance of wilderness qualities (see RMP direction for fire management within the WSA)**
- **Where appropriate, Minimum Impact Suppression Tactics (MIST) will be used to protect sensitive plant species, highly erodible soils, cultural resources, riparian habitat conservation areas, to prevent the spread of cheatgrass and noxious weeds.**
- **Appropriate Resource Specialists will be consulted to ensure that resource management concerns are adequately addressed and that necessary mitigation of suppression activities occurs. They will initiate Emergency Consultation with the USFWS or NOAA Fisheries whenever suppression activities impact threatened and endangered species habitat.**
- **Mechanized equipment will not be used in any Areas of Critical Environmental Concern (ACEC) and in areas closed to off-highway vehicle (OHV) use without Line Officer approval.**
- **Aerial application of foam or retardant should not be used within 300 ft of any body of water, including lakes, rivers, streams, and ponds. Exceptions would be made to protect life or property, firefighter safety, and when potential damage to natural resources outweighs possible loss of aquatic life. In case of accidental exposure, the BLM Field Manager will be contacted immediately.**
- **In order to minimize risk to firefighters and to reduce wildland fire suppression costs, fires may be allowed to burn up to natural fuel breaks where and when it is appropriate and beneficial to resource values.**
- **To minimize spread of noxious weeds, equipment used for suppression should be cleaned before arriving on-site. Staging areas and fire camps should not be located on sites with noxious weed infestations.**
- **The WY BLM Northern Zone Archaeologists will be notified of any cultural resources encountered during suppression activities.**
- **Developed recreation sites and structures on public lands will be protected.**
- **When aerial resources are used water will not be applied to rock surfaces known or suspected of having rock art.**
- **When aerial resources are used retardant applications will avoid rock surfaces known or suspected of having rock art by a minimum of 300 ft. In case of accidental exposure, the BLM Field Manager will be contacted immediately.**
- **Where MIST is not used an Archaeologist will be ordered at the same time that earth moving machinery is ordered onto an incident.**
- **Where appropriate, Minimum Impact Suppression Tactics (MIST) will be used to protect cultural resources, and to protect historic viewshed quality along the Nez Perce Trail (FMUs Absaroka Front and Foothills Sagebrush), and the Bridger Trail**

(FMUs Nowater, Foothills Sagebrush, Basin Bottom) (see MIST guidelines, Attachment 4.)

These guidelines apply to all FMUs and are supplemented by specific constraints applicable to each FMU, as stated in the FMU descriptions in Section IIId.

Wildland Fire Use:

The current Resource Management Plans do not allow for wildland fire use based on the mixed land ownership patterns and large amount of livestock grazing in the planning area. Wildland fire use will be addressed in the new zone-wide RMP that addresses both the Worland and Cody field offices. The RMP planning process is scheduled to begin in October of 2006.

Prescribed Fire:

Prescribed fire is defined as management ignited fire that is used to alter, maintain, or restore vegetative communities to achieve desired resource conditions. It is also used to protect life, property, and values that would be degraded by wildland fire (USDI BLM, 2000).

The Northern Zone will use prescribed fire and other vegetation treatments to support objectives identified in the Cody RMP (1988), Grass Creek RMP (1996), and Washakie RMP (1986). Section IIb of this FMP identifies priority vegetation types where prescribed fire and/or mechanical treatments will be used to achieve resource objectives. Section IIId of this plan provides recommendations for FMUs, including numbers of acres to be treated over the next 10 years. Specific geographic areas within FMUs will be prioritized for treatment based on NFP direction.

In order to implement and document a prescribed fire project, NEPA compliance requires an interdisciplinary team to conduct site-specific analysis, including Endangered Species Act (ESA) and National Historic Preservation Act (NHPA) consultation. Following current BLM Prescribed Fire Management Guidelines, the Northern Zone will then produce a Prescribed Fire Plan. The Prescribed Fire Plan is a site-specific implementation document containing specific resource objectives, prescription criteria, and provisions for suppression if the fire escapes prescription.

Non-Fire Fuels Treatment:

Non-fire fuels treatment is an essential component of the Northern Zone's fire management program. It will be used in appropriate areas in conjunction with, prior to, or as an alternative to prescribed fire. Treatment will be tailored to specific resource management objectives such as hazardous fuels reduction, restoration of priority vegetation types, and noxious weed management. Treatment options include that include various silvicultural treatments, building fuel breaks, removing material by chipping slash piles or making it available for firewood, and chemical and biological treatments. Whenever possible, the treatment method will be designed to provide local economic benefits. Examples include post and pole harvesting, provision of firewood, and awarding contracts for the treatment of noxious weed infestations. NEPA-

compliant analysis, ESA, and NHPA consultation will occur before implementation of site-specific projects.

Rehabilitation:

Rehabilitation activities can be divided into short and long-term actions. Short-term actions mitigate the effects of fire suppression activities (e.g., dozer lines and helispots). The appropriate Resource Specialist will direct necessary mitigation actions.

Long-term rehabilitation actions are undertaken to repair lands damaged by wildland fire that are unlikely to recover naturally. The Northern Zone will evaluate all areas burned by wildland fire to determine whether post-fire rehabilitation is necessary to prevent extensive resource damage. Rehabilitation will be undertaken for reasons such as the prevention of erosion and sediment impacts to crucial fisheries habitat, mass wasting onto private property, invasion by noxious weeds, and restoration of a municipal watershed. Rehabilitation actions undertaken by the Northern Zone will emphasize the maintenance and restoration of native plant species and communities. In the absence of a Normal Fire Rehabilitation Plan, a site-specific Emergency Stabilization and Rehabilitation (ESR) Plan will be prepared, following guidance in the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook (USDA, USDI, 2002). This will include NEPA-compliant environmental analysis.

d. Wildland Fire Management Strategies:

In order to facilitate fire management planning, the Northern Zone has delineated 5 separate FMUs (Figure 1). These units contain Bureau of Land Management, Bureau of Reclamation, Department of Defense, Forest Service, National Park Service, state, and private land. The FMUs are based on similar risk ratings for ecological degradation and opportunity for improvement through program management. The FMUs are not the same units used to analyze the Northern Zone's Interagency Initial Attack Assessment (IIAA)/National Fire Management Analysis System (NFMAS). Each FMU description on the following pages contains a breakdown of vegetation types into broad categories, based on University of Wyoming gap data (1994) and ground truthing. Attachment 3 contains vegetation tables for each FMU, showing acreages of specific cover types by land ownership within each category.

The general management guidelines for fire suppression in Section IIIc, page 14 apply to all FMUs and specific constraints applicable to individual FMUs are identified wherever necessary.

North Zone Fire Management Units (FMUs)

The planning area (Wyoming North Zone) was divided into five fire management units based on a combination of wildfire AMR and resource management concerns. Fire management objectives and strategies were developed by an interdisciplinary team for each FMU.

Resource objectives for FMUs containing sage grouse habitat will be developed by an interdisciplinary team on a site specific basis. These objectives will incorporate the Wyoming Guidelines for Managing Sagebrush Communities with Emphasis on Fire Management (2002). The objectives will also incorporate data being collected for both landscape and stand fire regime and condition classes (FRCC) of sage-grouse habitat.

Wildland fire use was not discussed for any of the FMUs. The current RMP's do not allow for wildland fire use based on the mixed land ownership patterns and large amount of livestock grazing in the planning area. Wildland fire use will be addressed in the new zone-wide RMP that addresses both the Worland and Cody field offices. The RMP planning process is scheduled to begin in October of 2006.

Number of acres to be treated by vegetation type per decade for each FMU have been estimated and are found in the description of each FMU. These numbers of acres are derived in part from the Northern Wyoming Zone Risk Assessment and Mitigation Strategies Plan (March 2003) and review of wildfire and prescription fire activity of the FMU between 1980 and 2002. However, an unforeseen event such as a large wildfire, rapid expansion of an invasive species, or construction of a new subdivision could create the need to reevaluate objectives and strategies for an FMU. For example, a large wildfire might appear to meet or exceed the planned acreage for prescribed and non-fire fuels treatments in an FMU. Under these circumstances, an interdisciplinary review of the effects of the wildfire could conclude that the wildfire did not meet resource management objectives for a variety of reasons. In such a case, it would be necessary to reevaluate desired future condition goals for a particular plant community and the fire management objectives and strategies for a given FMU.

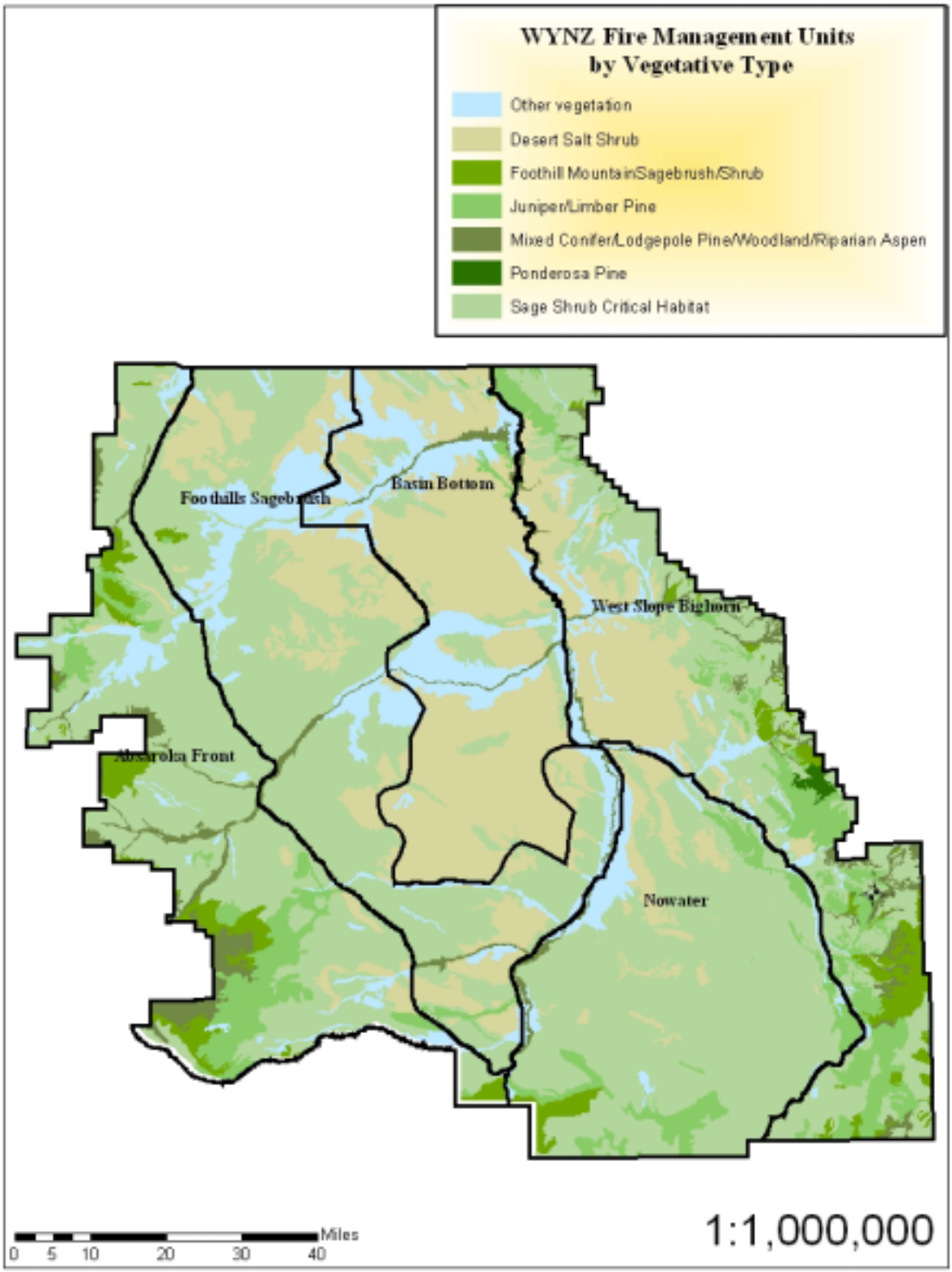

Figure 1. WYNZ Fire Management units by vegetative type

A note on "sagebrush shrub critical habitat":

Sagebrush critical habitat is composed primarily of Wyoming Big sagebrush and secondarily of perennial forbs and grasses. Some of the areas delineated on the FMU maps as Critical Sage Habitat were *absent* from the 1994 University of Wyoming GAP data and consequently ground truthed by our wildlife biologists. The criteria used to label these Wyoming Big sagebrush dominated areas as critical are 1) their position within lower precipitation zones, 2) the significant role they play in sequestering precipitation under the sagebrush canopy, 3) the significant role they play in providing food and/or cover for antelope, deer, insects, lagomorphs, migratory passerines, and sage grouse, 4) the presence of active sage grouse leks within them, and 5) the use of these areas for sage grouse nesting and brood rearing. Our wildlife biologists hypothesize that they are also used as both brooding and rearing grounds and are in the process of collecting data to support or refute these hypotheses.

The sagebrush found in the areas labeled as Foothill Mountain sage and shrub is Mountain Big sagebrush and does not meet the criteria for being critical. It is found in higher precipitation zones, regenerates much faster than does Wyoming Big sagebrush, and typically plays a smaller role as food and cover for big game and/or sage grouse. Lastly, few active or historical leks are found within the Mountain sagebrush type within the FMUs.

In the following FMU descriptions, the terms **Fire Regime and Condition Class** are used extensively. Please refer to the following tables of each for a description and the implications of each term. The fire regimes and condition classes of the Wyoming North Zone fire management units are given and notated following the descriptions.

Fire Regime defined - Periodicity and pattern of naturally occurring fires in a particular area or vegetative type, described in terms of frequency, biological severity, and area of extent.

Group	Frequency	Severity
I	0-35 years	Low
II	0-35 years	Replacement
III	35-100+ years	Mixed
IV	35-100+ years	Replacement
V	200+ years	Replacement

The fire regimes of Wyoming North Zone fire management units are as follows:

Vegetation Class	Fire Regimes
Desert salt shrub	IV
Foothill Mountain sage and shrub	III
Juniper and Limber pine	III
Mixed conifer, Lodgepole pine, and riparian aspen	I, III, and IV
Ponderosa pine	I
Sagebrush shrub critical habitat	III

Condition Class defined - Used to classify the condition of a vegetative biome in regards to natural fire disturbance.

Class	Description
1	Fire regimes are within an historical range and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and functioning within historical range.
2	Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased) resulting in moderate changes to one or more of the following: fire size, fire intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range.
3	Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, fire intensity and severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range.

Condition classes of vegetative types of the Wyoming North Zone fire management units are shown in Attachment 2, Condition Class Map and Table of WYNZ FMUs.

Areas classified as condition class 3 have either been invaded by taxa that result in increased fire events or have missed multiple fire events. As examples, the area of condition class 3 in the Nowater FMU has been invaded by downy brome (*Bromus tectorum*) and the frequency of fires has increased to every 2 to 8 years. Alternatively, most Ponderosa pine stands in the West Slope Bighorn FMU have missed 3 or more fire intervals in the past 100 years.

All cottonwood riparian areas in the Wyoming North Zone are being invaded by Tamarisk and Russian olive. These invasive species have altered the historical fire regime. Most of these altered areas are located within close proximity to urban interface communities and rural homes. Fires within these areas are difficult to extinguish due to large amounts of fine flashy fuels, a heavy dead component, and continuous fuel beds. High frequency, high severity fires kill the native cottonwood species and favor the success of Tamarisk and Russian olive that thrive after fire. Because of this invasion and altered fire frequencies these areas, too, are in condition class 3.

Absaroka Front FMU

Description

Location- Absaroka Front FMU is located on the west side of the Big Horn Basin. It extends from the Montana border in the north to the southern boundary of the Wyoming North Zone at the Wind River Indian Reservation. It encompasses portions of the Shoshone, Greybull, and Big Horn Rivers' watersheds. It covers approximately 1,129,942 acres which includes 380,320 acres of BLM land (including 7,781 acres of BOR land for fire administration), 6,195 acres of Forest Service land, 542,056 acres of privately owned land, and 138,432 acres of State land.

Characteristics- The Absaroka Front FMU has a general topography of east slopes from the Absaroka Range with foothills and long drainages. Its elevation ranges from above 11,000 to 5,000 ft. The vegetation can be divided into six subtypes as follows: 4% desert salt shrub, 19% foothill Mountain Sagebrush and shrub, 14% juniper and limber pine, 4% mixed conifer, including lodgepole pine and riparian aspen, 53% sagebrush shrub critical habitat, and 6% of acres that include barren areas, alpine tundra, greasewood flats, and crop land. Invasive plant taxa include Canada thistle, cheatgrass, hounds tongue, Musk thistle, spotted knapweed, tamarisk, white tip, and white top. Air quality meets National Air Quality Standards.

The mountain topography that characterizes the Absaroka Front FMU supports soils formed over volcanic bedrock, though soils derived from shale and sandstone are just as common. Due to the higher elevations and increased precipitation of this FMU, the soils are typically well developed and productive. However, these attributes also make these soils susceptible to erosion. The erosion hazard for most of the FMU is high and extreme. Based on Forest Service Water Erosion Prediction Project (WEPP) interface, predicted erosion values following wildfire average 9 tons per acre and could exceed 45 tons per acre in a worst case scenario.

Fire History- From 1992-2003 the FMU had 41 fires for a total of 17,560 acres. Approximately 80% of these fires were ignited by lightning with the remainder human caused. Fire behavior in this FMU can range widely depending on microclimate, fuel type, and land use. The higher elevations normally have decreased fire spread because of greater relative humidity, especially if lightning strikes are accompanied by rain. Land use, i.e., livestock grazing vs. recreation, influences fire spread in lower elevations and can range from fast moving grass fires to slower, more intense shrub and juniper fires.

Values at Risk- Owl Creek WSA is found in the southern part of this FMU as are two ACECs--one located on Carter Mountain and the other located in the Owl Creek Drainage: The Carter Mountain ACEC has been implemented to protect alpine tundra and fragile soils and Owl Creek ACEC has been implemented to ensure wildlife corridors, scenic values, and fragile environments.

Wildlife values at risk include crucial habitat for deer, elk, and Bighorn sheep. Absaroka Front FMU also contains habitat for threatened and endangered Grizzly Bear and Canadian Lynx and the sensitive Sage Grouse and Mountain Plover, and Yellowstone cutthroat trout. Over 26,000 acres of commercial forest land are found in the Absaroka Front FMU as are oil and gas

improvements and mining operations. Recreation values include campgrounds, developed trailheads, boat ramps, and fishing access points. Range improvements and livestock forage are present as are pre-historic and historic cultural sites including cabins, fences, traps, and pole structures.

Communities at Risk- Absaroka Front FMU contains six communities identified as at risk. The Wapiti/Rattlesnake Subdivision, South Fork Shoshone River Subdivision, Cedar Mountain, and Sheep Mountain communities have a composite rating of High. Cottonwood Acres and Sage Valley Subdivision have a composite rating of Moderate. Mitigation plans are being developed for each of these communities and will be implemented when completed.

Fire Management Objectives

Suppression Objectives:

- Attempt to protect all WUI from loss or damage within the FMU.
- Attempt to provide protection to cultural resources in area.
- In desert cottonwood riparian areas and all perennial stream riparian areas, the goal would be that wildland fires would be confined or contained to less than 10 acres under moderate to high fire intensity levels.
- Attempt to prevent wildland fire from spreading to conifer/Lodgepole pine woodland and riparian aspen.
- In Sage shrub critical habitat wildland fires will be confined/contained to less than 100 acres 90% of the time, or no more than a loss of 5% of the total FMU's burnable acres.

Fire Use and Prescribed Fire Objectives: Fuel treatments will be designed to reduce dense even- age stands of sagebrush, reduce juniper and limber pine invasion into sagebrush and riparian areas, and reduce the heavy fuel buildup that has resulted from pine beetle infestation and fire suppression. Prescribed fire will be used in conjunction with timber harvest and mechanical treatments to rejuvenate aspen stands.

Planned Fuels Treatments by Vegetative Class: Approximately 25,000 acres are planned to be treated in the Absaroka Front FMU over the next 10 years. These acres include 1000 of mixed conifer/Lodgepole pine/Woodland/Riparian aspen, 10,000 of juniper/limber pine invasion of Foothill mountain sagebrush/shrub, and 14,000 acres of Foothill mountain sagebrush/shrub.

Non-Fire Fuels Treatment Objectives: Multi staged treatments will be done to accomplish specific area goals, such as juniper stand reduction to encourage aspen stand rejuvenation.

Post Fire Rehabilitation and/or Restoration Objectives: Aggressive post-fire rehabilitation and restoration of wildfires will be done to promote native plant community reestablishment and soil stabilization.

Community Protection/Community Assistance Objectives: The communities of Wapiti/Rattlesnake Subdivision, South Fork Shoshone River Subdivision, Cedar Mountain, and

Sheep Mountain are all part of a current risk and mitigation review. Upon completion of this review mitigation plans will be implemented. Mitigation plans need to be formed for the communities of Cottonwood Acres and Sage Valley Subdivision.

Non-fire Fuels Treatments - The implementation of non-fire fuels treatments may be considered as needed by site-specific plan.

Restoration and Rehabilitation - Restoration and rehabilitation will emphasize the re-establishment and perpetuation of habitat diversity.

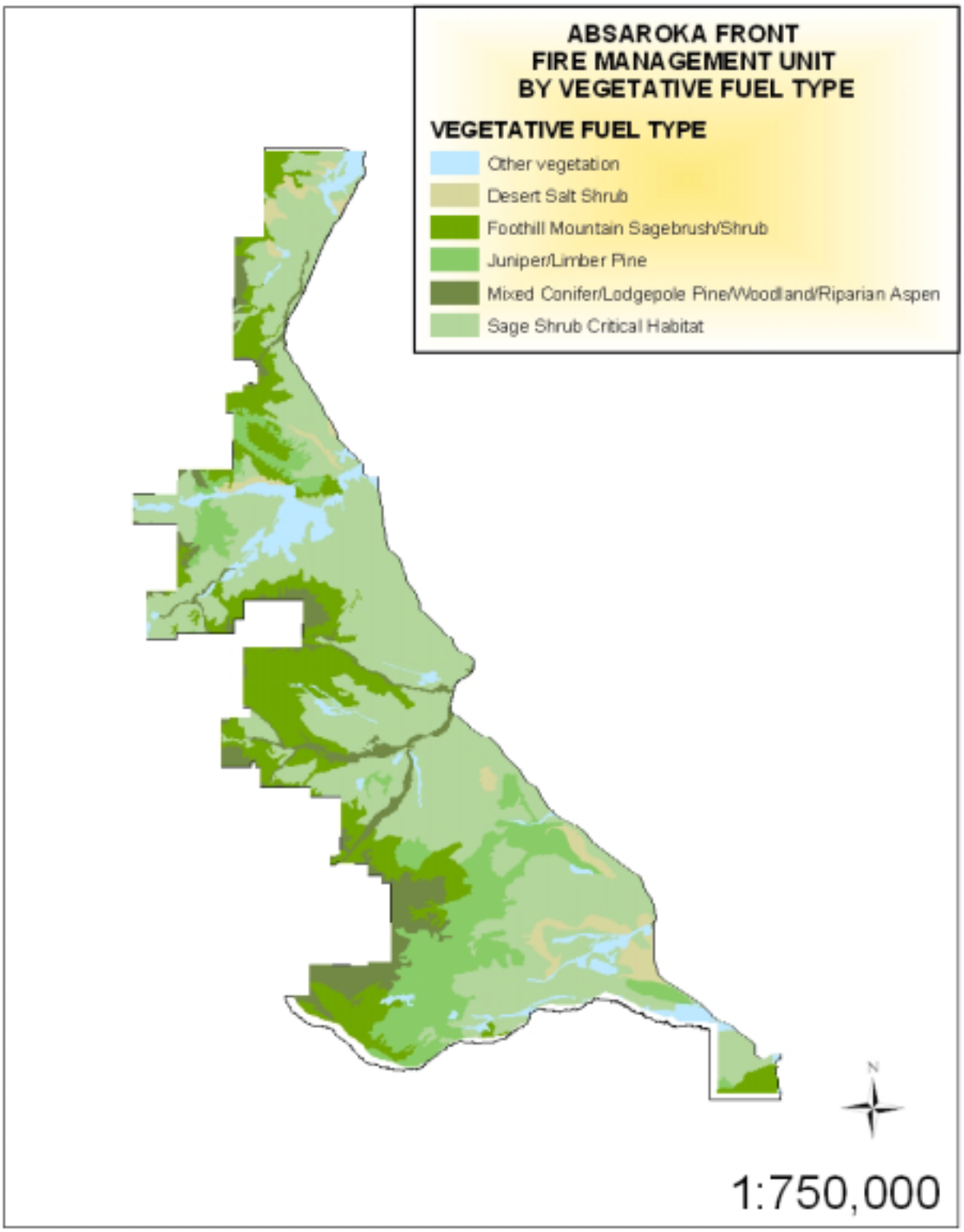

Figure 2. Absaroka Front FMU

Foothills Sagebrush FMU

Location – Foothills Sagebrush FMU is located in the interior portion of the Bighorn Basin. Its boundaries are defined by the sagebrush/grassland foothills of Owl Creek with Carter and the Absaroka Mountains on the western edge. It encompasses portions of the Greybull, Shoshone, and Bighorn Rivers' watersheds. It includes parts of Hot Springs, Park, Big Horn, and Washakie Counties. It covers approximately 1,318,566 acres which includes 790,157 acres of BLM land (including 55,112 acres of BOR land for fire administration), 71,014 acres of state land, and 402,283 acres of privately owned land.

Characteristics – The Foothills Sagebrush FMU has a general topography consisting of numerous long drainages separated by lower foothills. Elevations in this FMU range from above 6000 ft to 3600 ft. The vegetation can be divided into six subtypes as follows: 37% desert salt shrub, 0.25% Foothill Mountain sagebrush and shrub, 0.50% juniper and limber pine, 1.25% mixed conifer, including lodgepole pine and riparian aspen, 48% sagebrush shrub critical habitat, and 13% of acres that include barren areas, greasewood flats, and crop land. Invasive plant taxa include black henbane, cheatgrass, Canada thistle, hounds tongue, Musk thistle, Russian and spotted knapweed, tamarisk, white tip, and white top. Air quality meets National Air Quality Standards. No Federally listed threatened or endangered species have been identified for the Foothills Sagebrush FMU.

The Foothills Sagebrush FMU is characterized by dissected, rolling foothills topography. Its soils formed over interbedded sandstone and shale. Moderately high precipitation, 10 to 14 inches per year, promotes productive soils. The erosion hazard ranking for river bottoms and benches is slight, while that for the steeper badland area is high. Predicted erosion values, based on Forest Service WEPP interface, for the sagebrush dominated communities averages 4.5 tons per acre and could be as high as 20 tons per acres in a worst case scenario.

Fire History – Fire frequency, size, and intensity in this FMU have all been low historically: between 1992 and 2003 twenty-two fires totaled 382 acres. Thirty-five percent of fires were lightning ignitions and 65 % human caused. Fire spread has occurred when rains did not accompany lightening ignition in early summer when sagebrush has higher fuel moisture content. Areas vegetated with invasive cheatgrass have had fast fire spread but with limited movement into sagebrush critical habitat.

Values at Risk – Wildlife values at risk include crucial sage grouse, mule deer, and antelope habitat. Oil and gas improvements and pre-historic and historic cultural sites are present.

Historically, wildfires occurred at return intervals of 32-70 years in sage brush (*Artemisia* sp.) vegetation types. However, the frequency and size of wildfires within the zone are considerably higher than historical levels. Cheat grass matures earlier than native species and provides easily ignited fuel that promote a rapid rate of fire spread. Greater fire frequencies occur which cause a lower species richness in native communities and increase the relative frequency of cheat grass.

Communities at risk – Four communities are recognized as at risk: Thermopolis, Sage Valley Subdivision, Oregon Basin, and Silvertip/Elk.

Fire Management Objectives

Suppression Objectives:

- Attempt to protect all WUI from loss or damage within the FMU.
- Attempt to provide protection to cultural resources in area.
- In desert cottonwood riparian areas and all perennial stream riparian areas, the goal would be that wildland fires would be confined or contained to less than 10 acres under moderate to high fire intensity levels.
- In Sage shrub critical habitat wildland fires will be confined/contained to less than 100 acres 90% of the time or no more than a loss of 5% of the total FMU's burnable acres.

Fire Use and Prescribed Fire Objectives: Use prescribed fire and mechanical/chemical treatments to maintain, enhance, and/or rehabilitate sagebrush shrub critical habitat vegetation type acreage with emphasis on limiting the spread of cheatgrass.

Planned Fuels Treatments by Vegetative Class: Eight thousand acres of Sage Shrub critical habitat will be treated in the next decade. There are no planned treatments of any other vegetation type within this FMU.

Non-fire Fuels Treatment Objectives: Multi staged treatments will be utilized, including chemical and mechanical treatments, to reduce cheatgrass competition with native plant taxa.

Post-fire Rehabilitation and/or Restoration Objectives: Aggressive post-fire rehabilitation and restoration of wildfires will be done to promote native plant community reestablishment and soil stabilization.

Community Protection/Community Assistance Objectives: Communities within this FMU have been assessed through RAMS analysis of 2003 and mitigation plans will be devised.

Non-fire Fuels Treatments - The implementation of non-fire fuels treatments may be considered as needed by site-specific plan.

Restoration and Rehabilitation - Restoration and rehabilitation will emphasize the re-establishment and perpetuation of habitat diversity.

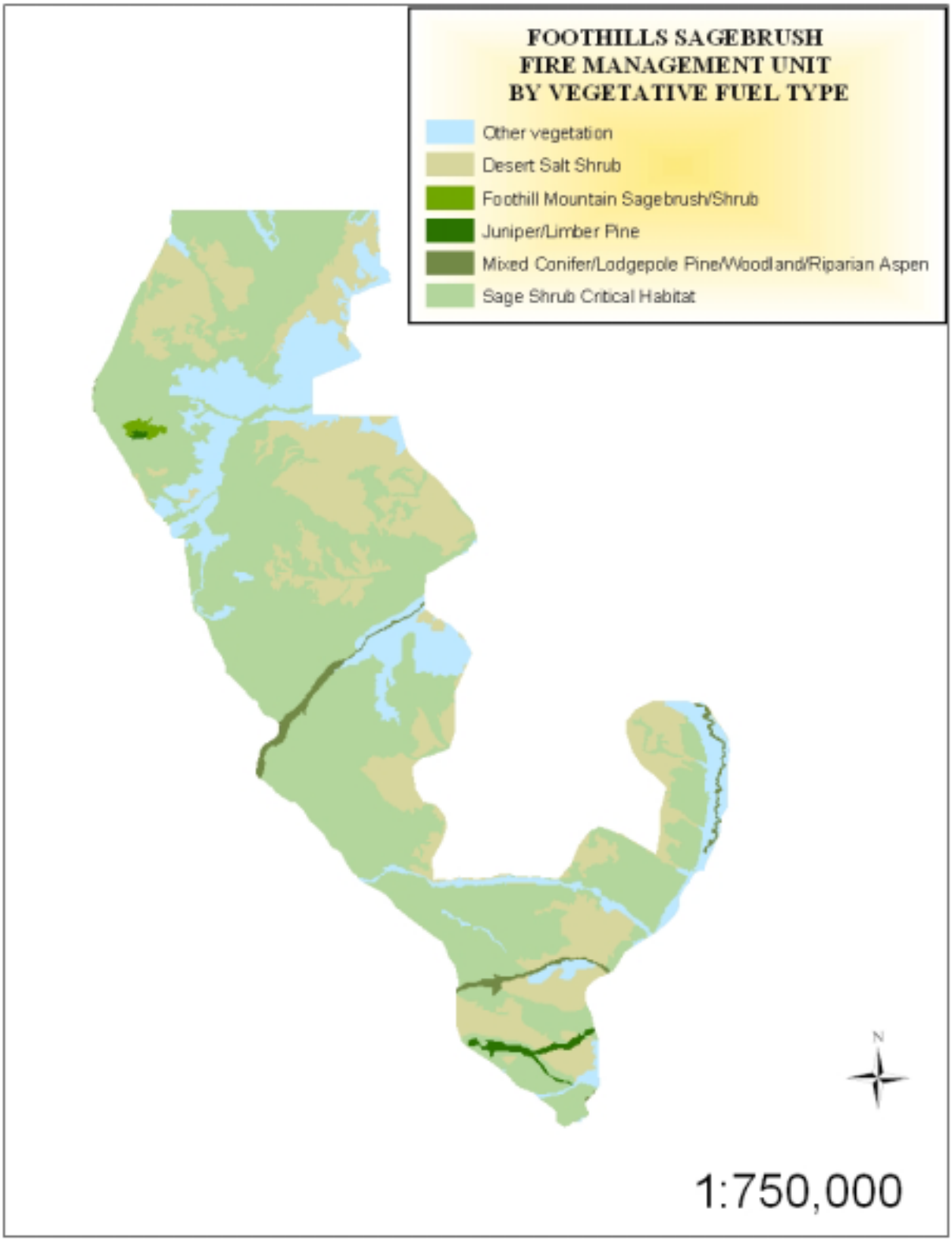

Figure 3. Foothills Sagebrush FMU

Basin Bottom FMU

Description

Location - The Basin Bottom FMU is located south of the Montana State line and west of the convergence of the Nowood and Big Horn Rivers near Manderson. Its western boundary is shared with the eastern boundary of the Foothills Sagebrush FMU. Part of its southwest boundary is Bridger Trail and its eastern boundary the Bighorn River. It covers approximately 929,866 acres which includes 623,586 acres of BLM land (including 22,493 acres of BOR land for fire administration), 3,543 acres of DOD land, 10,277 acres of National Park Service land, 234,850 acres of privately owned land, and 35,137 acres of State land.

Characteristics - The features of the Basin Bottom FMU include a dissected, rolling desert topography that includes salt flats, canyons, and, in some places, plains eroded to clay shale bedrock forming badlands. Elevation ranges from 3,600 ft to 5,900 ft. The vegetation can be divided into six subtypes as follows: 72% desert salt shrub, 0% foothill Mountain sagebrush and shrub, 1% juniper and limber pine, 2% mixed conifer, including lodgepole pine and riparian aspen, 4% sagebrush shrub critical habitat, and 21% of acres that include barren areas and greasewood flats. Invasive plant taxa include cheatgrass, Russian knapweed, tamarisk, and white top. Air quality meets National Air Quality Standards. No Federally listed threatened or endangered species have been identified for the Basin Bottom FMU. The Bighorn River and its perennial tributaries contain fish species of concern: sturgeon chub, shovelnose sturgeon, sauger, western silvery minnow, and plains minnow.

The Basin Bottom soils formed over interbedded sandstone and shale. This FMU's soils are poorly productive because of low average annual precipitation, generally less than 8 inches per year, and soil alkalinity and salinity. The erosion hazard for Basin Bottom FMU is moderate in the southern portion and high in the northern portion. Following wildfire, the predicted erosion values, based on Forest Service WEPP interface, averages 2.5 tons in the southern portion and 4.2 tons per acre in the northern portion. The soil erosion worst case scenario for the southern and northern portions of this FMU ranges from 22 to 28 tons per acre, respectively.

Fire History – Historically, fire size and number in this salt shrub dominated FMU have been small: 27 fires occurred between 1992 and 2003 affecting about 378 acres, the majority from lightning ignition.

Values at Risk – Wildlife values at risk include use as antelope winter range and critical sagebrush habitat. Other values include use as winter livestock grazing and oil and gas production. Cultural resources at risk include Bridger Trail, Red Butte, and Red Gulch Dinosaur Tracksite.

Communities at risk – There are no communities at risk in Basin Bottom FMU. Some farms and ranches are found in close proximity to hazardous fuels within the FMU.

Fire Management Objectives

Suppression Objectives:

- Protect all WUI from loss or damage within the FMU.
- Provide protection to cultural resources in area.
- In riparian areas, wildland fires would be confined or contained to less than 10 acres under moderate to high fire intensity levels.
- In Sage shrub critical habitat wildland fires will be confined/contained to less than 100 acres 90% of the time, or no more than a loss of 5% of the total FMU's burnable acres.

Fire Use and Prescribed Fire Objectives:

Use prescribed fire to maintain, enhance, and/or rehabilitate sagebrush shrub critical habitat vegetation type.

Planned Fuels Treatments by Vegetative Class: Basin Bottom FMU is planned to have 500 acres of Sage shrub critical habitat treatment over the next ten years.

Non-fire Fuels Treatment Objectives: Multi staged mechanical and chemical treatments will be utilized to create mosaics of sagebrush shrub critical habitat vegetation type.

Post-fire Rehabilitation and/or Restoration Objectives: Aggressive post-fire rehabilitation and restoration of wildfires will be done to promote native plant community reestablishment and soil stabilization.

Community protection: There are no communities at risk within this FMU.

Prescribed Fire - Fuels treatments may be considered as needed by a site-specific plan.

Non-fire Fuels Treatments - The implementation of non-fire fuels treatments may be considered as needed by site-specific plan.

Restoration and Rehabilitation - Restoration and rehabilitation will emphasize the re-establishment and perpetuation of habitat diversity.

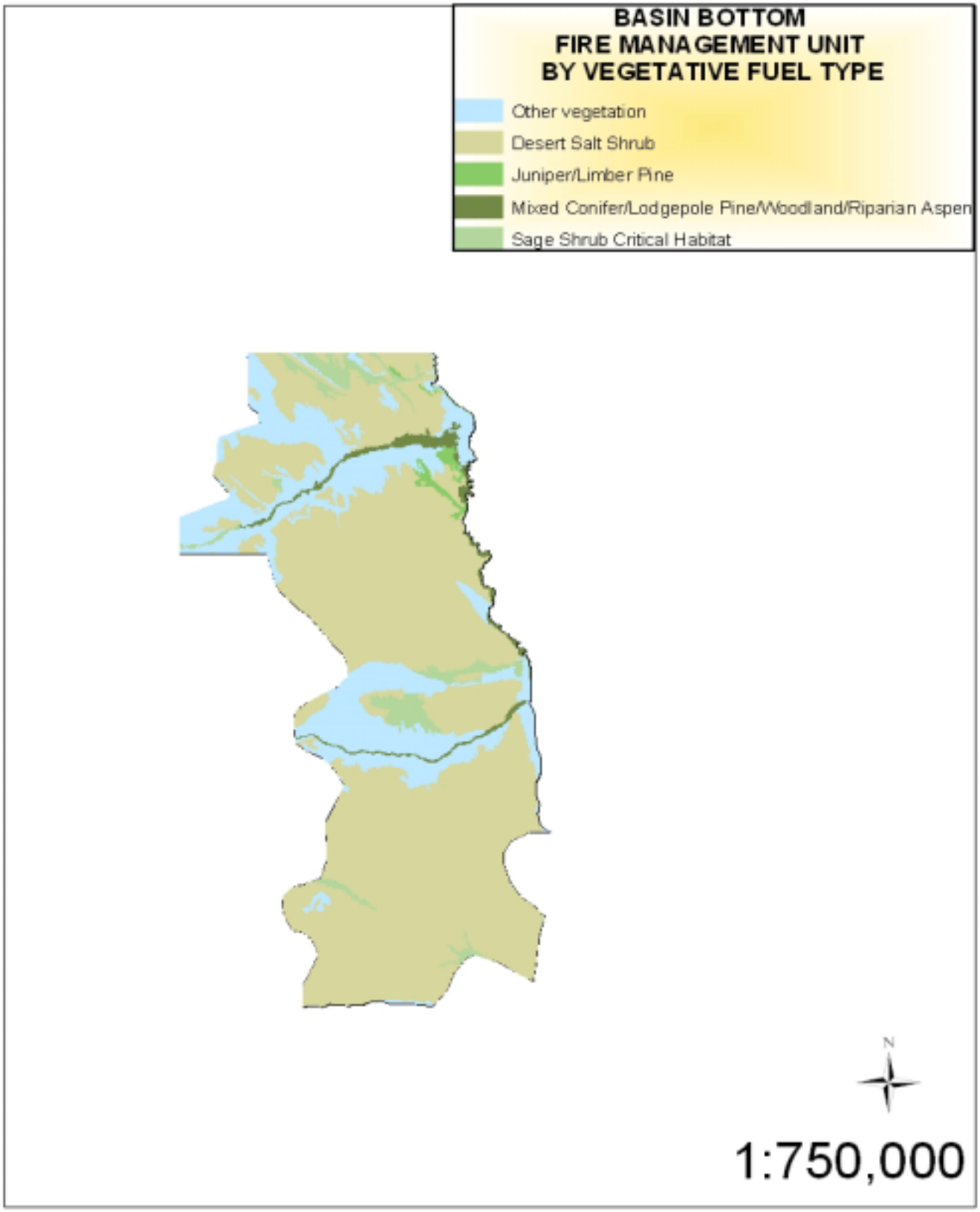

Figure 4. Basin Bottom FMU

Nowater FMU

Description

Location - The Nowater FMU is located south and east of the convergence of the Nowood and Bighorn Rivers near Manderson. Its southwest boundary is with the Wind River Indian Reservation and the easternmost boundary follows the Nowood River. It covers approximately 1,063,220 acres which includes 687,633 acres of BLM land (including 1,419 acres of BOR land for fire administration), 284,773 acres of private land, and 89,395 acres of state land.

Characteristics – The general topography of the Nowater FMU is dissected and rolling. Elevations range from 4000 ft to 5500 ft. The vegetation can be divided into six subtypes as follows: 21% desert salt shrub, 2% Foothill Mountain sagebrush and shrub, 10% juniper and limber pine, 1% mixed conifer, including lodgepole pine and riparian aspen, 60% sagebrush shrub critical habitat, and 6% of acres that include barren areas and crop land. Invasive plant taxa include black henbane**,** cheatgrass, Canada thistle, hounds tongue, Japanese brome, Musk thistle, Russian and spotted knapweed, tamarisk, white tip, and white top. Air quality meets National Air Quality Standards. No Federally listed threatened or endangered species have been identified for the Nowater FMU. The Bighorn River and its perennial tributaries contain fish species of concern: sturgeon chub, shovelnose sturgeon, sauger, western silvery minnow, and plains minnow.

The Nowater FMU soils formed over interbedded sandstone and shale. Average annual precipitation is 8 to 14 inches with production varying with precipitation. Areas of high alkalinity and salinity reduce productivity in areas. Most of the FMU has a moderate erosion hazard ranking. Predicted erosion values, based on Forest Service WEPP interface, would range from 2.6 tons per acre in lower precipitin areas to 5.5 tons per acre in the higher precipitation zones following wildfire. Worst case scenarios predict erosion rates exceeding 20 tons per acre.

Fire History – Historically, fire size in this sagebrush dominated FMU has been small but both size and occurrence appear to be increasing as cheatgrass and Japanese brome increase their distributions. Approximately 78,000 acres of sagebrush were burned by wildland fires in 1996 and between 1992 and 2003 an additional 26,832 acres burned in 55 fires. Most fires in this area were ignited by lightning, but some resulted from fire use and equipment. Fire behavior differs between the sagebrush and cheatgrass/Japanese brome fuel types: Fires within the latter typically exhibit fast spread rates following summer curing while the former have higher fuel moistures during the same months.

Values at Risk – Values to be protected include existing sagebrush shrub critical habitat and the numerous oil production facilities within the FMU. Cultural resources at risk are historical cultural sites including cabins and fences.

Historically, wildfires occurred at return intervals of 35 to 100 years in sage brush (*Artemisia* sp.) vegetation types with mixed severity. However, the frequency, size, and severity of

wildfires within this fire management unit are considerably higher than historical levels. Cheat grass matures earlier than native species and is an easily ignited fuel that promotes a rapid rate of fire spread. Greater fire frequencies occur, which cause a lower species richness in native communities and increase the relative frequency of cheat grass.

Communities at risk – Thermopolis may be at risk in the event of wildland fire that is not suppressed within buffers areas. Thermopolis has municipal and rural components with multiple summer homes and cabins interspersed in sagebrush and juniper woodlands.

Fire Management Objectives

Suppression Objectives

- Attempt to protect all WUI from loss or damage within the FMU.
- Attempt to provide protection to cultural resources in area.
- In desert cottonwood riparian areas and all perennial stream riparian areas, the goal would be that wildland fires would be confined or contained to less than 10 acres under moderate to high fire intensity levels.
- In Sage shrub critical habitat wildland fires will be confined/contained to less than 100 acres or no more than a loss of 3% of the total FMU's burnable acres.

Fire Use and Prescribed Fire Objectives:

Use prescribed fire to maintain, enhance, and/or rehabilitate sagebrush shrub critical habitat vegetation type, with emphasis on limiting the spread of cheatgrass/Japanese brome and reducing its extent on the landscape. Both size and control methods such as leaving jagged edges and unburned islands of sagebrush within wildfire boundaries will be done to provide for a mosaic of age classes in sagebrush shrub critical habitat vegetation type.

Planned Fuels Treatments by Vegetative Class: One thousand acres of sage shrub critical habitat are planned to be treated in the next decade.

Non-fire Fuels Treatment Objectives: Multi staged treatments will be utilized, including chemical and mechanical treatments, to reduce cheatgrass competition with native plant taxa.

Post-fire Rehabilitation and/or Restoration Objectives: Aggressive post fire rehabilitation and restoration will be initiated to facilitate reestablishment of sagebrush shrub critical habitat vegetation type.

C**ommunity protection**: There are no identified communities at risk in the Nowater FMU.

Prescribed Fire - Fuels treatments may be considered as needed by a site-specific plan.

Non-fire Fuels Treatments - The implementation of non-fire fuels treatments may be considered as needed by site-specific plan.

Restoration and Rehabilitation - Restoration and rehabilitation will emphasize the re-establishment and perpetuation of habitat diversity and reduction of cheatgrass/Japanese brome proliferation.

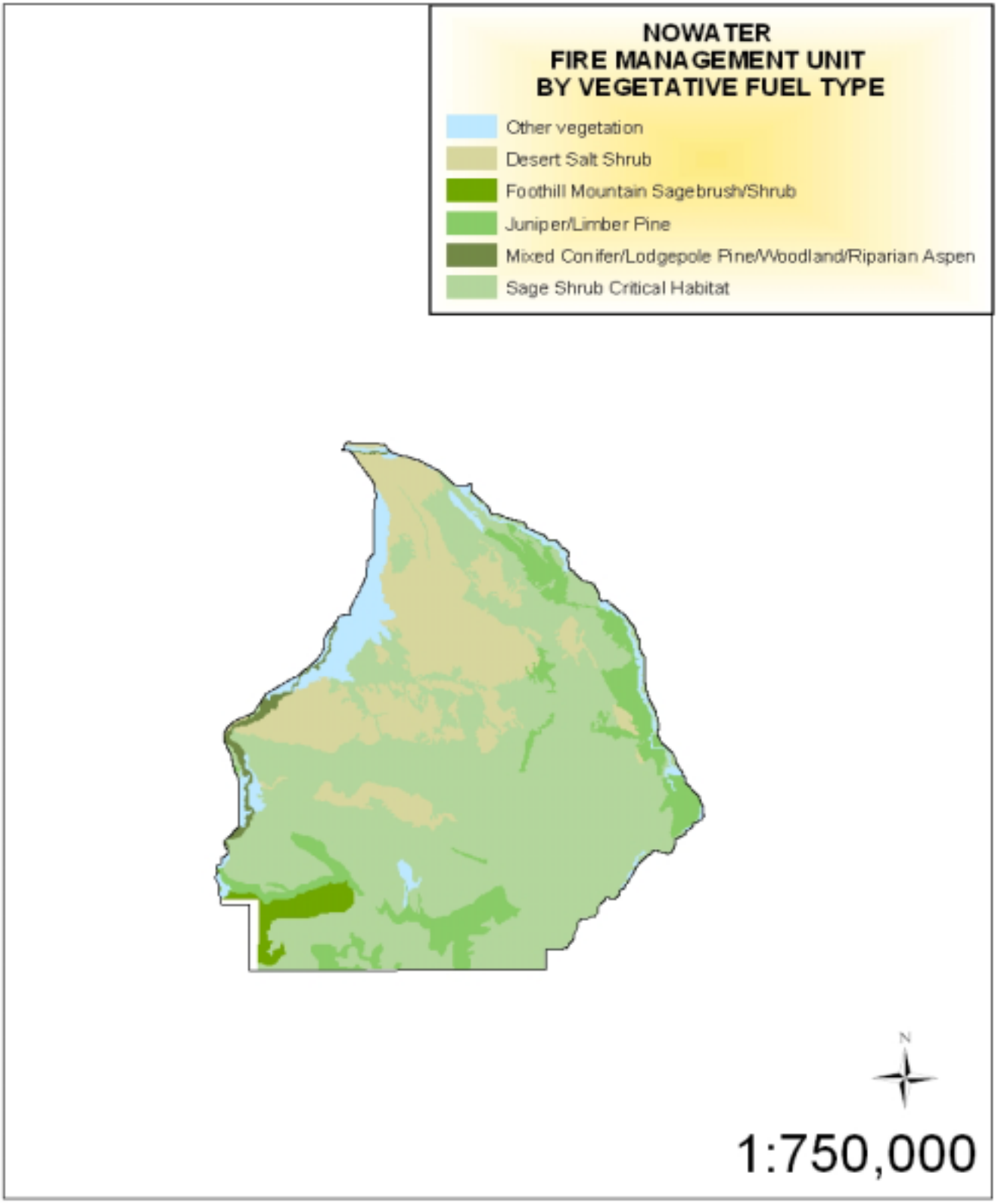

Figure 5. Nowater FMU

West Slope Bighorn FMU

Description

Location - The West Slope Bighorn FMU is located east and south of the convergence, near Manderson, of the Nowood and Bighorn Rivers. Its western boundary follows the Bighorn River south from the Montana State line to Manderson, Wyoming, then south along the Nowood River to the southern edge of the Washakie County border line. Its eastern boundary is from the Montana state line south along the Bighorn Mountains to the eastern edge of the Worland Field Office boundary. It covers approximately 1,116,093 acres which includes 657,780 acres of BLM land (including 81 acres of BOR land for fire administration), 1,188 acres of Forest Service land, 5,229 acres of Park Service land, 402,226 acres of private land, and 79,589 acres of state land.

Characteristics- The general topography of the West Slope Bighorn FMU increases in elevation from west to east with elevations ranging from 4000 ft to 8200 ft. The vegetation can be divided into six subtypes as follows: 23% desert salt shrub, 16% Foothill Mountain sagebrush and shrub, 18% juniper and limber pine, 7% mixed conifer, including lodgepole pine and riparian aspen, 1% Ponderosa pine, 27% sagebrush shrub critical habitat, and 8% of acres that include barren areas, sub alpine meadows, and crop land. Starting at the base of the mountains and proceeding upslope, four distinct timber zones are present. The first is a juniper woodlands zone followed by a ponderosa pine belt. The third zone is mixed conifers on north-facing slopes and lastly a zone of lodgepole pine intermingled with aspen. Invasive plant taxa include cheatgrass, Canada thistle, hounds tongue, Japanese brome, Musk thistle, Russian and spotted knapweed, tamarisk, white tip, and white top. Air quality meets National Air Quality Standards. Two federally listed endangered species have been identified for the West Slope Bighorn FMU – the bald eagle and the peregrine falcon. The Yellowstone cutthroat trout has been petitioned for listing under the Endangered Species Act. The Bighorn River and its perennial tributaries contain fish species of concern: sturgeon chub, shovelnose sturgeon, sauger, western silvery minnow, and plains minnow.

The West Slope Bighorn FMU is dissected and rolling east of the Bighorn Mountains foothills. Average annual precipitation is 10 to 18 inches with productivity varying with it. The erosion hazard ranking changes from slight to high moving east from its western boundary along the Bighorn River. The northern most area of this FMU has an erosion hazard rating of extreme. Predicted erosion values, based on Forest Service WEPP interface, following wildfire average 8 tons per acre. The worst case scenario predicts erosion rates exceeding 21 tons per acre.

Fire History – Between 1992 and 2003 the West Slope Bighorn FMU had 77 fires with a total of 9,432 acres burned. Sixty eight percent of the fires in the FMU were caused by lightning, while 32% of the fires in the FMU were caused by human ignitions.

Values at Risk – Values at risk include existing sagebrush shrub critical habitat and elk and mule deer wintering grounds. Also, there is approximately 14,418 acres of commercial forestland. There are cabins, outbuildings, recreational sites and other structures interspersed throughout the FMU.

Communities at risk – Communities include Beaver Creek, Hyatt Ranch, Upper Canyon Creek, Ten Sleep Special Use Area, and Middle Fork Powder River.

Fire Management Objectives

Suppression Objectives:

- Attempt to protect all WUI from loss or damage within the FMU.
- Attempt to provide protection to cultural resources in area.
- Attempt to protect commercial timber stands in condition class 2 Fire Regime IV from catastrophic stand-replacing wildfire.
- In desert cottonwood riparian areas and all perennial stream riparian areas, the goal would be that wildland fires would be confined or contained to less than 10 acres under moderate to high fire intensity levels.
- In Sage shrub critical habitat wildland fires will be confined/contained to less than 100 acres 90% of the time or no more than a loss of 5% of the total FMU's burnable acres.

Fire Use and Prescribed Fire Objectives:

Pyric treatment to sagebrush shrub critical habitat vegetation type and reduction of juniper and limber pine invasion into sagebrush and riparian areas. Reduce heavy fuel build-up that has resulted from pine beetle infestation and fire suppression. Timber harvest, prescription fire, and mechanical treatments will be used to rejuvenate aspen stands.

Planned Fuels Treatments by Vegetative Class: A total of 17,000 acres will are planned to be treated. This includes 200 acres of Ponderosa pine, 7,00 acres of Sage shrub critical habitat, 7,000 acres of juniper and limber pine invasion of Foothill mountain sagebrush shrub type, and 1,000 acres of mixed conifer/Lodgepole pine/Woodland/Riparian aspen vegetation type.

Non-fire Fuels Treatment Objectives: Multi staged treatments will be utilized, including chemical and mechanical treatments to reduce cheatgrass competition with native plant taxa, to reduce ladder fuels in ponderosa pine stands, and reduce juniper encroachment into areas historically dominated by other taxa.

Post-fire Rehabilitation and/or Restoration Objectives: Aggressive post fire rehabilitation and restoration will be initiated to facilitate reestablishment of native plant communities.

Community protection/Community Assistance Objectives: Zone currently has one ongoing risk assessment and mitigation contract for the wildland urban interface community near the mouth of the Ten-Sleep Canyon. Two other assessments (Middle Fork Powder River and Upper Canyon Creek) are scheduled to occur over the next several years.

Prescribed Fire - Fuels treatments may be considered as needed by a site-specific plan.

Non-fire Fuels Treatments - The implementation of non-fire fuels treatments may be considered as needed by site-specific plan.

Restoration and Rehabilitation - Restoration and rehabilitation will emphasize the re-establishment and perpetuation of habitat diversity and reduction of cheatgrass/Japanese brome proliferation.

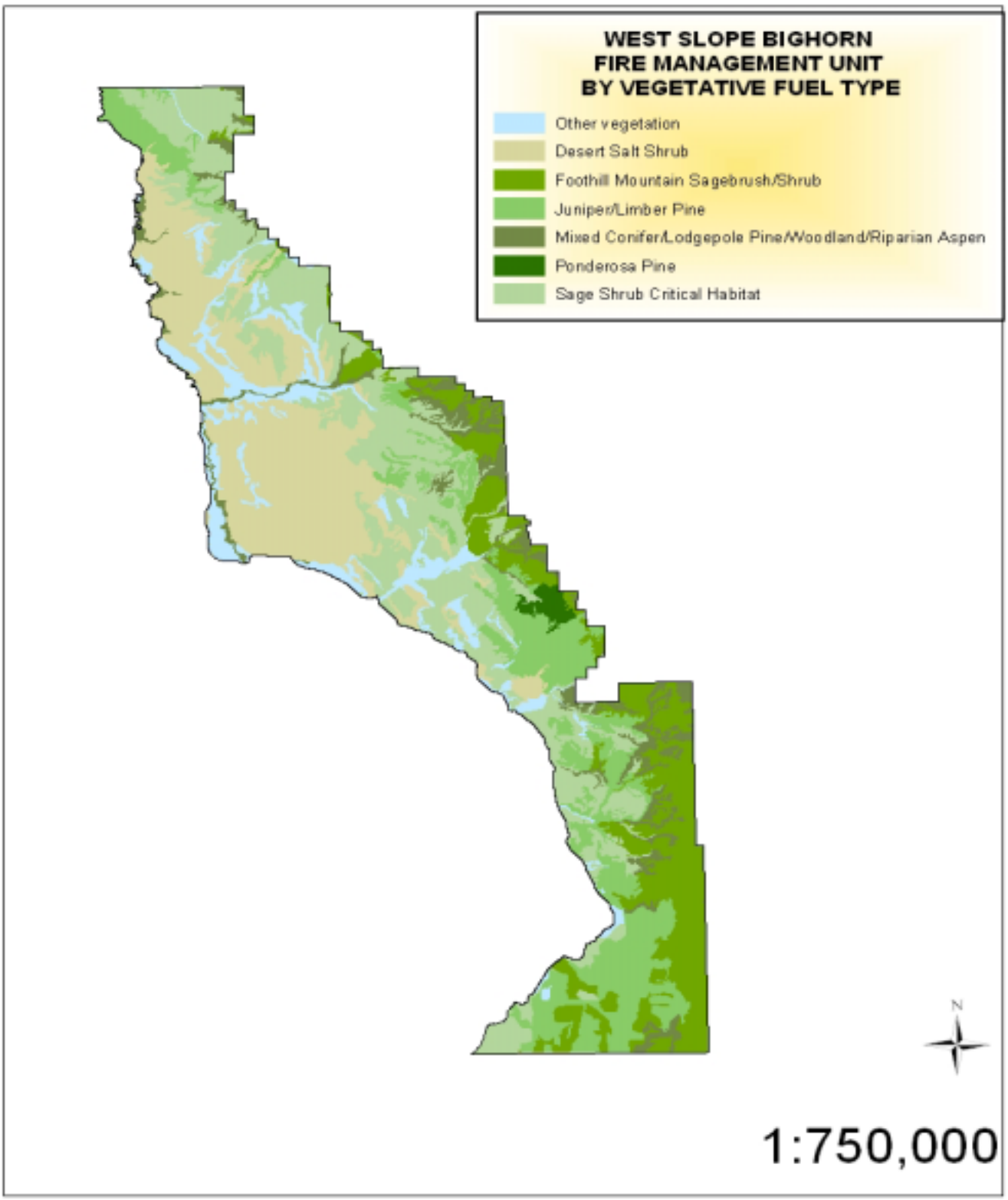

Figure 6. West Slope Bighorn FMU

IV. Fire Management Program Components

a. Wildland Fire Suppression: (2810, 2821, and 2824 programs)

1. *Fire Planning Unit Fire History Analysis*
During the period of 1992-2003, the Fire Planning Unit averaged 19 fires per year, burning 11,685 acres annually. Approximately 80% of these wildfires are Size Class A, B, and C incidents (less than 100 acres in size). On average, lightning accounts for approximately 66% of the annual number of fires while a variety of human caused fires accounts for the remaining 44%. While the majority of fires are relatively insignificant in terms of size and fire intensity, periodic stand replacement events typically burn at high fire intensity levels (FIL 5 and 6). These fires can be several thousand acres in size.

2. *Suppression/Preparedness Actions*
The operational roles of the BLM in the wildland/urban interface are wildland firefighting, hazardous fuels reduction, cooperative prevention and education, and technical assistance. Structural fire suppression is the responsibility of tribal, State, or local governments, as described in the Interagency Standards for Fire and Fire Aviation Operations.

Use Appropriate Management Response (AMR) to suppress all fires in accordance with management objectives based on current conditions and fire location. A response can vary form an aggressive initial action to using MIST tactics and natural barriers in sensitive areas. AMR strategies would be tailored to address areas management considerations such as Areas of Critical Environmental Concern (ACECs), critical habitat for T&E species, areas of soil instability, areas of cultural heritage resources, and areas of other critical resource constraints.

Requirements for fire operations/suppression plans can be found in the "Interagency Standard for Fire and Fire Aviation Operations" (Red Book) and the Office of Fire and Aviation website at **http://www.fire.blm.gov/**. All plans for fire and resource personnel use can be accessed at Worland Field Office or Cody Interagency Dispatch Center.

Agency Administrators will ensure employees are trained, certified and available to participate in the wildland fire program locally, regionally, and nationally as the situation demands, as described in the Interagency Standards for Fire and Fire Aviation Operations.

See Section V-a of this document for a complete summary of the preparedness organization including staffing, budget, equipment, etc.

3. *Fire Prevention, Community Education, Community Risk Assessment, and Other Community Assistance Activities (Firewise)*

a. Annual Prevention Program

Prevention is an active part of the fire management program. Details of the prevention

program may be found in the RAMS Wildland Fire Prevention Plan. Training, prevention posters, and signs have and will be implemented throughout all communities within the Bighorn Basin. Community risks assessments and mitigation activities are conducted in partnership with the local communities each year. Specific details can be found in the RAMS Wildfire Assessment and Management Plan for Communities-at-risk.

b. Special Orders and Closures (See State-wide interagency fire restriction plan)
http://www.wy.blm.gov/fire/firedocs/firerestrictplan.htm
All special orders and closures will be coordinated with local cooperators, recommended by the FMO, and approved by the appropriate manager(s) (see RAMS Wildland Fire Prevention Plan).

c. Industrial Operations and Fire Precautions
See RAMS Wildland Fire Prevention Plan.

4. *Annual Fire Training Activities*
a. Qualifications and Fireline Refresher
Training and fitness requirements for all personal involved in fire/suppression support can be found in the 2004 Interagency Standards for Fire and Fire Aviation Management. Attendance at the refresher training is a prerequisite for issuance of a red card prior to June 15th annually. The successful completion of the appropriate level work capacity testing (WCT) is required annually. The WCT will expire on the first day of each calendar year. Management oversight and review of the wildland and prescribed fire positions falls under the jurisdiction of the Wyoming BLM North Zone Qualification and Certification Committee (see Attachment 2 - Wyoming BLM North Zone Qualification and Certification Committee Charter).

b. Fire Season Readiness
Requirements for preparedness and operational plans can be found in the 2004 Interagency Standards for Fire and Fire Aviation Management, and also located at Cody Interagency Dispatch Center.

5. *Detection*
The Fire Management Staff may request aerial detection services on an as-needed basis from Cody Interagency Dispatch Center.

6. *Fire Weather and Fire Danger*
The agency maintains four Remote Automated Weather Stations (RAWS) as follows:

Name	NWS ID	NESDIS ID	Elevation	Latitude	Longitude
Rattlesnake	480212	3278A4E8	6800	44 34.43	109 14.14
Hyatt High	480307	3264D47A	5720	44 18.00	107 30.58
Grass Creek	480804	3264C70C	7100	43 56.00	108 51.14
Splitrock	480904	3278B79E	6000	43 55.00	107 40.00

Cody Interagency Dispatch Center staff is responsible for recurrent daily activities to manage RAWS data and for the input of key dates to initiate seasonal data collection and termination.

Two portable RAWS are available; they can be installed to provide site specific weather information for projects where permanent RAWS information is not sufficient to collect needed data for a specific site.

All unit RAWS use NFDRS fuel model T, except Rattlesnake which uses H, along with the energy release component to develop fire danger ratings on a daily basis.

7. *Aviation Management*
The Fort Washakie Interagency Helicopter, the Southern Wyoming BLM Helicopter, and local vendors are available to provide point-to point transportation, aerial ignition platforms and reconnaissance missions to support resource management activities. Aviation resources associated with wildfire are normally procured by Cody Interagency Dispatch Center. Aircraft used in support of resource management and other activities unrelated to wildfire are acquired through the North Zone Aviation Manager. Aviation use within the FPU is conducted in accordance with procedures described in the North Zone Aviation Management Plan.

8. *Initial Attack*
All fires within the FPU will be managed with suppression actions consistent with preplanned dispatch protocols in conformance with resource management objectives identified in this plan. Tactics and strategies will be based on the current and predicted weather and fire behavior. Firefighter and public safety is always the first priority. Use the following information for determining initial attack priorities and appropriate management response.

The FMU priorities within the fire planning unit for initial attack are separated into two categories that rank by priority. Priority was determined based on factors of localities of WUI areas, resource values and management considerations and environmental considerations. If fires are within or threatening urban interface zones, category one and its associated rank will be the highest priority. When fires fall outside the urban interface zones and are not threatening, category two and its associated rank will be the highest priority due to ecological degradation and environmental concern.

Category 1:
1.) West Slope Bighorn
2.) Absaroka Front
3.) Nowater
4.) Foothills Sagebrush
5.) Basin Bottom

Category 2:
1.) Nowater
2.) West Slope Bighorn
3.) Absaroka Front
4.) Foothills Sagebrush
5.) Basin Bottom

As fire complexity increases, additional staffing will be requested as appropriate and consistent with incident complexity.

9. *Extended Attack and Large Fire Suppression*
The BLM requires no narrative in this section. This section is here to maintain consistency with other agencies format. BLM direction is outlined in the Interagency Standards for Fire and Fire Aviation Operations.

10. *Other Management Considerations*
Fire trespass issues, off-set agreements and interagency agreements are based on a fire management policy and are identified in this document.

Smoke Management Concerns: At this time, smoke management is not a concern. Prior to any ignition, proposed burns are submitted to the Wyoming Airshed Coordinator for approval.

Consultation Procedures: Due to the fact that "May Affect" projects in the Wyoming Northern Zone BLM need to go through the consultation process, projects need to be identified in a timely manner. Presently, this is a significant workload for resource specialists and biologists in the North Zone. If potential impacts to federally listed species are identified during initial project scoping, the appropriate consulting agencies, USFWS, Wyoming Game and Fish and NOAA Fisheries, will be involved in project design and mitigation. Consultation will be concluded prior to signing the Decision Record. If no potential impacts to threatened or endangered species are identified, a "No Effect" determination will be made and placed in the project file prior to signing the Decision Record.

All necessary cultural and botanical clearances will also be conducted prior to the start of the NEPA document. Documentation of clearances will be conducted by the Botanist and Archeologist prior to the writing of the NEPA document.

b. Wildland Fire Use (2821, 2823, and 2824) - referred to as Wildland Fire Use for Resource Benefit

The current RMP's do not allow for wildland fire use based on the mixed land ownership patterns and large amount of livestock grazing in the planning area. Wildland fire use will be addressed in the new zone-wide RMP that addresses both the Worland and Cody field offices. The RMP planning process is scheduled to begin in October of 2006.

c. Prescribed Fire and Non-Fire Treatments (2823, 2824)

1. *Planning, Documentation and Program Direction*
The North Zone conducts fuels treatments to reduce hazardous fuels, restore fire–adapted ecosystems, promote community assistance and to and to accomplish resource management objectives. All projects are closely coordinated with the Cody and Worland resources staffs and especially the rangeland, forestry, wildlife habitat and weed programs which also manage

vegetation. Long term project planning priorities have been identified through the RAMs Fuels Management Plan located in Attachment 6. Additional opportunities for fuels treatments not identified in RAMs are evaluated on a case by case basis. At the individual treatment level planning will take place using this process:

1. A project proposal will be submitted to the Field Manager. If the Field Manager approves the project for further planning an interdisciplinary team will be formed.

2. All of the applicable elements in the Job Planning check list in the Prescribed Fire Management Handbook (H -9214) will be addressed for both prescribed fire and non-fire projects. Project maps will be produced using GIS and their storage location will be documented in the project file.

3. Planning efforts will follow the NEPA process. The interdisciplinary team will identify the purpose and need for the treatment, determine objectives, propose treatment alternatives, and develop monitoring protocols to evaluate if objectives are met or not. The team will consist of a combination of resources and support services staff for all prescribed fire projects. For mechanical and chemical treatments involvement of the zoned support services staff will be on an as needed basis.

4. The public, permittees, state, local, and federal agencies will be consulted during the NEPA process in accordance with the collaborative framework identified in the National Fire Plan's 10 – Year Comprehensive Strategy.

5. An appropriate decision document will be prepared depending on the level of NEPA documentation that is required. For example, a Decision Memorandum would be used for a CX, a Decision Record for an EA, and Record of Decision for an EIS.

6. For prescribed fire projects, Prescribed Open Burn Permits, Wyoming State Land Board approval, private land releases, grazing agreements and all other necessary permits and approvals will be completed prior to any ignition. Preferably, these permits, agreements and approvals will be obtained in the winter well before the spring burning period.

7. For all prescribed burn projects, a prescribed burn plan will be completed consistent with the Prescribed Fire Management Handbook (H -9214).

8. All prescribed burns will be conducted in accordance with the approved burn plan. Close consultation will occur between the support services staff and resources staff during the implementation phase. Both staffs will work together to make needed adjustments to ensure project objectives are met for both fire and non-fire projects.

9. All prescribed fire and non-fire treatments will have a monitoring protocol. The intensity of monitoring will vary depending on the project and post treatment land use. For example, an intensive monitoring protocol might include vegetation sampling before and after the treatment, grazing studies, and fuels surveys. The minimum monitoring standard

for all projects is described in **Monitoring of Fuels and Rehabilitation Treatments on page 47.**

10. All completed projects will be mapped in GIS.

11. Acres treated will be reported in the National Fire Plan Operations and Reporting System (NFPORS), RIPS, and MIS. The project files will be stored in the RIPs system at each field office. For prescribed fire projects, the field burn file and project planning file will be combined when the project is complete.

12. Reporting acres and maintenance of GIS data is a field office responsibility.

13. All treatments for the upcoming fiscal year will be entered in NFPORS by April 15 each year.

Primary burn windows in the FPU are spring and fall. During winters with light snow pack burning can be successfully conducted as early as February. Prior to these burning windows the public is made aware of upcoming project through general media releases and formal notifications in accordance with the burn plans.

The winter season is dedicated to planning future projects, developing and supervising contracts, evaluating monitoring information, pile burning, equipment maintenance.

Mechanical fuels contracts utilizing heavy equipment are often conducted during the winter to minimize soil disturbance. These contracts usually consist of mowing, thinning, and timber sales that may include with fuels treatments.

Approximately 15 - 20 projects a year take place. In recent years the zone has averaged about 2100 acres of mechanical and chemical treatments and 2000 acres of prescribed fire treatments. The relatively small size of the individual treatments is a caused by the need to negotiate grazing agreements for most projects. Local ranchers have limited ability to set aside large acreages that are necessary to accommodate treatments, especially prescribed burns.

In the future, it is anticipated that acreage would increase if grazing agreements can be reached to treat cheatgrass in the Nowater FMU.

The majority of the acres is condition class 2 and 3 and can be moved to condition class 2 after treatment.

In 2003 about 60% of the total treatment budget was implemented through contractors from the Rocky Mountain states. About 5% was implemented using local contractors from the Big Horn Basin in Wyoming.

Other than firewood, no market currently exists for mechanically treated by products. However, one project did produce large amount of wood chips which were given to the public for landscaping.

The zone has submitted two stewardship contracts in 2004.

Position needs to meet the fuels management work load are 4 Type II burn bosses, 6 ignition specialist and 6 holding specialist for prescribed fire. Planning and monitoring efforts require 3 Natural Resource Specialist with staff support from both resources and support services. One fire ecologist assists in project planning, evaluation and implementation. At least 4 CORs are required to supervise contracts that range form Risk Assessments and Mitigation plans to large scale thinning projects with heavy equipment. One fuels technician is required to supervise the summer fuels module, fill various roles in RX fire and mechanical treatment implementation and to assist in planning and monitoring efforts. The fuels program manger provides for program coordination and accountability, manages budget, reports accomplishments, and plans out year projects.

All of the above personnel fill various roles depending on the need and most are qualified to perform several different functions.

Maps displaying proposed and completed prescribed fire, mechanical, and chemical treatments are maintained in the GIS at the field office level.

2. Air Quality and Smoke Management

The Cloud Peak, Washakie, and Absaroka Beartooth Wilderness Areas are Class I air sheds. The entire zone is classified as a Class 2 air shed. Prevailing winds usually carry smoke away from the Washakie and Absaroka Beartooth Wilderness Areas. The Cloud Peak Wilderness area could be impacted from smoke produced from prescribed fires. Burns are ignited under conditions that facilitate high lofting into the transport layer and over the wilderness area. Any impacts are short term in nature.

Air quality across the FPU is generally good. There are no non-attainment areas in or near the zone.

Permits are obtained from the Wyoming Department of Environmental Quality for all prescribed burn projects each year. Project proposals with SASEM runs are submitted to DEQ in January each year.

d. Emergency Stabilization and Rehabilitation (ESR):

The annual workload associated with ESR is based on the existing fire history of the NZ. Based on the current policy associated with this effort, the NZ will continue efforts in ESR to “protect, and sustain ecosystems, public health, safety, and to help communities protect infrastructure.” The NZ has only written three ESR plans during the last nine seasons.

Any wildfire suppression damage will be funded by the suppression account and included in a short rehab plan before the fire team is disbanded. If it is determined during this effort that an ESR plan is needed, the state office ESR coordinator will be notified. A state mini BAER team

will be assembled to assist the FO in getting started on the effort and reviewing the completed plan for the State Director or Washington office approval.

The anticipated workload associated with this effort will consist of writing an ESR plan and a NEPA document for the rehab activities, and consulting with all appropriate agencies, land owners, and affected livestock operators. The NEPA documentation and consultation are up to date and in place for the use of chemicals to control noxious weeds associated with wildfire. The NZ will continue treatment in and around a disturbed area associated with wildfire until Resource Specialists determine there is no longer a threat of noxious weeds. If necessary, this treatment will continue beyond the time frame for ESR funding.

When preparing an assessment for rehabilitation efforts of wildfire, the NZ will identify and analyze OHV use in the burned area. If there is an apparent threat for OHV use to cause resource damage, the field office will restrict OHV use in a geographic area in and/or around the burn based on resource specialist's professional judgment. Main routes into the area should be signed with information regarding the restrictions, including the anticipated length of time that the changes would be in effect. In addition, the restrictions should be announced on the radio for an appropriate length of time and a news release published in the local news papers.

e. Monitoring of Fuels and Rehabilitation Treatments:

It is important that baseline monitoring efforts in the NZ take place prior to any prescribed fire, mechanical, chemical, and rehabilitation treatments. Post treatment monitoring is required to determine if direct treatment objectives and resource management objectives were met. Direct treatment objectives are usually attributes such as plant mortality, fuel consumption, burn pattern (mosaic) and total acreage. Resource management objectives usually concern post treatment vegetation attributes such as cover, frequency, production, density, and stocking level of a desired species. (See H-9214, Chapter 2, E-F.)

The minimum monitoring standard for prescribed burns is weather, observed fire behavior, and fire treatments objectives such as fuel consumption, fire severity, burn pattern, and burned acres. If fuel moisture values, such as live fuel moisture or soil moisture are included in the prescription, then those parameters should also be monitored.

In addition, all prescribed fire and non-fire fuels treatments will have:

- pre and post Fire Regime and Condition Class evaluation **(Appendix W)**

- at least one photo point location, which can be returned to, preferably taken in 4 opposing directions both pre and post treatment.

- North Zone Fuels Treatment Monitoring Form completed and filed in the RIPs project file **(Appendix X).**

- GIS data base that includes a completed attribute table and pre and post treatment shape files of the treatment perimeter **(Appendix Y).**

Assignment of monitoring responsibilities is a field office responsibility.

In addition, a representative number and type of treatments will be evaluated to document the effectiveness of modifying fire behavior. For example, the zone fuels specialist will calculate pre and post treatment fire behavior for a least each fuel model treated in the zone.

Although not required for every project, more detailed vegetative, soils and other resource data is desirable if time and personnel power allows. This is particularly true of treatment methods which have not been widely used in the zone. An effort should also be made to conduct monitoring on treatments which were completed prior to this fire plan. A number of prescribed burns were conducted in the late 1970's, early 1980's, and throughout the 1990's in the North Zone that have permanent monitoring studies in place. These studies offer ideal opportunities to monitor long term vegetative response to treatment that should be shared throughout the BLM.

Every effort should be made to integrate fuels and rehabilitation monitoring with other resource monitoring programs. For example, a permanently located monitoring study designed to monitor rangeland health may also serve as the monitoring study for a fuels project. If the study happens to fall within a treatment area and the ID team determines the study can serve a dual purpose, there would not be a need to install a new monitoring location just for the fuels project.

Monitoring of rehabilitation efforts would follow the same general protocol to the extent practical.

f. Community Assistance

There are 5 communities within the North Zone identified as at risk through RAMS and the Federal Register. Each community is in a different stage of assessment and mitigation and a description of such is as follows:

- The community of Thermopolis has had a risk assessment completed; mitigation plan outlined and has been fully implemented and completed.
- The community of Ten Sleep Canyon/Special Use Area has had a risk assessment completed; mitigation plan outlined and is currently being implemented and a target completion date is being determined.
- The community of the North Fork/South Fork of the Shoshone River is currently undergoing a risk assessment; upon completion, a mitigation plan will be formulated, a time table for implementation identified and a target date of completion set.
- The communities of Canyon Creek and the Middle Fork of the Powder River currently do not have a completed risk assessment nor mitigation plan; a risk assessment is planned for each community by FY05.

Rural fire assistance grants have been awarded to the communities of Thermopolis, Ten Sleep, Worland, Basin, Greybull, Shell, Manderson, Meeteetse, Cody and Clark. Specific items purchased have included PPE, communication components, firefighting equipment (i.e. hose, tools, etc.) and upgrades to apparatus. Grants have also been awarded to provide training from the North Zone BLM to the community fire districts. This training has accomplished significant improvement in the abilities of the communities and continues to be an ongoing project.

V: Organization and Budget

a. Budget and Organization

The current budget and organization is not sufficient to meet 100% of the objectives described within this FMP. We have a significant reduction in native herbaceous vegetation due to the invasion of alien annual species. Cheat grass has increased our fire frequency which in turn has increased the relative frequency of cheat grass. More initial attack resources are needed to manage the ever changing fire regime within the WY BLM Northern Zone and the increasing work loads associated with an expanding urban interface.

Currently the WY BLM North Zone is operating at the identified Maximum Efficiency Level (MEL). This level has been identified to provide safe, cost-effective support of land and resource management plans. This planned level identifies needed management oversight, required staffing, equipment and training standards. Due to the fact that WY BLM North Zone is at MEL and yet is not meeting objectives, re-evaluation of the identified MEL should commence.

The following charts show the current MEL by sub activity:

Sub-Act:2810	**Program Management**	**Fire Use and Fuels**	**Admin Support**	**Prevention**	**Init Atk/ Suppression**	**Total Dollars**
PERSONAL	65,280		21,612	10,909	287,642	385,443
EQUIPMENT	2,246		511		10,720	13,477
PROCUREMENT	1,225		16,336	1,532	28,179	47,272
CONTRACT	10,212		3,063			13,273
F.O.R.			3,222		54,133	57,335
TRAVEL	5,105		4,084	1,532	12,252	22,973
TRAINING	1,021		1,532	1,021	16,336	19,910
AVIATION						
TOTAL:	**85,087**		**50,360**	**14,994**	**409,242**	**559,683**

Sub-Act:2823	Program Management	Fire Use and Fuels	Admin Support	Prevention	Init Atk/ Suppression	Total Dollars
PERSONAL		89,813				89,813
EQUIPMENT		5,105				5,105
PROCUREMENT	5,105					5,105
CONTRACT			13,273			13,273
F.O.R.		15,315				15,315
TRAVEL		10,210				10,210
TRAINING		7,658				7,658
AVIATION						
TOTAL:	**5,105**	**128,101**	**13,273**			**146,479**

Sub-Act:2824	Program Management	Fire Use and Fuels	Admin Support	Prevention	Init Atk/ Suppression	Total Dollars
PERSONAL	216,925					216,925
EQUIPMENT						
PROCUREMENT	3,063					3,063
CONTRACT			24,504			24,504
F.O.R.	10,721					10,721
TRAVEL	15,315					15,315
TRAINING						
AVIATION						
TOTAL:	**246,024**		**24,504**			**270,528**

The following charts show the current organization:

Chart 1- Positions:

Resource	Current Staffing	Normal Activation	Sub Activity	Cost
FMO	1	Yearly	2810	48,000
FOS	1	Yearly	2810	37,602
Fuels Specialist	1	Yearly	2823	56,535
Center Manger	1	Yearly	2810	59,677
Dispatcher	1	June-Sept.	2810	20,459
Fuels Mod. Supervisor	1	April-Nov.	2823	34,000
Engine Mod. Supervisor	3	April-Nov.	2810	103,200
Assistant Mod. Supervisor	3	May-Oct.	2810	90,300
Seasonal Fire Crew	9	June-Sept.	2810	154,800
Seasonal Fuels Crew	9	June-Oct.	2823/2824	171,000
Natural Resource Specialist	3	Yearly	2824	190,000

Chart 2- Equipment:

Resource	Current Number	Sub Activity	Yearly Cost
Command Vehicles	2	2810	5,520
Fuels Specialist Vehicle	1	2823	3,360
CIDC Vehicle	1	2810	3,984
Fuels Chases	2	2823/2824	6,720
NRS vehicles	3	2824	8,280
Type VI engine	3	2810	42,271
Fire Chases	2	2810	6,720
Utility/Terra Torch Vehicle	1	2810	1,260

Bureau of Land Management Implemented Fire Resources - Attachment 1
Office: Wyoming North Zone

Resources	Quantity	Number of Personnel	Total Work Months
Number of Engines:	3	15	84
Number of Water tenders:			
Number of Dozers:			
Number of Tractors / plows:			
Number of Fire Boats:			
Number of Type 1 Crews:			
Number of Helitack Crews:			
Number of Fuels Crews:	1	10	54
Number of Type 2 Crews sponsored:			
Number of Smokejumpers (AK & NIFC only):			
Number of Fire Management Officers:	1		10
Number of Assistant FMOs / FCOs:			
Number of Fire Operations Specialists:	1		10
Number of Dispatchers:	2		14
Number of Other Aviation Staff (Aviation Mgr., Seat Mgr, etc.):			
Number of Mitigation/Education/Prevention Specialists / Techs:			
Number of Resource Specialists:	3		30
Number of Fuels Specialists:	1		10
Number of Other Fire Staff:	1		2
Number of PFT funded by Preparedness:	2		
Number of Career Seasonals funded by Preparedness:	7		
Number of Temporaries funded by Preparedness:	10		
Number of PFT funded by Fuels:	4		
Number of Career Seasonals funded by Fuels:	1		
Number of Temporaries funded by Fuels:	9		

* In completing this table, only include Preparedness resource numbers funded by Fire Preparedness (2810) and reflect the peak fire organization resources for the year. Do not include resources funded under severity. The fuels related resources numbers are to include the resource funded by the non-WUI (2823) and WUI (2824) programs.

b. Cooperative Agreements and Interagency Contracts

- Cody Interagency Dispatch Center – Gives Cody Interagency Dispatch Center authority to dispatch BLM Northern Zone resources for initial attack and fire support. The agreement includes delegation of authority to CDC for dispatch activities and Zone FMO to represent Field Office Managers on the oversight committee and multi-agency coordination (MAC).

- Fort Washakie Interagency Helicopter – Establishes the role and operation of the interagency helicopter with the BIA at Ft. Washakie; the BLM in Rawlins, Worland, and Cody; and the Forest Service—Bighorn and Shoshone National Forests.

- BLM/USFS – Defines initial attack responsibilities and exchange.

- Wyoming Interagency Cooperative Fire Protection Agreement – Outlines details of implementing the agreement through annual operating plans between federal and county wildland fire protection agencies (Park, Hot Springs, Big Horn and Washakie).

- Wyoming Interagency Fire Restriction Plan – Provides direction for when and how to implement fire restrictions or closures in conjunction with Wyoming cooperators.
  A number of agreements and memoranda of understanding are in place at the state and national levels that are not addressed in this Fire Management Plan. The agreements are incorporated in policy and addressed in manuals and handbooks.
- Wyoming Cody Dispatch Center Zone Incident Service and Supply Plan- This plan provides the general administrative procedures to support Incident Management Teams (IMT) operations and to ensure consistency while involved in incidents in the Cody Interagency Dispatch (CDC) Zone.

c. Equipment Rental Agreements

Copies of these agreements are available in the Wyoming Cody Dispatch Center Zone Incident Service and Supply Plan.

d. Contract Suppression and Prescribed Fire Resources

Copies of these contracts/agreements are available in the Wyoming Cody Dispatch Center Zone Incident Service and Supply Plan.

VI. Monitoring and Evaluation of the Zone Fire Plan

a. Annual Monitoring Requirements

The Northern Zone will monitor the effectiveness of this FMP in meeting fire and resource management objectives as outlined in the 2001 FWFMP, area RMPs and associated activity plans. Any shortages or conflicts will be resolved and the FMP will be revised as needed. Project level plans will be evaluated to ensure that the treatment/action meets the purpose and need for the project. The effectiveness of the FMP will be evaluated for both the fuels and fire suppression programs:

Fuels Treatment

The fuels treatment program involves reduction of natural fuels, activity-generated fuels such as slash, and restoration of fire adapted ecosystems. In addition to the monitoring protocols prescribed for fuels treatments in section e. Monitoring of Fuels and Rehabilitation Treatments: on page 47, the following program goals will be evaluated:

-Percentage of WUI vs. Non WUI treatments
The national program goal is 60% WUI and 40% non - WUI treatments.

-Percentage of treatments utilizing collaborative planning
The national program goal is for 60% of all treatments to be planned using a collaborative process.

Wildland Fire Suppression

Fire suppression direction is to protect life, property, and resource values from wildland fire in a cost-efficient and safe manner. The following criteria will be evaluation measurements:

-Budget and program are based on an analysis of efficiency
-Wildland fire suppression organization reflects the analysis based on current year funding
-Wildland fire suppression is based on least-cost plus damages with consideration for policy concerns
-Appropriate management response is commensurate with RMP direction
-In addition to RMP standards and guidelines, each incident will be monitored for effectiveness of the planned strategies and tactics; Zone wildland fires will have FMO or FOS documented site visits to review tactics and rehabilitation.

b. Reporting Requirements

All wildland fires are currently entered into the BLM Fire Reporting system (DI-1202).

Fuels and fire rehabilitation accomplishment and reporting are currently entered into the National Fire Plan Operations and Reporting System.

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LIST OF ACRONYMS

ACEC	Area of Critical Environmental Concern
ARPA	Archaeological Resources Protection Act
BLM	Bureau of Land Management
CIDC	Cody Interagency Dispatch Center
CFO	Cody Field Office
DNA	Documentation of NEPA Adequacy
EA	Environmental Assessment
EFSA	Escaped Fire Situation Analysis, now known as WFSA
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESR	Emergency Stabilization and Rehabilitation
FLPMA	Federal Land Policy and Management Act
FMP	Fire Management Plan
FMU	Fire Management Unit
FWFMP	Federal Wildland Fire Management Policy
GAP	Gap Analysis Project
LUP	Land Use Plan
MIST	Minimum Impact Suppression Tactics
MMA	Maximum Manageable Area
NEPA	National Environmental Policy Act
NFP	National Fire Plan
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service (now NOAA Fisheries)
NOAA	National Oceanic & Atmospheric Administration
OHV	Off-highway vehicle
RHCA	Riparian Habitat Conservation Area
RMP	Resource Management Plan
RX	Prescribed Burn
SRMA	Special Recreation Management Area
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WFIP	Wildland Fire Implementation Plan
WFO	Worland Field Office
WFSA	Wildland Fire Situation Analysis
WFURB	Wildland Fire Use for Resource Benefit
WSA	Wilderness Study Area
WUI	Wildland-Urban Interface
DGF	Wyoming Department of Game and Fish

GLOSSARY

Area of Critical Environmental Concern - Acreage within BLM public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historical, cultural, or visual values; fish and wildlife resources, or other natural systems or processes; or to protect life and safety from natural hazards.

Critical Habitat - Under the Endangered Species Act, critical habitat is defined as habitat of federally listed threatened or endangered species where those physical and biological features essential to conservation of the species are found and which may require special management considerations or protection. This habitat may currently be occupied or determined by the Secretary of the Interior to be essential for areas outside the species' current range.

Ecosystem - 1) A community of living plants and animals interacting with each other and with their physical environment; a geographic area where it is meaningful to address the interrelationships with human social systems, sources of energy, and the ecological processes that shape change over time.
2) The complex of a community of organisms and its environment functioning as an ecological unit in nature.

Endangered Species - Any species of animal or plant in danger of extinction throughout all or a significant portion of its range and so designated by the Secretary of Interior in accordance with the 1973 Endangered Species Act.

Environmental Assessment (EA) – Environmental Assessments were authorized by the NEPA of 1969. They are concise, analytical documents prepared with public participation that determine if an Environmental Impact Statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.

Environmental Impact Statement (EIS) – A detailed public document which complies with NEPA law and regulation; an EIS describes a major Federal action which significantly affects the quality of the human environment, provides alternatives to the proposed action, and analyzes the effects of the proposed action.

Fire Frequency (Fire Return Interval) - How often fire burns a given area; often expressed in terms of fire return intervals (e.g., fire returns to a site every 5-15 years).

Fire Management Plan - A strategic plan that defines a program to manage wildland and prescribed fires based on an area's RMP. A Fire Management Plan must provide for firefighter and public safety; include fire management strategies, tactics, and alternatives; address values to be protected and public health issues; and be consistent with resource management objectives, activities of the area, and environmental laws and regulations. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

Fire Management Unit – A land management area definable by objectives, management constraints, topographic features, access, values to be protected, political boundaries, fuel types, and fire regime groups; that set it apart from the management characteristics of an adjacent FMU.

Fire Regime - Periodicity and pattern of naturally occurring fires in a particular area or vegetative type, described in terms of frequency, biological severity, and area of extent.

Fire-Adapted Ecosystem - An ecosystem with the ability to survive and regenerate in a fire-prone environment.
Fuel Reduction - Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

Hazardous Fuels - A fuel complex defined by kind, arrangement, volume, condition, and location that forms a special threat of ignition or of suppression difficulty.

Interdisciplinary Team - A group of individuals with different specialized training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one discipline is sufficiently broad to adequately solve the problem; through interaction, participants bring different points of view and a broader range of expertise to bear on the problem.

Maximum Manageable Area - The maximum manageable area in a Wildland Fire Implementation Plan designates the ultimate acceptable size for a given wildland fire managed for resource benefits. It provides for a closely directed fire management application in a specific area defined by resource objectives, fire and weather prescription elements, social needs, political considerations, and management capability.

Noxious Weeds - Any plant designated by a federal, state, or county government to be injurious to public health, agriculture, recreation, wildlife, or any public or private property. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host for serious insects or diseases, and generally non-native.

Preparedness - Activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination.

Prescribed fire (RX) - Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist and NEPA requirements must be met prior to ignition.

Prescribed Fire Plan (Burn Plan) – This document provides the prescribed fire burn boss information needed to implement an individual prescribed fire project.

Prescription - Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Prevention - Activities directed at reducing the number of person-caused fires, including public education, law enforcement, dissemination of information, and the reduction of hazards.

Rehabilitation - The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.
Resource Management Plan - A document prepared by BLM Field Office staff with public participation and approved by the State Director that provides general guidance and direction for land management activities.

Riparian Habitat Conservation Areas - Portions of watersheds where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecological functioning is crucial to maintenance of the stream's water, sediment, woody debris, and nutrient delivery systems.

Sensitive Species - Those plant and animal species identified by the BLM State Director as sensitive, usually in cooperation with the State Agency responsible for managing the species. Sensitive species are also defined as those (a) which are under status review by the USFWS or NOAA Fisheries; or (b) whose numbers are declining so rapidly that Federal listing may become necessary; or (c) with typically small and widely dispersed populations; or (d) inhabiting ecological refugia of other specialized or unique habitats.

Special Recreation Management Area – BLM administrative units established to direct recreation program priorities, including the allocation of funding and personnel, to those public lands where a commitment has been made to provide specific recreation activities and experience opportunities on a sustained yield basis.

Suppression – All the work of extinguishing or containing a fire, beginning with its discovery.

Threatened Species - Any species likely to become endangered within the foreseeable future throughout all or a significant portion of its range and that has been designated in the Federal Register by the Secretary of Interior as such.

Watershed - The area of land bounded by a divide, that drains water, sediment, and dissolved materials to a common outlet at some point along a stream channel, or to a lake, reservoir, or other body of water; also called drainage basin or catchment.

Wilderness Study Area - A roadless area or island that has been inventoried and found to have wilderness characteristics and is being subjected to planning and public review to determine wilderness suitability.

Wildland - An area in which development is essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities; structures, if any, are widely scattered.

Wildland Fire for Resource Benefit (also known as Wildland Fire Use) - The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in FMPs.

Wildland Fire Implementation Plan - A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.

Wildland Fire Situation Analysis – A decision making process that evaluates alternative management strategies against selected safety, environmental, social, economic, political, and resource management objectives.

Wildland-Urban Interface - The line, area, or zone where structures or other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Attachment 1.

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AVIATION PLAN

Worland and Cody Field Offices

Routine flying is far safer than traveling by automobile, measured by number of deaths or injuries per passenger mile. However flying is inherently unsafe because the flight environment is unforgiving of mistakes. Much of the flying done by BLM employees is not routine and is potentially much more threatening to safety than the normal passenger transport that provides comforting accident statistics. Most of our flying is at low altitude, in terrain hazardous to flight, or at remote locations where communications and dealing with emergency situations is difficult. Because of our special needs, some of our flying is done under exemptions from regulations which govern usual flight activities.

For reasons of safety and fiscal and statutory compliance, a protocol has evolved to direct flight operations conducted by agencies. This aviation plan describes the structure of our aviation organization, and policies and procedures for use of aircraft to ensure our aircraft use is safe, efficient and in compliance with directives governing Bureau aircraft use.

AVIATION PLAN ORGANIZATION

The Office of Aircraft Services, located in Boise, is responsible for Department-wide functions related to aircraft services and facilities. Much of the way we perform our aviation activities is pursuant to directives originating from this office. OAS functions include, among other things:

1. Procuring commercial aviation services, DOI-owned aircraft, and other related services in support of Bureau aviation use.

2. Establishing standards governing operational procedures, aircraft maintenance, and qualifications and proficiency standards for aircrew and maintenance personnel.

3. Development and implementation of aviation safety programs, accident/incident/hazard reporting systems, and aviation user training programs.

This is not an inclusive list. When we use aviation services we work through OAS.

The BLM National Aviation Office is also located at Boise. Aviation policy specific to the BLM originates with this office.

The BLM State Director is responsible for all aviation activities within his jurisdiction. State Directors must assure that no person engages in aviation activities as a passenger, manager or crew member without required training specific to the mission and level of responsibility. Each appoints a State Aviation Manager to provide staff assistance on all aviation matters.
The Field Manager is responsible for planning and conducting aviation activities within his jurisdiction. Each assigns an Aviation Manager to provide staff assistance on aviation matters.

The Aviation Manager serves as the principal aviation professional for the field office(s) and is responsible for aviation matters within the local office jurisdiction. These responsibilities include oversight of local aviation operations and identification and procurement of necessary aviation training for North Zone personnel.

AVIATION POLICY AND DIRECTIVES

Except during life threatening emergencies, Bureau aircraft use is subject to the following general policy:

A. Flight operations using government owned, contracted, or chartered aircraft will be accomplished with safety as the prime consideration.

B. Personnel performing aviation functions shall meet the requirements of Departmental Manuals and recognized Bureau standards.

C. The aviation management program will subscribe to the United States aviation industry quality standards for operations, maintenance and training.

D. The aviation organization will be developed and maintained to the most efficient level appropriate for the BLM mission.

E. Line management has the responsibility to enhance the BLM mission through efficient aircraft utilization. Field offices are empowered to accomplish their mission with undue restriction, regulation or oversight.

F. The BLM shall not intentionally compete with private industry. If the mission is proprietary to the government, can't be effectively accomplished by commercial sources, or service cost is excessive, the Bureau may consider use of government owned or operated aircraft.

Bureau aviation activities are subject to a variety of directives, originating both within and outside of the Bureau. Attachment 1 lists most of those affecting us. Most relevant to our operations are Departmental Manual and Bureau Manual sections prescribing DOI and BLM aviation management respectively. The former includes a number of specific subject handbooks, e.g. *Aviation Life Support Equipment* (PPE) and *Aviation Transportation of Hazardous Materials*. Additionally, aviation and fire activities, which are often interagency undertakings, are increasingly conducted according to interagency guidance. Those interagency guides which have been adapted by the Bureau become mandatory for our operations. A significant example is the *Interagency Helicopter Operations Guide*, but there are a number of others.

FIELD OFFICE AIRCRAFT USE

APPROVED AIRCRAFT: Except for regularly scheduled commercial flights, aircraft we may use are only those certified for our use by the Office of Aircraft Services or by the U.S. Forest Service. These aircraft will have on board an **Airplane** or **Helicopter Data Record** card, specific to that aircraft and describing the tasks that aircraft may do for us. The presence of an aircraft data card issued by OAS indicates that procurement arrangements are in

place for the use of that aircraft by DOI agencies; this is not true of aircraft data cards issued by the U.S.F.S. Consequently, except for aircraft use that can be charged to a wildfire or other incident number, we cannot use aircraft that have been certified only by the U.S.F.S.
Occasionally we have an opportunity to use a civil, i.e. non-governmental, aircraft for the mutual benefit of the government and the cooperating party making the aircraft available. This may be done providing there is no cost to the government, and OAS has ensured that the aircraft and pilot meet the standards necessary for us to utilize them.

APPROVED PILOTS: Pilots authorized to work for us are issued **Interagency Airplane Pilot** or **Helicopter Pilot Qualification** cards by either OAS or the U.S.F.S. We may use pilots certified by either agency. These cards list the missions the pilots may do for us, and we may not use them for missions not specifically identified on the cards. The requirement to use only agency-certified aircraft and pilots to conduct Bureau business may not be circumvented, for example by taking a short period of annual leave to conduct a flight.

AUTHORIZED PASSENGERS: An authorized passenger may be anyone on board a government flight whose presence enhances accomplishment of a Departmental program. This could include federal, state and local agency employees, volunteers and private citizens. Conversely, unauthorized passengers would be people whose presence on board the aircraft would serve no official Departmental purpose. Volunteers may not participate in special use flights (defined below).

SCHEDULING FLIGHTS: Requests for aircraft use, except for wildfire incidents, should be made through the zone aviation manager. This provides an opportunity to match the aircraft to the mission, ensure the pilot and aircraft ordered are certified to work for us, and provides an opportunity for oversight required by Departmental and Bureau directives. **If the zone aviation manager is unavailable, arrangements may be made through the state aviation manager. If both are unavailable aircraft may be ordered through Cody Interagency Dispatch Center.** Flight requests associated with wildfire will normally be handled through CDC.

SPECIAL USE ACTIVITIES: Non-routine flight operations requiring special consideration due to their functional use are special use flights and require preparation of a special use plan, approved by the respective field manager. This applies to all of our helicopter use, and may apply to some of our fixed wing mission flights as well. Low level flight, i.e. below 500 feet, is special use flight, but for the North Zone is limited to helicopters only. It is North Zone policy that 500 feet above ground level is the minimum altitude for fixed wing flight. Everyone on board a special use flight must be addressed in the special use plan. Special use flights are subject to specific clothing and PPE requirements described below.

RISK ASSESSMENT: Risk assessment is a subjective analysis of the physical and procedural hazards associated with a proposed flight. This is done by identifying the risks, evaluating the magnitude of these risks and determining possible mitigation, with the objective of comparing the risks assumed with the anticipated benefits of the flight. A variety of risk assessment methods and matrixes exist. Some form of this procedure should take place, even if informally. Attachment 3 provides samples of risk assessment and go/no go formats.

TRAINING: Departmental and Bureau Manuals require that participants in aviation activities be provided training appropriate to the flight activity being undertaken. In practice this means anyone participating in other than point-to-point flights should attend a basic airplane/helicopter safety course (OAS course No. B-3) at least every third year. In circumstances where an individual who has not had this training will be a passenger on a special use flight, someone that has had the training must attend the loading and unloading of the passenger and cargo, or must also be on the flight. This training is recommended for anybody having anything to do with aviation activities, and is available locally at least every third year.

ORDERING AND USING AIRCRAFT

BEFORE THE FLIGHT

1. Request the flight on Bureau Form 9400-1a, available from the aviation manager. It is helpful to do this several days in advance, with more time required for special use flights. Particular aircraft are often unavailable on short notice. On the form describe the purpose of the flight, passengers, desired dates and times (alternative dates are helpful), special needs, e.g. aircraft mounted GPS equipment or specific pilot or aircraft, etc. A cost code to charge the flight to is required. If weights are relevant, which they usually are, weights of passengers and gear will be needed. If the flight is other than point-to-point a map of the general area of operation is useful. Administrative flights, i.e. point-to-point passenger transport, are subject to mandatory cost comparisons and documentation.

2. If the flight will be a special use flight, a special use plan must be prepared. The aviation manager can help with this. Anticipate the need for more lead time for this.

3. Obtain personal protective equipment (PPE) necessary for the flight. If the flight will begin early it would be prudent to get the equipment the previous day. Some flights may require nothing extraordinary. Some special use flights and all helicopter flights require use of a full complement of PPE. For these flights all passengers must avoid garments of synthetic fabrics and must wear lace-up leather boots, a nomex flight suit, nomex or leather gloves, and a flight helmet. In the Worland Field Office flight helmets, flight suits and gloves and earplugs are available from the aviation manager, or from the Lead Support Services Specialist. The Cody Field Office has a separate cache of flight gear. For all winter flights of any kind, bring whatever gear needed to protect yourself from cold for an extended period of time.

4. Obtain radios for flight following, i.e. for ongoing communication of the location of the aircraft in flight. Most, but not all, vendors will have all that is needed as standard equipment on the aircraft, but an additional hand held radio carried along may prevent the termination of a flight in the event of a radio equipment failure. If the vendor does not have what we need we will have to provide our own. Flight following will normally be done with Cody Interagency Dispatch Center. They will do this outside of normal working hours if needed. The aviation manager will make arrangements for flight following.

5. Obtain aerial hazards maps from the aviation manager. These are for the pilot to see during the pre-flight briefing. These show towers, power line corridors, etc. and the location and dimensions of the military training routes crossing the Big Horn Basin.

6. On the day of the planned flight, show up at the airport or rendezvous location early enough to provide for an unhurried pre-flight briefing. The briefing is a two-part enterprise; the passenger briefs the pilot on the mission, and the pilot briefs the passengers about the aircraft and its operation.

   FAA regulations and Departmental directives require that the pilot provide a briefing for the passengers.. The pilot should show his OAS/FS pilots card and should point out the OAS/FS-issued aircraft data card on the aircraft. These are issued annually so should be checked for currency and to verify that both are certified for the task. His briefing should address safety procedures and equipment, emergency procedures and survival equipment.

   If multiple passengers are involved, one must act as chief of party. This person represents the group to the pilot, assembles the passengers for boarding, checks the aircraft and pilot cards, provides manifests to the pilot and to dispatching and receiving units, makes necessary contact before and after the flight, signs flight invoices if needed, and in general attends to the welfare of the other passengers. If the flight is point-to-point the chief of party must ensure a FAA flight plan has been filed, unless other flight following

arrangements have been made. Laminated wallet-sized *Aviation User Checklist* cards which describe briefing items and chief of party duties are available from the aviation manager.

The briefing for the pilot should be as explicit and detailed as possible. The more clearly he understands the mission, the better able he will be to provide the service we need. This is also the time to discuss flight following and clarify how this will be handled.

If the pilot appears fatigued, question him about it, especially during periods of high fire activity. Pilots we use are limited to eight hours of flying per day and fourteen-hour work days. There are other limitations as well. These are described in Attachment 2. No matter what is specified by directives, if you are confronted by a pilot you think is unfit or unprepared to fly, don't fly with him. You may always decline a flight.

Occasionally vendors have been asked to attach cameras or antennas to the exterior of the aircraft. Don't ask them to do this; such attachments violate our directives and some are violations of Federal Aviation Regulations. GPS devices do not need to have antennas outside the aircraft to be effective and most aircraft are now equipped with their own.

A list of substances and devices that are regarded as hazardous materials when transported by air is surprisingly inclusive. They include, among other things, all kinds of batteries, fuels, explosives, almost any aerosols or compressed gases (especially pepper spray and tear gas), fusees, heat detection devices and ammunition. A procedure has been developed for carrying these items on aircraft, and is described in the interagency handbook *Aviation Transport of Hazardous Materials*. This handbook requires the pilot be informed in writing when anything identifiable as hazardous material is placed on an aircraft.

7. On single-engine fixed-wing aircraft the passengers must be aboard and the doors closed before the engine is started. Likewise, the engine must be stopped before the doors are opened and they depart the aircraft. On Interior Department flights, boarding and departing multi-engine fixed-wing aircraft may take place with engines running, provided there are no engines operating on the side where this activity is occurring, and the pilot is at the controls. This is different from U.S.F.S. flights, where boarding and departing are not permitted if any engines are operating.

DURING THE FLIGHT

1. Establish flight following with Cody Interagency Dispatch Center upon departure. A phone call to them before departure is helpful if this is available. A national flight following frequency of 168.650 kh is available. This is intended for cross-country flights but local use is so minor that it may sometimes be used without interfering with other traffic. CDC can suggest alternatives regarding radio frequencies. Some vendors have external antennas with cables that can be connected to our hand-held radios, so if aircraft radios do not suit our needs, we may obtain serviceable communications with our own equipment. If our own radios are to be used, needed frequencies may need to be installed.

   If contact with CDC cannot be maintained, alternatives may be available. Flight following may be possible with either Cody or Worland Field Offices. Consider this only if CDC is unavailable. Flight following consists of describing the location and heading of the aircraft at regular intervals not to exceed 15 minutes. The contact should be initiated from the aircraft, not from CDC. The purpose is to make the aircraft less difficult to find, should it be forced down. Most aircraft are now equipped with GPS devices and can provide precise locations. If radio contact cannot be maintained, terminate the flight and contact the flight following station by phone as soon as possible.

A plan for dealing with overdue or missing aircraft has been developed for the North Zone. Aircraft are overdue when communication has not occurred for longer than fifteen minutes. When 30 minutes have elapsed without contact, it will be regarded as a missing aircraft. This will be dealt with as prescribed in the *Aviation Incident/Accident Response Guide*, and may involve launching a search aircraft.

2. Wear your personal protective equipment. Specific PPE requirements are to be found in the interagency *Aviation Life Support Equipment Handbook*. Be protective of your hearing around aircraft, especially helicopters, which cause rapid, permanent hearing loss in the voice frequency range.

3. Assist the pilot in detecting aerial hazards. If low level flight is involved be particularly alert for wires. Point out other aircraft, birds, towers or anything that may be a danger to the aircraft. The most effective method of avoiding aerial hazards is still see and avoid. Two military training routes cross the Big Horn Basin. These routes are operational twenty-four hours a day and are potentially more than thirteen miles wide in places. They are commonly occupied at altitudes below 500 feet. Many people think military aircraft have technical means to readily detect other aircraft. Most do not and avoid collisions the same way we do. Your pilot will appreciate another set of eyes.

4. The pilot has ultimate authority when airborne. Flying the aircraft and activity therein is his responsibility; regarding these things he is in charge. On the other hand we are paying for the flight so if we are not getting the services we need, talk to the pilot about it.

5. As a result of accidents occurring in congested airspace near airports, the concept of a sterile cockpit has developed. The intent is to cease unnecessary conversations on the radio and in the cockpit during takeoffs and landings and otherwise near airports, so the pilot may fly without distractions.

6. Don't: - ask the pilot to descend below 500 feet in a fixed wing aircraft. He probably would but he shouldn't.

   - manipulate aircraft controls, even if offered by the pilot. This violates Departmental directives.

   - remain on board the aircraft during refueling, or assist with refueling.

   - ask the pilot to do something he is uncomfortable with. If he is uncomfortable with it you should be also.

   - begin a flight in the dark or conclude one after dark in a single-engine aircraft. We may fly single-engine vendor aircraft only during daylight hours, defined as from a half -hour before official sunrise to a half-hour after official sunset.

AFTER THE FLIGHT

1. When the flight is completed, the vendor is paid through the use of the triplicate form *AIRCRAFT USE REPORT*, Form No. OAS- 23. The pilot should have a pad of these and will fill out the form. The passenger or chief of party need only verify the services provided, initial in the "Signed Received" column, and bring the white ("Original - OAS Copy") and yellow ("User Copy") copies back to the aviation manager. The vendor retains the blue copy.

   The aviation manager will verify the information and forward the document to OAS for payment. OAS pays the vendor and then bills the field office according to the charge code provided on the Flight Request Form and entered onto the OAS-23. A copy will also go to the state aviation manager.

2. If anything was observed during the flight that should be added to the aerial hazards map, please inform the aviation manager.

3. A SAFECOM, or aviation Safety Communiqué is a method of identifying potential or actual threats to aviation safety and to document incidents where safety has been compromised. This is done on an inter-agency form, FS 5700-14/OAS-34. Typically these forms are used to report the following types of situations:

- unsafe actions by pilots, fuelers, aviation users;

- failure of passengers or vendor personnel to use required PPE;

- non-compliance with regulations or directives;

- problems with policies and directives which may cause threats to aviation safety;

- any situation, practice or condition which may compromise aviation safety.

Additionally, SAFECOMS are used to document aircraft maintenance which is other than routine, and aviation incidents causing minor aircraft damage or minor injuries, i.e. requiring first aid only.

Besides identifying obvious dangers, SAFECOMS are a means of illuminating potential problems which become apparent only in the aggregate, i.e. by identifying trends. For example, a minor maintenance problem with an aircraft assumes greater significance if several SAFECOMS disclose that this problem is common to many aircraft of the same type. Or a forgivable error by a pilot may suggest remedial action if other SAFECOMS show this pilot to be prone to errors.

If you have seen or experienced something having to do with a flight or with any other aspect of aviation operations that you are uncomfortable with, don't ignore it. A conversation with the pilot or others may help. If not , complete a SAFECOM. It may be useful to discuss the situation with the local or state aviation manager first, but this is not required; anyone may submit a SAFECOM. Whether submitted electronically or as a hard copy, the form is in a simple, self-explanatory, fill-in-the-blank format. The OAS home page provides a means of submitting one electronically. The e-mail address for OAS is given at the bottom of Attachment 1.

3 Attachments:

1 - Directives (1p)
2 - Pilot Duty Limitations (1p)
3 - Risk Assessments (2pg)

DIRECTIVES

A. Federal Aviation Regulations, with authorized exceptions.

B. GSA Federal Property Management Regulations - Subchapter G: Aviation, Transportation, and Motor Vehicles.

C. (1) OMB Circular A-76: Performance of Commercial Activities.

"..., it has been and continues to be the general policy of the Government to rely on commercial sources to supply the products and services the Government needs."

(2) OMB Circular A-123: Internal Control Systems.

"Agencies shall maintain effective systems of accounting and administrative control."

(3) OMB Circular A-126: Improving the Management and Use of Government Aircraft.

"...prescribes policies to be followed by Executive Agencies in acquiring, managing, using, accounting for the costs of, and disposing of aircraft."

D. Departmental Manual, Part 112, Chapter 12 - Office of Aircraft Services authority and organization.

E. Departmental Manual, Parts 350-354 - DOI Aviation Management.

F. BLM Manual, Section 9400 - Aviation Management.

G. Interagency Guides - e.g. *Interagency Helicopter Operations Guide, Interagency Airspace Coordination Guide,* etc.

There are other interagency guides that have formally adapted as Bureau policy. Some of these deal with aviation resources and uses not normally dealt with at the field office level.

As noted previously, in addition to the interagency guides, OAS has issued a number of handbooks which have been adapted by the BLM are thereby Bureau policy.

All of the documents listed above are available from the zone aviation manager, or form the state aviation manager. Additionally, the OAS has a web site at http://www.oas.gov/ Among other things available here are full texts of the Departmental Manuals, including the handbooks referred to above, fill-in-the-blanks SAFECOMS, and links to other aviation sites.

(Attachment 1)

PILOT DUTY LIMITATIONS

8 hours maximum flight time per day.

14 hours maximum duty day length.

10 consecutive hours of rest prior to any duty day.

42 hours maximum flight time during any consecutive six-day period. If 36 or more hours of flight time have been accumulated in any six-day period, the pilot shall have the next day off, and a new six-day period cycle will begin.

All flight crew members shall have **two days off** within any 14 consecutive calendar days.

(Attachment 2)

(Attachment 3-1)

RISK ASSESSMENT is the subjective analysis of physical hazards and operational procedures to arrive at a GO/NO-GO decision. Risk assessments support informed GO/NO-GO decisions which are the responsibility of line management. The pilot retains the final authority for a NO-GO decision when safe operation of the aircraft is a factor.	
If you answer <u>NO</u> to any of the elements, stop and re-evaluate.	The following is designed to provide the aircraft user or manager a checklist to help determine a GO/NO-GO decision.

YES	NO	GO/NO-GO CHECKLIST
		1. Aircraft data card, checked, mission approved.
		2. Pilot qualification card, checked, mission approved.
		3. Pilot flight/duty limitations checked.
		4. Manifest completed and left at departure point.
		5. Weight and balance completed by pilot.
		6. Mission approved by management. PPE available and worn if needed.
		7. Pilot briefed by personnel on intended missions and hazards.
		8. Aircraft safety briefing provided to passengers.
		9. Personnel trained and qualified for mission.
		10. Flight plan completed; flight following procedures established and operational.
		11. Hazard map reviewed for low-level flights.
		12. Weather forecast received, winds within prescribed limits.
		13. Cargo weighed, checked and secured.
		14. Survival equipment available if required.

(Attachment 3-2)

METHOD	YES	NO
1. Is there an alternative method which would accomplish the mission more safely and/or efficiently (including accomplishment by ground methods)?		
2. Is the method selected approved and do detailed instructions for safe accomplishment exists?		

3.	Have adequate flight following and communications methods been established?		

	MEDIUM		
1.	Can factors of terrain, altitude, temperature, or weather which could adversely affect the mission's success be mitigated?		
2.	Will the mission be conducted at low (below 500 ft. AGL) or high altitudes? Can the objective be achieved by flying at a higher altitude?		
3.	If low level flight, have all known aerial hazards been identified during the planning process and are they known to all participants?		
4.	If there is a potential for an airspace conflict (military, media or sightseeing aircraft), have mitigation measures been taken?		
5.	Have adequate landing areas been identified and/or improved to minimum requirements?		

	MAN		
1.	Is the pilot properly carded for the mission to be conducted?		
2.	Will the flight be conducted within the pilot flight time/duty day requirements and limitations?		
3.	Have the minimum number of personnel necessary to accomplish the mission safely been assigned, and to they meet personnel qualifications and experience requirements?		
4.	Will adequate personnel (flight and ground crew) and pilot briefings be conducted prior to the flight?		
5.	Are users aware that the pilot-in-command has final authority over any operations conducted involving the aircraft or its occupants?		

	MACHINE		
6.	Is the aircraft capable of performing the mission in the environment (altitude, temperature, terrain, weather) where the operation will occur?		
7.	Is the aircraft properly carded for the mission?		

WYOMING BLM NORTH ZONE QUALIFICATION and CERTIFICATION COMMITTEE CHARTER

The Qualification and Certification Committee's main duty is to provide management oversight and review of the wildland and prescribed fire positions under their jurisdiction.

The Committee also:

- Certifies that qualifications generated by the Incident Qualification and Certification System (IQCS) or other agency systems for employees are valid by reviewing the training and experience of each employee.

- Determines if each employee possesses the personal characteristics necessary to perform the wildland and prescribed fire positions in a safe and efficient manner.

- Makes recommendations to the appropriate agency administrator or designee – who is responsible for final signature.

- Develops interagency training requirements and sponsors courses that can be offered locally.

- Ensures training nominees meet minimum requirements for attending courses.

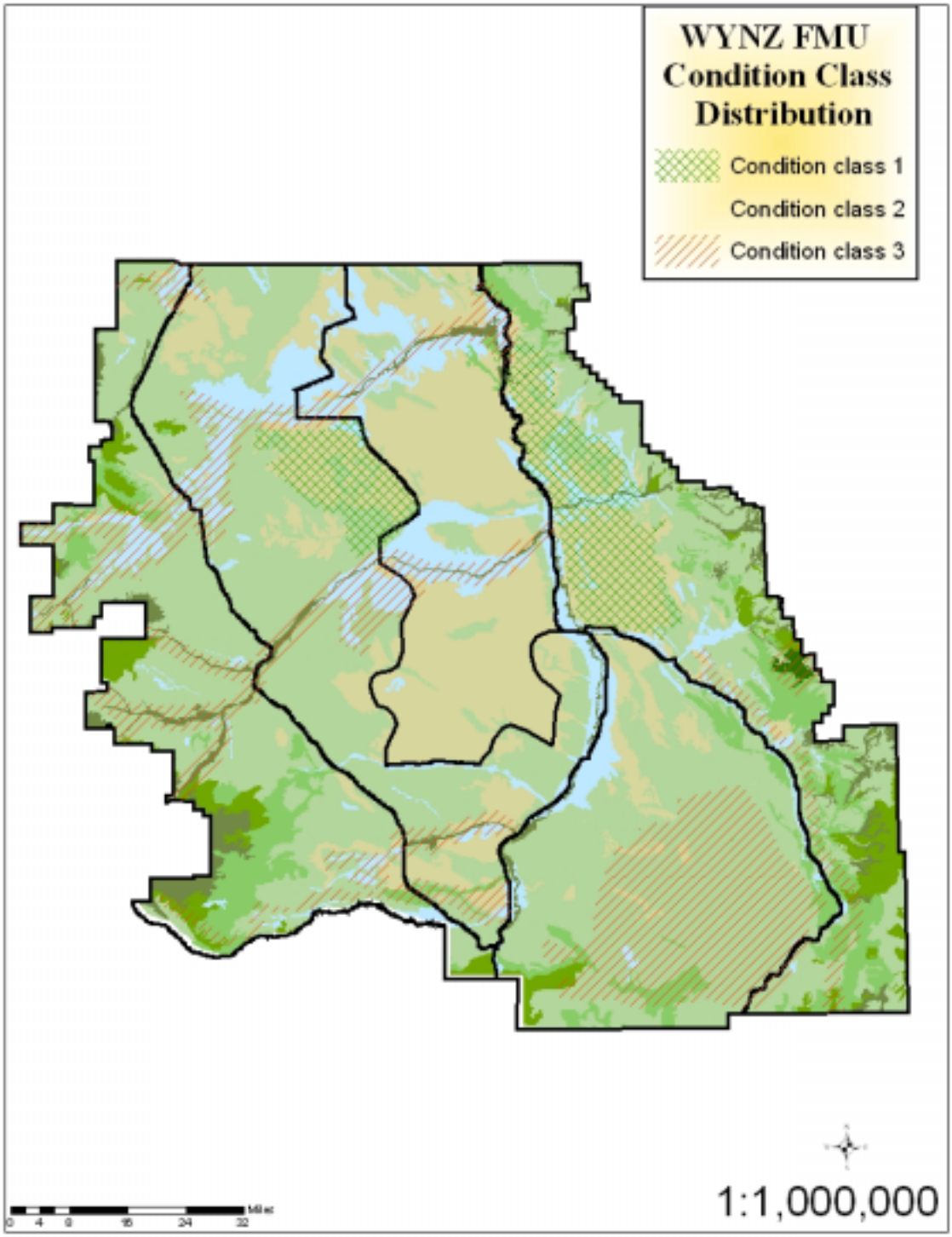
- Makes recommendations regarding the initiation of position task books.

- Examines current zone red card qualifications and insures that critical ICS positions are being developed to meet anticipated needs for local fires.

- Provides an open forum for employees to discuss their role in the fire and prescribed fire organizations and how to advance in a systematic format.

Attachment 2.

Attachment 3-1: *Condition Class Map and Table of WYNZ FMUs*


WYNZ FMU
Condition Class
Distribution
Condition class 1
Condition class 2
Condition class 3
1:1,000,000

Condition Class Table

Condition class is a description of ecosystem health defined in the Cohesive strategy as follows:

Condition Class 1: For the most part, fire regimes are within historical ranges. Vegetative composition and structure are intact. The risk of losing key ecosystem components from the occurrence of fire remains relatively low.

Condition class 2: In these areas fire regimes have been moderately altered from their historic range by either increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified for these acres.

Condition class 3: Fire regimes have been significantly altered from their historic return interval. The risk of losing key ecosystem components from fire is high. Fire frequencies have departed from historical ranges by multiple return intervals. Vegetative structure, composition, and diversity have been significantly altered. These acres have the greatest risk of ecological collapse.

Estimated Current Condition Class for NWFMZ Lands:

Condition Class 1	**165,435 Acres**
Condition Class 2	**4,047,554 Acres**
Condition Class 3	**1,289,561 Acres**

Attachment 3-2

Absaroka Front FMU Vegetation Types

and Acres by Ownership

VEGETATION TYPE	BLM ACRES IN FMU	BOR ACRES IN FMU	DOD ACRES IN FMU	FS ACRES IN FMU	NPS ACRES IN FMU	PRIVATE ACRES IN FMU	STATE ACRES IN FMU	TOTAL ACRES IN FMU	% FMU
DESERT SALT SHRUB	24,046	1,406	0	0	0	12,030	2,301	39,783	4
FOOTHILL MOUNTAIN SAGE AND SHRUB	50,782	546	0	720	0	107,640	40,782	200,470	19
JUNIPER AND LIMBER PINE	76,096	1,007	0	1	0	59,022	13,408	149,534	14
MIXED CONIFER, LODGEPOLE PINE, AND RIPARIAN ASPEN	28,420	0	0	5,430	0	0	8,829	42,679	4
PONDEROSA PINE	0	0	0	0	0	0	0	0	0
SAGEBRUSH SHRUB CRITICAL HABITAT	195,453	3,791	0	44	0	308,260	70,062	577,610	53
GREASEWOOD, BARREN, AND CROP	5,523	1,031	0	1	0	55,104	3,050	64,709	6
TOTAL	380,320	7,781	0	6,195	0	542,056	138,432	1,074,785	100

BLM = Department of the Interior, Bureau of Land Management
BOR = Department of the Interior, Bureau of Reclamation
DOD = Department of Defense
FS = Department of Agriculture, United States Forest Service
NPS = Department of the Interior, United States Park Service
Private = Deeded acres
State = State of Wyoming

Attachment 4-1

Basin Bottom FMU Vegetation Types

and Acres by Ownership

VEGETATION TYPE	BLM ACRES IN FMU	BOR ACRES IN FMU	DOD ACRES IN FMU	FS ACRES IN FMU	NPS ACRES IN FMU	PRIVATE ACRES IN FMU	STATE ACRES IN FMU	TOTAL ACRES IN FMU	% FMU
DESERT SALT SHRUB	573,837	19,563	3,543	0	6,995	38,903	27,687	670,528	72
FOOTHILL MOUNTAIN SAGE AND SHRUB	0	0	0	0	0	0	0	0	0
JUNIPER AND LIMBER PINE	5,325	0	0	0	1,021	1,034	116	7,496	1
MIXED CONIFER, LODGEPOLE PINE, AND RIPARIAN ASPEN	1,246	255	0	0	228	16,134	1,195	19,058	2
PONDEROSA PINE	0	0	0	0	0	0	0	0	0
SAGEBRUSH SHRUB CRITICAL HABITAT	25,271	812	0	0	128	9,046	1,038	36,295	4
GREASEWOOD, BARREN, AND CROP	17,907	1,863	0	0	1,905	169,733	5,101	196,509	21
TOTAL	623,586	22,493	3,543	0	10,277	234,850	35,137	929,886	100

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Attachment 4-2

Foothills Sagebrush FMU Vegetation Types

and Acres by Ownership

VEGETATION TYPE	BLM ACRES IN FMU	BOR ACRES IN FMU	DOD ACRES IN FMU	FS ACRES IN FMU	NPS ACRES IN FMU	PRIVATE ACRES IN FMU	STATE ACRES IN FMU	TOTAL ACRES IN FMU	% FMU
DESERT SALT SHRUB	379,829	29,048	0	0	0	51,679	24,589	485,145	37
FOOTHILL MOUNTAIN SAGE AND SHRUB	646	0	0	0	0	2,623	39	3,308	0.25
JUNIPER AND LIMBER PINE	5,029	0	0	0	0	2,305	103	7,437	0.50
MIXED CONIFER, LODGEPOLE PINE, AND RIPARIAN ASPEN	1,859	0	0	0	0	14,444	295	16,598	1.25
PONDEROSA PINE	0	0	0	0	0	0	0	0	0
SAGEBRUSH SHRUB CRITICAL HABITAT	398,742	23,107	0	0	0	177,015	41,388	640,252	48
GREASEWOOD, BARREN, AND CROP	4,052	2,957	0	0	0	154,217	4,600	165,826	13
TOTAL	790,157	55,112	0	0	0	402,283	71,014	1,318,566	100

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Attachment 4-3

Nowater FMU Vegetation Types

and Acres by Ownership

VEGETATION TYPE	BLM ACRES IN FMU	BOR ACRES IN FMU	DOD ACRES IN FMU	FS ACRES IN FMU	NPS ACRES IN FMU	PRIVATE ACRES IN FMU	STATE ACRES IN FMU	TOTAL ACRES IN FMU	% FMU
DESERT SALT SHRUB	201,593	671	0	0	0	10,826	13,675	226,765	21
FOOTHILL MOUNTAIN SAGE AND SHRUB	4,861	0	0	0	0	14,591	1,218	20,670	2
JUNIPER AND LIMBER PINE	47,674	0	0	0	0	41,716	13,571	102,961	10
MIXED CONIFER, LODGEPOLE PINE, AND RIPARIAN ASPEN	508	0	0	0	0	7,687	326	8,521	1
PONDEROSA PINE	0	0	0	0	0	0	0	0	0
SAGEBRUSH SHRUB CRITICAL HABITAT	429,895	207	0	0	0	157,447	55,120	642,736	60
GREASEWOOD, BARREN, AND CROP	3,102	474	0	0	0	52,506	5,485	61,567	6
TOTAL	687,633	1,419	0	0	0	284,773	89,395	1,063,220	100

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Private = Deeded acres
State = State of Wyoming

Attachment 4-4

Western Slope Big Horn FMU Vegetation Types and Acres by Ownership

VEGETATION TYPE	BLM ACRES IN FMU	BOR ACRES IN FMU	DOD ACRES IN FMU	FS ACRES IN FMU	NPS ACRES IN FMU	PRIVATE ACRES IN FMU	STATE ACRES IN FMU	TOTAL ACRES IN FMU	% FMU
DESERT SALT SHRUB	217,759	81	0	0	999	31,067	13,807	263,713	23
FOOTHILL MOUNTAIN SAGE AND SHRUB	52,215	0	0	441	0	116,532	15,170	184,358	16
JUNIPER AND LIMBER PINE	103,882	0	0	566	3,972	78,758	16,787	203,965	18
MIXED CONIFER, LODGEPOLE PINE, AND RIPARIAN ASPEN	27,521	0	0	82	96	46,603	4,174	78,476	7
PONDEROSA PINE	5,224	0	0	0	0	3,143	552	8,919	1
SAGEBRUSH SHRUB CRITICAL HABITAT	216,369	0	0	98	0	71,061	24,259	311,787	27
GREASEWOOD, BARREN, AND CROP	34,810	0	0	1	162	55,062	4,840	94,875	8
TOTAL	657,780	81	0	1188	5,229	402,226	79,589	1,116,093	100

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Attachment 4-5

Attachment 5.

Minimum Impact Suppression Tactics Guidelines

USDA Forest Service - Northern Region
1993

Note: The following pages are quoted directly from, and provide the majority of the content contained in, *Minimum Impact Suppression Tactics Guidelines* (USDA Forest Service - Northern Region 1993). Beginning and ending quotation marks are omitted, since the entire document is quoted; however, where only portions of the document are reproduced, deletions are indicated by an ellipsis (...). Some errors in the original document (word choice, grammar, punctuation, etc.) have been edited.

Preamble: The following Minimum Impact Suppression Tactics (MIST) guide is designed to assist Forest Service fire personnel when taking suppression action on wildfires located in wilderness, proposed wilderness or other lands with similar land management objectives. The guidelines are intended to reduce fire suppression impacts on the land while insuring the actions taken are timely and effective....

Concept: The concept of Minimum Impact Suppression Tactics (MIST) is to use the minimum amount of forces necessary to effectively achieve fire management protection objectives, consistent with land and resource management objectives. It implies a greater sensitivity to the impacts of suppression tactics and their long-term effects when determining how to implement an appropriate suppression response.... MIST is not intended to represent a separate or distinct classification of firefighting tactics, but rather a mindset of how to suppress a wildfire while minimizing the long-term effects of the suppression action.... The principle of fighting fire aggressively, but providing for safety first, will not be compromised. The key challenge to the line officer, fire manager, and firefighter is to be able to select the wildfire suppression tactics that are appropriate, given the fire's probable or potential behavior. The guiding principle is always "least cost plus loss" while meeting land and resource management objectives... These actions, or MlST, may result in an increase in the amount of time spent watching, rather than disturbing, a dying fire to insure it does not rise again. They may also involve additional rehabilitation measures on the site that were not previously carried out. When selecting an appropriate suppression response, firefighter safety must remain the highest concern. In addition, fire managers must be assured the planned actions will be effective and will remain effective over the expected duration of the fire....

Goal: The goal of MIST is to halt or delay fire spread in order to maintain the fire within predetermined parameters while producing the least possible impact on the resource being protected. These parameters are represented by the initial attack incident commander's "size-up of the situation" in the case of a new start, or by the "escaped fire situation analysis (EFSA)" in the case of an escaped fire.

It is important to consider probable rehabilitation needs when selecting the appropriate suppression response. Tactics that reduce the need for rehabilitation are preferred whenever feasible.

Suppression Responsibility

...safety is the highest priority. All action will be anchored to the standard fire orders and watch out situations. Safety will remain the responsibility of each person involved with the incident.

Initial/Extended Attack

Incident Commander - To understand and carry out an appropriate suppression response that will best meet the land management objectives of the area at the least cost plus loss. Insure all forces used on the fire understand the plan for suppressing the fire in conjunction with MIST.

Keep in communication with responsible fire manager or line officer to insure understanding and support of tactics being used on the fire. Evaluate and provide feedback as to the tactical effectiveness during and after fire incident.

Project Fire

Type I/II Incident Commander - To carry out instructions given by the responsible line officer, both verbally and through the Escaped Fire Situation Analysis (EFSA). Establish and nurture a close dialogue with the resource advisor assigned to the fire team. Review actions on site and evaluate for compliance with land line officer direction and effectiveness at meeting fire management protection objectives.

Responsible Line Officer - To transmit the land management objectives of the fire area to the fire team and to define specific fire management protection objectives. Periodically review for compliance.

Resource Advisor - To insure the interpretation and implementation of EFSA and other oral or written line officer direction are adequately carried out. Provide specific direction and guidelines as needed. Participate at fire team planning sessions, review incident action plans, and attend daily briefings to emphasize resource concerns and management's expectations. Provide assistance in updating the EFSA when necessary. Participate in incident management team debriefing and assist in evaluation of team performance related to MIST.

Guidelines

Following is a list of considerations for each fire situation.

Hot-Line/Ground Fuels

* Allow fire to burn to natural barriers.
* Use cold-trail, wet line or combination when appropriate.
* If constructed fireline is necessary, use only width and depth to check fire spread.
* Consider use of fireline explosives for line construction.
* Burn out and use low impact tools like swatter or 'gunny' sack.
* Minimize bucking and cutting of trees to establish fireline; build line around logs when possible.
* Use alternative mechanized equipment such as excavators, rubber tired skidders, etc. rather than tracked vehicles.
* Use high pressure type sprayers on equipment prior to assigning to incident to help prevent spread of noxious weeds.
* Constantly recheck cold trailed fireline.

Hot-Line/Aerial Fuels

* Limb vegetation adjacent to fireline only as needed to prevent additional fire spread.
* During fireline construction, cut shrubs or small trees only when necessary. Make all cuts flush with the ground.
* Minimize felling of trees and snags unless they threaten the fireline or seriously endanger workers. In lieu of felling, identify hazard trees with a lookout or flagging.

* Scrape around tree bases near fireline if it is likely they will ignite.
* Use fireline explosives for felling when possible to meet the need for more natural appearing stumps.

Mop-up/Ground Fuels

* Do minimal spading; restrict spading to hot areas near fireline.
* Coldtrail charred logs near fireline; do minimal tool scarring.
* Minimize bucking of logs to extinguish fire or to check for hotspots; roll the logs instead if possible.
* Return logs to original position after checking and when ground is cool.
* Refrain from making bone yards; burned and partially burned fuels that were moved should be returned to a natural arrangement.
* Consider allowing large logs to burn out. Use a lever rather than bucking to manage large logs which must be extinguished.
* Use gravity socks in stream sources and/or a combination of water blivits and fold-a-tanks to minimize impacts to streams.
* Consider using infrared detection devices along perimeter to reduce risk.
* Personnel should avoid using rehabilitated firelines as travel corridors whenever possible because of potential soil compaction and possible detrimental impacts to rehabilitation work, i.e., water bars.

Mop-up/Aerial Fuels

* Remove or limb only those fuels which, if ignited, have potential to spread fire outside the fireline.
* Before felling consider allowing ignited tree/snag to burn itself out. Ensure adequate safety measures are communicated if this option is chosen.
* Identify hazard trees with a lookout or flagging.
* If burning trees/snags pose a serious threat of spreading fire brands, extinguish fire with water or dirt whenever possible. Consider felling by blasting when feasible. Felling by crosscut or chainsaw should be the last resort. Align saw cuts to minimize visual impacts from more heavily traveled corridors. Slope cut away from line of sight when possible.

Logistics

Campsite Considerations

* Locate facilities outside of wilderness whenever possible.
* Coordinate with the Resource Advisor in choosing a site with the most reasonable qualities of resource protection and safety concerns.
* Evaluate short-term low impact camps such as coyote or spike versus use of longer-term higher impact camps.
* Use existing campsites such as reserved sites used by outfitters, if possible.
* New site locations should be on impact-resistant and naturally draining areas such as rocky or sandy soils, or openings with heavy timber.
* Avoid camps in meadows, along streams or on lakeshores. Locate at least 200 feet from lakes, streams, trails, or other sensitive areas.
* Consider impacts on both present and future users. An agency commitment to wilderness values will promote those values to the public.
* Lay out the camp components carefully from the start. Define cooking, sleeping, latrine, and water supply.
* Minimize the number of trails and ensure adequate marking.
* Consider fabric ground cloth for protection in high use areas such as around cooking facilities.

* Use commercial portable toilet facilities where available. If these cannot be used, a latrine hole should be utilized.
* Select latrine sites a minimum of 200 feet from water sources with natural screening.
* Do not use nails in trees.
* Constantly evaluate the impacts which will occur, both short and long term.

Personal Camp Conduct

* Use "leave no trace" camping techniques.
* Minimize disturbance to land when preparing bedding site. Do not clear vegetation or trench to create bedding sites.
* Use stoves for cooking, when possible. If a campfire is used, limit to one site and keep it as small as reasonable. Build either a "pit" or "mound" type fire. Avoid use of rocks to ring fires.
* Use down and dead firewood. Use small diameter wood, which burns down more cleanly. *Don't burn plastics or aluminum - pack them out with other garbage.
* Keep a clean camp and store food and garbage so they are unavailable to bears. Ensure items such as empty food containers are clean and odor-free; never bury them.
* Select travel routes between camp and fire and define clearly. Carry water and bathe away from lakes and streams. Personnel must not introduce soaps, shampoos or other personal grooming chemicals into waterways.

Aviation Management

One of the goals of wilderness managers is to minimize the disturbance caused by air operations during an incident.

Aviation Use Guidelines

* Maximize back haul flights as much as possible.
* Use long line remote hook in lieu of constructed helispots for delivery or retrieval of supplies and gear.
* Take precautions to insure noxious weeds are not inadvertently spread through the deployment of cargo nets and other external loads.
* Use natural openings for helispots and paracargo landing zones as far as practical. If construction is necessary, avoid high visitor use areas.
* Consider maintenance of existing helispots over creating new sites.
* Obtain specific instructions for appropriate helispot construction prior to the commencement of any ground work.
* Consider directional falling of trees and snags so they will be in a natural appearing arrangement.
* Buck and limb only what is necessary to achieve safe/practical operating space in and around the landing pad area.

Retardant Use

During initial attack, fire managers must weigh the non-use of retardant with the probability of initial attack crews being able to successfully control or contain a wildfire. If it is determined that use of retardant may prevent a larger, more damaging wildfire, then the manager might consider retardant use even in sensitive areas. This decision must take into account all values at risk and the consequences of larger firefighting forces' impacts on the land.

Consider impacts of water drops versus use of foam/retardant. If foam/retardant is deemed necessary, consider use of foam before retardant use.

Hazardous Materials

Flammable/Combustible Liquids

* Store and dispense aircraft and equipment fuels in accordance with National Fire Protection Association (NFPA) and Health and Safety Handbook requirements.
* Avoid spilling or leakage of oil or fuel (from sources such as portable pumps) into water sources or soils.
* Store any liquid petroleum gas (propane) downhill and downwind from firecamps and away from ignition sources.

Flammable Solids

* Pick up residual fusees debris from the fireline and dispose of properly.

Fire Retardant/Foaming Agents

* Do not drop retardant or other suppressants near surface waters.
* Use caution when operating pumps or engines with foaming agents to avoid contamination of water sources.

Fireline Explosives

* Remove all undetonated fireline explosives from storage areas and fireline at the conclusion of the incident and dispose of according to Bureau of Alcohol, Tobacco and Firearms (BATF) and Fireline Blaster Handbook requirements. Properly dispose of all packaging materials.

Fire Rehabilitation

Rehabilitation is a critical need. This need arises primarily because of the impacts associated with fire suppression and the logistics that support it. The processes of constructing control lines, transporting personnel and materials, providing food and shelter for personnel, and other suppression activities have a significant impact on sensitive resources, regardless of the mitigation measures used. Therefore, rehabilitation must be undertaken in a timely, professional manner.

During implementation, the resource advisor should be available for expert advise, support of personnel doing the rehabilitation work, and quality control.

Rehabilitation Guidelines

* Pick up and remove all flagging, garbage, litter, and equipment. Dispose of trash appropriately.
* Clean fire pit of unburned materials and fill back in.
* Discourage use of newly established trails created during the suppression effort by covering with brush, limbs, small diameter poles, and rotten logs in a naturally appearing arrangement.
* Replace dug out soil and/or duff and obliterate any berms created during the suppression effort.
* If impacted trails have developed on slopes greater than six percent, construct waterbars according to

the following waterbar spacing guide:

Trail Percent Grade	*Maximum Spacing (feet)*
6-9	400
10-15	200
15-25	100
25+	50

* Where soil has been exposed and compacted, such as in camps, on user-trails, and at helispots and pump sites, scarify the top 2 to 4 inches and scatter with needles, twigs, rocks, and dead branches. It is unlikely that seed and fertilizer for barren areas will be appropriate, in order to maintain the genetic integrity of the area. It may be possible, depending on the time of year and/or possibility of a rainy period, to harvest and scatter nearby seed, or to transplant certain native vegetation.
* Blend campsites with natural surroundings, by filling in and covering latrine with soil, rocks, and other natural material. Naturalize campfire area by scattering ashes in nearby brush (after making sure any sparks are out) and returning site to a natural appearance.
* Where trees were cut or limbed, cut stumps flush with ground, and scatter limbs and boles out of sight in an unburned area. Camouflage stumps and tree boles using rocks, dead woody material, fragments of stumps, bolewood, limbs, soil and fallen or broken green branches. Scattered sawdust and shavings will assist in decomposition and be less noticeable. Use native materials from adjacent, unimpacted areas if necessary.
* Remove newly cut tree boles that are visible from trails or meadows. Drag other highly visible woody debris created during the suppression effort into timbered areas and disburse. Tree boles that are too large to move should be slant cut so a minimal amount of the cut surface is exposed to view. Chopping up the surface with an axe or pulaski, to make it jagged and rough, will speed natural decomposition.
* Leave tops of felled trees attached. This will appear more natural than scattering the debris.
* Consider using explosives on some stumps and cut faces of the bolewood for a more natural appearance.
* Consider, if no other alternatives are available, helicopter sling-loading rounds and tops from a disturbed site when there has been an excessive amount of bucking, limbing and topping.
* Tear out sumps or dams, where they have been used, and return site to natural condition. Replace any displaced rocks or streambed material that has been moved. Reclaim streambed to its predisturbed state, when appropriate. Walk through adjacent undisturbed area and take a look at the rehabilitation efforts to determine success at returning the area to as natural a state as possible. Good examples should be documented and shared with others!

Demobilization

Because demobilization is often a time when people are tired or when weather conditions are less than ideal, enough time must be allowed to do a good job. When moving people and equipment, choose a method which is most efficient and has the least impact on the landscape and fire organization mission. An on-the-ground analysis of "How Things Went" will be important.

Post-Fire Evaluation

Post-fire evaluation is important for any fire occurrence so management can find out how things went in order to identify areas needing improvement, formulate strategies and produce quality work in the future.

This activity is especially important in wilderness and like sensitive areas due to their fragility and inclination to long-term damage by human impacts.

Resource advisors and functional specialists such as wilderness rangers will be responsible for conducting the post-fire evaluation. They are the people who have the experience and knowledge to provide information required to make the evaluation meaningful and productive.
Post-fire evaluation will consist of data collection, documentation and recommendations. This process and report will, in most cases, be fairly simple and to the point. It should be accomplished before an overhead team departs from the fire. The evaluation emphasis should be on the MIST actions and not on the effects of the fire.

Evaluation will be completed on wildfires exceeding 100 acres and on a sample of fires less than 100 acres. It is appropriate to evaluate a diversity of fires, ranging from a spot fire suppressed by smokechasers or jumpers to a large project fire managed by an overhead team.

Region 1 is proposing a post-fire evaluation of sites, which includes data collection on campsites and helispots, using Cole's Site Inventory System report INT-259, "Wilderness Campsite Monitoring Methods: A Source Book." Data collected will be added to inventories already completed for recreational impacts on wilderness. This information should provide managers with a clearer picture of which activities affect these "last, best places."

Data Collection/Documentation/Recommendations

This phase will be completed by a review of the rehabilitation plan and visit to the fire site as soon after demobilization as possible. An inventory of camps and helispots will be completed using Cole's Inventory System. This will also include an objective overview of other areas covered by the rehabilitation plan.

Observations will be documented in a brief report to the line officer with a copy to the appropriate incident commander. In the report, the evaluator will include recommendations for ensuing fire suppression activities on similar lands. It is important that the evaluator recognize and commend the initial attack forces or overhead team for positive activities. Make special note of the extra efforts and sensitivity to suppression impacts.

Below is a sample format for a Post-Fire Evaluation Report (**Note:** This report is reproduced in summary form):

Post-Fire Evaluation for _____ Fire

Existing Direction Pertinent for Fire

(Insert general and specific land use plan direction for the management area, including guidance for management concerns such as threatened or endangered plants or animals)

Findings

A. Resource Advisor Input and/or Actions

(Include a synopsis of the actions of the resource advisor and his or her input into suppression strategies/tactics)

B. Escaped Fire Situation Analysis (EFSA)

(How did the EFSA respond to the sensitivities of this fire area.)

C. Line Direction to Incident Commander

(Synopsis of what the line officer told the incident commander to do.)

D. Incident Action Plan

(Synopsis of how incident action plan responded to fire area.)

On-site Verification

(State here who made the field visit, the date, and what observations were made in terms of meeting the guidelines for MIST.)

Overall Review Evaluation

(Include overall findings of how well objectives were accomplished in terms of minimum impact activities.)

Review Recommendations

(What areas can we improve on, where did we do well, etc.)