IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY WILDLAND FIRE MANAGEMENT ENVIRONMENTAL ASSESSMENT

1. INTRODUCTION

1.1. Purpose and Need

The Idaho National Engineering and Environmental Laboratory (INEEL) is a U.S. Department of Energy (DOE)-managed reservation occupying about 890 square miles in southeastern Idaho. The INEEL lies within the upper Snake River Plain *sagebrush steppe ecosystem*[1]. Much of the sagebrush steppe ecosystem throughout the west has been segmented and lost to development and agriculture. The remaining sagebrush steppe ecosystem and the habitat it provides is threatened with irreversible conversion to non-native annual weeds by rangeland management practices in combination with the natural fire process. The sagebrush steppe of the INEEL is now threatened and DOE must evaluate its management role and alternatives available to preserve this important component of the western ecosystem.

1.2. Background

The potential for wildland fires on the INEEL is routinely high because of rapid growth of grasses and brush during cool, wet springs followed by extended dry weather in the late spring and early summer months. The result is dry vegetation, accumulating year after year providing large quantities of fuel for fires. Fire is a natural component of the ecosystem. Over time, the climax sagebrush steppe vegetation on the INEEL has repeatedly burned and recovered through natural successional stages. Under natural conditions, the climax sagebrush steppe vegetation is composed of native shrubs, and annual and perennial grasses and broadleaf herbs called forbs. When this native vegetation type burns the following general response is expected: sagebrush is killed, perennial grasses and forbs re-sprout and annuals survive as seed that germinates when conditions are favorable. Generally, over the course of several years, seed from surviving sagebrush in unburned areas is distributed by the wind, seedling sagebrush are established, and after about 5 years of growth, produce seeds of their own. The maturing sagebrush competes with other native plants for water and nutrients and a natural balance is established. As the plant community matures, the fuel load increases and the stage is set for another fire and recovery cycle. Researchers estimate that t~~T~~he entire cycle typically takes between 40 and 70 years.

The introduction of non-native annual plants, such as cheatgrass, into the sagebrush steppe ecosystem has altered the natural fire frequency and recovery cycle. Cheatgrass sprouts from seed in the spring, fall or winter and goes to seed and dries by early summer. When cheatgrass is present and fire occurs, the cheatgrass seed quickly germinates to compete for moisture and nutrients with native seeds and surviving plants. As the vegetation recovers from the fire, cheatgrass represents a higher percent of the fuel load and tends to create a continuous carpet of fuel that is extremely prone to fire. If there is another fire before the sagebrush matures and produces seed, sagebrush will disappear from the plant community. As the frequency of fire increases, cheatgrass will continue to increase in this fire-altered environment. Without intervention, the sagebrush steppe ecosystem and the habitat it provides may be irretrievably lost. The U.S. Fish and Wildlife Service (FWS) has received six petitions to list as threatened or endangered under the Endangered Species Act (ESA), various populations of sage grouse. One of those petitions requests listing the Eastern Subspecies of the Greater Sage Grouse, which inhabits the INEEL, as an

[1] Italicized words are included in the Glossary on page 55.

endangered species. Wildland fires, along with pre- and post-fire suppression vegetation management could influence the life cycle of sage grouse and other species that rely on stands of sagebrush for food and cover.

From 1994 to 2000 about 130,000 acres of the INEEL and several hundred thousand acres of Bureau of Land Management (BLM)-managed public land burned on the Snake River Plain of southeast Idaho (see Figure 1-1). The fires on the INEEL threatened facilities and exposed soils to wind erosion, resulting in severe dust storms that impact operations and create traffic hazards for weeks.

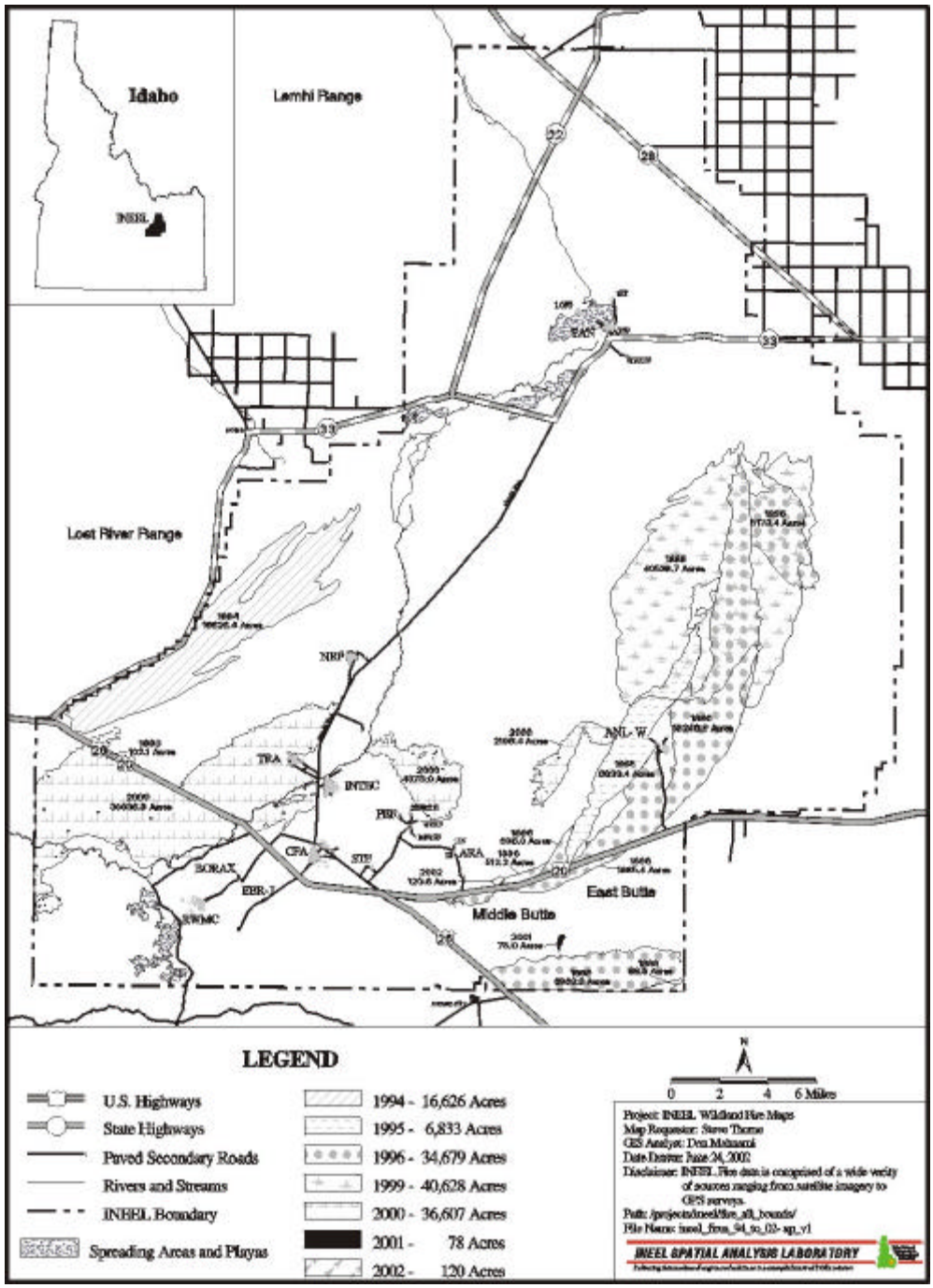

Figure 1-1. Wildland fires on the INEEL (1994-2002).

Most of the acreage on the INEEL that burned between 1994 and 2000 is recovering well with the exception of sagebrush. Most native plant species are recovering and represent most of the plant composition, but cheatgrass is a component. In isolated areas, cheatgrass and other annual non-native weeds are dominant. If this situation persists and no changes are made to wildland fire pre-fire, fire suppression, and post-fire tactics and there is no intervention to reduce cheatgrass and manage for sagebrush, the stage may be set for an uncontrollable transition from sagebrush steppe to cheatgrass. Soil erosion and dust levels ~~are~~ continu~~e~~ing to ~~improve~~ decline as vegetation recovers.

1.3. Related Actions

In October 2000, the Secretary of Energy directed three actions aimed at improving capabilities within DOE to prevent and respond to wildland fires, one of which was to conduct a complex wide initial joint review of the adequacy of fire safety programs and related emergency management capabilities. The DOE Offices of Independent Oversight and Performance Assurance, Security and Emergency Operations, and Environment, Safety and Health conducted this review between October 15, and December 15, 2000. The review activities included assessing the abilities of selected DOE sites to prevent and respond to wildland fires and providing recommendations for (a) pertinent site-specific and DOE-wide improvements, and (b) the scope and conduct of a comprehensive follow-on fire safety review.

The review indicated that the sites had a variety of plans, procedures, and resources in place for preventing and responding to wildland fires, with some sites having implemented exemplary practices in these areas. This is consistent with DOE's successful record to date in protecting facilities from wildland fires, which reflects solid basic capabilities of fire protection programs across the DOE complex. The review also identified several areas in need of additional management attention to strengthen the Department's wildland fire response capabilities. Actions that are appropriate at the INEEL include:

- Evaluate and document risk from, and potential consequences of, wildland fires
- Expand the Fire department baseline needs to reflect wildland fire response needs
- Prepare fire response plans that adequately address and implement procedures for wildland fire prevention and mitigation
- Implement or expand fire department and emergency management self-assessments to include an assessment of wildland fire prevention and response.

The details of the initial joint review can be found in the associated report "Initial Joint Review of Wildland Fire Safety at DOE Sites, December 2000."

In addition, INEEL's "Wildland Fire Management Guide[1]," provides general fire management information and recommended practices to those organizations directly involved in the preparedness for, prevention of, response to, and recovery from wildland fires on the INEEL. It is based on the criteria of the National Fire Protection Association Pamphlets 295, "Standard for Wildfire Control," and 299, "Protection of Life and Property from Wildfire." However, the INEEL does not currently maintain a land management plan similar to other federal agencies managing large areas of federal lands, that can be used as a basis for the development of fire management policy and objectives related to natural and cultural resources. This Environmental Assessment describes the analysis of various management approaches related to implementation of alternative wildland fire management alternatives for inclusion in this guide.

Bureau of Land Management Environmental Impact Statement – BLM is preparing an Environmental Impact Statement (EIS) to analyze the potential impacts of a new direction in public lands management that responds to the ecological linkages between fire and fuels management activities on

[1] Guide (GDE)-7063 "INEEL Wildland Fire Management Guide," Internal Guidance Document, BBWI.

public lands. The new direction in fire and fuels management will integrate several disciplines and emerging technologies that were not available when the district's existing land use plans were originally prepared. These include recent developments in landscape science (such as geographical information systems [GIS]), current ecological theory regarding ecosystem states and transitions, wildlife strongholds and the impacts of fragmented habitats on wildlife populations, as well as using recently developed, and future, technologies to improve the health of public lands. The BLM proposes to amend the district's twelve existing land use plans with new direction to coordinate fire and fuels management in the district. The land use plan amendments will establish a broad ranging, 'big-picture,' landscape-level management direction recognizing that present ecological health is the cumulative product of past influences. Public lands managed by the BLM are adjacent to most of the INEEL boundary.

Because BLM is also engaged in a wildland fire planning effort, DOE and BLM have been coordinating efforts. That coordination lead to an initial decision to include the INEEL in the BLM EIS and identify it as a Category "B" Polygon meaning that wildland fire is not desired and aggressive fire suppression tactics would be employed. However, if DOE makes a decision based on this EA that would change the "B" polygon designation, DOE will work with BLM to revise the designation ~~in their EIS~~.

Sagebrush Steppe Ecosystem Reserve – DOE signed a memorandum of agreement with the BLM, FWS, and the Idaho Department of Fish and Game on July 17, 1999, to set aside a portion of the INEEL as a sagebrush steppe reserve (hereinafter the "Reserve"). The Reserve covers about 73,000 acres on the northwest corner of the INEEL. After discussion at the Secretary of Interior and Secretary of Energy level, the BLM was designated as the lead agency in preparing a natural resources management plan that would outline how the area would be managed in the future to retain the characteristics of a healthy sagebrush steppe ecosystem. The overall objectives of the natural resources management plan are to establish specific goals and make management practice recommendations necessary to achieve the objectives set forth in the Proclamation for the Reserve, identify data gaps and research opportunities on the Reserve, and establish vegetation and wildlife management guidance, objectives, policies, and management practices. The BLM plans to complete the Natural Resource Management Plan in August 2003. Presently, the wildland fire management activities for the Reserve would be the same as those identified in this EA for the rest of the INEEL. If the management plan and associated EA for the Reserve indicate~~s~~ the need for a wildland fire strategy that differs from an alternative selected based on this EA, that strategy would be incorporated into the INEEL's wildland fire management.

1.4. Management Goals and Objectives

The DOE realizes that as a first priority, no resource or property value is worth endangering ~~people~~human life or public safety. The following guiding principles from the Federal Wildland Fire Policy (see Table 1-1) reflect this basic commitment. The policy also recognizes the second priority is to protect resources and property, based on the relative values of property and resources and, being realistic, the ability of an agency to fight severe wildfire. DOE is a signatory to this policy and supports the concepts discussed in the Federal Wildland Fire Management Policy for the "integration of wildland fire into our land management planning and implementation activities". The policy further states, "These "umbrella" Federal policies do not replace existing agency-specific policies, but will compel each agency to review its policies to ensure compatibility" (Review and Update of the 1995 Federal Wildland Management Policy 2001). The following sections provide the INEEL specific management goals and objectives for INEEL's Infrastructure, Fire Department and Fire Marshall organizations (hereinafter referred to as INEEL Infrastructure) and air, water, wildlife/habitat, and cultural resources.

While independently recognized as having a well defined and comprehensive fire safety program, DOE has not finalized its policies and guidance on wildland fire management. The Department is also not

Table 1-1. Federal wildland fire guiding principles.[1]

- Firefighter and public safety is the first priority in every fire management activity.
- The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process. "Federal" agency land and resource management plans set the objectives for the use and desired future condition of the various public lands.
- Fire management plans, programs, and activities support land and resource management plans and their implementation.
- Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity. Net gains to the public benefit will be an important component of decisions.
- Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives. "Federal" agency administrators are adjusting and reorganizing programs to reduce costs and increase efficiencies. As part of this process, investments in fire management activities must be evaluated against other agency programs in order to effectively accomplish the overall mission, set short- and long-term priorities, and clarify management accountability.
- Fire management plans and activities are based upon the best available science. Knowledge and experience are developed among all wildland fire management agencies. An active fire research program combined with interagency collaboration provides the means to make this available to all fire managers.
- Fire management plans and activities incorporate public health and environmental quality considerations.
- "Federal, "State", Tribal, and local interagency coordination and cooperation are essential. Increasing costs and smaller work forces require that public agencies pool their human resources to successfully deal with the ever increasing and more complex fire management tasks. Full collaboration among "Federal" agencies and between the "Federal" agencies and "State", local, and private entities results in a mobile fire management work force available to the full range of public needs.
- Standardization of policies and procedures among "Federal" agencies is an ongoing objective. Consistency of plans and operations provides the fundamental platform upon which "Federal" agencies can cooperate and integrate fire activities across agency boundaries and provide leadership for cooperation with "State" and local fire management organizations.

1. Review and Update of the 1995 Federal Wildland Management Policy 2001.

required by law to have a comprehensive body of wildland management policies similar to those used by the BLM or the U.S. Forest Service. Furthermore, no funds are ~~directly~~ currently appropriated to the INEEL for the purposes of land management including activities such as fuel load management, fire response and recovery, habitat protection, or basic environmental research necessary to understand the effects of fire in the local environment. These activities are funded at the Laboratory level using overhead funding.

Nevertheless, the INEEL has historically maintained a highly effective wildland fire response capability and, as a prudent best management practice, conducts its land management activities consistent with the policies and guidance of the Federal land management agencies, including dedicated environmental research and management. However, the consequence of using overhead funding to conduct these activities causes the Laboratory to continually balance competing needs with resources and shift those resources as priorities dictate. Therefore, the extent to which the Laboratory can commit to the alternatives described in this document must be continually evaluated in the context of overall needs and resources as the Laboratory strives to accomplish its clean-up and nuclear energy missions.

1.4.1. INEEL Infrastructure Objectives

The INEEL's Infrastructure wildland fire management goal is focused on protecting INEEL ~~resources~~ physical assests (personnel, physical property, remediation investments) and limiting the interruptions of day-to-day laboratory operations that can result from wildland fire. This includes pre-fire objectives to maintain defensible spaces, aggressive fire suppression objectives to limit the size and duration of wildland fires, and timely rehabilitation of fire areas to minimize dust and soot impacts on personnel and equipment.

To achieve this goal, wildland fire management objectives include the following:

- Firefighter and public safety. No wildland fire situation, with the possible exception of threat to human survival, requires the exposure of firefighters to life-threatening situations.
- Minimize impact to INEEL structures, systems, and components.
- Minimize impact on natural and cultural resources.

- Prudent expenditure of allocated resources.
- Implement a protective and effective wildland fire education/prevention/*trespass* program.
- Integrate cooperative wildland fire management actions with surrounding wildland fire management agencies and organizations.
- Timely rehabilitation of burned areas and repair of resource damage caused by fire suppression activities.

In addition to these overall objectives, specific objectives include:

- Maintain defensible space around improved property.
- Inspect, improve and maintain roads as necessary to ensure emergency response vehicles can access INEEL wildland fires in a timely manner. Roads can also support fire suppression operations by providing a firebreak or, defensible anchor points for indirect fire suppression activities.
- Control all wildland fires within their first burning period (that is, before 10:00 a.m. the following day) using an aggressive initial attack with direct and indirect fire suppression tactics as appropriate.
- Controlling fires in their early stages to:
  - Maximize resource protection
  - Minimize fire suppression resources and operations interruptions
  - Minimize risk of burning *soil contamination areas* (SCAs)
  - Minimize power interruption from wildland fire
  - Minimize potential for INEEL wildland fires to impact adjacent public and private lands
  - Minimize the need for rehabilitation resources
- Rehabilitate burned areas as necessary to control dust and minimize effects on INEEL personnel, equipment and operations.

1.4.2. Air Resources Objectives

The goal for management of air resources on the INEEL is to comply with all federal and state air regulations. However, federal and state air regulations are only relevant to pre- and post-fire activities; regulations do not apply to wildfire emissions or emergency response actions, such as bulldozing *containment lines*, or lighting backfires. As a general practice, it is the goal of INEEL operations to minimize emissions of pollutants to the atmosphere to the extent practicable. With respect to wildfires and wildfire prevention, objectives to meet these goals include:

- Plan and conduct pre-fire and post-fire activities to minimize dust generation
- Minimize, to the extent practicable, dust generation during fire suppression activities
- Prevent wildfires to the extent possible
- Minimize extent of wildfires, and therefore, emissions
- Prevent or minimize wildfires burning through SCAs
- If fires do burn through SCAs, apply measures to minimize spread of contaminated soil after the fire.

1.4.3. Water Resources Objectives

The following goals provide the basis for protecting the INEEL's water resources: (1) conduct research, environmental remediation, and operations in a manner that protects unique natural resources of the INEEL, (2) manage water resources in a responsible manner to protect the water resource for current and future use, and (3) design, construct, and operate DOE facilities so that the environment is protected from the impacts of natural phenomena, such as regional flood hazards, and wildland fires.

The following water resources management objectives implement these goals:

- Minimize erosion
- Minimize sedimentation
- Minimize pollutant exposure
- Comply with applicable regulations
- Use fiscal resources responsibly.

1.4.4. Wildlife/Habitat Resources Objectives

The INEEL contains the largest remnant of undeveloped, ungrazed sagebrush steppe ecosystem in the Intermountain West (DOE 1997a). That ecosystem has been identified as critically endangered with less than two percent remaining in the western U.S. (Noss et al. 1995, Saab and Rich 1997). The INEEL is also designated as a National Environmental Research Park (NERP). A NERP is an outdoor laboratory for evaluating the environmental consequences of energy use and development as well as strategies to mitigate those effects.

The goal of ecological resource management on the INEEL is to perpetuate and protect a large, unfragmented native sagebrush steppe ecosystem, respond to existing executive orders, and federal, state, and DOE mandates for protecting biological resources, and support NERP objectives. Recognizing that fire is a natural ecosystem process, wildland fire management can protect ecological resources from damage by wildland fire and/or pre-fire, fire suppression and post-fire activities. Specific objectives include:

- Limit the size of *unwanted* wildland fires that put ecological resources at risk
- Maintain a natural fire cycle and landscape-scale ecosystem diversity[1]
- Reduce the need for rehabilitation following fire suppression
- Protect sage grouse and other sagebrush-obligate species and their habitat
- Prevent habitat loss and habitat fragmentation
- Maintain as much of the existing sagebrush steppe ecosystem as possible
- Maintain plant genetic diversity
- Protect unique ecological research opportunities
- Prevent invasion of non-native species, including *noxious weeds*.

1.4.5. Cultural Resources Objectives

Cultural resource management on the INEEL is viewed as a dynamic process with some goals being accomplished each year, and new objectives being added in response to changing conditions. The goal of the INEEL's Cultural Resource Management Office (CRMO) is to reduce or eliminate impacts to cultural resources from INEEL activities, including those from wildland fires.

With respect to wildfires and wildfire prevention, objectives to meet these goals include:

- Preventing damage to cultural resources through advanced planning and integration with infrastructure and fire department activities
- ~~If damage to cultural resources will be unavoidable, minimize~~Minimizing damage to cultural resources through consultation, advanced planning, and integration with infrastructure and fire department activities, if damage to cultural resources is unavoidable

[1] For purposes of this EA, natural fire cycle means eliminating fires on burned areas for 70 to 100 years to allow big sagebrush, especially the *A. wyomingensis* stands, sufficient time to re-establish. On a landscape scale, this means ensuring there are sufficient mature stands of sagebrush to provide for sagebrush obligate species.

- Conducting fire and fire suppression damage assessments to determine necessary mitigation
- ~~Eliminate~~ Eliminating or significantly ~~reduce~~ reducing the need for construction of containment lines during wildland fires and post-fire rehabilitation in archaeologically sensitive areas.