

**National Park Service
U.S. Department of the Interior**



**FORT LARAMIE NATIONAL HISTORIC SITE
WYOMING**

FIRE MANAGEMENT PLAN

Environmental Assessment /Assessment of Effect

July 2003

Environmental Assessment Assessment of Effect

FIRE MANAGEMENT PLAN **Fort Laramie National Historic Site** **2003**

Summary

National Park Service policy requires that any NPS area with combustible vegetation must prepare a Fire Management Plan. Three alternatives were considered for the Fort Laramie National Historic Site (Fort Laramie NHS) Fire Management Plan – Alternative 1 - no action, continued aggressive suppression of wildland fires coupled with hazard tree removal; Alternative 2 - NPS preferred action that would adopt a fire management program of appropriate management response to unwanted wildland fires while utilizing prescribed fire and mechanical treatments for fuels management; and Alternative 3 – appropriate management response to unwanted wildland fires coupled with mechanical fuels management. Suppression operations in each alternative would quickly respond to wildland fires and achieve effective control to protect human life and property with the least amount of damage to the park's natural and cultural resources. An appropriate management response may consider a variety of factors such as cost, firefighter safety, effectiveness of actions, and availability of natural or man-made barriers in selecting firefighting strategies and tactics; the response may not be as aggressive as that required in the absence of a fire management plan. The alternative of wildland fire use was considered and rejected because Fort Laramie NHS is not sufficiently large enough to sustain free-burning fires without substantial risk to cultural resources and park neighbors. Managing wildland fire for resource benefits also requires personnel with specialized skills and qualifications. It is unlikely that qualified personnel would be readily available to Fort Laramie NHS within the time periods required by policy.

This environmental assessment analyzes impacts to firefighter and public safety, vegetation, wildlife and wildlife habitat, species of special concern, air quality, floodplains and wetlands, geology and soils, cultural resources and cultural landscapes, visitor experience and aesthetics, and describes cumulative effects of each alternative. None of the direct, indirect or cumulative impacts of the proposed action are considered major for any of the impact topics.

Public Comment

Note to Reviewers and Respondents:

If you wish to comment on this environmental assessment, you may mail comments to the name and address below. This environmental assessment will be on public review for 30 days. Please note that names and addresses of people who comment become part of the public record. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations, businesses,

and individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

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Chapter 1 – PURPOSE AND NEED

Background

Fort Laramie National Historic Site is located on the Laramie River near its confluence with the North Platte in southeastern Wyoming (Figure 1). Fort Laramie NHS was a fur trading post from 1834 to 1848 and a military post from 1849 to 1890. Several historic trails and routes, including the Pony Express, passed through Fort Laramie; over 350,000 pioneer immigrants passed through the fort during the westward migration. Fort Laramie was also the scene of the signing of two important Indian peace treaties: the Treaty of 1851 and the Treaty of 1868.

Fort Laramie NHS National Monument was established by Presidential Proclamation (No. 2292) in 1938. In 1960, Congress (P.L. 86-444; 74 Stat. 83) revised the boundaries and renamed the area Fort Laramie National Historic Site. The boundaries were further modified by Congress in 1978 (P.L. 95-625; 92 Stat. 3477) to include a total of 832.85 acres (Figure 2). In 1996, Fort Laramie NHS was listed in the National Register of Historic Places. Fort Laramie NHS represents the NPS's theme of westward expansion, with a sub-theme of military-Indian conflicts.

The Presidential Proclamation of 1938 established Fort Laramie NHS for the purpose of "... improving, preserving, and conducting such lands and structures as a public historic site..." Both the 1938 Proclamation and the 1960 legislation direct that management be consistent with provisions of the NPS Organic Act (39 Stat. 535).

All lands within the NHS are classified Historic Zone, with three basic subzones: (1) Development subzone, 100 acres; (2) Natural Environment subzone, 40 acres; and (3) Special Use subzone, 63 acres. The remaining land within the park consists of former agricultural property and natural areas. These lands are managed as prairie grassland (Figure 3).

Fort Laramie NHS's principal features are historic resources: 13 contributing buildings, 20 contributing sites, and 3 contributing structures. These are described in much greater detail in the Statement for Management (1989), General Management Plan (1993) and Cultural Landscapes Inventory (2002).

The local electricity, telephone service, and natural gas providers hold special use permits for lines that serve the government facilities within the park. Four companies hold special use permits or rights of way for oil and gas pipelines that run underground through the northwest corner of the park. Two irrigation companies convey water underground through the northeast corner of the park. Parts of the Fort Laramie Canal are within the southern portion of the park. One corporation and three named individuals own the mineral interests on approximately 301 acres within the park. None of these would pose problems for fire management activities.

Purpose

Grasslands and riparian areas are the predominant vegetation communities at Fort Laramie NHS. Fire is a natural component of grassland ecology and one of the primary influences under which the grasslands of Fort Laramie NHS evolved. Fire has now been excluded from the Fort Laramie area, to a large extent, for over 100 years.

The purpose of this Environmental Assessment (EA) is to analyze fire management program alternatives and their direct, indirect, and cumulative impacts. Under some of these alternatives, prescribed fire would be used to maintain historic fire-dependent communities. Subsequent to this EA, a Fire Management Plan (FMP) will be developed to direct fire management activities. That plan will identify Fire Management Units, values to be protected, and individual management actions in conformance with NPS fire management policies.

Need

The National Park Service's *Management Policies* (2001) and Director's Order 18 – Wildland Fire Management – require that each park area with vegetation capable of sustaining fire develop a plan to manage fire on its lands. Fort Laramie NHS needs to have a comprehensive fire management program to protect natural and cultural resources, the public and employees, and park facilities. Accordingly, the park will be preparing a Fire Management Plan based on recommendations listed in the park's General Management Plan (1993), Vegetation Management Plan (2002), internal scoping with park staff, and this Environmental Assessment.

Scope of the Plan

The scope of the Fire Management Plan is confined to areas within the authorized boundaries of Fort Laramie NHS. Therefore, the Fire Management Plan would deal only with the 832 acres of the NHS. This EA considers impacts within the NHS and adjacent areas that could reasonably be impacted by fire management actions.

Fire Planning Considerations

In compliance with the National Environmental Policy Act (NEPA), this EA describes for comparative purposes the potential effects of implementing alternative fire management programs at Fort Laramie National Historic Site. At the conclusion of the NEPA process, an operational FMP would be written and approved, in accordance with the selected alternative.

Included with the description of the preferred alternative is a 5-year fuels treatment plan (Appendix 3). This action plan defines fuels treatment activities proposed to be implemented during the 5-year period following the approval of the NHS's FMP. On a subsequent annual basis, the Fort Laramie NHS and Grand Teton NP staff would evaluate fuel and resource conditions, progress on treatments and results, funding availability, and other issues to update the 5-year fuels treatment plan. (Grand Teton NP staff is involved because the fire management office at Grand Teton NP provides fire management assistance to Fort Laramie NHS.) The plan and its updates would be consistent with the program objectives and the selected alternative defined

in the FMP and the EA. In this way the fire program incorporates an adaptive management approach into its planning and program implementation. To ensure on-going compliance with specific laws such as the National Historic Preservation Act and the Endangered Species Act, requisite consultation for resource impacts is performed on a project-by-project basis where a programmatic agreement has not been developed.

It is possible that during the FMP annual evaluation and update, changes in park conditions or in policy and law may indicate that the fire management plan is no longer applicable. It is also possible that the fire program staff may propose a 5-year fuels treatment plan that is inconsistent with the FMP and EA. If Fort Laramie NHS and Grand Teton NP staffs decide to revise the FMP or 5-year fuels treatment plan, and if said revisions would result in new impacts not considered in the original FMP EA, then such a program change would necessitate additional NEPA analyses. Regardless of whether changes are made to the plan, if new regulatory requirements, threatened and endangered species listings, or changes to the environment have occurred since the original EA, additional compliance would be required to continue implementing the program.

Fire History

Written records for fire occurrence within the park only date to the mid-1970s (Appendix 2) and records for the surrounding area are scanty. Recent oral history, obtained from long time locals and park employees, describes numerous small fires of less than one acre within current park boundary. Local residents suggest that fires regularly occur in the vicinity of the NHS each year, with ignition sources generally being attributed to escaped agricultural and trash burns, railroad operations and lightning. Fire occurrence is undoubtedly lower and fire size is smaller than would have occurred prior to the farming period. With the onset of farming in the region, the potential for large fires from outside the NHS to sweep over the area was lost as fuel continuity was diminished. Fire suppression over the years also contributed to reduction in fire size.

The active fire season is during the summer, typical of the Great Plains. Most recent fires within the NHS are lightning-caused and have occurred from June through August. Only nine fires, burning a total of 13-14 acres, were recorded in the NHS from 1976 through 2002. Fire size has ranged from 0.1 acre to 5 acres. Only three fires exceeded one acre; average fire size was less than 2 acres. Fire occurrence and fire size have been limited largely because (a) much of the area is maintained to display the historic scene and is therefore not very susceptible to fire and (b) cultivation of lands surrounding the site reduces the potential for fire entering from adjacent areas.

Within the NHS itself, fuels can be characterized by Northern Forest Fire Laboratory (NFFL) Fuel Models 1, 2 and possibly 9. Fuel models 1 and 2 are grass models. Fuel model 2 would also describe riparian woodlands with open overstories and shrub/grass understories. Fire in this model is characterized by fairly rapid rates of spread, relatively short flame length and low resistance to control. Fuel model 9 is a timber model that describes some riparian areas with a more closed overstory and less understory vegetation. Fire in this model is characterized by

lower rates of spread, short flame length and somewhat greater resistance to control. Except under extreme conditions, firefighters with hand tools and engines could provide effective fire suppression. When burning conditions are severe, aerial resources such as retardant and/or helicopter water drops may be necessary for successful suppression.

Fuels in the NHS may also be characterized as Fire Regime I (0-35 years fire frequency, low intensity burning), and Condition Class 1. This means that fires naturally recurred on short intervals in the grasslands and were not very intense. Condition Class 1 means that, even though fire has been excluded for a considerable time, the present fuel condition is such that the response to fire would be within the range of historic variability (i.e. fire effects would be in the expected range and there would be a low risk of losing key ecosystem components).

Please see Appendix 1 for definitions and descriptions of NFFL Fuel Models, Fire Regimes, and Condition Classes.

Relevant Laws, Policies and Planning Documents

A multitude of laws, regulations and policies influence development and implementation of a Fire Management Plan at Fort Laramie NHS. The following relate directly to preparation of a Fire Management Plan and Environmental Assessment for Fort Laramie NHS.

NPS Organic Act of 1916 – Congress directed the U.S. Department of the Interior and NPS to manage units “to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (16 U.S.C. § 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress” (16 U.S.C. § 1 a-1).

National Environmental Policy Act (NEPA) – The purpose of NEPA is to encourage productive and enjoyable harmony between man and his environment; to promote efforts which would prevent or eliminate damage to the environment and stimulate the health and welfare of mankind; and to enrich the understanding of the ecological systems and natural resources important to the Nation. NEPA requirements are satisfied by successful completion of an EA or EIS, in addition to a decision document.

Director’s Order-12 (DO-12) – DO-12 is the NPS guidance for Conservation Planning, Environmental Impact Analysis, and Decision Making. DO-12 states the guidelines for implementing NEPA according to NPS regulations. DO-12 meets all Council on Environmental Quality (CEQ) regulations for implementing NEPA. In some cases, NPS has added requirements under DO-12 that exceed the CEQ regulations.

Director's Order-18 (DO-18) – DO-18, the NPS guidance for Wildland Fire Management, states that “every NPS unit with burnable vegetation must have an approved Fire Management Plan.” DO-18 defines what an approved FMP must include, stressing that “fire-fighter and public safety is the first priority” and promoting “an interagency approach to managing fires on an ecosystem basis across agency boundaries.” Director's Order 18 also directs parks to identify, manage, and reduce, where appropriate, accumulations of hazardous fuels. Procedures for completion, review, approval, and required contents for FMPs are provided in Reference Manual-18 (RM-18). Until an FMP is approved, NPS units must take aggressive suppression action on all wildland fires.

The Federal Wildland Fire Management Policy and Program Review (1995) and Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide (1998) provide specific guidance on fire policy, planning and implementation. A more complete listing of relevant laws, Executive Orders, and policies is provided in Table 1 by impact topic.

A fire management plan and EA for Fort Laramie NHS must be consistent with other approved plans for the unit. The General Management Plan (GMP), completed in 1993 dealt with fire management only indirectly, but noted that the Resource Management Plan was being revised and proposed development of a Vegetation Management Plan. The Resource Management Plan was completed in 1984 and updated in 1995; it does not address fire management. The Vegetation Management Plan (2002) recommends the use of prescribed fire to accomplish resource management objectives. The Cultural Landscapes Inventory (2002) does not directly address fire management, but does provide objectives for maintenance of historic scenes. The NHS has a programmatic agreement with the Wyoming SHPO concerning management of cultural resources, but that document is silent on issues of fire management. A draft Fire Management Plan for Fort Laramie NHS was completed about 1990, but was not approved and implemented.

Objectives

Management objectives that relate to resource management are presented in the Statement for Management (1989) and General Management Plan (1993). These include:

- Reestablish and promote native plants and animals that contribute to and create the park's historic scene, to the greatest degree possible.
- Reestablish and protect, to the fullest extent possible, the integrity of the historic scene of the park.
- Protect and preserve the historic integrity of the buildings, ruins, structures, and collections of the area, assuring their availability, and assuring their survival, for the benefit of the public, in perpetuity.

Fire management objectives, tiered from resource management objectives, include the following:

- Ensure public and employee safety from wildland fire. Reduce risk of adverse impacts to park neighbors.
- Protect the public, private property, cultural, and historic resources of the unit by suppressing unplanned wildland fires.

- Maintain long-term stability and diversity of natural resources.
- Reduce the level of hazardous fuels.
- Discourage introduction and proliferation of invasive nonnative species.
- Ensure smoke production would not violate federal and State air quality standards.
- Manage fire cooperatively with adjacent land management agencies and private land-owners.
- Avoid impairment of park resources and values.

Scoping Issues and Impact Topics

Scoping Issues

Internal scoping was conducted with the park's Interdisciplinary Team, Grand Teton NP fire management staff, and Intermountain fire management staff on December 3, 2002. Issues which were raised in scoping included:

- Unplanned fire events may have adverse impacts on cultural and sensitive natural resources within the park.
- Unplanned fire events near the boundary may threaten or otherwise adversely impact local residential communities.
- Fire events may encourage the proliferation of invasive nonnative species; conversely, fire may be used under some conditions for management of invasive nonnative species.
- Consultation should be initiated pursuant to §7 of the Endangered Species Act and §106 of the National Historic Preservation Act to ensure that proposed actions would not adversely effect endangered species and cultural resources.

The park also conducted external scoping with tribes, partners, cooperators and permitting agencies from February 15 through March 22, 2003. A public scoping open house was held on February 22, 2003. Parties contacted by letter or press release are noted in Chapter 4. No additional issues were raised during external scoping.

Impact Topics

Issues and concerns affecting this project were identified by NPS specialists; no additional issues were identified through external scoping. After scoping, issues and concerns were distilled into distinct impact topics to facilitate the analysis of environmental consequences, which allows for a standardized comparison between alternatives based on the most relevant information. The impact topics were identified on the basis of federal laws, regulations, and orders; NPS *Management Policies*; and NPS knowledge of limited or easily impacted resources.

Topics analyzed in this EA include: firefighter and public safety, air quality, geology and soils, vegetation, floodplains and wetlands, wildlife, species of special concern, visitor experienc-

es and aesthetic resources, and cultural resources. Each of these impacts topics is individually addressed later in this Environmental Assessment.

Impact Topics Dismissed from Further Consideration

NEPA and CEQ regulations direct agencies to “avoid useless bulk...and concentrate effort and attention on important issues” (40 CFR 1502.15). Certain impact topics that are sometimes addressed in NEPA documents for other kinds of proposed actions or projects have been judged not to be substantively affected by any of the Fire Management Plan alternatives considered in this EA. These topics are listed below and in Table 1, and a rationale is provided for dismissing specific topics from further consideration.

Noise: Noise is defined as an unwanted sound. Hazard fuels reduction, hazard tree removal, prescribed fires, and fire suppression can all involve the use of noise-generating equipment such as chainsaws, trucks, and aircraft. Each of these fire management tools, especially when near operating saws and helicopters, are quite loud (in excess of 100 decibels) and operators are directed to use hearing protection equipment. The use of such equipment would be extremely infrequent in light of the fuel types at Fort Laramie NHS (hours or days per decade). This is not frequent enough to substantively interfere with human activities in the area or with wildlife behavior. Nor would such infrequent noise chronically impair the solitude and tranquility associated with the NHS. Therefore, this impact topic is dismissed from further analysis in this EA.

Waste Management: None of the Fire Management Alternatives would generate noteworthy quantities of either hazardous material or solid wastes that need disposal in hazardous waste or general sanitary landfills. Therefore, this impact topic is dismissed from further analysis in the EA.

Transportation: None of the FMP alternatives would substantively affect road, railroad, water-based, or aerial transportation in and around the NHS. One exception may be the temporary closure of nearby roads during fire suppression or prescribed burning activities or from dense smoke from such fires. However, as evidenced by recent fire history, such closures would be very infrequent and would not substantially impinge on local transportation. Therefore, this impact topic is dismissed from further analysis.

Utilities: Some types of projects involving construction may temporarily impact telephone, electrical, natural gas, water, and sewer lines, potentially disrupting service to customers. Other projects may exert increased demand on telephone, electrical, natural gas, water, and sewage infrastructure, sources, and services, thus compromising existing services or creating a need for new facilities. None of the FMP alternatives would cause any of these effects to any extent. Therefore, this impact topic is dismissed from further analysis.

Land Use: Vegetation at Fort Laramie National Historic Site consists primarily of grassland and riparian communities. Visitor and administrative facilities, as well as historic structures, are located within the NHS. Residential, industrial, agricultural and commercial land uses occur in small towns and farms outside the boundaries. Fire management would not affect land uses within the NHS or in areas adjacent to it. Therefore, this impact topic is dismissed from further analysis.

Socioeconomics: NEPA requires an analysis of impacts to the “human environment” which includes economic, social and demographic elements in the affected area. Implementation of the proposed action, particularly prescribed burning, may require temporary closures of project areas which may, in turn, inconvenience some park visitors. Such closures, however, are likely to be small in size and of very short duration. Some fire management activities would bring a short-term need for additional personnel in the NHS, but that would not substantially affect local businesses. Thus the proposed action would not impact local businesses or other agencies. Therefore, the socioeconomic environment will not be addressed as an impact topic in this document.

Environmental Justice: Executive Order 12898, “General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Executive Order 13045 requires Federal actions and policies to identify and address disproportionately adverse risks to the health and safety of children. None of the FMP alternatives would have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency’s Environmental Justice Guidance (1998). Therefore, environmental justice was dismissed as an impact topic in this document.

Prime and Unique Farmlands: In August, 1980, the Council on Environmental Quality (CEQ) directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture’s Natural Resources Conservation Service (NRCS) as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to the NRCS, no soils in the project area are classified as prime and unique farmlands. Thus, the topic of prime and unique farmland will not be addressed as an impact topic.

Wilderness: NPS *Management Policies* direct that proposed actions which have the potential to impact wilderness resources must be evaluated in accordance with NPS procedures for implementing NEPA. Since neither Fort Laramie nor adjacent lands are proposed or designated as wilderness, this impact topic was dismissed from further analysis.

Indian Trust Resources: Indian trusts are assets owned by Native Americans but held in trust by the United States. Indian trusts do not occur within Fort Laramie NHS and, therefore, are not evaluated further in this document.

Resource Conservation: The NPS *Guiding Principles of Sustainable Design* provides a basis for achieving sustainability in facility planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. The guidebook articulates principles to be used such as resource conservation and recycling. None of the FMP alternatives would minimize or add to resource conservation or pollution prevention on the NHS. Therefore, this impact topic is dismissed from further analysis in this EA.

Table 1. Summary of Impact Topics.

Impact Topic	Retained or dismissed from further evaluation	Relevant Laws, Regulations or Policies
Geology and Soils	retained	NPS Organic Act; NPS <i>Management Policies</i>
Water Resources	retained	Clean Water Act; Executive Order 12088; NPS <i>Management Policies</i>
Floodplains and Wetlands	retained	Executive Order 11988; Executive Order 11990; Rivers and Harbors Act; Clean Water Act; NPS Organic Act; NPS <i>Management Policies</i>
Vegetation	retained	NPS Organic Act; NPS <i>Management Policies</i>
Wildlife	retained	NPS Organic Act; NPS <i>Management Policies</i>
Species of Special Concern	retained	Endangered Species Act; NPS Organic Act; NPS <i>Management Policies</i>
Air Quality	retained	Clean Air Act (CAA); CAA Amendments of 1990; NPS Organic Act; NPS <i>Management Policies</i>
Visitor Experience. Aesthetic Resources	retained	Americans with Disabilities Act; NPS Organic Act; NPS <i>Management Policies</i>
Firefighter and Public Safety	retained	Director's Order #18; NPS <i>Management Policies</i>
Cultural Resources	archeology, historic structures, and landscapes retained ethnographic resources and museum objects dismissed	Section 106 of National Historic Preservation Act; Archeologic and Historic Preservation Act; Archeological Resources Protection Act; 36 CFR 800; NEPA; Executive Order 13007; Executive Order 11593; the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation; Programmatic Memorandum of Agreement Among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers ((1995); Director's Order 28; NPS <i>Management Policies</i>
Park Operations	dismissed	NPS <i>Management Policies</i>

Noise	dismissed	NPS <i>Management Policies</i>
Waste Management	dismissed	NPS <i>Management Policies</i>
Transportation	dismissed	NPS <i>Management Policies</i>
Utilities	dismissed	NPS <i>Management Policies</i>
Land Use	dismissed	NPS <i>Management Policies</i>
Socioeconomics	dismissed	40 CFR Regulations for Implementing NEPA; NPS <i>Management Policies</i>
Environmental Justice	dismissed	Executive Order 12898
Prime and Unique Farmlands	dismissed	Council on Environmental Quality 1980 memorandum on prime and unique farmlands
Wilderness	dismissed	The Wilderness Act; Director's Order #41; NPS <i>Management Policies</i>
Indian Trust Reserves	dismissed	Department of the Interior Secretarial Orders No. 3206 and No. 3175
Resource Conservation	dismissed	NEPA; NPS <i>Guiding Principles of Sustainable Design</i> ; NPS <i>Management Policies</i>

Chapter 2 – ALTERNATIVES CONSIDERED

Alternatives were framed through discussions among NHS personnel, Grand Teton fire management staff, and Intermountain fire management staff. The alternatives cover the range of what is physically possible, acceptable by policy, and feasible for local managers. Under each alternative, the NHS would be described as a single Fire Management Unit (FMU). Within the FMU, various activities will be concentrated in certain areas. For example, mowing would occur primarily around historic buildings and other interpreted structures. Prescribed burning would occur primarily in grasslands and hazard fuels projects would be conducted mainly in wooded areas. With all alternatives, unplanned wildland fires would be suppressed.

Alternative 1 - No-Action

This alternative represents a continuation of current management actions; it does not mean an absence of active management of fire and fuels. Under the no-action alternative, the fire management program would consist of aggressively suppressing wildland fires, continuing a hazard tree removal program, and mowing fine fuels near historic structures.

Aggressively suppressing wildland fires (initial attack) is accomplished by depriving a fire of additional fuels (e.g. building a fire line that is cleared down to mineral soil) or by cooling the fire sufficiently to prevent further combustion (e.g. applying water to the flaming front).

The hazard tree removal program in 2003 would consist of an evaluation of potentially hazardous trees in public access areas, followed by a limited removal of identified hazards. In 2004, potentially hazardous trees would be evaluated in non-public areas. Mowing vegetation near historic structures also reduces the vulnerability of those structures to wildland fires. Associated vehicle use is with rubber-tired, rather than tracked, vehicles and results in minimal ground disturbance.

Predicting the average annual acreage of unwanted wildland fire is quite uncertain, dependent as it is on climatic conditions, fuels conditions, locations and other factors. Given recent fire

history, however, only about one or two fires, each averaging less than two acres, would occur in a 5-year period. Initial attack activities would be aggressive with somewhat elevated risks to firefighters.

Mitigation as Part of the No-action Alternative

Given the uncertainty of the locations of wildland fires, the mitigations for the no-action alternative will focus primarily on endangered species, cultural resources and management constraints.

The fire management actions identified under the no-action alternative have little potential to adversely affect endangered species. Mitigation would include confining hazard tree removal to areas and/or times when bald eagles are not present. No mitigation is anticipated for Preble's meadow jumping mouse, mountain plover or Ute ladies'-tresses.

Fire management actions identified under the no-action alternative have little potential to adversely affect cultural resources. Mitigations to further ensure avoidance of impact include:

- Use of rubber-tired vehicles involved in mowing, hazard tree removal and fire suppression to minimize the potential of disturbing archeological sites.
- Use of water as much as possible rather than construction of hand line to contain unplanned wildland fires to minimize the potential of disturbing archeological sites.
- A suite of mitigation actions, used either individually or in combination, to reduce the potential effect of wildland fires and suppression actions on historic structures. These include blacklining around structures or features near wildland fires, treating structures with fire retardant foam concurrent with fires, wrapping structures with heat reflective materials, and establishing sprinkler systems on and around structures concurrent with wildland fire suppression activities.
- Monitor fire suppression activities and halt work if previously unknown resources are located; protect and record newly discovered resources.
- Brief suppression personnel about protecting cultural resources.

Additional management constraints which would further mitigate potential adverse impacts of wildland fire suppression under the no-action alternative include:

- Minimum impact suppression tactics would be employed in all tactical operations except as noted below.
- Fire retardant, if used, must be on the approved list of retardants used by the U.S. Forest Service and USDI Bureau of Land Management.
- Motorized equipment would not normally be used off of established roadways in the NHS. However, due to rapid rates of spread and the emergency nature of fires near the boundary, off-road use of motorized equipment such as all-terrain vehicles and wildland fire engines may be authorized by the Superintendent.
- All extended attack and project fire operations would have a park employee designated and available to assist suppression operations as a Resource Advisor. If qualified em-

ployees are not available, a Resource Advisor would be ordered through the interagency dispatch system.

- Helicopters may be used to transport personnel, supplies and equipment. Improvement of landing sites would be kept to a minimum and would include consultation with the assigned Resource Advisor. Helibases and landing sites within the NHS would be rehabilitated to pre-fire conditions to the extent reasonably possible.
- Suppression actions would avoid aerial and ground applications of retardant or foam within 300 feet of identified water sources.
- Except for spot maintenance to remove obstructions, no modifications would be made to roadways, trails, water sources, or clearings. All sites where modifications are made or obstructions removed would be rehabilitated to pre-fire conditions to the extent reasonably possible.
- Earth moving equipment such as tractors, graders, bulldozers, or other tracked vehicles would not be used for fire suppression. If special circumstances warrant extreme measures to ensure protection, the Superintendent may authorize the use of heavy equipment.
- Fireline location would avoid sensitive areas wherever possible.
- Following fire suppression activities, firelines would be re-contoured and water-barred.
- As a matter of practice, burned areas would not be reseeded unless there are overriding concerns about establishment of invasive nonnative species. Any reseeded areas would be with native species and occur only with the Superintendent's prior approval.

Alternative 2 – Appropriate Management Response and Integrated Fuels Management (Preferred Alternative)

The preferred alternative would incorporate continued suppression of all unwanted wildland fires, mechanical treatment of hazard fuels, and prescribed burning.

Appropriate management response provides for the full range of suppression strategies for management of wildland fires. The average acreage burned by wildland fires may increase slightly from Alternative 1 since fire managers would have the option of selecting from the full range of suppression strategies. Under this scenario, managers may choose to utilize natural or man-made barriers in a confine strategy to lower cost, increase firefighter safety, or minimize the impacts of suppression action.

Prescribed fire and mechanical treatments would be used individually or in combination (including sequence; i.e. mechanical treatment followed by burning) to achieve natural resource, cultural landscape, and fuels management objectives. Each treatment would involve developing an implementation plan and obtaining appropriate permits and approvals.

Mechanical treatments would be used to clear vegetation away from structures, cultural resources, and other high value resources to reduce spread potential and increase defensible space. Mechanical reduction of hazard fuels would use methods such as mowing grass, chopping shrubs, thinning woodlands, trimming ladder fuels, and removal of harvested biomass.

Prescribed burning (broadcast burning) would be conducted for hazard fuels reduction, maintenance of fire dependent communities, and nonnative plant control. All prescribed fires will be planned and approved consistent with the method and format required by RM-18.

Wildland fire used for resource benefit would not be permitted.

During a typical 5-year period, the following fire and fuels management activities are projected:

- One or two wildland fires averaging only about 2 acres each using an appropriate management response. Maximum fire size would probably not exceed 5-10 acres.
- Three to five prescribed fires of less than 50 acres each. See Appendix 3 and Figure 4 for actions proposed for the first 5-year period.
- Three to five mechanical fuels reduction projects, each usually less than 20 acres. See Appendix 3 and Figure 4 for actions proposed for the first 5-year period. These projects include overstory thinning of cottonwoods with chainsaws together with flail chopping (tractor-drawn “brush hog”) of understory shrubs. Woody material would be hand piled for later burning or removal. Eagle roost trees and other wildlife trees would be left intact.
- Pile burning of removed biomass from hazard fuels reduction projects. When drought conditions persist, the woody material would be hauled away rather than burned in place.
- Annual mowing of grass areas adjacent to historic structures (an ongoing maintenance operation).

Mitigation as Part of the Preferred Alternative

The mitigations for the preferred alternative will focus primarily on endangered species, cultural resources, and management constraints.

The U.S. Fish and Wildlife Service (FWS) identified five endangered, threatened or candidate species which may occur in or near Fort Laramie National Historic Site. These include the bald eagle (threatened; *Haliaeetus leucocephalus*), black-footed ferret (endangered; *Mustela nigripes*), mountain plover (proposed for listing; *Charadrius montanus*), Preble’s meadow jumping mouse (threatened; *Zapus hudsonius preblei*) and Ute ladies’-tresses (threatened; *Spiranthes diluvialis*).

Bald eagles use the NHS area in winter; the area of use focuses on large cottonwoods in the riparian areas along the Laramie and North Platte Rivers. FWS recommends providing a 1-mile disturbance-free buffer around such sites during periods that they are occupied. Black-footed ferrets are obligates of prairie dog towns. There are no prairie dog towns in the NHS; the closest known prairie dogs towns are about 5 miles away. The mountain plover uses bare or nearly bare areas for nesting – areas of very short and sparse vegetation; vegetation on these sites would likely be too discontinuous to support fire. The Preble’s meadow jumping mouse occupies wet meadow and riparian habitats; the species has not been recorded in Goshen County. Ute ladies’-tresses habitats are usually disturbed areas in moist soils along rivers and other wa-

terways. To prosper, they generally require areas with little competing vegetation. Habitats occupied by Ute ladies'-tresses would typically not be susceptible to fire.

Mitigation for bald eagles under the preferred alternative would consist of avoiding fire management activities within 1 mile of roost trees during the period of occupation by eagles. The proposed mechanical fuel treatments in riparian zones would be completed in the spring after eagles have left the area. Rubber-tired vehicles would be used to minimize ground disturbance. Large standing dead trees that are preferred roost sites would be left standing.

No mitigation is anticipated for black-footed ferrets, though surveys might be completed if prairie dog towns expand into the NHS (surveys are not warranted until or unless a prairie dog town complex reaches 200 acres or more).

Mitigation for Preble's meadow jumping mouse would consist of excluding broadcast prescribed fire from potential habitats until a FWS survey is completed. If the presence of the Preble's meadow jumping mouse is confirmed, further consultation would determine additional mitigation needs.

No mitigation is anticipated for mountain plover since vegetation in nesting areas would be too discontinuous to support fire .

No mitigation is anticipated for Ute ladies'-tresses since Ute ladies'-tresses have not been documented in the NHS and habitats occupied by Ute ladies'-tresses are typically not susceptible to fire.

Most of the park's cultural resources are located within the Historic Zone. By virtue of their concentrated location and absence of flammable vegetation in their immediate vicinity, most sites are not susceptible to wildland fire. Other sites and features, while they may not be vulnerable to fire, are susceptible to damage caused by fire suppression activities.

For those sites that may be vulnerable to impacts from wildland or prescribed fire, a wide range of options are available to eliminate or mitigate potential impacts. These include complete avoidance of prescribed fire in the vicinity of structures, blacklining around structures or features near wildland fires or proposed prescribed fires, treatment with fire retardant foam prior to or concurrent with fires, wrapping with heat reflective materials, and establishment of sprinkler systems on and around structures prior to prescribed fires or concurrent with wildland fire suppression activities. Other standard cultural resource mitigation measures include the following: prior to doing treatment work, conduct an inventory of previously unsurveyed areas using an archeologist who meets the Secretary of the Interior's standards; monitor fire management activities and halt work if previously unknown resources are located; protect and record newly discovered resources; brief work crews about protecting cultural resources; dispose of slash in areas lacking cultural sites; avoid ground disturbance in areas containing known cultural sites; prior to implementation of work, protect character-defining elements of the site's cultural landscapes. For prescribed fires, mitigations would be included in the prescribed fire

burn plan. In all cases, protection of structures and features will be more important than minimizing acres burned. The Wyoming SHPO requests that further consultation be conducted on each prescribed fire during preparation of the prescribed fire burn plan.

Fire management operations constraints, which would mitigate the potential impacts of operations (suppression, prescribed burning, hazard fuel reduction, etc.) on multiple resource values, include the following:

- A cultural resource advisor would participate in the planning and implementation of all projects.
- Potential effects to cultural resources would be mitigated by any one or a combination of the following: installation of temporary sprinkler systems; application of fire retardant foam; use of heat reflective wraps; fuel reduction adjacent to the structures; and avoidance of prescribed burns adjacent to or near structures. These actions may be employed singly or in combinations.
- Prescribed fires would not be planned near cultural and other sensitive resources unless adequate planning and mitigation has assured their protection.
- Appropriate management response to unwanted wildland fires would give priority to protection of cultural and other sensitive resources.
- Minimum impact suppression tactics would be employed in all tactical operations except as noted below.
- Whenever consistent with safe, effective suppression techniques, the use of natural barriers, such as sparsely vegetated areas, would be used as extensively as possible. The use of counterfire techniques, burnout for fireline improvement, and wetting agents (ground and aerially delivered) is authorized.
- Fire retardant, if used, must be on the approved list of retardants used by the U.S. Forest Service and USDI Bureau of Land Management.
- Motorized equipment would not normally be used off of established roadways in the NHS. However, due to rapid rates of spread and the emergency nature of fires near the boundary, off-road use of motorized equipment such as all-terrain vehicles and wildland fire engines may be authorized by the Superintendent.
- All extended attack and project fire operations would have a park employee designated and available to assist suppression operations as a Resource Advisor. If qualified employees are not available, a Resource Advisor would be ordered through the interagency dispatch system.
- Helicopters may be used to transport personnel, supplies and equipment. Improvement of landing sites would be kept to a minimum and would include consultation with the assigned Resource Advisor. Helibases and landing sites within the NHS would be rehabilitated to pre-fire conditions to the extent reasonably possible.
- Suppression actions would avoid aerial and ground applications of retardant or foam within 300 feet of identified water sources.
- Except for spot maintenance to remove obstructions, no modifications would be made to roadways, trails, water sources, or clearings. All sites where modifications are made

or obstructions removed would be rehabilitated to pre-fire conditions to the extent reasonably possible.

- Earth moving equipment such as tractors, graders, bulldozers, or other tracked vehicles would not be used for fire suppression. If special circumstances (e.g. immediate threats to human life or fire-susceptible historic structures) warrant extreme measures to ensure protection, the Superintendent may authorize the use of heavy equipment.
- Fireline location would avoid sensitive areas wherever possible.
- Following fire suppression activities, firelines would be re-contoured and water-barred.
- As a matter of practice, burned areas would not be reseeded unless there are overriding concerns about establishment of invasive nonnative species. Any reseeded areas would be with native species and occur only with the Superintendent's prior approval.

Alternative 3 – Appropriate Management Response and Non-fire Fuels Management

This alternative is similar to Alternative 2 except that use of prescribed fire would not be permitted. Using an appropriate management response to unwanted wildland fire, fire managers may choose to utilize natural or man-made barriers in a confine strategy to lower cost, increase firefighter safety, or minimize the impacts of suppression action. Mechanical treatment of hazard fuels would be the same as under Alternative 2. The average acreage burned by wildland fires may increase slightly from Alternative 1 since fire managers would have the option of selecting from the full range of suppression strategies.

With Alternative 3, the following fire and fuels management activities during a typical 5-year period would likely include (see Appendix 3):

- One or two wildland fires averaging only about 2 acres each even under an appropriate management response. Maximum fire size would probably not exceed 5-10 acres.
- Three to five mechanical fuels reduction projects, each usually less than 20 acres. See Appendix 3 and Figure 4 for actions proposed for the first 5-year period. These projects include overstory thinning of cottonwoods with chainsaws together with flail chopping (tractor-drawn "brush hog") of understory shrubs. Woody material would be hand piled for later burning or removal. Eagle roost trees and other wildlife trees would be left intact.
- Annual mowing of grass areas adjacent to historic structures (an ongoing maintenance operation).

Mitigation as a Part of Alternative 3

The mitigation actions for Alternative 3 are the same as those described under Alternative 2, the preferred alternative, except that mitigations for prescribed fire would not be necessary (prescribed fire is not a component of Alternative 3).

Alternatives Considered and Rejected

Two additional alternatives were identified and considered in the scoping process.

Alternative 4 was called the wildland fire use alternative. This alternative would employ the full range of available fire management strategies including suppression using an appropriate management response, wildland fire use, and prescribed burning. Mechanical fuel reduction methodologies would be the same as under Alternatives 2 and 3. This alternative differs from other alternatives in its authorization of wildland fire use (aka wildland fire used for resource benefit). This alternative was rejected because Fort Laramie NHS is not of sufficient size to manage free-burning fires without substantial threat to cultural resources and/or park neighbors. Managing wildland fire for resource benefits also requires personnel with specialized skills and qualifications. It is unlikely that qualified personnel would be readily available to Fort Laramie NHS within the time periods required by policy.

Alternative 5, the no management alternative, would allow all wildland fires to burn unimpeded by management action. No other manipulative activities (e.g. hazard fuels management) would be permitted. This alternative was rejected because it compromises public safety, causes undue risk to values to be protected (e.g. historic structures) and is inconsistent with federal policy and regulations.

Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that “the environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in NEPA’s Section 101” (*Forty Most Asked Questions Concerning Council on Environmental Quality’s National Environmental Policy Act Regulations*, 1981.)

Section 101 of the National Environmental Policy Act states that “...it is the continuing responsibility of the Federal Government to ... (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; (3) attain the widest range of beneficial uses of the environment without degradations, risk to health or safety, or other undesirable and unintended consequences; (4) preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment which supports diversity and variety of individual choice; (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities; and (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.” The environmentally preferred alternative for this project is based on these national environmental policy goals.

Alternative 1 – No Action. This alternative would aggressively suppress all wildland fires. Limited mechanical treatment (i.e. mowing) would remove fuels in the developed areas and adjacent to historical structures. This alternative would disturb the least amount of natural resources, but the grassland communities in Fort Laramie NHS are regarded as fire dependent. The alternative would not be as effective as Alternative 2 in maintaining the structure and diversity of grasslands. The no-action alternative may also expose firefighters to somewhat ele-

vated risks as well as potentially increased costs since it does not allow for use of confinement strategies in suppression operations. Therefore, this alternative would not result in the same level of protection of natural and cultural resources and people over the long-term as would occur with the preferred alternative. Consequently, the no-action alternative does not satisfy provisions 2, 3, and 4 of NEPA's Section 101.

Alternative 2 – Appropriate Management Response and Integrated Fuels Management (Preferred Action). This alternative provides the greatest flexibility in responding to unwanted wildland fire and further provides the greatest opportunities for effective management of hazardous fuels. It provides the lowest risk to firefighters by utilizing an appropriate management response (i.e. the full range of suppression strategies) to wildland fires. It provides opportunities for selection of individual or composite treatments of hazardous fuels, and thus would be most effective in managing such fuels. This fuel reduction program would ultimately provide for better health and safety of visitors and employees and protection of natural and cultural resources for succeeding generations. This alternative further provides for prescribed fire treatments intended to contribute to the maintenance of long-term stability and diversity in fire-dependent vegetation communities. The alternative would protect people and cultural and natural resources with minimum disturbance. This alternative would satisfy each of the provisions of the national environmental policy goals.

Alternative 3 – Appropriate Management Response and Non-fire Fuels Management. This is an intermediate alternative between the no-action (Alternative 1) and preferred action (Alternative 2) alternatives. The ability to employ an appropriate management response brings some of the benefits associated with Alternative 2. Mechanical treatments would still be available for hazardous fuel reductions, but these methods are ineffective tools for maintaining the long-term stability and diversity of fire dependent communities. The inability to use prescribed fire, then, renders this alternative less effective to achieving resource management goals. Consequently, Alternative 3 does not satisfy provisions 2 and 4 of NEPA's Section 101 as well as the preferred alternative.

The *environmentally preferable alternative* is *Alternative 2 – Preferred Action* because it surpasses the no-action Alternative and Alternative 3 in realizing the full range of national environmental policy goals as stated in §101 of the National Environmental Policy Act. Although the no-action alternative may result in the least immediate disturbance of natural resources, it does result in increased risk to firefighters in comparison with the other two alternatives and it does not provide opportunities for maintenance of fire-dependent vegetation communities. Alternative 3 more closely meets the criteria of §101 but is also foregoes opportunities for maintenance of fire-dependent vegetation communities.

Summary

Table 2: Methods Each Alternative Uses to Ensure Each Objective is Met

Objective	Alt. 1 - No-Action	Alt. 2 – AMR and Integrated Fuels Mgt	Alt. 3 – AMR and Non-fire Fuels Mgt
Ensure public and employee safety from wildland fire. Reduce risk of adverse impacts to park neighbors.	Removal of hazard trees and mowing fine fuels around historic structures would decrease danger to visitors, park neighbors, park facilities, and employees by reducing the likelihood of more intense wildland fires. Implementing LCES, reviewing 10 Standard Firefighting Orders and 18 Watch Out Situations, using temporary closures, and increasing public awareness would increase public and firefighter safety during suppression of wildland fires.	Integrated management (prescribed fire, mechanical removal of hazardous fuels) would decrease danger to visitors, park neighbors, park facilities, and employees by reducing the likelihood of more intense wildland fires. Implementing LCES, reviewing 10 Standard Firefighting Orders and 18 Watch Out Situations, using temporary closures, and increasing public awareness would increase public and firefighter safety during suppression of wildland fires. Appropriate management response would allow greater flexibility in ensuring firefighter and public safety.	Mechanical reduction of hazardous fuels would decrease danger to visitors, park neighbors, park facilities, and employees by reducing the likelihood of more intense wildland fires. Implementing LCES, reviewing 10 Standard Firefighting Orders and 18 Watch Out Situations, using temporary closures, and increasing public awareness would increase public and firefighter safety during suppression of wildland fires. Appropriate management response would allow greater flexibility in ensuring firefighter and public safety though the inability to use prescribed fire would make reduction of hazardous fuels less effective.
Protect cultural resources from wildland fire.	Aggressive initial attack would be used to protect cultural resources from wildland fire. Removal of hazard trees and mowing fine fuels around historic structures would reduce both the likelihood and intensity of wildland fires near cultural resources.	Appropriate management response (the full range of suppression strategies) would be used to protect cultural resources from wildland fire. Integrated management of hazardous fuels, using prescribed fire and mechanical reduction of fuels would reduce both the likelihood and intensity of wildland fires near cultural resources.	Appropriate management response (the full range of suppression strategies) would be used to protect cultural resources from wildland fire. Mechanical reduction of hazardous fuels would reduce both the likelihood and intensity of wildland fires near cultural resources.
Maintain long-term stability and diversity of natural resources.	Removal of hazard trees and mowing fine fuels around historic structures would help protect wildlands from exposure to unusually intense fires with fire effects potentially outside the range of normal variability.	Prescribed burning and mechanical reduction of hazardous fuels would protect wildlands from exposure to unusually intense fires with fire effects potentially outside the range of normal variability. Prescribed fire in grasslands would help maintain the long-term stability and diversity of those vegetation communities.	Mechanical reduction of hazardous fuels would protect wildlands from exposure to unusually intense fires with fire effects potentially outside the range of normal variability.
Discourage introduction	Some projects may use	Some projects may use pre-	Some projects may use me-

Objective	Alt. 1 - No-Action	Alt. 2 – AMR and Integrated Fuels Mgt	Alt. 3 – AMR and Non-fire Fuels Mgt
and proliferation of invasive nonnative species.	mechanical treatments of invasive nonnative species which are also hazardous fuels. Cleaning of mechanical equipment would help prevent the spread of invasive nonnatives to other portions of the park.	scribed fire and mechanical treatments on invasive nonnative species which are also hazardous fuels. Cleaning of equipment after the treatment would help prevent the spread of invasive nonnatives to other portions of the park.	chanical treatments on invasive nonnative species which are also hazardous fuels. Cleaning of equipment after the treatment would help prevent the spread of invasive nonnatives to other portions of the park.
Reduce the level of hazardous fuels.	Hazard trees and mowing fine fuels around historic structures would somewhat reduce the level of hazardous fuels.	Prescribed fire and mechanical removal would be used to reduce hazardous fuels.	Hazardous fuels would be reduced by mechanical treatments.
Smoke production would not violate federal and State air quality standards.	Smoke production would be limited to that from unwanted wildland fires.	Prescribed fire burn plan prescriptions would be designed to minimize smoke production. Smoke modeling would be included in prescribed fire planning to ensure smoke impacts are not unacceptable at sensitive receptors.	Smoke production would be limited to that from unwanted wildland fires.
Avoid impairment of park resources and values.	Fire suppression, removal of hazard trees, and mowing fine fuels around historic structures would not impair park resources and values in the immediate future.	Fire suppression and integrated management of hazardous fuels would not impair park resources and values. Use of prescribed fire in fire dependent communities would help maintain the long-term stability and diversity of those communities.	Fire suppression and mechanical removal of hazardous fuels would not impair park resources and values in the immediate future.

Table 3: Comparison of Alternatives

Issue	Alt. 1 – No Action	Alt. 2 – AMR and Integrated Fuels Mgt.	Alt. 3 – AMR and Non-fire Fuels Mgt.
Fire management	Continued aggressive suppression of all wildland fires.	The appropriate management response would be applied to all wildland fires. The full range of suppression strategies would be available to fire managers. Prescribed fire would be used to meet specific resource management objectives.	The appropriate management response would be applied to all wildland fires. The full range of suppression strategies would be available to fire managers.
Hazardous fuels man-	Removal of hazard trees	Prescribed fire and mechan-	Mechanical removal would

Issue	Alt. 1 – No Action	Alt. 2 – AMR and Integrated Fuels Mgt.	Alt. 3 – AMR and Non-fire Fuels Mgt.
agement	and mowing fine fuels around historic structures would be used to reduce hazardous fuels.	ical treatments would be used individually or in combination to reduce hazardous fuels.	be used to reduce hazardous fuels.
Maintenance of fire dependent vegetation communities	Removal of hazard trees and mowing fine fuels around historic structures would slightly reduce the potential for high intensity fire and attendant abnormal fire effects, but would otherwise not contribute to maintenance of fire dependent vegetation communities.	Prescribed fire would be used in selected locations to maintain or restore fire dependent vegetation communities. Mechanical reduction of hazardous fuels would reduce the potential for high intensity fire and attendant abnormal fire effects, but would otherwise not contribute to maintenance of fire dependent vegetation communities.	Mechanical reduction of hazardous of hazardous fuels would reduce the potential for high intensity fire and attendant abnormal fire effects, but would otherwise not contribute to maintenance of fire dependent vegetation communities.

Table 4: Summary Comparison of Alternatives and Impacts

Impact Topic	Alt. 1 – No Action	Alt. 2 – AMR and Integrated Fuels Mgt.	Alt. 3 – AMR and Non-fire Fuels Mgt.
Firefighter and Public Safety	Aggressive fire suppression poses greater risks to firefighters than an appropriate management response. Removal of hazard trees and mowing fine fuels around historic structures would reduce risks to visitors and employees.	Use of prescribed fire and mechanical reduction of hazardous fuels would reduce risks to firefighter and public safety from larger, more intense wildland fires. The ability to employ an appropriate management response provides the greatest protection of firefighter and public safety in suppression actions. The adverse impact, compared to the no-action alternative would be minor in the short-term and moderately beneficial in the long-term.	Use of mechanical reduction of hazardous fuels would reduce risks to firefighter and public safety from larger, more intense wildland fires. The ability to employ an appropriate management response provides the greatest protection of firefighter and public safety in suppression actions. The adverse impact, compared to the no-action alternative, would be minor in the short-term and of minor benefit in the long-term.
Air Quality	With low fire occurrence and small fire size, the impact from smoke would be minor, localized and temporary.	Slightly more smoke may be produced with various suppression strategies under the appropriate management response. Additional smoke would be produced from prescribed burning, but given the small acreage	Slightly more smoke may be produced with various suppression strategies under the appropriate management response.

Impact Topic	Alt. 1 – No Action	Alt. 2 – AMR and Integrated Fuels Mgt.	Alt. 3 – AMR and Non-fire Fuels Mgt.
		proposed for burning, the incremental impact from the no-action alternative would be minor for short periods in the immediate project area. Prescribed burning would comply with Wyoming Department of Environmental Quality smoke regulations.	
Geology and Soils	Some soil disturbance would occur in fire suppression activities such as fireline construction. Impacts would be short-term and minor.	Under the appropriate management response, soil disturbance would be the same or less than with aggressive suppression. Minor soil disturbance would occur during fuels management activities. Impacts would be temporary and minor in the short run. In the long run, hazard fuels reduction and prescribed burning for grassland maintenance would be a minor to moderate benefit by reducing soil disturbance associated with unwanted fires.	Under the appropriate management response, soil disturbance would be the same or less than with aggressive suppression. Minor soil disturbance would occur during fuels management activities. Impacts would be short-term and minor.
Vegetation	The magnitude of current wildland fires and hazard tree removal is so small that the impact to vegetation is minor from a park context. Given the typical fire behavior, fire effects are localized and short-term. Impacts would therefore be minor. Exclusion of fire from fire dependent communities may eventually result in minor to moderate adverse effects with conversion of those communities to less desirable communities.	Compared to the no-action alternative, the proposed action would affect fewer than 200 acres with prescribed burning and up to 100 acres of mechanical fuel reduction during a typical 5-year period. Incrementally larger areas (cannot be quantified in advance) may burn under the appropriate management strategy than with aggressive suppression. In the context of the park's size, the impact, though beneficial in fire dependent communities, would be minor.	Incrementally larger areas (cannot be quantified in advance) may burn under the appropriate management strategy than with aggressive suppression. Mechanical treatment acreage would be similar to Alternative 2. The impacts, incrementally from the no-action alternative, are minor.
Floodplains or Wetlands	Minor adverse impacts could result from fire suppression activities. Hazardous tree removal	The appropriate management response would facilitate avoidance of floodplains or wetlands in sup-	The appropriate management response would facilitate avoidance of floodplains or wetlands in sup-

Impact Topic	Alt. 1 – No Action	Alt. 2 – AMR and Integrated Fuels Mgt.	Alt. 3 – AMR and Non-fire Fuels Mgt.
	activities would have short-term minor adverse to minor beneficial impacts.	pression operations. Compared to the no-action alternative, this would be a minor beneficial impact. Hazardous fuels reduction activities would have short-term minor adverse and minor beneficial impacts. Prescribed burning would avoid sensitive floodplains or wetlands and therefore have no effect.	pression operations. Compared to the no-action alternative, this would be a minor beneficial impact. Hazardous fuels reduction activities would have minor adverse and minor beneficial impacts.
Wildlife	Impacts of fire exclusion under the no-action alternative would be slightly adverse for wildlife and wildlife habitats since only minimal acres of grasslands would be revitalized by fire.	Compared to the no-action alternative, the impacts of this alternative would have minor beneficial effects as the stability and diversity of grassland communities are increased through prescribed burning and mechanical fuel modifications.	The impacts of Alternative 3 on wildlife and wildlife habitat, with fuels reduction projects but no prescribed burning, would be minor.
Species of Special Concern	Given the low fire occurrence and small fire size, impacts of the no-action alternative on listed and sensitive species would be negligible. Similarly the limited nature of hazard tree removal projects would result in negligible impacts on listed and sensitive species. Therefore there would be “no effect” on listed species.	The impacts of fire suppression activities would be less than the no-action alternative. Prescribed burning and mechanical fuel reduction projects would be scheduled to avoid sensitive time periods for listed and sensitive species. The effects of prescribed burning would range from negligible for some listed species to slightly beneficial for other listed species. Therefore there would be “no effect” on listed species.	Incrementally more acres (cannot be quantified in advance) may burn under the appropriate management strategy than with aggressive suppression. Mechanical treatment acreage would be similar to Alternative 2. The impacts, incrementally from the no-action alternative, are negligible. Therefore there would be “no effect” on listed species.
Visitor Experience, Aesthetic Resources	Any adverse impacts of the no-action alternative would be short-term and minor.	This alternative would result in fewer than 200 additional acres burned during a typical 5-year period than under the no-action alternative or Alternative 3. Displacement of visitor activities by prescribed burning, if it occurs at all, would be only for a period of a few hours each year. Visitors may regard burned areas as either pleasing or displeas-	This alternative would result in slightly more acres burned than under the no-action alternative. Visitors may regard burned areas as either pleasing or displeasing. Mechanical fuel reductions would be conducted during periods of low visitation or in areas of limited visitor use and managed to minimize visual impact. Impacts would be short-

Impact Topic	Alt. 1 – No Action	Alt. 2 – AMR and Integrated Fuels Mgt.	Alt. 3 – AMR and Non-fire Fuels Mgt.
		ing. Mechanical fuel reductions would be conducted during period of low visitation or in areas of limited visitor use and managed to minimize visual impact. Impacts would therefore be localized, short-term, and minor.	term, localized, and minor.
Cultural Resources	Aggressive suppression of wildland fires and mowing of vegetation near historic structures would nearly eliminate the exposure of those structures to wildland fire. Although fireline construction has the potential to disturb unknown archeological resources, potential impacts on cultural resources are regarded as unlikely because fire occurrence and size are so low. Where suppression activities might encounter unknown archeological sites, the adverse impact would be minor.	Use of an appropriate management response in suppression of wildland fires would reduce ground disturbance and potential to impact buried or unknown cultural resources. Suppression of wildland fires and mowing of vegetation near historic structures would nearly eliminate the exposure of those structures to wildland fire. When prescribed fires are proposed near historic structures a suite of mitigation measures would be utilized to protect cultural resources. Mechanical fuels reduction projects would avoid known cultural resources. Most if not all pre-European archeological sites have probably experienced multiple fires. Prescribed burning then would have negligible impacts on these sites. Prescribed burning to maintain or restore fire dependent vegetation communities may have minor to moderate beneficial impacts to cultural landscapes. Direct impacts of the proposed action on cultural resources are regarded as negligible to minor.	Use of an appropriate management response in suppression of wildland fires would reduce ground disturbance and potential to impact buried or unknown cultural resources. Suppression of wildland fires and mowing of vegetation near historic structures would nearly eliminate the exposure of those structures to wildland fire. Mechanical fuels reduction projects would avoid known cultural resources. Direct impacts of Alternative 3 on cultural resources are regarded as negligible for historic structures; and beneficial, minor to moderate for cultural landscapes.

Chapter 3 – ENVIRONMENTAL CONSEQUENCES

Park management, with input from the public, identified cultural and natural resources that may be impacted by this project. Impact topics are resources protected by law, regulation, and policy that may be beneficially or adversely affected by an alternative.

Methodology for Assessing Impacts

Applicable and available information on known natural and cultural resources was compiled. Alternatives were evaluated for their effects on the resources and values determined during the scoping process. The impact analyses were based on professional judgment using information provided by park staff, relevant references and technical literature citations, and subject matter experts. For each impact topic, the analysis includes a brief description of the affected environment and an evaluation of effects. Potential impacts are described in terms of type (are the effects beneficial or adverse?), context (are the effects site-specific, local, or even regional?), duration (are the effects short-term or long-term?), and intensity (are the effects negligible, minor, moderate, or major, or would the effects constitute impairment of the Fort Laramie NHS' resources and values?). Because definitions of intensity (negligible, minor, moderate, or major) vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this environmental assessment/assessment of effect.

Direct, indirect, and cumulative effects are discussed in each impact topic. Predictions about direct and indirect effects are based on previous studies, monitoring information, wildland fire effects that have occurred in Fort Laramie National Historic Site or similar vegetation communities, and the expertise and judgment of resource management specialists.

When appropriate, we have also tried to identify mitigation measures that may be employed to offset or minimize potential adverse impacts.

Definitions of intensity levels varied by impact topic, but, for all impact topics, the following definitions were applied.

Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

Direct: An effect that is caused by an action and occurs in the same time and place.

Indirect: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.

Short-term: An effect that within a short period of would no longer be detectable as the resource is returned to its predisturbance condition or appearance. Short-term impacts, depending on impact topic, may range from a few hours up to five years (see table below).

Long-term: A change in a resource or its condition that does not return the resource to predisturbance condition or appearance, and for all practical purposes is considered permanent.

Intensity of Effects Defined

The following table defines impact thresholds, by impact topic, for each level of intensity included in this assessment.

Table 5. Impact Threshold Definitions

<i>Impact Topic</i>	<i>Negligible</i>	<i>Minor</i>	<i>Moderate</i>	<i>Major</i>	<i>Duration of Impact</i>
Firefighter and Public Safety	An action that could cause a change in level of risk to human safety, but the change would be so small that it would not be of any measurable or perceptible effect.	An action that could cause a change in risk level, but the change would be small and have a localized effect. Mitigation would be a standard procedure and highly effective in minimizing risk.	An action that would cause a change to levels of risk; however, mitigation to offset adverse effects would generally be of moderate complexity and would be effective.	An action that would cause a severe change or exceptional benefit to human safety related values. The change would have a substantial and possible permanent effect, and mitigation to offset adverse effects is not assured.	Short-term would refer to the duration of a fire management incident. Long-term refers to duration extending beyond the specific incident.
Geology and Soils	Impacts to soils would not be measurable or of any perceptible consequence.	Changes to character of soils is detectable but small, localized and of little consequence. Any mitigation needed to offset adverse effects would be standard, uncomplicated and effective.	Changes to character of soils readily apparent and of consequence. Changes would be evident over large portion of monument area. Mitigation measures to offset adverse effects would probably be necessary and likely successful.	Impacts to soils characteristics severe or of exceptional benefit over a wide area. Mitigation to offset adverse effects would be needed, but its success not assured.	Short-term refers to durations of less than 5 years. Long-term refers to durations in excess of 5 years.
Air Quality	Impact barely detectable and not measurable; if detected, would not be of any perceptible consequence.	Impact measurable but localized and of little consequence. No mitigation measures would be necessary.	Changes in air quality would have consequences to sensitive receptors, but effects would remain local. Mitigation measures	Changes in air quality would have substantial consequences to sensitive receptors. Mitigation measures necessary and success of measures not	Short-term would refer to hours or days; i.e. the duration of the fire management incident. Long-term would refer to that substantial-

			necessary and likely effective.	assured.	ly beyond the duration of the incident or action.
Floodplains or Wetlands	Impacts would be so small that they would not be of measurable to perceptible consequence. No substantial change to floodplain or wetland function.	Changes to floodplain or wetland function would be small, localized and of little consequence. Any adverse effects to function can be effectively mitigated.	Changes to floodplain or wetland function would be of consequence. Mitigation to offset adverse effects extensive but likely successful.	Changes to floodplain or wetland function would be noticeable and result in severely adverse or beneficial impacts. Loss of ecological function may be permanent. Mitigation to offset adverse effects is required and extensive, and success not assured.	Short-term refers to a period of 1-3 years. Long-term refers to a period of longer than 3 years.
Vegetation	The change in native vegetation communities would be so small that it would not be of any measurable or perceptible consequence.	Changes in populations of native vegetation would be small, localized, and of little consequence. Response to fire and/or other treatments would be within the range of normal fire effects. Any adverse effects can be effectively mitigated.	A large segment of one or more species populations would exhibit effects that are of consequence, but would be relatively localized. Response to fire and/or other treatments would be within the normal expected range of normal fire effects. Mitigation could be extensive, but likely effective.	Severely adverse, and possibly permanent effects to native plant communities. Response to fire and/or other treatments would be outside the normal range of expected fire effects. Mitigation to offset adverse effects would be required and extensive, and success not assured.	Short-term refers to a period of 1-3 years. Long-term refers to a period of longer than 3 years.
Wildlife and Wildlife Habitat	The change in wildlife populations and/or habitats would be so small that it would not be of any measurable or perceptible consequence.	Changes in wildlife populations or habitats would be small, localized, and of little consequence. Response to fire and/or other treatments would be within	Changes in wildlife populations or habitats would be of consequence, but would be relatively localized. Response to fire and/or other treat-	Severely adverse and possibly permanent effects to native wildlife populations or habitats. Response to fire and/or other treatments would be out-	Short-term refers to a period of 1-3 years. Long-term refers to a period of longer than 3 years.

		the range of normal fire effects. Any adverse effects can be effectively mitigated.	ments would be within the normal expected range of normal fire effects. Mitigation to offset adverse effects to native species extensive but likely successful.	side the normal range of expected fire effects. Mitigation to offset adverse effects would be required and extensive, and success not assured.	
Species of Special Concern	Listed species would not be affected or the change would be so small as to not be of any measurable or perceptible consequence to the population.	There would be a measurable effect on one or more listed species or their habitats, but the change would be small and relatively localized.	A noticeable effect to a population of a listed species. The effect would be of consequence to populations or habitats.	Noticeable effect with severe consequences or exceptional benefit to populations or habitats of listed species.	Short-term refers to a period of 1-3 years. Long-term refers to a period of longer than 3 years.
Visitor Experience; Aesthetic Resources	An action that could cause a change in visitors' activities and/or aesthetic resource values, but the change would be so small that it would not be of any measurable or perceptible effect. Few visitors would be affected.	An action that would affect some visitors and cause a change in visitors' activities or aesthetic resources, but the change would be small and localized. Mitigation would not be necessary.	An action that would cause a substantial measurable change in activities available to many park visitors. Mitigation to offset adverse effects would be necessary and effective. Aesthetic resources would not be substantially degraded.	An action that would cause a severe change or exceptional benefit to the activities of most park visitors. The change would have substantial and possibly permanent effect on visitor use. Aesthetic resources would be substantially degraded. Mitigation to offset adverse effects would be needed with success not assured.	Short-term refers to duration of days to a few months. Long-term refers to duration in excess of a year.
Cultural Resources	Impacts to archaeological resources, historic properties (National Register of Historic Places eligible or listed structure or building), natural or physical eth-	The impact affects an archaeological or historic site or feature or cultural landscape with little data potential. The historic context of the affected site(s)	The impact affects an archaeological or historic site or cultural landscape with modest data potential. The historic context of the affected	The impact affects an archaeological or historic site or cultural landscape with high data potential. The historic context of the affected site(s) would be	Short-term refers to a transitory effect; one which largely disappears over a period of days or months. The duration of long-term effects is essentially per-

	<p>nographic resource, or cultural landscapes, either beneficial or adverse, which are at the lowest levels of detection, barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be <i>no adverse effect</i>.</p>	<p>would be local. The impact would not affect the contributing elements of a listed structure eligible for the National Register of Historic Places. Also, an action that could affect a natural or physical ethnographic resource, but the effect would be small, and, if measurable, it would be small and localized. For purposes of Section 106, the determination of effect would be <i>adverse effect</i>.</p>	<p>site(s) would be State. For a National Register eligible site, the adverse impact would affect the contributing elements of the site but would not diminish the integrity of the resource and jeopardize its National Register eligibility. Also, an action that would cause some effect to a natural or physical ethnographic resource. The effect would be noticeable but localized. For purposes of Section 106, the determination of effect would be <i>adverse effect</i>.</p>	<p>national. For a National Register eligible or listed site, the impact would affect the contributing elements of the site by diminishing the integrity to the extent that it is no longer eligible for listing on the National Register. Also, an action that would cause a noticeable to severe effect or exceptional benefit to a natural or physical ethnographic resource. The effect would be substantial and possibly permanent. For purposes of Section 106, the determination of effect would be <i>adverse effect</i>.</p>	<p>manent.</p>
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Cumulative Effects Methodology

From CEQ regulations (1508.7), a “cumulative effect” is the effect on the environment that results from the incremental effect of the action(s) when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such action.

Cumulative impacts are determined by combining the impacts of each alternative with other past, present, and reasonably foreseeable future actions. Therefore, it is necessary to identify other ongoing or reasonably foreseeable future projects on NPS lands of Fort Laramie National Historic Site and, if applicable, the surrounding area.

Other Ongoing and Proposed Projects in the Area

Fort Laramie NHS is currently conducting an environmental assessment on the development of a new visitors' center. The environmental assessment will be released in the summer of 2003. The document will examine the no-action alternative and five action alternatives. Three of the action alternatives propose new construction within the park boundaries; one proposes new construction in the Town of Fort Laramie; and two propose expanded adaptive use of historic buildings.

As called for in the 1993 Record of Decision for the General Management Plan, Fort Laramie NHS is seeking line item construction funding to move the maintenance facility from its current location in the historic district to the other side of the Laramie River in the vicinity of the park's "bone yard" or storage area. Currently, Fort Laramie NHS understands that funding may be available as early as 2007 or as late as 2010.

Fort Laramie NHS is engaged in a grassland restoration program to more appropriately represent the historic scene. Part of this effort includes "brush-hogging" (i.e. motorized chopping) in natural areas to favor native species. Another part of the effort may include chemical treatment of invasive nonnative species (primarily thistle and Russian olive). Separate NEPA analysis will be completed for these chemical treatments.

Fort Laramie NHS has historically provided winter pasture (6-7 months per year) for 25 to 30 horses from Rocky Mountain National Park. Forage availability limits the number of horses pastured to no more than 32 animals. Though this activity is not necessarily intended as a vegetation management program, it does affect fine fuels and thus potentially influences the fire management program.

Compliance with Section 106, National Historic Preservation Act

In accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 of the NHPA (36 CFR Part 800, *Protection of Historic Properties*), impacts to cultural resources and the cultural landscape will be identified and evaluated by (1) determining the area of potential effects, (2) identifying cultural resources present in the area of potential effects that were either listed in or eligible to be listed in the National Register of Historic Places, (3) applying the criteria of adverse effect to affected cultural resources either listed in or eligible to be listed in the National Register, and (4) considering ways to avoid, minimize or mitigate adverse effects.

CEQ regulations and the NPS's *Conservation Planning, Environmental Impact Analysis and Decision-making* (Director's Order #12) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g., reducing the intensity of an impact from major to moderate or minor. However, any resultant reduction in intensity of impact resulting from mitigation is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect as defined by Section 106 is similarly reduced. Although adverse effects under Section 106 may be mitigated, the effect remains adverse.

Under the Advisory Council's regulations, a determination of either *adverse effect* or *no adverse effect* also must be made for affected National Register-eligible cultural resources. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualify it for inclusion in the National Register, e.g., diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by an alternative that would occur later in time, be farther removed in distance or be cumulative (36 CFR Part 800.5, *Assessment of Adverse Effects*). As noted earlier, although adverse effects under Section 106 may be mitigated, the effect remains adverse. A determination of *no adverse effect* means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the National Register.

A Section 106 summary will be included in the impact analysis section for cultural resources. The Section 106 summary is intended to meet the requirements of Section 106 and is an assessment of the effect of the undertaking (implementation of the alternative) on cultural resources, based upon the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations.

Impairment Methodology

National Park Service's *Management Policies* (2001) require analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within park, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values. An impact to any park resource or value may constitute an impairment, but an impact would be more likely to constitute an impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

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

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. A determination on impairment is made in the Environmental Consequences section by resource topic.

FIREFIGHTER AND PUBLIC SAFETY

Affected Environment. There are several small communities near Fort Laramie NHS – the towns of Guernsey (pop. about 1300 people) and Lingle (pop. about 500 people), and the unincorporated community of Fort Laramie (pop. about 300 people). Guernsey and Lingle are about 10 miles west and east, respectively, from Fort Laramie NHS. The community of Fort Laramie is only a couple of miles from the NHS.

Thirteen individuals, partnerships, corporations, or associations own most of the property surrounding the fort. The land is in ranching and agricultural use. The federal government owns one piece of property along the south boundary. It is managed by the Bureau of Land Management. Additional information about land ownership is available through Goshen County.

A Goshen County road crosses the park north to south near the eastern boundary. The Fort Laramie Cemetery Association owns in fee simple part of the right of way along the road. The association's ownership totals approximately 1.3 acres.

Wildland fire management and fuels management programs have some level of inherent risk to both firefighters and the public. Potential risks to firefighter and public safety can be reduced or eliminated by mitigation measures such as, but not limited to:

- Adhering to the 10 Standard Firefighting Orders.
- Being aware of potential Watch Out Situations.
- Employing LCES (Lookouts, Communications, Escape Routes, Safety Zones; this is risk mitigation firefighters commonly use).
- Completing risk analyses.
- Imposing temporary closures.
- Distributing informational fliers to park staff and visitors, including information on temporary closures.

Regulations and Policies. Current laws and policies require that the following conditions be achieved in the park:

Desired Conditions – Firefighters and the public are protected from injury or undue threat from wildland fire management, prescribed burning or fuels management projects.

Source – NPS Management Policies, D.O. 18, RM-18.

Impacts of Alternative 1: No-Action

Impact Analysis: Suppression activities would continue on an average of one or two small fires (average less than 2 acres each) in a typical 5-year period, primarily in NFFL fuel models 1 and 2. Fire behavior is characterized by slow to rapidly moving surface fires in grasslands with flame lengths varying from a few inches to 4 or 5 feet. Fire in wooded riparian areas may exhibit more intense fire behavior but most fires would be confined to surface fuels. Most fire suppression efforts, based on recent fire history, would be confined to a few hours duration. Hazard tree removal would employ the use of chainsaws and vehicles.

The direct effect of the no-action alternative is exposure of fire management personnel to the hazards typically associated with wildland fire suppression: burns, cuts and abrasions from equipment, falls, smoke inhalation, and other injuries. Indirect effects include long-term effects of smoke inhalation.

Direct and indirect effects to firefighters would be mitigated by application of the Ten Standard Firefighting Orders, LCES and other risk mitigation actions. Temporary closures would be used to reduce exposure to park visitors and neighbors. Mechanical hazard tree removal would employ standard safety equipment and protocols.

The communities of Guernsey, Lingle and Fort Laramie have so many cultivated lands and other fuel discontinuities (e.g. man-made barriers to fire such as roads) between them and Fort Laramie NHS that the potential for an escaped wildland fire in the NHS to threaten the communities is substantially reduced.

Overall, the direct impacts to firefighters and the public would be localized, short-term, and minor. Indirect effects would also be localized, short-term, and minor.

Cumulative Effects: Firefighters, visitors and park neighbors are exposed regularly to hazards associated with vehicle use and other work activities. Cumulative effects of the no-action alternative include a slightly longer duration of exposure to hazards associated with fire suppression activities. The cumulative effects on wildland firefighter and public safety are temporary, localized and minor.

Impacts of Alternative 2: AMR and Integrated Fuels Mgt

Impact Analysis: The preferred alternative would reduce risks to wildland firefighters and visitors by allowing use of an appropriate management response to wildland fires. This response may include selecting control lines along natural or man-made barriers which reduces the exposure of firefighters in unburned fuels adjacent to a fire perimeter. Additional exposure is created by prescribed burning and mechanical fuels reduction so the overall risks, particularly to firefighters, are slightly elevated from the no-action alternative.

The direct effect of the no-action alternative is exposure of fire management personnel to the hazards typically associated with wildland fire suppression and prescribed burning: burns, cuts and abrasions from equipment, falls, smoke inhalation and other injuries. Indirect effects include the long-term effects of smoke inhalation.

Direct and indirect effects to firefighters would be mitigated by application of the Ten Standard Firefighting Orders, LCES and other risk mitigation actions. Temporary closures would be used to reduce exposure to park visitors and neighbors. The risks associated with prescribed burning would be further mitigated by ensuring the burns are conducted within the approved prescription. Mechanical hazard fuel reduction activities would employ standard safety equipment and protocols.

The communities of Guernsey, Lingle and Fort Laramie have so many cultivated lands and other fuel discontinuities (e.g. man-made barriers to fire such as roads) between them and Fort Laramie NHS that there is virtually no potential for an escaped wildland fire in the NHS to threaten the communities.

With mitigation measures in place, the direct impacts of the preferred alternative would be short-term, localized, and minor. Indirect effects would also be localized, short-term, and minor.

Cumulative Effects: Firefighters, visitors and park neighbors are exposed regularly to hazards associated with vehicle use and other work activities. Cumulative effects of the preferred alternative include a slightly longer duration of exposure to hazards associated with fire suppression and prescribed burning activities. The cumulative effects on wildland firefighter and public safety are temporary, localized, and minor.

Impacts of Alternative 3: AMR and Non-fire Fuels Mgt

Impact Analysis: The direct and indirect impacts to wildland firefighter and public safety with Alternative 3 are intermediate because risk on wildland fires is reduced by using an appropriate management response and there would be no prescribed burning. Mitigations to risk would be similar to those described above under the preferred alternative. Overall, the direct impacts of Alternative 3 to firefighters and the public would be short-term, localized, and minor. Indirect effects would also be localized, short-term, and minor.

Cumulative Effects: Firefighters, visitors and park neighbors are exposed regularly to hazards associated with vehicle use and other work activities. Cumulative effects of Alternative 3 are similar to, but slightly less than, the preferred alternative. The cumulative effects on wildland firefighter and public safety are temporary, localized, and minor.

GEOLOGY AND SOILS

Affected Environment. The GMP (1993) states the following regarding soils within Fort Laramie NHS: “The soils of the historic site are composed of Banks Loamy Fine Sand and sandy silt overlying river gravels. Soil permeability is good-to-moderate. Recurrent construction activity in the area has resulted in a mixed condition, with saturation of cultural litter and debris. Unconsolidated sand and gravel are saturated to a depth of over 150 feet in the fort area, in a narrow gravel-filled channel, which rapidly diminishes south of the river. The water table is very shal-

low (16-18 feet) on the north side of the Laramie River. The water table is higher south of the river, because of seepage from the Fort Laramie Canal, with water standing in lower holes and Oregon Trail ruts.” The NRCS notes that these soils are relatively young with limited organic matter. They are resistant to water erosion but may be eroded by wind when denuded of vegetation or litter cover.

Regulations and Policies. Current laws and policies require that the following conditions be achieved in the park:

Desired Conditions – Soil stability and fertility are perpetuated. Soil stability and fertility in the long-term are not decreased as a result of fire management programs and practices.

Source – NPS Organic Act, *NPS Management Policies* (2001).

Impacts of Alternative 1: No Action

Impact Analysis: Wildland fire has various effects on soil properties. Variables which influence effects include: fire severity (related to the downward heat pulse), residence time of the flaming front, soil moisture, and the amount of organic matter. The direct effects of fire on soil properties may include changes in soil chemistry (e.g. loss of nitrogen), reduction in porosity, and consumption of organic matter. Indirect effects would include an increase in soil temperature and erosion after vegetation layers are removed. Because fuel loading is light with grass fuel types, fires in grass fuel types have a short residence time and generate only a small downward heat pulse. The effects of unplanned wildland fires on soils in Fort Laramie NHS, particularly given small fire size and infrequent occurrence as well as low organic content in local soils, would be well within the range of normal effects. As such the impacts of fire on soils would be minor and short-term.

Localized and temporary direct adverse impacts to soils result from fire suppression operations. Since all of the recent wildland fires have been limited to 5 acres or less, the impact of fire suppression is considered minor. Indirect effects could include erosion on fire lines, but that potential can be mitigated by not placing firelines on steep slopes or by rehabilitation of firelines in those areas.

Hazard tree removal and mowing grass near historic structures also has the potential to disturb soil surfaces. The type and magnitude of potential disturbance is substantially reduced by use of hand-held tools and rubber-tired vehicles. With reasonable care to minimize ground disturbance during these projects, the potential adverse impact is expected to be localized, short-term and minor.

Both the direct and indirect effects of the no-action alternative on soils and geology would be localized, short-term and minor.

Cumulative Effects: Cumulative effects on soils and geology would include the effects of construction projects proposed in the General Management Plan. These effects are expected to be

short-term and localized to the immediate construction areas. Cumulative effects on soils and geology, then, are anticipated to be localized, short-term and minor.

Conclusion: The no-action alternative would result in localized, short-term and minor direct and indirect adverse impacts to geology and soils. Alternative 1 would not produce any major adverse impacts or impairment of soil and geology resources or values whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 2: AMR and Integrated Fuels Mgt

Impact Analysis: Wildland fire has various effects on soil properties. Variables that influence effects include: fire severity (related to the downward heat pulse), residence time of the flaming front, soil moisture, and the amount of organic matter. The direct effects of fire on soil properties may include changes in soil chemistry (e.g. loss of nitrogen), reduction in porosity, and consumption of organic matter. Indirect effects would include an increase in soil temperature and erosion after vegetation layers are removed. Because fuel loading is light with grass fuel types, fires in grass fuel types have a short residence time and generate only a small downward heat pulse. The effects of unplanned wildland fires on soils in Fort Laramie NHS, particularly given small fire size and infrequent occurrence as well as low organic content in local soils, would be well within the range of normal effects. As such the impacts of fire on soils would be minor and short-term.

Localized and temporary direct adverse impacts to soils result from fire suppression operations. Since all of the recent wildland fires have been limited to 5 acres or less, the impact of fire suppression is considered minor. Indirect effects could include erosion on fire lines, but that potential can be mitigated by not placing firelines on steep slopes or by rehabilitation of firelines in those areas.

Use of an appropriate management response to wildland fires may result in a slight increase in acres burned. However, the use of existing barriers under this scenario would result in less fireline construction, less ground disturbance and fewer direct and indirect impacts to soils.

In addition to the annual grass mowing around historic structures, mechanical treatment of hazardous fuels would involve up to about 100 acres during a typical 5-year period. Chainsaws would be used to thin cottonwood stands; cut material would be piled for later burning or removal. Shrubs would be reduced by mechanical flailing (“brush hog” pulled with a rubber-tired tractor). Soil disturbance from these activities would be minimal. The increase in potential impacts attributable to this aspect of the preferred alternative would be short-term, localized and minor.

Prescribed burning would be broadcast on fewer than 200 acres during a typical 5-year project period; these surface burns would elevate ground temperatures only a few degrees with virtually no effect on soils. Planning for such burns can utilize natural barriers and other mitigation

measures to minimize ground disturbance. Pile burning would occur in the mechanical fuels treatment areas in the year following the mechanical treatments when soils are moist and cool. Although there would be increased heating of soils directly below the piles, the impact to soils would be temporary, minor and localized. Areas dominated by highly erosive soils of the Calvin-Gilpin association would be avoided in prescribed fire planning unless adequate mitigations are in place. The direct impacts of the prescribed burning component of the preferred alternative, therefore, are expected to be minor, localized, short-term, and easily mitigated. The indirect impacts – that of potential wind erosion and increased soil heating (from solar radiation) with removal of vegetation from blocks of land up to 50 acres annually – would be somewhat increased over the no-action alternative, but are still regarded as localized, short-term and minor.

Both the direct and indirect impacts of the preferred alternative on geology and soils would be localized, short-term, and minor.

Cumulative Effects: Cumulative effects on soils and geology would include the effects of construction projects proposed in the General Management Plan. These effects are expected to be short-term and localized to the immediate construction areas. The direct and indirect effects of the preferred alternative are regarded as short-term, localized and minor. Cumulatively the effects on soils and geology are also anticipated to be localized, short-term and minor.

Conclusion: The preferred alternative would result in increased soil exposure as vegetation is removed by wildland and prescribed fires. In a grass community, regrowth is rapid following fire so ground cover would be absent only a short period. Soil heating from burning in grasslands is minimal and would not be sufficient to cause substantive changes in soil properties. The direct, indirect and cumulative impacts of this alternative on soils and geology would be localized, short-term and minor. The preferred alternative would not produce any major adverse impacts or impairment of soil and geology resources or values whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 3: AMR and Non-fire Fuels Mgt

Impact Analysis: The impacts of Alternative 3 would be intermediate between those of the no-action and preferred alternatives. Use of an appropriate management response to unwanted wildland fires may result in a slight increase in acres burned. However, the use of existing barriers under this scenario would result in less fireline construction and subsequently less ground disturbance. Mechanical treatment of hazardous fuels would differ from Alternative 2 only in the removal rather than burning of woody fuels. The direct and indirect impacts of this alternative would be the same as those described for the preferred alternative, except that there would be no prescribed burning and attendant impacts.

The potential direct and indirect impacts on soils by this alternative are therefore regarded as short-term, localized, and minor.

Cumulative Effects: The cumulative effects of fire management actions would be the same as those described under the preferred alternative, or perhaps slightly less due to an absence of prescribed fire. Cumulative effects on soils and geology, then, are anticipated to be localized, short-term and minor.

Conclusion: The impacts of Alternative 3 would be similar but less than those of the preferred alternative – short-term, localized and minor. Alternative 3 would not produce any major adverse impacts or impairment of soil and geology resources or values whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

AIR QUALITY

Affected Environment. Fort Laramie NHS is classified as a Class II Air Quality area. A Class II designation indicates the maximum allowable increase in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter, as specified in the 1963 Clean Air Act (42 U.S.C. 7401 *et seq.*). Further, the Clean Air Act provides that the federal land manager has an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts.

Mobile sources of air pollution in the area include railroads, motor vehicles and farm equipment. The GMP notes that the area is unclassified for ozone, carbon monoxide, and nitrogen oxides. Air quality at the site is within attainment of Class II standards.

Regulations and Policies. Current laws and policies require that the following conditions be achieved in the park:

Desired Conditions – Air quality related values would be protected from pollution sources emanating from within and outside park boundaries. Park management activities do not violate federal and state air quality standards.

Source – Clean Air Act; NPS Organic Act; NPS *Management Policies* (2001).

Impacts of Alternative 1: No Action

Impact Analysis: Direct impacts to air quality from wildland fire under the no-action alternative would include release of particulates and smoke into airshed and the potential for a slight increase in fugitive dust from suppression activities. On a local basis, there may be a localized, intermittent, and temporary exceeding of air quality standards (especially particulates) resulting in short-term, minor to moderate adverse impacts to air quality and visibility. Mitigation would include rapid suppression and extinguishing of remaining smoke from heavy fuels. On a

regional basis, effects to air quality would generally include minor short-term adverse impacts, as quantities of pollutants, primarily particulates, are released to the atmosphere and travel beyond NHS boundaries. Indirect effects from these air emissions would include reduced visibility along roadways, reductions in recreation values due to visibility limitations, smoke and odors, and possible health effects to sensitive residents and visitors.

Under the no-action alternative, wildland fires would be suppressed at as small a size as possible. Although it is not possible to accurately predict the number of acres burned and amount of smoke generated, the recent past history suggested that fewer than 5 acres would burn in an average 5-year period. Gasoline-powered equipment is used for hazard tree removal and mowing around historic structures. However, the amount of acres treated by these mechanical methods would result in a very small contribution of air pollutants.

Thus the direct and indirect impacts of the no-action alternative would be short-term and minor on a local scale and nearly negligible on a regional scale.

Cumulative Effects: Cumulative effects on air quality and visibility in the NHS would result from traffic on highways, recreational user traffic, farming activity, other wildland fires and the local residential communities. Construction projects proposed by the GMP would further contribute to cumulative effects on air quality. The cumulative effects, absent a major increase in non-fire related pollutants or very large wildland fires in the regional area, are regarded as localized, short-term and minor.

Conclusion: Adverse impacts to air quality and air quality-related values result from emissions of air pollutants, smoke and odors. Since recent wildland fire occurrence is so low and fire size so small, the direct and indirect adverse impacts of the no-action alternative to air quality would be localized, short-term and minor. The no-action alternative would not produce any major adverse impacts or impairment of air quality resources or values whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 2: AMR and Integrated Fuels Mgt

Impact Analysis: Under Alternative 2, the preferred alternative, the additional sources of air pollution would come from prescribed burning and from less aggressive suppression of some unwanted wildland fires. Prescribed fire would likely be used to burn three to five blocks totaling fewer than 200 acres during a typical 5-year period; ignition design and timing can minimize smoke production, though burning in these fuel models would not generate much smoke. Pile burning in the mechanical fuels treatment area would be scheduled for the winter or spring and conducted on days of good smoke dispersion. Some additional smoke would be generated from utilization of the appropriate management response, though the acres burned would likely be small. These increases in smoke production would result in similar, but slightly greater direct and indirect impacts compared with the no-action alternative. The pollutant generated by use of gasoline-powered equipment during mechanical fuel reduction projects would be

slightly greater than that of the no-action alternative. Given the level of burning and fuel reduction over a typical 5-year period, however, the direct and indirect impacts on air quality are still regarded as localized, short-term and minor.

The park would comply with all federal, state, and local air quality laws and regulations, specifically the U.S. Clean Air Act and State of Wyoming regulations. Smoke modeling using SASEM (Simple Approach Smoke Estimation Model) or similar models would be completed to ensure sensitive receptors are not unduly impacted. Park staff would notify the Wyoming Department of Environmental Quality regarding the date and location of proposed burns and comply with any state burning restrictions. If the state suspends burning because of poor air quality on the scheduled burn date, the park would not ignite any fuels. The influence of smoke on health and safety and the scenic viewshed would be kept to a minimum by following smoke management prescriptions listed in the Fire Management Plan.

Overall the direct adverse impacts to air quality would be short-term, localized and minor. Mitigation would probably not be needed, but could be applied in the form of altered ignition patterns on prescribed fires. Indirect impacts would be short-term and minor in a local context and nearly negligible on a regional scale.

Cumulative Effects: Cumulative effects on local and regional air quality and visibility would result from traffic on highways, recreational user traffic, farming activity, other wildland fires and the local residential communities. Construction projects proposed by the GMP would further contribute to cumulative effects on air quality. The cumulative effects, including the increased smoke from prescribed burning but absent a major increase in non-fire related pollutants or very large wildland fires in the regional area, are regarded as localized, short-term and minor.

Conclusion: Adverse impacts to air quality and air quality-related values result from emissions of air pollutants, smoke, and odors. The direct and indirect impacts of the preferred alternative would be somewhat greater than the no-action alternative due to the contribution of prescribed burning. Since the occurrence of both wildland and prescribed fires is so infrequent and of such short duration, the direct adverse impacts of the preferred alternative to air quality would be localized, short-term and minor. The indirect effects would be short-term and minor in a local context and nearly negligible on a regional scale. The preferred alternative would not produce any major adverse impacts or impairment of air quality resources or values whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 3: AMR and Non-fire Fuels Mgt

Impact Analysis: Under Alternative 3, the only source of increased air pollution compared with the no-action alternative would be the slight increase in smoke production from less aggressive suppression of some fires and the use of gasoline-powered equipment in hazard fuels reduction projects. With the absence of prescribed burning, the direct and indirect impacts of Alternative 3 would be similar to but less than those described for the preferred alternative.

Cumulative Effects: Cumulative effects on local and regional air quality and visibility would result from traffic on highways, recreational user traffic, farming activity, other wildland fires and the local residential communities. Construction projects proposed by the GMP would further contribute to cumulative effects on air quality. The cumulative effects, absent a major increase in non-fire related pollutants or very large wildland fires in the regional area, are regarded as localized, short-term and minor.

Conclusion: Adverse impacts to air quality and air quality-related values result from emissions of air pollutants, smoke, and odors. The direct and indirect impacts of Alternative 3 would be somewhat greater than the no-action alternative due to the contribution of hazard fuels reduction projects and slightly greater burned acreage for wildland fires managed under an appropriate management response. The impacts would be less than those attributed to the preferred alternative due to the absence of prescribed burning. Since the occurrence of wildland fires is so infrequent and of such short duration, the direct adverse impacts of Alternative 3 to air quality would be localized, short-term and minor. The indirect effects would be short-term and minor in a local context and nearly negligible on a regional scale. Alternative 3 would not produce any major adverse impacts or impairment of air quality resources or values whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

FLOODPLAINS AND WETLANDS

Affected Environment. A survey of existing information by the NPS Water Resources Division (cited in the GMP 1993) indicates that the 100-year flood elevation is 4,240 feet and the 500-year floodplain elevation is 4,248 feet. No existing developments or historic buildings are within the 100-year floodplain. Several ruins and a laundress area lie within the 100-year floodplain on the southeast side of the Laramie River. Flash flooding is not a common occurrence within the NHS.

Properly functioning floodplains store water during flood periods, reduce the volume and velocity of immediate runoff and release water from bank storage during periods of lower flows.

Some wetlands at Fort Laramie NHS exist in association with the floodplain riparian area. These are identified as Palustrine emergent, Palustrine scrub-shrub, Riverine lower perennial unconsolidated bottom, and Riverine lower perennial unconsolidated shore classes. Some wetlands occur as a result of seepage from the Laramie Canal. These latter sites, existing because of canal seepage, are occupied by artificially sustained vegetation that was not on the landscape during the historic period. (See Jones and Tebben (2002) for more discussion of wetland vegetation types.)

Properly functioning wetlands also store water and sustain submerged and/or emergent vegetation. Wetlands contribute to a diversity of habitats for vegetation and wildlife at Fort Laramie NHS.

Regulations and Policies. Current laws and policies require that the following conditions be achieved in the park:

Desired Conditions – Floodplains and wetlands retain their natural function. Changes within floodplain and wetlands remain within the range of natural variation.

Source – NPS Organic Act; NPS *Management Policies* (2001); E.O. 11988.

Impacts of Alternative 1: No Action

Impact Analysis: Under the no-action alternative, wildland fires could occur on floodplains in the riparian area or near wetlands. Aggressive suppression would result in minor ground disturbance (compaction or rutting), but would not substantively affect floodplain or wetland functions. Similarly, vehicle use associated with hazard tree removal would cause very limited compaction and rutting. These effects can be minimized by conducting hazard tree operations when floodplain soils are not wet. Wildland fire would also most likely occur when floodplain soils are drier. Given the very low fire occurrence and small fire size (and the occurrence of most fires outside the riparian zone), direct effects on floodplain and wetland function would be localized, short-term and minor. Potential indirect impacts include erosion of topsoil from burned uplands onto the floodplains; these are also expected to be localized, short-term and minor.

Cumulative Effects: Other actions which may contribute to cumulative effects on floodplains and wetlands include: flow manipulation from Grayrocks Reservoir (Laramie River) and/or Glendo Reservoir (North Platte River), vegetation changes which decrease or increase the ability of floodplains to store water, and park management actions (particularly in avoiding disturbance to wetlands). There are no indications that a change in these actions are anticipated which would adversely affect floodplains and wetlands. No other projects are planned that would adversely impact floodplains and wetlands. Therefore, the cumulative effect of the no-action alternative on floodplains and wetlands would be localized, short-term and minor.

Conclusion: The direct and indirect impacts on floodplains from the no-action alternative would at most be very localized, short-term and minor. The no-action alternative would not produce any major adverse impacts or impairment of floodplains and wetlands whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 2: AMR and Integrated Fuels Mgt

Impact Analysis: Under the preferred alternative, slightly larger acreage may be burned when the appropriate management response is applied to wildland fires. Because suppression activi-

ties could generally avoid sensitive riparian areas, the net effect of reducing such disturbance even with larger burned acreage would be a direct minor beneficial impact. Prescribed burning, except possibly for pile burning, is not proposed in floodplains and wetlands. Prescribed burning would have negligible direct and indirect effects on floodplain and wetland function.

Mechanical treatments – reduction in dead standing trees and chopping shrubs – would be conducted on less than 100 acres during a typical 5-year period; much of the area currently proposed for treatment is within the areas of riparian and wetland communities. Accumulated dead fuels (mainly cottonwood) would be cut with chainsaws and hand piled. Direct adverse impact would be compaction or rutting of soils on floodplains. Indirect impacts include the potential for a very slight reduction in water storage. Use of a rubber-tired tractor to pull and power the flail chopper would minimize adverse impacts in the riparian zone as would scheduling the work when soils are less vulnerable to compaction. Most wetlands would simply be avoided. Overall, the direct impacts of fuels reduction on floodplain and wetland functions would be short-term, localized and minor.

The overall direct impacts of the preferred alternative on floodplains and wetlands would be short-term, localized and minor. The indirect impacts would be negligible.

Cumulative Effects: Other actions which may contribute to cumulative effects on floodplains and wetlands include: flow manipulation from Grayrocks Reservoir (Laramie River) and/or Glendo Reservoir (North Platte River), vegetation changes which decrease or increase the ability of floodplains to store water, and park management actions (particularly in avoiding disturbance to wetlands). There are no indications that a change in these actions are anticipated which would adversely affect floodplains and wetlands. No other projects are planned that would adversely impact floodplains and wetlands. Therefore the cumulative effect of the preferred alternative on floodplains and wetlands would be localized, short-term and minor.

Conclusion: The preferred alternative would at most have very localized, short-term and minor direct impacts on floodplains. The indirect impacts would be negligible. The alternative would not produce any major adverse impacts or impairment of floodplains and wetlands whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 3: AMR and Non-fire Fuels Mgt

Impact Analysis: The fire management activities of Alternative 3 in floodplains and wetlands would be virtually the same as those of the preferred alternative. Therefore, the impacts are judged to be the same – short-term, localized and minor.

Cumulative Effects: Other actions which may contribute to cumulative effects on floodplains and wetlands include: flow manipulation from Grayrocks Reservoir (Laramie River) and/or Glendo Reservoir (North Platte River), vegetation changes which decrease or increase the ability of floodplains to store water, and park management actions (particularly in avoiding disturb-

ance to wetlands). There are no indications that a change in these actions are anticipated which would adversely affect floodplains and wetlands. No other projects are planned that would adversely impact floodplains and wetlands. Therefore, the cumulative effect of Alternative 3 on floodplains and wetlands would be localized, short-term and minor.

Conclusion: Alternative 3 would at most have very localized, short-term and minor direct impacts on floodplains. The indirect impacts would be negligible. Alternative 3 would not produce any major adverse impacts or impairment of floodplains and wetlands whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

VEGETATION

Affected Environment. The Vegetation Management Plan (2002) provides considerable detail concerning the current and historic vegetation for Fort Laramie NHS. Much of the information below is summarized from that report; we will generally not cite the publications cited in the Report. The reports states: “The vegetation of Fort Laramie is predominantly a mix of upland grass vegetation types, with a mix of riparian and wetland vegetation types growing in strips along the Laramie River..., the Fort Laramie Canal..., and the North Platte River...” Most of the lands within the NHS were disturbed at some time in the past, perhaps beginning with the fur trade period, increasing with occupation of trading and military posts, and continuing through the homestead/agricultural period.

Two native grass communities occur in the park. One is a needle-and-thread/blue grama community that probably represents the native grassland typical of the Fort Laramie NHS area. This community includes varying amounts of western wheatgrass. Exotic species that occur in this community include cheatgrass, common salsify, Japanese brome, smooth brome and Kentucky bluegrass. The second community is dominated by sand dropseed, buffalo grass and the exotic cheatgrass. This community occurs on sites that were disturbed in the past several decades, and the Vegetation Management Plan suggests that, absent the previous disturbance, community composition would be similar to the needle-and-thread/blue grama type.

The Vegetation Management Plan also describes other disturbed site communities, most notably one dominated by cheatgrass, common kochia, and Russian thistle, and the other dominated by smooth brome. The report notes that both types occur on lands that would probably have supported native grass communities prior to disturbance.

The riparian areas are a mosaic of cottonwood groves with herbaceous understories. The dominant species is plains cottonwood, but peachleaf willow, green ash, narrowleaf cottonwood and lanceleaf cottonwood also occur in these groves. Other species include western snowberry, western wheatgrass, prairie cordgrass and Nebraska sedge. Much of the riparian area appears approximately similar to that which existed prior to the establishment of the trading and military posts though it now contains several nonnative species.

The Vegetation Management Plan for Fort Laramie NHS notes that 177 species of vascular plants have been documented in the NHS. Nearly 50 nonnative vascular plant species occur in the NHS, most of which were apparently introduced after the period of historic significance. Cheatgrass is the most widespread nonnative species. Species included on the Wyoming noxious weed list include: Canada thistle, quackgrass, field bindweed, yellow toadflax, scotch thistle, marsh sowthistle and puncturevine. Most park management documents include direction to reduce the occurrence and dominance of nonnative species. The Vegetation Management Plan recommends a management scheme which includes survey (inventory), monitoring, and restoration of areas dominated by nonnative species. Restoration tools include tilling, mowing, other mechanical treatments, chemical treatments, seeding and prescribed burning. The Plan, citing NPS documents and scientific publications, notes that prescribed fire is recommended as the primary means of maintaining native grass communities.

The Plan notes that although one study recommended prescribed burning between mid-March and late April, the typical natural fire season is during the summer. The Plan notes that burning during the summer may be more effective in contributing to the control of some nonnative species. Many invasive nonnative species (e.g. cheatgrass) employ an ecological strategy of early maturation and seed dissemination. For this type of species, summer burning may not provide effective control since their seeds would already be released and surface temperatures under fast moving summer fires may not be high enough to kill the seeds. Conversely, fire effects studies at Dinosaur National Monument have documented the replacement of cheatgrass by western wheatgrass after summer burning.

The following information concerning fire ecology and fire effects on native and invasive nonnative species is drawn primarily from the Fire Effect Information System (FEIS) (<http://www.fs.fed.us/database/feis>). The information is not intended to express recommendations but merely to indicate how various authors characterized the effect of fire on species of interest. More information is available at the website.

- Native grasses such as needle-and-thread, blue grama, western wheatgrass, and sand dropseed generally respond vigorously to fire, particularly fire in the later summer when the grasses are dormant. Fire effects studies at Dinosaur National Monument indicate that response is strongest when fires have short residence times (Perryman, et al. 2002).
- Canada thistle can survive individual fires, but repeated burning on relatively short intervals (annually to every 4 or 5 years) reduces plant density, especially when burning during periods that favor native grasses. Early spring burning of Canada thistle may result in vigorous sprouting and reproduction.
- Fire would kill above ground parts of field bindweed but the plant would sprout from surviving rhizomes. Some contributors to FEIS suggested that an integrated approach to control might include herbicide applications.

- The literature in FEIS is mixed concerning the effects of fire on quackgrass with some studies showing quackgrass populations stimulated by fire and others suggesting fire may suppress quackgrass.
- The literature is mixed on the effects of spring or fall burning on smooth brome and Japanese brome, except that repeated burning on short intervals (less than 5 years) results in decreased density. There was no information on the effects of summer burns, though some researchers suggested control may be better if brome plants are burned while they still retain seeds. Native species competition after burning may depress brome species.
- Information on fire effects of the other invasive species at Fort Laramie NHS was not available in the Fire Effects Information System.

Regulations and Policies. Current laws and policies require that the following conditions be achieved in the park:

Desired Conditions – Vegetation communities in Fort Laramie NHS would be restored and would maintain long-term ecological diversity and stability, with fire-dependent communities sustained by fire and fire intolerant communities protected for unwanted wildland fire.

Source – NPS Organic Act, NPS *Management Policies* (2001)

Impacts of Alternative 1: No Action

Impact Analysis: Under this alternative, wildland fires would be suppressed at the smallest reasonable acreage. Given recent fire incidence, an estimated one or two fires during a 5-year period would burn a total of 3-4 acres. With relatively continuous fuel beds the potential exists for larger fires (see Appendix 1 for example), especially under drought conditions and/or as fuel accumulations increase. In Fort Laramie NHS, however, fuel discontinuities would likely prevent large fire size except under the most extreme conditions.

The direct impacts of wildland fire include removal of above ground biomass. Some mortality of grass, shrub and tree species would result, especially if the residence time of fire is extended and the intensity (downward heat pulse) is subsequently greater. Although no fire effects monitoring or research has been conducted at Fort Laramie NHS, fire effects studies at Dinosaur National Monument showed that mortality of needle-and-thread and Indian ricegrass averaged over a two-year period following a head fire was not substantially different from mortality expected from plant senility.

Indirect effects of wildland fire on these vegetation community types is varied, depending on species affected (whether they sprout or not in response to fire) and the degree of immediate impact (whether individual plants are killed or not). The response of grassland or riparian communities would be expected to be within the normal range of response where those communities are already dominated by native species. Re-sprouting by grass and many shrubs would be expected during the same year as burning or, if the year is particularly dry, no later than the next spring. The timing and intensity of burning may result in an indirect effect – a

slight shift in species composition, though the degree of shift would be minor. The long-term indirect effect of burning in native grasslands is to invigorate the community, resulting in robust growth and increased seed production.

The direct effect of burning communities dominated by nonnative species would also include removal of above ground biomass and some mortality of individual plants. The indirect impacts may range from expansion/proliferation of nonnative species in the burned area to depression of nonnative species. The response is largely dependent on the time and intensity of burning as well as secondary factors such as competition with native species, reseeding the burned area with native species, or other subsequent treatment(s) of nonnative species.

The direct impact of hazard tree removal is removal of individual trees. Indirect effects include some damage to herbaceous plants and shrubs by vehicle use associated with the project.

Overall, the direct impacts of wildland fire under the no-action alternative, particularly given the low occurrence of wildland fire and small acreages burned, would be localized, short-term and minor. The indirect impacts would be localized, short-term and negligible.

Cumulative Effects: Other projects and activities such as grassland restoration (treatment of invasive nonnative weeds, reseeding with native species), construction of facilities, and grazing by domestic horses contribute to cumulative impacts. Grassland restoration would have minor to moderate beneficial long-term effects on vegetation communities. No data exists to document the effects of grazing by domestic horses, but the direct impact on grassland vigor and composition is probably minimal since grazing occurs during periods when native grasses are dormant. Facility construction would have long-term adverse impacts in the immediate construction area, but the area affected would be sufficiently small that the overall impacts to vegetation communities would be minor. The cumulative effects of the no-action alternative, therefore, would be localized, short-term and minor, though fire exclusion in fire-dependent grassland communities could be moderately adverse in the long-term since these communities have a natural fire return interval of less than 10 years.

Conclusion: The no-action alternative would have localized, short-term and minor direct adverse impacts on vegetation communities. The indirect impacts would be localized, short-term and negligible. The no-action alternative would not produce any major adverse impacts or impairment of vegetation communities whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 2: AMR and Integrated Fuels Mgt

Impact Analysis: Under the preferred alternative, slightly larger acreage may be burned when the appropriate management response is applied to wildland fires. Because suppression activities could avoid sensitive plant communities, the net effect of reducing such disturbance even with larger burned acreage would be a localized, short-term, minor beneficial impact.

Under this alternative, fewer than 200 acres of grassland would be burned with broadcast prescribed fire in a typical 5-year period; no more than about 50 acres would be burned in any year. The objective of such burning is the restoration and/or maintenance of native grassland communities. Grasslands identified for burning are dominated by native species though patches of nonnative vegetation are included in the burn blocks.

The direct effects of an appropriate management response to wildland fires and implementation of prescribed burning are the same as those described under the no-action alternative. They would simply be evident on a somewhat larger scale – i.e. on about 200 acres over a typical 5-year period – as a result of prescribed burning. The indirect effects are also the same but again on a somewhat larger scale. A moderate, long-term indirect beneficial effect would generally be a more diverse, robust and stable native grassland community.

The impacts of burning on nonnative species are less certain and may range from suppression of some nonnatives to stimulation of others. Each prescribed fire burn plan which involves patches dominated by nonnative species would consider the species present and design the burn to discourage nonnatives and encourage native species. Further investigation and monitoring of initial prescribed burns would refine prescriptions for use of fire in management of invasive nonnative species.

Overall, then, the direct effects of fire on the landscape under the preferred alternative would be localized, minor, and short-term. In the long-term, indirect effects would be minor to moderate and beneficial.

Hazard fuel reduction activities would include thinning of cottonwoods and brush reduction (flail chopping) in the riparian area. The direct effects of these activities on vegetation would be a reduction in fuel loading, a change in understory dominance (from brush to grass) in treated areas, and some crushing of herbaceous vegetation. Use of rubber-tired tractors to pull the flail would minimize disturbance of herbaceous plants. Pile burning would probably kill the vegetation immediately under the piles; early seral species should be evident in these burned areas within one or two years. The indirect effect would be more open stands which would be less susceptible to intense wildland fires. This aspect of the preferred alternative would therefore result in localized, short-term and minor adverse impacts. Long-term indirect impacts would be localized, minor to moderate and beneficial for native vegetation communities.

Overall, the long-term impacts of the preferred alternative on vegetation communities would be beneficial, moving the communities toward more natural composition.

Cumulative Effects: Other projects and activities such as grassland restoration (treatment of invasive nonnative weeds, reseeding with native species), construction of facilities, and grazing by domestic horses contribute to cumulative impacts. Grassland restoration would have minor to moderate beneficial long-term effects on vegetation communities. No data exists to document the effects of grazing by domestic horses, but the direct impact on grassland vigor and composition is probably minimal since grazing occurs during periods when native grasses are

dormant. Facility construction would have long-term adverse impacts in the immediate construction area, but the area affected would be sufficiently small that the overall impacts to vegetation communities would be minor. The cumulative effect on vegetation would be minor and adverse in the short-term but minor to moderate and beneficial in the mid- to long term.

Conclusion: The preferred alternative would have direct localized, short-term and minor adverse impacts on vegetation communities. Long-term indirect impacts would be minor to moderate and beneficial as grassland communities are restored and maintained. The preferred alternative would not produce any major adverse impacts or impairment of vegetation communities whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 3: AMR and Non-fire Fuels Mgt

Impact Analysis: Wildland fire suppression activities under Alternative 3 would be the same as those described for the preferred alternative and would have the same direct and indirect impacts. The direct and indirect impacts of mechanical fuels reductions would be the same as described under the preferred alternative. Thus the overall direct and indirect effects in the short-term would be localized, minor and adverse. The long-term indirect effect of hazard fuels reduction would be minor and beneficial. Not as many beneficial effects accrue under this alternative as under the preferred alternative because less effort is invested in restoring and maintaining native grasslands.

Cumulative Effects: Other projects and activities such as grassland restoration (treatment of invasive nonnative weeds, reseeding with native species), construction of facilities, and grazing by domestic horses contribute to cumulative impacts. Grassland restoration would have minor to moderate beneficial long-term effects on vegetation communities. No data exists to document the effects of grazing by domestic horses, but the direct impact on grassland vigor and composition is probably minimal since grazing occurs during periods when native grasses are dormant. Facility construction would have long-term adverse impacts in the immediate construction area, but the area affected would be sufficiently small that the overall impacts to vegetation communities would be minor. The cumulative effect on vegetation would be minor and adverse in the short-term. Cumulative effects would be minor and beneficial in the long-term.

Conclusion: Alternative 3 would have localized, short-term and minor direct adverse impacts on vegetation communities. Long-term indirect impacts would be minor and beneficial as the potential for intense wildland fire is diminished. Alternative 3 would not produce any major adverse impacts or impairment of vegetation communities whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

SPECIES OF SPECIAL CONCERN

Affected Environment. The U.S. Fish and Wildlife Service (FWS) identified five endangered or threatened species that may occur in or near Fort Laramie National Historic Site. These include the bald eagle (threatened; *Haliaeetus leucocephalus*), black-footed ferret (endangered; *Mustela nigripes*), mountain plover (proposed for listing; *Charadrius montanus*), Preble's meadow jumping mouse (threatened; *Zapus hudsonius preblei*) and Ute ladies'-tresses (threatened; *Spiranthes diluvialis*). There are no designated critical habitats within the NHS.

Bald eagles use the NHS area in winter, roosting in and hunting from large cottonwoods in the riparian areas along the Laramie and North Platte Rivers. FWS recommends providing a 1-mile disturbance-free buffer around such sites during periods that they are occupied. Mitigation for this species under the preferred alternative would consist of avoiding fire management activities within 1 mile of roost trees during the period of occupation by eagles. Mechanical fuel treatments in riparian zones would be completed in the spring after eagles have left the area. Large standing dead trees that are preferred roost sites would be left standing.

Black-footed ferrets are obligates of prairie dog towns. There are no prairie dog towns in the NHS; the closest known prairie dog towns are about 5 miles away. No mitigation is therefore anticipated, though surveys might be completed if prairie dog towns expand into the NHS (surveys are not warranted until or unless a prairie dog town complex reaches 200 acres or more).

The mountain plover uses bare or nearly bare areas for nesting – areas of very short and sparse vegetation. Vegetation on these sites would be too discontinuous to support fire. No mitigation is therefore anticipated.

The Preble's meadow jumping mouse occupies wet meadow and riparian habitats. Although the species has not been recorded in Goshen County, FWS recommends surveys to determine presence or absence of the species and has volunteered to conduct such surveys. Mitigation would consist of excluding broadcast prescribed fire from potential habitats until a FWS survey is completed. If presence of the Preble's meadow jumping mouse is confirmed, further consultation would determine additional mitigation needs.

Ute ladies'-tresses habitats are usually disturbed areas in moist soils along rivers and other waterways. To prosper, they generally require areas with little competing vegetation. Since Ute ladies'-tresses have not been documented in the NHS and habitats occupied by Ute ladies'-tresses are typically not susceptible to fire, no mitigations are anticipated.

Regulations and Policies. Current laws and policies require that the following conditions be achieved in the park:

Desired Conditions – Federal-and state-listed threatened and endangered species and their habitats are sustained. No fire management actions jeopardize the continued existence of listed or candidate species or adversely impact critical habitats.

Source – Endangered Species Act; NPS Organic Act; NPS Management Policies.

Impacts of Alternative 1: No Action

Impact Analysis: With the no-action alternative, all wildland fires would be aggressively suppressed, thus minimizing the potential disturbance of listed species and their habitats. Recent fire history suggests this would involve only one or two fires totaling 3-4 acres during a 5-year period. Hazard tree removal would be scheduled during periods (e.g. spring and summer) when bald eagles would not be present. Hazard tree removal would occur on lands not likely to be occupied by any of the other listed (or proposed for listing) species. Vehicle use associated with wildland fire suppression and hazard tree removal would occur in habitats potentially occupied by listed species, with the effect of temporarily pressing vegetation. Given that none of the species except bald eagle are known in the area, both direct and indirect impacts of the no-action alternative to species of special concern are regarded as negligible and have “no effect.”

Cumulative Effects: Efforts to restore native grassland communities (e.g. treatment of invasive nonnative species) would eventually provide minor to moderate beneficial impacts to species of special concern. The impacts of grazing by horses have not been identified, but would likely be negligible to minor on listed species, especially since that grazing occurs during the winter. Construction proposed by the GMP would be outside habitats utilized by species of special concern. No other projects are planned for the NHS that would affect listed species or their habitats. Therefore, the cumulative effects associated with the no-action alternative are negligible.

Conclusion: The potential direct and indirect effects of the no-action alternative on special concern are regarded as negligible. The no-action alternative would not produce any major adverse impacts or impairment of species of special concern whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument. From the standpoint of Section 7 of the Endangered Species Act, the impacts of the no-action alternative would have “no effect.”

Impacts of Alternative 2: AMR and Integrated Fuels Mgt

Impact Analysis: With Alternative 2, an appropriate management response may employ the use of natural or man-made barriers to contain an unwanted wildland fire rather than building fire lines through sensitive vegetation communities. Therefore, individual fires might become slightly larger under an appropriate management response. Potential habitat for Ute ladies'-tresses, mountain plover and Preble's meadow jumping mouse are usually not susceptible to fire. No prairie dog towns exist in the park. Eagle roost trees can be identified and protected. The direct effects of wildland fire and suppression activities on potential endangered species habitats including the removal and crushing of vegetation would be minor due to the very low frequency of activity associated with fire occurrence. The direct effects of suppression actions under the preferred alternative are therefore negligible and of “no effect.” Indirect effects of

suppression action would include the loss or improvement of potential habitats over time and are regarded as negligible.

Fewer than 200 acres of upland grasslands would be treated with broadcast prescribed fire during a typical 5-year period. Isolated piles would be burned within the areas of mechanical fuels reduction. None of the listed species are expected to inhabit the upland grasslands where most of the prescribed burning would occur. With the mitigations identified in the Affected Environment section above, the potential direct adverse impact on species of special concern would at most be a small, temporary loss of habitat. Thus the direct adverse impacts would be short-term, localized and negligible to minor. Prescribed burning would have minor long-term indirect beneficial impacts to listed species through the restoration of native grasslands.

The potential for mechanical treatments proposed for the riparian areas to adversely affect habitat for Preble's meadow jumping mouse is extremely low. Mechanized equipment is very unlikely to traverse potential habitat for Ute ladies'-tresses. Mechanical treatments would not be conducted when bald eagles are present, thus avoiding any direct impacts. Direct impacts could include crushing of vegetation and consuming vegetation under burn piles. Indirect effects of mechanical fuels reduction may include the loss or improvement of potential habitats over time. The direct and indirect impacts would therefore be localized, short-term and negligible to minor.

Overall, the direct impacts of the preferred alternative on species of special concern are short-term, localized, and negligible to minor. Longer-term indirect impacts would be beneficial due to restoration and maintenance of more natural habitats.

Cumulative Effects: Efforts to restore native grassland communities (e.g. treatment of invasive nonnative species) would eventually provide minor to moderate beneficial impacts to species of special concern. The impacts of grazing by horses have not been identified, but would likely be negligible to minor on listed species, especially since that grazing occurs during the winter. Construction proposed by the GMP would be outside habitats utilized by species of special concern. No other projects are planned for the NHS that would affect listed species or their habitats. Therefore, the cumulative effects associated with the preferred alternative would be localized, short-term, and negligible to minor.

Conclusion: The direct impacts of the preferred alternative on species of special concern are short-term, localized, and negligible to minor. Longer-term indirect impacts would be beneficial due to restoration and maintenance of more natural habitats. The preferred alternative would not produce any major adverse impacts or impairment of species of special concern whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument. From the standpoint of Section 7 of the Endangered Species Act, the impacts of the preferred alternative would have "no effect."

Impacts of Alternative 3: AMR and Non-fire Fuels Mgt

Impact Analysis: With the absence of prescribed burning in this alternative, only a slightly larger area may be burned than under the no-action alternative using an appropriate management response to suppression of unwanted wildland fires. Mechanical treatments would remain the same as under Alternative 2. The potential direct and indirect impacts of Alternative 3 would therefore be the same as the preferred alternative except that no effects attributable to prescribed burning would accrue. Therefore the direct impacts of Alternative 3 on listed species would be short-term, localized, and negligible to minor.

Cumulative Effects: Efforts to restore native grassland communities (e.g. treatment of invasive nonnative species) would eventually provide minor to moderate beneficial impacts to species of special concern. The impacts of grazing by horses have not been identified, but would likely be negligible to minor on listed species, especially since that grazing occurs during the winter. Construction proposed by the GMP would be outside habitats utilized by species of special concern. No other projects are planned for the NHS that would affect listed species or their habitats. Therefore, the cumulative effects associated with Alternative 3 would be localized, short-term, and negligible to minor.

Conclusion: The potential direct and indirect effects of Alternative 3 on special concern would be localized, short-term, and negligible to minor. Alternative 3 would not produce any major adverse impacts or impairment of species of special concern whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument. From the standpoint of Section 7 of the Endangered Species Act, the impacts of Alternative 3 would have “no effect.”

WILDLIFE

Affected Environment. Fort Laramie NHS contains a variety of wildlife typical of the high plains and Rocky Mountain area. Mammals frequenting the area include: mule deer, coyote, beaver, muskrat, cottontail, jackrabbit and several rodents. Birds include a suite of passerines, waterfowl, woodpeckers and raptors. The Laramie and North Platte Rivers include both native and nonnative species, the most common being longnose sucker, white sucker, longnose dace, creek chub, johnny darter, red shiner and sand shiner.

No fire effects monitoring or research has been conducted in Fort Laramie NHS. Fire effects studies of small mammals in Dinosaur National Monument indicated that although there was decreased community diversity in the initial few years following burning of shrublands, there was no long-term impact on species richness and similarity compared with unburned control plots (Olson, et al. 2003). There were no differences in diversity indexes between burned and control plots across sample years and sites combined; diversity on burned plots generally fluctuated more across post-burn sample years by site than did diversity on control plots. There were shifts in species composition within communities during early post-burn years. We expect the shifts in composition would be less when grasslands are burned at Fort Laramie NHS than when shrublands were burned at Dinosaur National Monument since many of the species that

prefer shrublands (e.g. sagebrush vole, green-tailed towhee) would be less common at Fort Laramie NHS.

Large ungulates may be temporarily displaced by fire, but fire effects studies in Dinosaur National Monument indicated increased use of post-burn habitats.

Olson, et al. (*in prep*) found that species richness, density and diversity of breeding birds at Dinosaur National Monument were higher on burned than unburned plots across all sites during the early post-burn period (1-5 years). These indices were lower on burned plots during later post-burn periods (5+ years). Similarity index values indicated that maximum overlap of bird species between burned and unburned plots across all sites occurred during the intermediate post-burn years and minimal overlap occurred during early and late post-burn periods. They concluded that fire in Wyoming big sagebrush resulted in short-term (5-7 years) increases in species richness, density, and community diversity on burned sites. Though not analyzed by Olson, et al. (*in prep*), a few species appeared to be nearly obligate in unburned sites (e.g. green-tailed towhee) while granivores appear to be more common in the burned sites. As a general conclusion, then, it appears that burning in Wyoming big sagebrush does not adversely affect breeding bird populations. Since grasslands would recover structure more rapidly than shrublands, burning in grasslands would likely result in smaller changes in the avian community than those evident in burning shrublands.

Species diversity and abundance of birds within prairie ecosystems is typically greater in riparian areas than in adjacent uplands. Burning in riparian areas may have varied effects on birds, depending on the intensity and extent of the fire. Fires, which are large and severe, may displace breeding birds for many years. Mortality of trees, however, would result in increased bark insect populations and subsequent increases in use by insectivorous birds. Fires that are small and/or of low intensity would result in few or very short-term changes in bird populations.

The effects of fires on wildlife are also influenced by scale. Small fires would result in little if any effect on wildlife populations. Large fires have the potential for greater impact since a greater area is burned. Irregular perimeters on wildland fires have the effect of creating more edge, an effect which brings greater habitat diversity.

Regulations and Policies. Current laws and policies require that the following conditions be achieved in the park:

Desired Conditions – Most species present in the mid-1800s are still represented in the NHS fauna. Diversity and abundance of wildlife populations are robust, within the carrying capacity of the area. Population fluctuations remain within the normal range of variability.

Source – NPS Organic Act; NPS *Management Policies* (2001).

Impacts of Alternative 1: No Action

Impact Analysis: Under this alternative, wildland fires would be suppressed at the smallest reasonable acreage. Given recent fire incidence, an estimated one or two fires during a 5-year period would burn a total of 3-4 acres. Direct impacts would include very limited loss of habitat for short periods following fire and possible disruption of ground nests and dens due to fireline construction. Short-term indirect impacts would include temporary displacement of individuals. Long-term indirect impacts of fire exclusion would be slightly adverse as habitats senesce and are less able to support wildlife populations.

Direct impacts of hazard tree removal under the no-action alternative would include a small loss of nesting sites for birds and small mammals and possible disruption of ground nests and dens due to vehicle use. Short-term indirect impacts would include temporary displacement of individuals.

From the standpoint of a suite of wildlife population, the direct and indirect impacts would be of such short duration and small magnitude as to likely not be measurable. Therefore, the direct and indirect impacts of the no-action alternative on wildlife would be localized, short-term and negligible. In the long-term, the indirect effect of fire exclusion on wildlife would be minor and adverse with a loss of habitat diversity.

Cumulative Effects: Efforts to restore native grassland communities (e.g. treatment of invasive nonnative species) would eventually provide minor to moderate beneficial impacts to wildlife populations. The direct impacts of grazing by horses have not been identified, but would likely include trampling of runs and under-snow paths used by small mammals. From a population standpoint, these effects are regarded as adverse but minor. Construction proposed by the GMP would displace individuals of wildlife populations in the limited area of the construction site(s). From a population standpoint, this impact would be regarded as localized, long-term and minor. No other projects are planned for the NHS that would adversely affect wildlife or their habitats. Therefore, the cumulative adverse effects associated with the no-action alternative would be localized, short-term, and negligible to minor.

Conclusion: The direct impacts of the no-action alternative would be localized, short-term and negligible to minor. In the long-term, the indirect effect of fire exclusion on wildlife would be minor and adverse with a loss of habitat diversity. Long-term population effects would be negligible. The no-action alternative would not produce any major adverse impacts or impairment to wildlife resources whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 2: AMR and Integrated Fuels Mgt

Impact Analysis: The preferred alternative would result in an increase of acreage burned from slightly larger wildland fires suppressed under an appropriate management response (i.e. holding fires at existing barriers rather than constructing firelines), but ground disturbance would be lessened in comparison with the no-action alternative. Fewer than 200 acres would be burned

by broadcast prescribed fire during a typical 5-year period. Most prescribed fires would not exceed 50 acres.

The direct effects of this burning include short-term, localized losses of habitat and subsequent displacement of wildlife. The direct population impacts would be minor, short-term changes in abundance and diversity of small mammals and passerine birds. If fires extend into wooded areas with some tree mortality, slight increases in populations of insectivorous birds might be expected. The indirect effect of burning under the preferred alternative would be greater habitat diversity (structure, stand age, stand closure, etc.). Abundance of some species might decline slightly while other species abundance may slightly increase. From the standpoint of the entire faunal community, the short-term impacts of burning under the preferred alternative would be minor and, depending on the species, adverse or beneficial. Long-term indirect effects would be beneficial and minor to moderate.

Mechanical fuel reduction treatments would include thinning and brush chopping on up to 100 acres during a typical 5-year period, followed a year later by pile burning of activity fuels. Piles would provide temporary increased cover for small mammals, but their limited area would probably not provide population level effects. Snags (standing dead trees) with evidence of wildlife importance use would be retained in the stands. Direct effects on individuals of species which prefer shrublands would include temporary displacement and loss of habitat. Conversely, some species would find more and better habitat as a result of brush reduction. Indirect impacts include greater habitat diversity for the faunal complex and a reduced potential for large fires and subsequent loss of large areas of habitat. Therefore, the direct and indirect impacts of mechanical fuel reduction on wildlife would be minor in the short-term and, depending on the species, adverse or beneficial. From the standpoint of the entire faunal community, the longer-term indirect effect of hazard fuels reductions would provide a minor beneficial impact as habitats become more diverse and natural.

Overall, then, the direct impacts of the preferred alternative on wildlife in the short-term would be localized, negligible to minor, and adverse or beneficial depending on the species affected. Long-term indirect impacts would be localized, minor and beneficial.

Cumulative Effects: Efforts to restore native grassland communities (e.g. treatment of invasive nonnative species) would eventually provide minor to moderate beneficial impacts to wildlife populations. The direct impacts of grazing by horses have not been identified, but would likely include trampling of runs and under-snow paths used by small mammals. From a population standpoint, these effects are regarded as adverse but minor. Construction proposed by the GMP would displace individuals of wildlife populations in the limited area of the construction site(s). From a population standpoint this impact would be regarded as localized, long-term and minor. No other projects are planned for the NHS that would adversely affect wildlife or their habitats. The long-term effects associated with the preferred alternative would be a slight increase in species diversity associated with a mosaic of restored habitats. Therefore, the cumulative adverse effects associated with the preferred alternative would be localized, short-term, and negligible to minor.

Conclusion: The direct impacts of the preferred alternative would be localized, short-term, and depending on the species, negligible or minor and adverse or beneficial. Long-term indirect impacts would be localized, minor and beneficial. Long-term population effects would be beneficial and negligible to minor. The preferred alternative would not produce any major adverse impacts or impairment to wildlife resources whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 3: AMR and Non-fire Fuels Mgt

Impact Analysis: Use of an appropriate management response to unwanted wildland fires would result in a slightly increased burned acreage but less ground disturbance. Mechanical fuel reduction activities would be similar to those of the preferred alternative (Alternative 2) except that harvested biomass would be removed rather than pile burned. No prescribed burning would occur under this alternative. The direct and indirect impacts of Alternative 3 would be the same as those described under the preferred alternative, with the exception of those impacts attributed to prescribed burning. Thus the impacts of Alternative 3 would be short-term, localized, and depending on species, negligible to minor and adverse to beneficial. From the standpoint of the entire faunal community, the long-term impacts would be minor and beneficial.

Cumulative Effects: Efforts to restore native grassland communities (e.g. treatment of invasive nonnative species) would eventually provide minor to moderate beneficial impacts to wildlife populations. The direct impacts of grazing by horses have not been identified, but would likely include trampling of runs and under-snow paths used by small mammals. From a population standpoint, these effects are regarded as adverse but minor. Construction proposed by the GMP would displace individuals of wildlife populations in the limited area of the construction site(s). From a population standpoint, this impact would be regarded as localized, long-term and minor. No other projects are planned for the NHS that would adversely affect wildlife or their habitats. The long-term effects associated with Alternative 3 may be a slight increase in species diversity associated with a mosaic of restored habitats. Therefore, the cumulative adverse effects associated with Alternative 3 would be localized, short-term, and negligible to minor.

Conclusion: The direct impacts of the Alternative 3 would be localized, short-term, and, depending on the species, negligible to minor and adverse or beneficial. Long-term population effects would be beneficial and negligible to minor. Long-term indirect impacts would be localized, minor and beneficial. Alternative 3 would not produce any major adverse impacts or impairment to wildlife resources whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

VISITOR EXPERIENCE, AESTHETIC RESOURCES

Affected Environment. Annual visitation at Fort Laramie NHS is approximately 50,000 people with over two-thirds of visits occurring in June through August. Nearly 80 percent of visitors come from outside the local area. The average visit lasts about 1 hour and 50 minutes. Principal activities are walking tours of the historic buildings and grounds as well as the Visitor Center.

The GMP (1993) and Cultural Landscapes Plan (2002) note that views of and from the NHS are important components of the historic scene. The rural character of the land, with few visual intrusions, evokes images of how the area may have looked during the days of the fur trade and military occupation.

Fire management activities which have the potential to effect park operations, visitor uses and visitor experiences include suppression, prescribed burning and hazard fuels projects. Suppression and prescribed fire would involve having additional personnel, engines and other equipment in the area. Temporary closures may be imposed restricting access to visitors. Hazard fuels projects would also involve additional fire personnel in the area as well as use of chainsaws and vehicles.

Regulations and Policies. Current laws and policies require that the following conditions be achieved in the park:

Desired Conditions – Visitor activities are not substantially disrupted by fire management activities. The quality of visitor experiences, particularly with respect to scenic vistas, is not adversely impacted by smoke or other fire management activities.

Source – NPS Organic Act; NPS *Management Policies*, Americans with Disabilities Act.

Impacts of Alternative 1: No Action

Impact Analysis: The no-action alternative would continue aggressive suppression of wildland fires and limited removal of hazard trees. Depending on the location of a wildland fire, park operations and visitor uses may be temporarily disrupted, but the disruption would probably not extend beyond a few hours. Temporary closures to restrict visitor access would ensure visitor safety. Indirect effects would include the presence of burned areas within views, but that would lend another aspect to the historical scene. Most burned areas would “green up” during the same season or, at the latest, the next spring. Given the recent fire history of one or two small fires in a five-year period, the direct and indirect impacts of the no-action alternative on park operations, visitor experience and aesthetic resources would be localized, minor and very short-term.

Hazard tree removal would be (a) either scheduled during periods of low visitor use or (b) be conducted in areas where visitor access is restricted. Visitor access to the NHS would not be curtailed; consequently there would be no direct impacts to visitors. Indirect effects would include the sound of chainsaws for very short periods of time and the sight of scars where limbs or trees were removed. The continued exclusion of fire from the area may detract from the

historic scene for some discerning visitors, but this indirect effect would not likely diminish their experience. The direct and indirect effects on visitor experience and aesthetics would therefore be localized, short-term and negligible to minor.

Cumulative Effects: The other projects proposed for the area which would contribute to cumulative effects on visitor experience and aesthetics are construction of a new visitor center and moving maintenance operations away from the historic resources. In the short-term, these construction activities would intrude on the pastoral scene and be a localized, direct, and minor adverse impact. In the long-term, these actions would reduce the intrusion of administrative facilities in the historic scene and thus enhance visitor experiences. The direct and indirect effects of the no-action alternative would be localized, short-term and minor. Therefore, the cumulative effect of the no-action alternative would be localized, short-term and minor.

Conclusion: The direct and indirect adverse impacts of the no-action alternative on aesthetic resources and visitor experiences would be localized, short-term and minor. The no-action alternative would not produce any major adverse impacts or impairment to visitor experiences and aesthetic resources whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 2: AMR and Integrated Fuels Mgt

Impact Analysis: With the preferred alternative, there may be a slight increase in smoke production and temporarily blackened areas from (a) potential small increases in burned acreage by wildland fires managed under an appropriate management response and (b) small prescribed burns (fewer than 200 acres in 5 years) designed to restore and manage grasslands. Smoke production would be of very limited duration in these fuels – usually a few hours at most. Blackened areas in a grassland usually green up within weeks to months (and no later than the following spring). There may be minor displacement of some visitor activities during prescribed burn operations, but that effect would be limited to a few hours each year. Temporary closures to restrict visitor access would ensure visitor safety. The presence of fire, smoke, and blackened areas presents an opportunity for interpretation and would enhance the experience of some visitors. Thus the direct impacts of increased burning on visitor experiences and aesthetic resources would include smoke in scenic views, temporary restrictions in access to some areas, and the presence of blacked areas within historic scenes. Because the frequency and size of these fires would be so small, the direct impact to visitor experiences and aesthetic resources is localized, short-term and minor. On the other hand, the potential for restored grasslands and a more appropriate historic scene would be a minor to moderate, long-term, beneficial indirect impact.

Mechanical removal of hazardous fuels would be conducted (a) during periods of low visitation or (b) in areas of restricted public access and designed to create little visual impact or change in scenic vistas. Visitor access to the NHS would not be curtailed; consequently there would be no direct impacts to visitors. Indirect effects would include the sound of chainsaws and/or flail choppers for very short periods of time and a somewhat changed scene as riparian woodlands

are thinned (most visitors would probably not recognize the thinning). Therefore, the adverse direct impacts of the preferred alternative on visitor experiences would be short-term, localized, and minor. Longer-term indirect impacts would include a reduced potential for large fires and subsequent reduced potential for substantive modifications of historic scenes; these indirect impacts would be minor to moderate and beneficial.

Cumulative Effects: The other projects proposed for the area which would contribute to cumulative effects on visitor experience and aesthetics are construction of a new visitor center and moving maintenance operations away from the historic resources. In the short-term, these construction activities would intrude on the pastoral scene and be a localized, direct, and minor adverse impact. In the long-term, these actions would reduce the intrusion of administrative facilities in the historic scene and thus enhance visitor experiences. The direct and indirect effects of the preferred alternative would be localized, short-term and minor. Therefore the cumulative effect of the preferred alternative would be localized, short-term and minor.

Conclusion: The adverse direct impacts of the preferred alternative on visitor experiences would be short-term, localized, and minor. Longer-term indirect impacts would be localized, minor to moderate, and beneficial. The preferred alternative would not produce any major adverse impacts or impairment to visitor experiences and aesthetic resources whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 3: AMR and Non-fire Fuels Mgt

Impact Analysis: Alternative 3 would have intermediate impacts compared to the no-action and preferred alternatives. Some very slight increases in smoke production and burned acres may occur with wildland fires managed under an appropriate management strategy. Mechanical fuel reduction activities would be similar to those of the preferred alternative (Alternative 2) except that harvested biomass would be removed rather than pile burned. Mechanical removal of hazardous fuels would be conducted during periods of low visitation or in areas of restricted public access and designed to create little visual impact or change in scenic vistas. No prescribed burning would occur under this alternative. Therefore, the direct and indirect impacts of Alternative 3 on visitor experiences and aesthetic resources would be similar, except for those attributed to prescribed burning, to the preferred alternative and are regarded as short-term, localized, and minor.

Cumulative Effects: The other projects proposed for the area which would contribute to cumulative effects on visitor experience and aesthetics are construction of a new visitor center and moving maintenance operations away from the historic resources. In the short-term, these construction activities would intrude on the pastoral scene and be a localized, direct, and minor adverse impact. In the long-term, these actions would reduce the intrusion of administrative facilities in the historic scene and thus enhance visitor experiences. The direct and indirect effects of Alternative 3 would be localized, short-term and minor. Therefore, the cumulative effect of Alternative 3 would be localized, short-term and minor.

Conclusion: Both the direct and indirect adverse impacts of Alternative 3 on aesthetic resources and visitor experiences would be localized, short-term and minor. Alternative 3 would not produce any major adverse impacts or impairment to visitor experiences and aesthetic resources whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

CULTURAL RESOURCES

Affected Environment. The cultural resources of Fort Laramie NHS are described in considerable detail in the GMP (1993), Preliminary Cultural Landscape Report (1993) and Cultural Landscapes Inventory (2002). The NHS was listed in the National Register of Historic Places (NRIS Number 66000755) in 1966. With an additional certification, a historic district of approximately 536 acres was listed in the National Register in 1986. Additional information generated by the Cultural Landscapes Inventory is being submitted to the National Register. The NHS has a programmatic agreement (2002-2005) with the Wyoming State Historic Preservation Officer for day-to-day management activities.

The GMP identifies two types of cultural resources: archeological resources and historic resources, the latter comprised of historic structures and historic views. The current term “cultural landscape” includes historic views.

Archeological Resources. Archeological resources include sites from both the fur trade/military occupation period and Native American features and artifacts. Archeological investigations have identified many historical features, foundations and deposits from the fur trade period through the ranching and farming period. Archeological surveys could not be presumed to be complete, but surface examinations have been completed throughout the NHS. Given the short natural fire return interval in grasslands, any archeological sites that predate early military occupation would probably have been subjected to the effects of multiple wildland fires.

Historic Resources. The List of Classified Structures identified 44 significant structures, of which 36 historic structures have been documented on the National Register nomination. These include 13 buildings, 20 sites, and 3 structures.

Cultural Landscapes. A Level II cultural landscape inventory has been completed for the NHS. A Level II inventory identifies landscape characteristics and their associated features. It includes a condition assessment, costs associated with treatment and stabilization, and establishes priorities for Level III inventory and the preparation of Cultural Landscape Reports.

The Cultural Landscape Inventory (CLI) considers the NHS as a single historic landscape. Historic views from and within the NHS are regarded as contributing components of the

historic fabric. Since adjacent lands are used primarily for agriculture, the views have retained a historic appearance. The CLI states: "Overall, the Fort Laramie cultural landscape retains historic integrity from the early and late military eras." Of particular note relative to this analysis is a statement in the Cultural Landscapes Inventory that "Fort Laramie's existing vegetation does not reflect the type of vegetation that existed during the site's historic period." This is primarily due to the introduction of invasive nonnative species that occurred after the military era.

No ethnographic studies have been conducted for Fort Laramie NHS. There are no records of any traditional cultural properties.

Heat from typical grassland fires would be insufficient to damage artifacts and other archeological materials in subsurface settings even if they are buried only a centimeter or less below the ground surface. In heavier or continuous fuels, temperatures at the soil surface, however, are sufficient to damage stone or ceramic resources by scorching, fracturing, charring, and spalling. The type of fire spread can influence heat levels at and below the soil surface. Head fires generate less heat at the surface than do backing fires.

Cultural resources at Fort Laramie NHS vary in their susceptibility and vulnerability to the effects of wildland and prescribed fires. Most of the park's cultural resources are located within the Historic Zone. By virtue of their concentrated location and absence of flammable vegetation in their immediate vicinity, most sites are not susceptible to wildland fire. Other sites and features, while they would not be vulnerable to fire, are susceptible to damage caused by fire suppression activities.

For those sites which would be vulnerable to impacts from wildland or prescribed fire, a wide range of options are available to eliminate or mitigate potential impacts. These include complete avoidance of prescribed fire in the vicinity of structures, blacklining around structures or features near wildland fires or proposed prescribed fires, treatment with fire retardant foam prior to or concurrent with fires, wrapping with heat reflective materials, and establishing sprinkler systems on and around structures prior to prescribed fires or concurrent with wildland fire suppression activities. Other standard cultural resource mitigation measures include the following: prior to doing treatment work, conduct an inventory of previously unsurveyed areas using an archeologist who meets the Secretary of the Interior's standards; monitor fire management activities and halt work if previously unknown resources are located; protect and record newly discovered resources; brief work crews about protecting cultural resources; dispose of slash in areas lacking cultural sites; avoid ground disturbance in areas containing known cultural sites; prior to implementation of work, protect character-defining elements of the site's cultural landscapes. For prescribed fires, mitigations would be included in the prescribed fire burn plan. In all cases, protection of structures and features will be more important than minimizing acres burned. The Wyoming SHPO requests that further consultation be conducted on each prescribed fire during preparation of the prescribed fire burn plan.

Regulations and Policies. Current laws and policies require that the following conditions be achieved in the park:

Desired Conditions – Historic properties and archeological sites are identified and inventoried and their significance and integrity are evaluated under National Register criteria. The qualities that contribute to the eligibility for listing or listing of historic properties or archeological sites on the NRHP are protected in accordance with the Secretary of the Interior’s Standards.

Source – National Historic Preservation Act; Executive Order 11593; Archeological and Historic Preservation Act; Archeological Resources Protection Act; the Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation; Programmatic Memorandum of Agreement Among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995); NPS Organic Act; NPS Management Policies.

Impacts of Alternative 1: No Action

Impact Analysis: Under this alternative, wildland fires would be suppressed at the smallest reasonable acreage. Given recent fire incidence, an estimated one or two fires during a 5-year period would burn a total of 3-4 acres. Fire suppression activities in fine fuels include construction of “scratch” lines, blacklining, use of swatters and direct attack with water. Fire suppression in heavier fuels would include construction of a handline to mineral soil and direct attack with water. Management constraints (see Description of Alternatives) note that retardant may be used; that off-road use of equipment such as engines is warranted only if the potential disturbance they would cause is less than resource damage from fire; and that heavy equipment such as bulldozers would be used only in the event of threats to human life or fire-susceptible historic structures. Given past fire history, these circumstances are very unlikely. A wide range of mitigation measures (see Affected Environment above) are also available for use concurrent with fire occurrence.

Archeological Resources

The direct impacts of fire suppression on archeological resources under the no-action alternative would be to expose buried archeological materials during handline construction or disturb materials immediately below the surface with vehicle use. In grasslands, however, the primary initial attack would probably be with swatters and water, thus further limiting ground disturbance. Fire may have a higher resistance to control in woodlands. Most woodlands occur in the riparian zone/floodplain where the likelihood of archeological resources is much lower. The indirect effects include exposure of artifacts to erosion and theft. Given (a) very infrequent fire occurrence, (b) small fire size, and (c) implementation of identified mitigations and management constraints, the direct and indirect effects of fire suppression on archeological resources under the no-action alternative would be localized and minor.

The direct impact of hazard tree removal and mowing on archeological resources would be exposure of materials due to ground disturbance by vehicles associated with the ac-

tivities. Indirect impacts would include exposure of artifacts to erosion and theft. With avoidance of known archeological resources and implementation of mitigation actions, the direct and indirect impacts of hazard tree removal and mowing would be localized and minor.

Historic Structures

The direct impact of fire suppression on historic structures would be limited to the potential to damage such structures by contact with fire fighting equipment. Indirect impacts include the possibility of smoke damage. Given (a) very infrequent fire occurrence, (b) small fire size, and (c) fuel management (mowed grass) adjacent to most structures, the direct and indirect effects of fire suppression on historic structures under the no-action alternative would be localized and negligible to minor.

The direct impact of hazard tree removal and mowing on historic structures would include the potential of damage to such structures by contact with mowing equipment. Indirect effects are not apparent.

The direct and indirect impacts of hazard tree removal and mowing grass near historic structures would be localized and negligible to minor.

Cultural Landscape

The direct effects of fire suppression on the cultural landscape under the no-action alternative would be the temporary presence of firefighters and firefighting equipment and the intrusion of firelines. Given past fire history, the intrusion of firefighters and equipment would be in the magnitude of a few hours or days per decade. Firelines would be rehabilitated (obliterated or camouflaged) soon after fires are controlled. Indirect effects of suppression would include potential erosion in mineral soil of firelines. Use of water rather than digging firelines and rehabilitation of new firelines would mitigate this potential effect. The longer term indirect effect would be adverse and minor due to the difficulty in restoring more natural grasslands under the no action alternative.

The direct effect on the cultural landscape from hazard tree removal and mowing around historic structures is the presence of small areas of manicured vegetation within the landscape. Such actions are deemed appropriate, though, for visitor safety and defensible space around historic structures. Indirect effects of hazard tree removal and mowing are not evident.

The direct and indirect impacts of the no-action alternative on the cultural landscape would be localized, short-term and minor.

In summary, the direct impacts of the no-action alternative on cultural resources would be localized, short-term, and negligible to minor. The indirect impacts of the no-action alternative on cultural resources would be localized, short-term, and minor.

Cumulative Effects: The NHS is engaged in or planning other activities which would contribute to cumulative impacts. These include restoration of native grasslands which would more completely present the historic scene, construction of a new Visitor Center, and moving maintenance operations out of the Historic Zone. Grazing of horses would be compatible with the cultural landscape. The impacts of these activities on cultural resources would be mitigated in the planning and implementation phases and would therefore be localized and minor. The impacts of the no-action alternative are regarded as localized, short-term and negligible to minor. Therefore, the cumulative impacts would be localized, short-term, and minor.

Conclusion: The direct impacts of the no-action alternative on cultural resources would be localized, short-term, and negligible to minor. The indirect impacts of the no-action alternative on cultural resources would be localized, short-term, and minor. The no-action alternative would not produce any major adverse impacts or impairment to cultural resources whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 2: AMR and Integrated Fuels Mgt

Impact Analysis: As noted above under the no-action alternative, the effects of fire on surface and subsurface artifacts vary with fuel loading and fire behavior. More intense fire on surface artifacts may cause scorching, fracturing, charring, and spalling. If artifacts are buried under as little as 1 cm of soil, the effects are far less. Head fires generate a smaller downward heat pulse than do backing fires. With prescribed burning, use of head fires can reduce any potential impact on unknown surface archeological resources. Fire suppression and prescribed fire activities in fine fuels include construction of “scratch” lines, blacklining, use of swatters, and direct attack with water.

The amount of fire on the landscape would be increased under the preferred alternative. With use of appropriate management responses to wildland fires, acreage may increase slightly as natural and man-made barriers are used in lieu of constructed firelines. Prescribed fire would be used to maintain and restore native grasslands on fewer than 200 acres during a typical 5-year period. When prescribed burning is proposed near historic structures, the prescribed burn plans would specify actions to avoid or mitigate potential adverse impacts to known structures or features.

Mechanical reduction of hazardous wildland fuels would be conducted primarily in the riparian areas. The Cultural Landscapes Inventory regards the riparian cottonwood groves as noncontributing elements.

Archeological Resources

With the preferred alternative, slightly larger acreage may burn as appropriate management responses are implemented. This, however, would result in fewer firelines and avoidance of known archeological sites. The direct impacts of fire suppression on archeological resources under the preferred alternative would be to expose buried archeological materials during handline construction or disturb materials immediately below the surface with vehicle use. In grasslands, however, the initial attack would focus on using natural barriers. Other suppression activities would probably be with swatters and water, thus further limiting ground disturbance. Fire may have a higher resistance to control in woodlands. Most woodlands occur in the riparian zone/floodplain where the likelihood of archeological resources is much lower. The indirect effects include exposure of artifacts to erosion and theft. Given (a) very infrequent fire occurrence, (b) small fire size, and (c) implementation of identified mitigations and management constraints, the direct and indirect effects of fire suppression on archeological resources under the preferred alternative would be localized and minor.

Prescribed burning would occur under the preferred alternative on fewer than 200 acres in a typical 5-year period and seldom over 50 acres in a single year. Burning would be primarily in grasslands. Known archeological sites could be avoided during preparation of control lines. The direct impacts of prescribed burning would be to damage stone or ceramic resources by scorching, fracturing, charring, and spalling if fire intensity is quite high. However, fire intensity in grasslands is usually low (especially with head fires) so temperatures at the ground surface would be elevated only slightly. Indirect impacts include exposure of surface artifacts to erosion or theft. Most burned grasslands, however, would “green up” within the same season or, at the latest, the next spring. Regrowth would then diminish the possibility of artifacts being eroded or stolen. The direct and indirect impacts of prescribed burning would be localized, short-term and minor.

Most mechanical hazardous fuels reduction would occur in the riparian woodlands. These are situated on floodplains where the likelihood of archeological material is less than on uplands. The direct impact of mechanical hazard fuel reductions would be exposure of materials due to ground disturbance by vehicles associated with the activities. Indirect impacts would include exposure of artifacts to erosion and theft. With avoidance of known archeological resources and implementation of mitigation actions, the direct and indirect impacts of hazard tree removal and mowing would be localized and minor.

Historic Structures

Again, slightly more acres may be burned when wildland fires are managed under an appropriate management response. The direct impact of fire suppression on historic structures would be limited to the potential to damage such structures by contact with fire fighting equipment. Indirect impacts include the possibility of smoke damage. Given (a) very infrequent fire occurrence, (b) small fire size, and (c) fuel management (mowed grass) adjacent to most structures, the direct and indirect effects of fire suppression on historic structures under the preferred alternative would be localized and negligible to minor.

Most prescribed burning would not be conducted near historic structures. When prescribed burning is proposed near historic structures, one or more of the mitigations mentioned under the Alternatives section above would be included in the prescribed fire plan and implemented prior to ignition. With mitigations in place and mowed grass adjacent to historic structures, there should be no direct adverse impacts to historic structures. Indirect impacts would include smoke drifting into historic structures. Prescriptions using wind directions that move smoke away from structures would reduce or eliminate this effect. Given the infrequency of prescribed burning and small burn block size, the direct and indirect impacts of prescribed burning on historic structures would be localized, short-term, and negligible to minor.

Most mechanical hazardous fuels reduction would occur in the riparian woodlands. These are situated on floodplains where there are no historic structures. Therefore, there would be no direct or indirect adverse impacts of mechanical hazardous fuels reduction actions on historic structures.

In summary, the direct and indirect adverse impacts of the preferred alternative on historic structures would be localized, short-term, and negligible to minor.

Cultural Landscape

The direct effects of fire suppression on the cultural landscape under the preferred alternative would be the temporary presence of firefighters and firefighting equipment and the intrusion of firelines. Given past fire history, the intrusion of firefighters and equipment would be in the magnitude of a few hours or days per decade. Firelines would be rehabilitated (obliterated or camouflaged) soon after fires are controlled. Indirect effects of suppression would include potential erosion in mineral soil of firelines. Use of water rather than digging firelines, and rehabilitation of new firelines would mitigate this potential effect. The direct and indirect adverse impacts of fire suppression under the preferred alternative would be localized, short-term, and minor.

Prescribed burning would occur under the preferred alternative on fewer than 200 acres in a typical 5-year period and seldom over 50 acres in a single year. Burning would be primarily in grasslands. The SHPO requests that consultation occur on individual prescribed fires during preparation of the prescribed fire burn plan. The direct impact of

prescribed burning on the cultural landscape would be temporarily blackened areas – fewer than 200 acres in an average 5-year period and seldom more than 50 acres in a single year. Most burned grasslands, however, would “green up” within the same season or, at the latest, the next spring. Regrowth would then diminish the effect on the cultural landscape. The indirect effect of prescribed burning would be to maintain robust and diverse grassland communities and thus maintain an important element of the cultural landscape. The direct adverse impacts of prescribed burning on the cultural landscape would be localized, short-term, and minor. The indirect impact of prescribed burning on the cultural landscape would be localized, long-term, minor to moderate, and beneficial.

Riparian woodlands are considered a noncontributing element to the cultural landscape. Mechanical fuels reduction projects would thin cottonwood stands and reduce shrub understories. There would be no direct adverse impacts on the cultural landscape from mechanical fuels reductions. The indirect impact of mechanical fuels reductions would be to bring the vista associated with riparian woodlands closer to that which would have existed in the historical period. Thus the indirect effect would be localized, minor, and beneficial.

In summary, the direct adverse impacts of the preferred alternative on the cultural landscape would be localized, short-term, and minor. The indirect impacts would be localized, long-term, minor to moderate, and beneficial.

Overall, the direct impacts of the preferred alternative on the cultural resources would be localized, short-term, and minor. The indirect impacts, particularly for cultural landscapes, would be localized, long-term, minor to moderate, and beneficial.

Section 106 Summary: After applying the Advisory Council on Historic Preservation’s criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), we conclude that the preferred alternative would be managed and implemented to have *no adverse effect* on cultural resources at Fort Laramie National Historic Site.

Cumulative Effects: The NHS is engaged in or planning other activities which would contribute to cumulative impacts. These include restoration of native grasslands which would more completely present the historic scene, construction of a new Visitor Center, and moving maintenance operations out of the Historic Zone. Grazing of horses would be compatible with the cultural landscape. The impacts of these activities on cultural resources would be mitigated in the planning and implementation phases and would therefore be localized and minor. The adverse impacts of the preferred alternative are regarded as localized, short-term and negligible to minor. Therefore, the cumulative adverse impacts would be localized, short-term, and minor.

Conclusion: The direct impacts of the preferred alternative on cultural resources would be localized, short-term, and minor. The indirect impacts, particularly for cultural landscapes, would be localized, long-term, minor to moderate, and beneficial.

The preferred alternative would not produce any major adverse impacts or impairment to cultural resources whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Impacts of Alternative 3: AMR and Non-fire Fuels Mgt

Impact Analysis: The impacts of Alternative 3 would be the same as described under the preferred alternative, with the exception that no prescribed burning and attendant impacts would occur. With the absence of prescribed fire from this alternative, grasslands important to the cultural landscape would be more difficult to maintain in the long-term. This would be an indirect adverse impact associated with Alternative 3.

Overall, the direct and indirect adverse impacts of Alternative 3 on the cultural resources would be localized, short-term, and minor.

Cumulative Effects: The NHS is engaged in or planning other activities which would contribute to cumulative impacts. These include restoration of native grasslands which would more completely present the historic scene, construction of a new Visitor Center, and moving maintenance operations out of the Historic Zone. Grazing of horses would be compatible with the cultural landscape. The impacts of these activities on cultural resources would be mitigated in the planning and implementation phases and would therefore be localized and minor. The adverse impacts of Alternative 3 are regarded as localized, short-term and negligible to minor. Therefore, the cumulative adverse impacts would be localized, short-term, and minor.

Conclusion: Both the direct and indirect impacts of Alternative 3 on cultural resources would be localized, short-term, and minor. Alternative 3 would not produce any major adverse impacts or impairment to cultural resources whose conservation is necessary to the purpose of the establishment of the monument, that are key to the natural or cultural integrity of the monument, or that are actions identified as a management goal of the monument.

Chapter 4 – CONSULTATION/COORDINATION

Agencies/Organizations/Persons Contacted During Scoping

By telephone and letter:

U.S. Fish and Wildlife Service

State Historic Preservation Officer, State of Wyoming

By letter:

Arapaho Business Council

Flandreau Santee Lakota

Oglala Lakota Tribal Council
Santee Sioux Tribal Council
Standing Rock Lakota Tribal Council
Shoshone Business Council
Crow Tribe of Montana
Cheyenne River Lakota Tribal Council
Lower Brule Lakota Tribal Council
Crow Creek Lakota Tribal Council
Northern Cheyenne Tribal Council
Rosebud Lakota Tribal Council
Sisseton-Wahpeton Sioux Tribal Council
Yankton Sioux Tribal Council
Bureau of Land Management
Wyoming State Historic Preservation Office
Laura Flannery
Historic Landmark Commission
Sophia Foote
Fort Laramie Cemetery Association
Jack Gregg
Byron Paules
Charles Oliver
Goshen County
Walter Missel
Town of Fort Laramie
City of Torrington
Town of Lingle
Goshen County Irrigation Ditch Company
Fort Laramie Ditch Company
Corn Creek
Hal Carnahan

By Press Release:

Scottsbluff Star Herald
Gering Courier
KOLT Radio (Scottsbluff)
KDUH TV (Scottsbluff)
Wheatland Chamber of Commerce
KUWR (Laramie)
Guernsey Gazette
The Lingle Guide
The Lusk Herald
KGOS Radio (Torrington)
KSTF TV (Gering)
Torrington Chamber of Commerce

Wyoming Travel & Tourism
Buffalo Bill Historical Center Museum (Cody)
The Torrington Telegram
Platte County Record
KMOR Radio (Scottsbluff)
Wyoming State Historical Society (History News) (Cheyenne)
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Preparers

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List of EA Recipients

Federal Agencies

U.S. Fish and Wildlife Service
Bureau of Land Management
Natural Resource Conservation Service

Tribes

Arapaho Business Council
Flandreau Santee Lakota
Oglala Lakota Tribal Council
Santee Sioux Tribal Council
Standing Rock Lakota Tribal Council
Shoshone Business Council
Crow Tribe of Montana
Cheyenne River Lakota Tribal Council
Lower Brule Lakota Tribal Council
Crow Creek Lakota Tribal Council
Northern Cheyenne Tribal Council
Rosebud Lakota Tribal Council
Sisseton-Wahpeton Sioux Tribal Council
Yankton Sioux Tribal Council

State Agencies

State Historic Preservation Officer
Wyoming Game and Fish Department

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To request a copy of the appendices or figures please contact:

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