United States Department of Agriculture
Forest Service

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Bureau of Land Management

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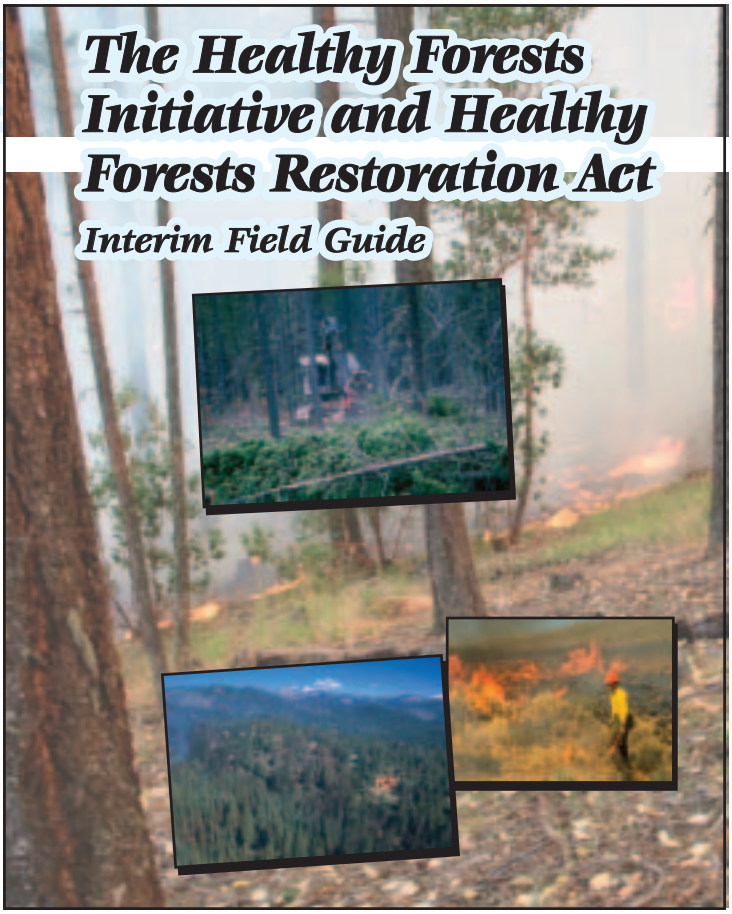
The Healthy Forests Initiative and Healthy Forests Restoration Act

Interim Field Guide



USDA Forest Service

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Introduction

Over the past 2 years, administrative procedures and processes governing preparation of projects to reduce hazardous fuel and restore healthy ecological conditions on Federal land have undergone many changes. These changes have resulted from the Healthy Forests Initiative (HFI), launched in 2002 to reduce administrative process delays to implementation of such projects, and from the Healthy Forests Restoration Act (HFRA), passed in December 2003. The HFRA provides improved statutory processes for hazardous-fuel reduction projects (figure 1) on certain types of at-risk National Forest System (NFS) and Bureau of Land Management (BLM) lands and also provides other authorities and direction to help reduce hazardous fuel and restore healthy forest and rangeland conditions on lands of all ownerships.

Purpose of This Field Guide

This *Field Guide* is designed to help resource managers understand the changes in procedures and processes under the HFI and HFRA. It briefly summarizes the various HFI tools that have become available. The guide does not address all HFI tools directly. Its primary focus is on the expedited processes provided in Title I of the HFRA for hazardous-fuel treatment on NFS and BLM lands.

The new information is intended only to cover activities authorized by the HFRA. Previously issued guidance for other HFI authorities should be referred to when using those tools.

Figure 1—A wildland fire creeps up a treated hillside in southern Oregon during the peak of fire season. Forest restoration treatments funded by the National Fire Plan substantially reduced the threat of severe wildland fire in this area, while improving long-term forest health.

The *Field Guide* should be used as a companion to the National Environmental Policy Act (NEPA) selection tool and other resources on the Healthy Forests Web sites at *http://frdev.ftcol.wo.fs.fed.us/hfra* and *http://www.doi.gov/initiatives/forest.* The guide will be updated periodically. Check the Web sites for the latest version.

This *Field Guide* does not provide guidance on conducting strategic assessments of fuel treatment and the need for ecosystem restoration. Such assessments, conducted at appropriate landscape scales, should set priorities for reducing the risk to social and ecological values caused by uncharacteristically dense vegetation. The assessments should evaluate the potential for vegetation treatments, such as mechanical treatments and prescribed fire, to reduce the risk. A tactical schedule of priority vegetation-treatment projects should result from these strategic assessments. This *Field Guide* assumes that such a strategic assessment and the companion tactical schedule of treatments have been prepared.

HFI and HFRA projects must operate within the established guidelines of resource management plans and other legally applicable guidance. This guide assumes that effective interdisciplinary processes will be used to identify landscape goals and to establish stand-treatment priorities and objectives within the context of those goals. Concepts such as the emulation of natural disturbances and the range of natural variability may be useful when setting landscape and stand goals and objectives.

This guide will help managers determine whether the HFI and HFRA authorities apply to planned hazardous-fuel reduction projects or whether other authorities should be used.

The four components of using the HFI and HFRA authorities to implement projects are:

1—On lands in or adjacent to the wildland-urban interfaces of at-risk communities and other at-risk Federal lands, work in collaboration with communities in setting priorities and, as appropriate, in developing Community Wildfire Protection Plans.

2—Develop the project information needed to determine whether proposed projects can use the improved HFI and HFRA authorities.

3—Use the NEPA process identified for HFI and HFRA projects.

4—Fund, implement, and monitor the HFI and HFRA projects.

In addition, this guide briefly summarizes the provisions of Titles II through VI of the HFRA and discusses the status of implementation actions under each title. Because this legislation was enacted in December 2003, implementation actions for several of these titles remain a work in progress.

Increased Risk of Catastrophic Fire

About 190 million acres of Federal forest and rangeland in the lower forty-eight States face high risk of large-scale insect or disease epidemics and catastrophic fire due to deteriorating ecosystem health and drought.

While the increased risk of catastrophic wildland fire is often blamed on long-term drought or expansion of the wildland-urban interface in the Western United States, the underlying cause is the buildup of forest fuel and changes in vegetation composition over the last century. Unnaturally dense stands competing for limited water and nutrients are at increased risk of unnaturally intense wildland fires and insect or disease epidemics.

The severity of this problem has been recognized by many observers, including the general public, the U.S. Congress, President Bush, the Western Governors Association, the National Association of State Foresters, the Intertribal Timber Council, the National Association of Counties, and others.

In 2001, the U.S. Congress funded the National Fire Plan to reduce hazardous fuel and restore forests and rangeland. In response, the Secretaries of Agriculture and the Interior, along with Western Governors and other interested parties, developed a 10-year strategy and implementation plan for protecting communities and the environment. This plan, coupled with the Federal Wildland Fire Management Policy (2001), forms a framework for Federal agencies, States, Tribes, local governments, and communities to reduce the threat of fire, improve the condition of the land, restore forest and rangeland health, and reduce risk to communities.

Delays Caused by Procedural and Administrative Processes

USDA Forest Service and U.S. Department of the Interior (DOI) BLM efforts to reduce the intensity and destructiveness of wildland fires have been hampered by administrative processes that have delayed critical fuel-reduction projects (figure 2). These delays not only put communities and homes at risk, they allow the condition of key watersheds to continue to degrade. Despite actions already taken and a 98-percent success rate in suppressing fires while they are still small, wildland fires continue to damage far more land each year than Federal agencies are treating.

The Administration launched the HFI in 2002 to reduce barriers to the timely removal of hazardous fuel. Sixteen months later, Congress passed the HFRA to reduce delays and remove statutory barriers for projects (figures 3 and 4) that reduce hazardous fuel and improve forest health and vigor. Other provisions of the HFRA are designed to address forest and rangeland health on private lands.

Figure 2—The wildland-urban interface is a mosaic of communities, structures, and vegetation types. Fuel in this interface near Ruch, OR, was treated using a machine that ground unwanted vegetation into mulch, reducing the risk of catastrophic wildland fire on DOI BLM lands and adjacent private land.

Figure 3—Prescribed fire is one of the tools resource managers use to reduce fuel and improve forest and range conditions. This burn was conducted at the DOI BLM's Lower Snake River District in Idaho.

Healthy Forests Initiative

The HFI expedites administrative procedures for hazardous-fuel reduction and ecosystem-restoration projects on Federal land. The administrative actions undertaken through the HFI include:

NEPA Categorical Exclusions

New categorical exclusion categories allow certain fuel-treatment projects (such as mechanical thinning and prescribed fires) and rehabilitation projects after a fire (such as reseeding and tree planting) to proceed in full compliance with NEPA, but without lengthy environmental and sociological documentation. The new categorical exclusions require agencies to identify projects through a public process undertaken in collaboration with State and local governments, Tribes, landowners, and other interested persons and community-based groups.

Guidance for Environmental Assessments of Forest Health Projects

The DOI and the USDA Forest Service continue to use new guidance from the Council on Environmental Quality to conduct environmental assessments for fuel reduction and to restore fire-adapted ecosystems. Fifteen pilot fuel-treatment projects were begun using this guidance. Additional direction and helpful hints to improve environmental assessments (EAs) will be available by the summer of 2004.

Figure 4—Mechanical harvests can successfully remove smaller biomass material while leaving larger trees.

USDA Forest Service Appeals Rule Amendments

The USDA amended the rules for project appeals to hasten the review of forest health projects. Early and meaningful public participation in the decisionmaking process benefits communities and makes the appeals process less cumbersome. Early public participation will result in timely project decisions and allow faster implementation.

DOI BLM Full Force and Effect Regulations

The DOI BLM added regulations so wildland fire management decisions can be effective immediately when:

- Vegetation, soil, or other resources on public lands are at substantial risk of wildland fire because of drought, fuel buildup, or for other reasons, or
- Public lands are at immediate risk of erosion or other damage because of wildland fire.

The regulations also expedite administrative review of those decisions. This rule supplements existing full force and effect regulations for forest management (43 CFR 5003).

DOI Appeals Rules Amendments

The DOI Office of Hearings and Appeals amended rules in order to expedite its review of wildland fire management decisions. The rule changes allow the DOI BLM to place wildland fire management decisions in effect immediately in certain situations and require the appeals board to decide appeals on a strict time schedule. The rule changes also require those appealing a project to have raised the objection during the public comment period on the project.

New Endangered Species Act Procedures

On January 7, 2004, joint Endangered Species Act (ESA) counterpart regulations of the Departments of the Interior, Agriculture, and Commerce became effective. The regulations make the consultation process more effective under Section 7 of the Endangered Species Act for projects within the scope of the National Fire Plan, while maintaining protection for threatened and endangered species. The new process provides an alternative to informal consultation with the U.S. Fish and Wildlife Service (USFWS) or National Oceanic and Atmospheric Administration (NOAA) Fisheries on actions determined "not likely to adversely affect" any listed species or designated critical habitat. It also enables the USFWS and NOAA Fisheries to focus their limited resources on consultations that are likely to have some adverse effects on endangered species. Implementation of counterpart regulations awaits development of an interagency agreement establishing training and experience criteria for managers in the action agencies who will be using the new process.

In addition to the joint counterpart regulations, the Director of the USFWS and the assistant administrator for fisheries at NOAA issued guidance to their regional offices on two aspects of consultation under Section 7 of the ESA. The first directive, issued on October 11, 2002, stresses the need to work with the action agencies to make the Section 7 consultation process more effective. The second directive, issued on December 10, 2002, provides additional guidance to regional offices, requiring an evaluation of the net long-term benefit of hazardous-fuel treatment projects.

Stewardship Contracting

Congress has enacted legislation expanding stewardship contracting authority with communities, the private sector, and others, allowing the USDA Forest Service and DOI BLM to enter into long-term contracts (up to 10 years) to meet land-management objectives (for example, to reduce wildland fire risk and improve forest and rangeland health). Stewardship contracts focus on producing desirable results on the ground that improve forest and rangeland health and provide benefits to communities. Among other things, the new stewardship contracting authority allows forest products to be exchanged for ecological restoration services, which may include thinning and removing brush.

DOI Administrative NEPA Improvements

The DOI is incorporating administrative improvements and existing best practices into its NEPA processes Department-wide. These improvements, which can be applied under the HFI and the HFRA, are intended to reduce conflict and enhance public participation. The reforms cover a number of areas, including: consensus-based management, public participation, community-based training, use of integrated analysis, adaptive management, and tiered and transferred analysis. Each of these concepts is aimed at ensuring that the field staff has the tools to tailor their approach to the NEPA process to local needs and interests.

Healthy Forests Restoration Act

The Healthy Forests Restoration Act of 2003 (P.L. 108-148) contains a variety of provisions to expedite hazardous-fuel reduction and forest-restoration projects on specific types of Federal land that are at risk of wildland fire or insect and disease epidemics. The act helps rural communities, States, Tribes, and landowners restore healthy forest and rangeland conditions on State, Tribal, and private lands. It also:

- Encourages biomass removal from public and private lands
- Provides technical, educational, and financial assistance to improve water quality and address watershed issues on non-Federal lands
- Authorizes large-scale silvicultural research
- Authorizes acquisition of Healthy Forest Reserves on private land to promote recovery of threatened and endangered species, and improve biodiversity and carbon sequestration
- Directs the establishment of monitoring and early warning systems for insect or disease outbreaks

Title I provides authorities for expedited vegetation treatments on certain types of NFS and BLM lands that are at risk of wildland fire; have experienced wind throw, blowdown, or ice-storm damage; are currently experiencing disease or insect epidemics; or are at imminent risk of such epidemics because of conditions on adjacent land. This title:

- Provides expedited environmental analysis of HFRA projects
- Provides administrative review before decisions are issued on proposed HFRA projects on NFS lands
- Contains requirements governing the maintenance and restoration of old-growth forest stands when the USDA Forest Service and DOI BLM carry out HFRA projects in such stands
- Requires HFRA projects on NFS and BLM land to maximize retention of larger trees in areas other than old-growth stands, consistent with the objective of restoring fire-resilient stands and protecting at-risk communities and Federal lands
- Requires collaboration between Federal agencies and local communities, particularly when Community Wildfire Protection Plans are prepared
- Requires using at least 50 percent of the dollars allocated to HFRA projects to protect communities at risk of wildland fire
- Requires performance to be monitored when agencies conduct hazardous-fuel reduction projects and encourages multiparty monitoring that includes communities and other diverse stakeholders (including interested citizens and Tribes)
- Encourages courts to expedite judicial review of legal challenges to HFRA projects
- Directs courts that consider a request for an injunction on an HFRA-authorized project to balance the short- and long-term environmental effects of undertaking the project against the effects of taking no action

Environmental Analysis Requirements for HFI and HFRA Projects

The process for accomplishing hazardous-fuel reduction and vegetation-restoration projects on Federal lands can be improved, while maintaining appropriate environmental standards and collaborating with communities and interested publics. Agencies need to provide the time and opportunity for public collaboration. When undertaking projects, managers must focus on the ecological processes that provide healthy, resilient ecosystems and that support healthy human communities. Making some NEPA procedures more efficient does not reduce our obligation to complete appropriate environmental evaluation, nor must it shortchange the right of the public to understand agency proposals and provide their views to Federal agencies on matters affecting public lands.

Collaboration with communities and the public is the cornerstone of *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan* (May 2002). While some procedural requirements have been expedited, all existing environmental statutes remain in place.

Healthy Forests Initiative

On August 22, 2002, President Bush established the Healthy Forests Initiative, directing the Departments of Agriculture and the Interior, and the Council on Environmental Quality, to improve regulatory processes to ensure more timely decisions, greater efficiency, and better results in reducing the risk of catastrophic wildland fires. On June 5, 2003, the Departments of Agriculture and the Interior adopted two new categorical exclusions from documentation in an EA or environmental impact statement (EIS): an exclusion for hazardous-fuel reduction and another for rehabilitation of resources and infrastructure damaged by wildfire (68 FR 33814).

Categorically Excluding Hazardous-Fuel-Reduction Actions

To be categorically excluded from documentation in an EA or EIS, a proposed hazardous-fuel-reduction action must meet the following requirements:

- Hazardous-fuel-reduction activities using prescribed fire can be categorically excluded if they do not include more than 4,500 acres. Activities using mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing can be categorically excluded if they do not include more than 1,000 acres. Such activities:

  —Shall be limited to areas in the wildland-urban interface or to areas in Condition Classes 2 or 3 in Fire Regime Groups I, II, or III outside the wildland-urban interface.

  —Shall be identified through a collaborative framework as described in *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan.*

  —Shall be consistent with agency and departmental procedures and applicable resource management plans.

  —Shall not be in wilderness areas or impair the suitability of wilderness study areas for preservation as wilderness.

  —Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure, but may include the sale of vegetative material if the primary purpose of the activity is to reduce hazardous fuel.

- Rehabilitation activities after wildland fires can be categorically excluded if they are less than 4,200 acres. These activities are to repair or improve lands unlikely to recover to a management-approved condition after being damaged by a wildland fire, or to repair or replace minor facilities damaged by fire. Such activities include planting trees, replacing fences, restoring habitat, restoring heritage sites, repairing roads and trails, and repairing damage to minor facilities, such as campgrounds. These activities:

  —Shall be consistent with agency and departmental procedures and applicable resource management plans

  —Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure

  —Shall be completed within 3 years after a wildland fire

Before a proposed action that meets these criteria can be categorically excluded, the proposal must be reviewed sufficiently to determine that no extraordinary circumstances (USDA Forest Service) or exceptions (DOI BLM) exist. Direction for USDA Forest Service extraordinary circumstances is found in FSH 1909.15 Section 30.3. DOI BLM direction for exceptions is found in 516 DM 2 appendix 2.

Categorically excluded USDA Forest Service actions are not subject to administrative appeal (36 CFR 215.4). Categorically excluded DOI BLM actions are subject to notification, protest, and administrative appeal (43 CFR part 4, as modified by 43 CFR 5003.1 and 43 CFR 4190.1).

More information on categorical exclusion of hazardous-fuel-reduction projects is available at: *http://www.fs.fed.us/emc/hfi* or *http://elips.doi.gov/elips/release/3511.htm.*

Categorical exclusions for some vegetation management actions may be available under other authorities. While the projects eligible for such categorical exclusions are designed primarily for objectives other than treatment of hazardous fuel, fuel reduction may be an important secondary benefit. Review the appropriate agency guidance to determine whether such exclusions apply to specific projects. Additional information on USDA Forest Service categorical exclusions is available at: *http://frdev.ftcol.wo.fs.fed.us/hfra*.

Environmental Assessments

The Council on Environmental Quality provided new guidance for the preparation of EAs for fuel reduction and fire-adapted ecosystem-restoration projects in December 2002. The guidance included a general outline and made the following major points:

- The EA should be "a concise public document," no longer than 10 to 15 pages, that addresses four elements: need for the proposed action, description of alternatives, description of the environmental impacts of the proposed action and the alternatives, and a list of the agencies and persons consulted.
- The EA should reference any supporting data, inventories, and other documents that were relied on in its presentation.
- Interested agencies and the public must be involved in EA preparation to the extent practicable.
- When a Finding of No Significant Impact is prepared, the EA should be attached and incorporated by reference.
- When the EA and Finding of No Significant Impact are ready, reasonable public notice of their availability must be provided.
- If an EIS is needed, a Notice of Intent must be published describing the proposed action and alternatives, the scoping process, and the name of the agency contact.

Healthy Forests Restoration Act

Section 104 of the HFRA establishes special procedures when agencies prepare EAs or EISs for authorized hazardous-fuel-reduction projects. Categorical exclusions cannot be used for projects authorized under Title I of the HFRA. Except for the act's authorization to analyze fewer NEPA alternatives (Sections 104(c) and (d)), most of the requirements of Section 104 are consistent with normal NEPA practices.

Section 104(e) of the HFRA requires agencies to provide notice of the project and conduct a public meeting when preparing authorized hazardous-fuel-reduction projects.

Section 104(f) encourages meaningful public participation during preparation of authorized hazardous-fuel-reduction projects. The USDA Forest Service and DOI BLM shall facilitate collaboration when they are preparing authorized hazardous-fuel-reduction projects. As appropriate, collaboration should include representatives from Tribes, local representatives from Federal and State agencies, local governments, landowners, other interested persons, community-based groups, and other nongovernmental organizations. Local involvement is critical when planning projects, setting project priorities, and allocating resources at the local level. Agencies need to plan ahead to provide adequate time for collaboration.

For all EAs completed under the HFRA, USDA Forest Service and DOI BLM offices must use the *Guidance for Environmental Assessments for Forest Health Projects* provided in a December 9, 2002, memorandum from the Council on Environmental Quality, available for review at: *http://www.fire.blm.gov/ea_sites/guidance/g_CEQmemo.pdf*.

Developing the Proposed Action and Alternatives

Authorized hazardous-fuel-treatment projects under the HFRA cannot take place in any of the following:

- Wilderness areas
- Wilderness study areas
- Areas where the removal of vegetation is prohibited by an act of Congress or Presidential proclamation (including prohibitions in the area's implementation plan)

All proposed HFRA actions must be consistent with the applicable resource management plans and they must be on lands managed by the USDA Forest Service or DOI BLM. This means that any proposed action that would not be consistent with a resource management plan must be: modified to make it consistent with the plan, or be covered by a plan amendment or project-specific amendment.

For areas inside the wildland-urban interface and within 1½ miles of the boundary of an at-risk community, the USDA Forest Service and DOI BLM are not required to analyze any alternative to the proposed action, with one exception:

If the at-risk community has adopted a Community Wildfire Protection Plan and the proposed action does ***not*** implement the recommendations in the plan regarding the general location and basic method of treatments, agencies are required to analyze the recommendations in the plan as an alternative to the proposed action (Sections 104(d)(2) and (3)).

Agencies are not expected to develop a full no-action alternative. However, they should evaluate the effects of failing to implement the project. This information will be useful if courts consider requests for an injunction and must balance the short- and long-term effects of taking or failing to take an action. See the *Judicial Review* section for more detailed guidance.

For areas within the wildland-urban interface, but farther than 1½ miles from the boundary of an at-risk community, the USDA Forest Service and DOI BLM are not required to analyze more than the proposed agency action and one additional action alternative (Section 104(d)(1)). Agencies are expected to analyze the effects of failing to take action.

For authorized HFRA projects in all other areas, analyses must describe the proposed action, a no-action alternative, and an additional action alternative, if one is proposed during scoping or the collaborative process. If more than one additional alternative is proposed, the agency will select one and provide a written record describing the reasons for its selection (Section 104(c)).

Decision Diagrams

Several diagrams on the following pages have been prepared to help managers use the HFI and HFRA authorities. These diagrams summarize the requirements of the laws, but do not substitute for a careful review of the laws themselves.

Decision Diagram Key

Using Decision Diagrams With the Field Guide

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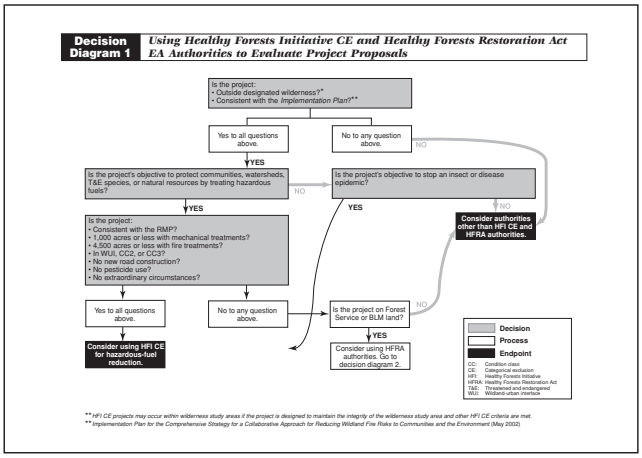


Diagram 1 helps you determine whether your project qualifies for HFI CE or HFRA authorities.

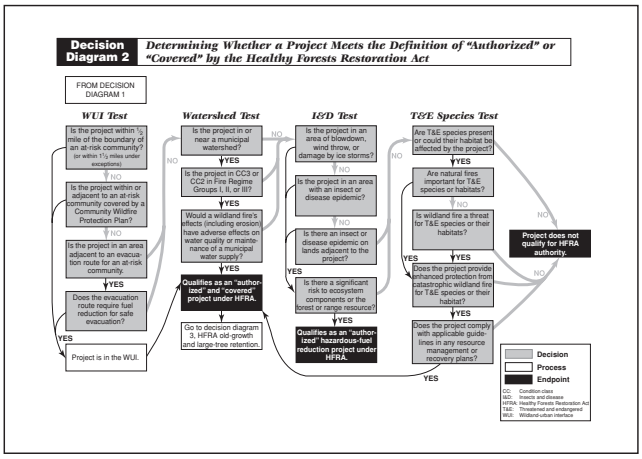


Diagram 2 helps you determine whether your project qualifies as an "authorized" or "covered" project under HFRA authorities.

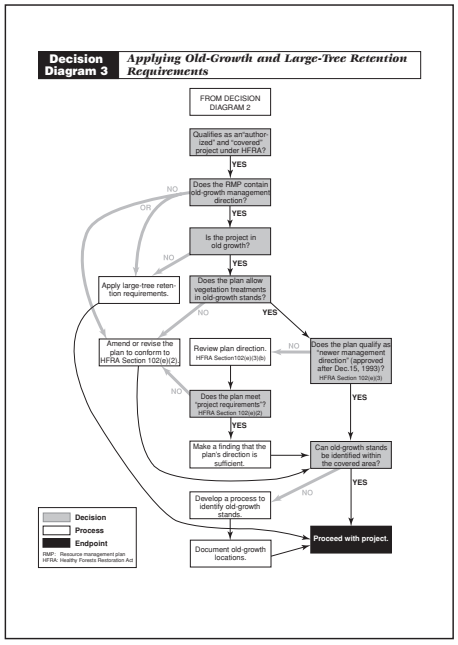
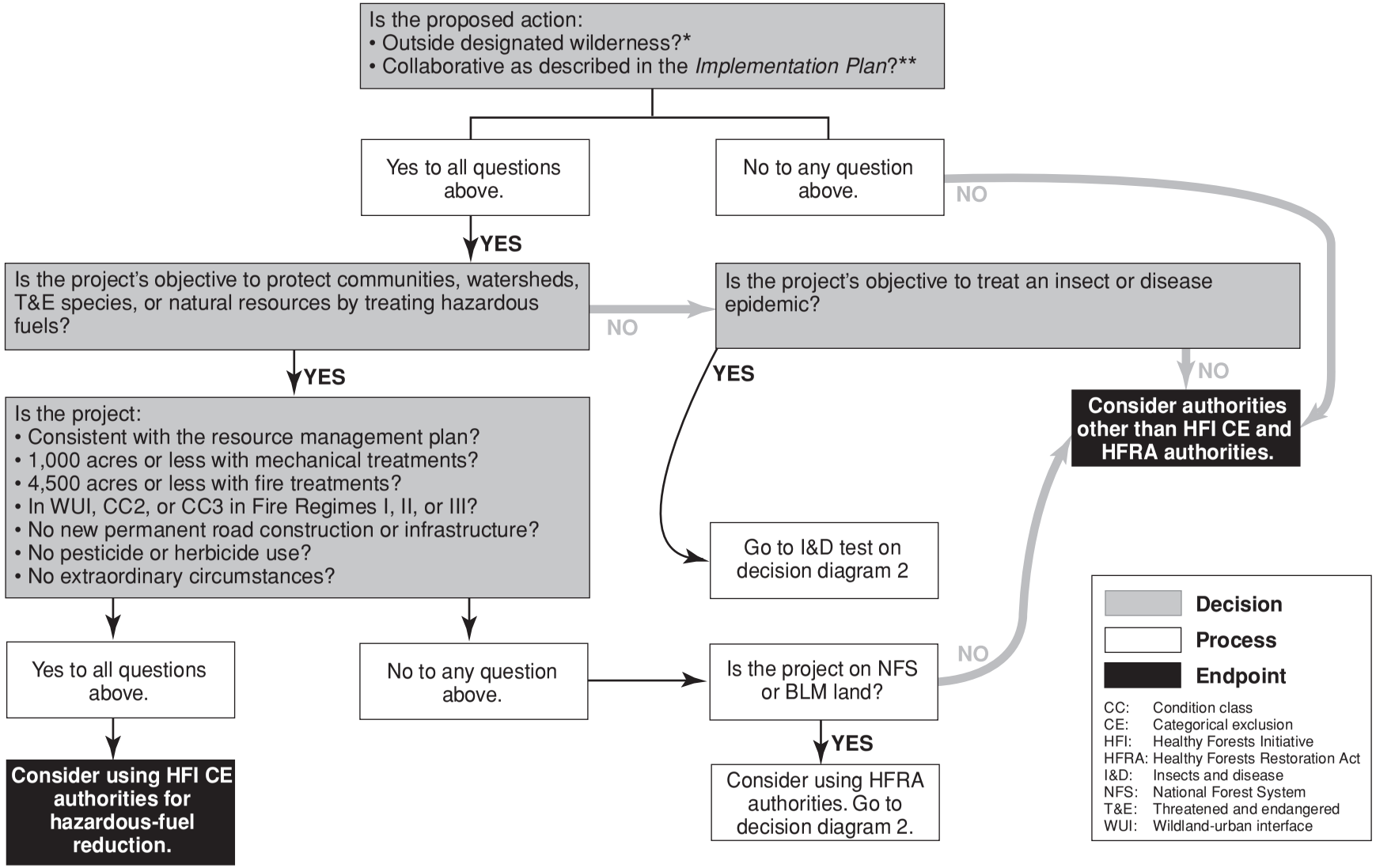


Diagram 3 helps you determine whether the old-growth or large-tree retention guidelines apply to "covered" projects.

CE: Categorical exclusion
HFI: Healthy Forests Initiative
HFRA: Healthy Forests Restoration Act

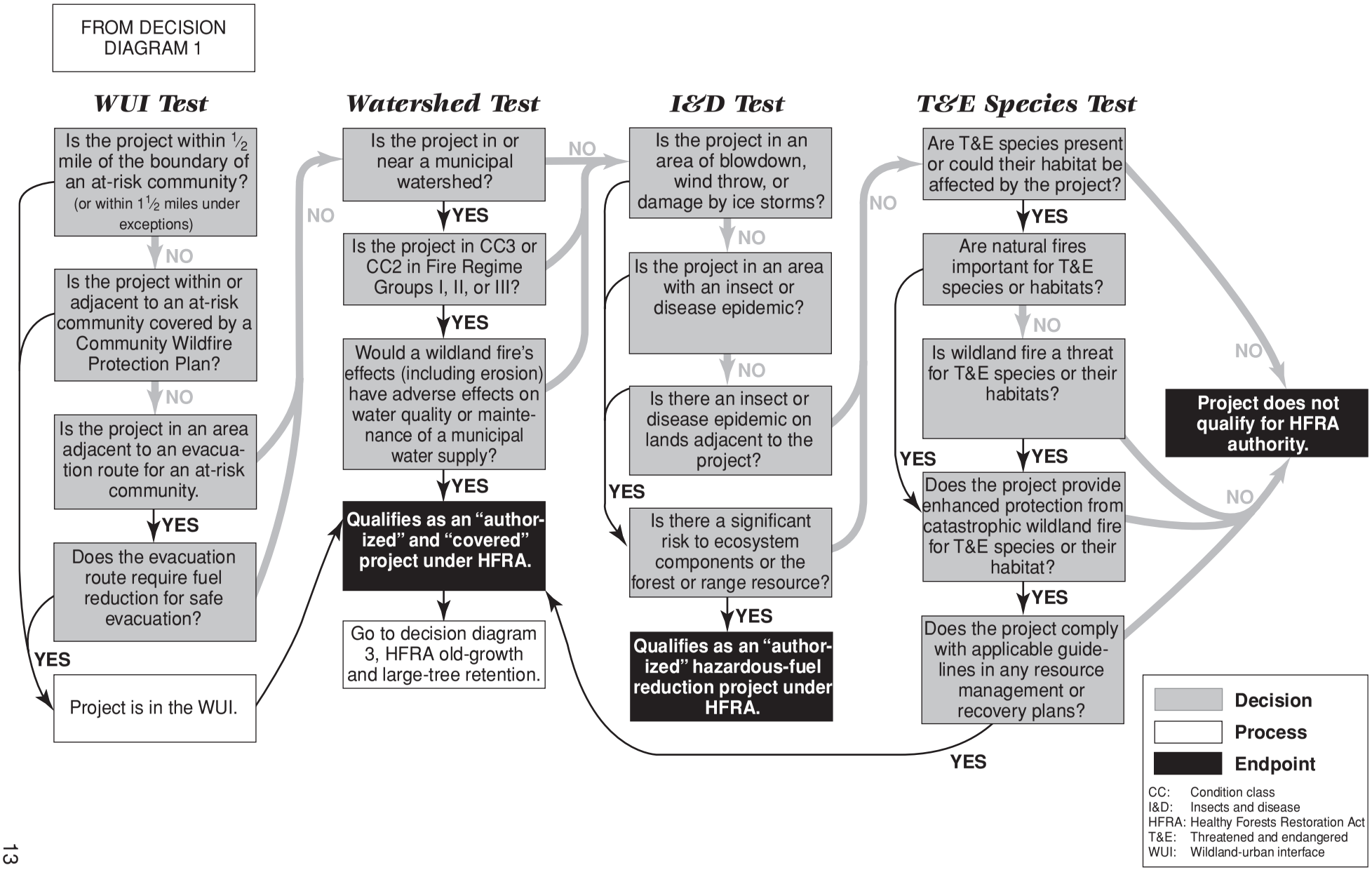
Decision Diagram 1 — *Using Healthy Forests Initiative CE and Healthy Forests Restoration Act Authorities to Evaluate Project Proposals*



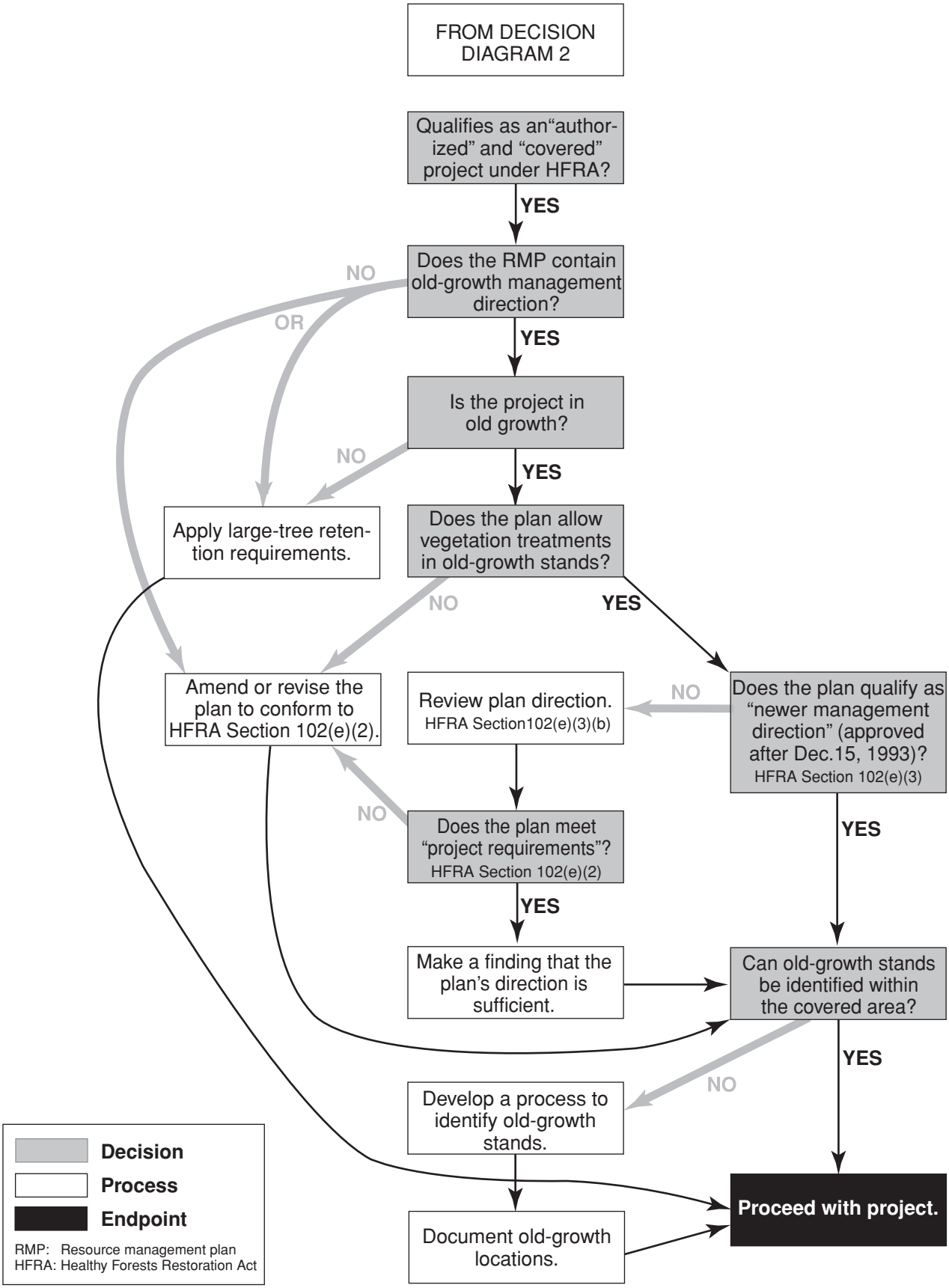
* *HFI CE projects may occur within wilderness study areas if the project will not impair the suitability of the wilderness study area for preservation as wilderness and other HFI CE criteria are met. HFRA projects may not occur in wilderness study areas.*

** *Implementation Plan for the Comprehensive Strategy for a Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment* (May 2002). Implementing a Community Wildfire Protection Plan will fulfill the requirements for collaboration in the *Implementation Plan*.

Decision Diagram 2 — *Determining Whether a Project Meets the Definition of "Authorized" or "Covered" by the Healthy Forests Restoration Act*



Decision Diagram 3 — *Applying Old-Growth and Large-Tree Retention Requirements*



Title I of the HFRA—Hazardous-Fuel Reduction on NFS and BLM Land

Title I of the HFRA focuses primarily on expedited hazardous-fuel treatment on some NFS and BLM lands at risk of wildland fire and insect or disease epidemics. These lands include areas where vegetation treatment will provide long-term benefits to threatened and endangered species. The act encourages Federal agencies to involve State and local governments and citizens when developing plans and projects for vegetation treatment on Federal and adjacent non-Federal lands. The HFRA is consistent with community-based wildland fire planning, watershed planning, and related ongoing efforts under the *National Fire Plan* (*http://www.fireplan.gov*) and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan (May 2002, http://www.fireplan. gov/reports/11-23-en.pdf*). The HFRA does not duplicate or replace these ongoing efforts.

Hazardous-fuel reduction projects on NFS and BLM lands in one or more of the following areas qualify for expedited NEPA review under the HFRA:

- WUIs of at-risk communities
- Municipal watersheds that are at risk from wildland fire
- Areas where wind throw, blowdown, ice storm damage, or the existence or imminent risk of an insect or disease epidemic significantly threatens ecosystem components or resource values
- Areas where wildland fire poses a threat to, and where the natural fire regimes are important for, threatened and endangered species or their habitat

The types of lands listed above define where the authorities of the HFRA can be used to expedite vegetation treatment, such as mechanical thinning or prescribed fire, on NFS and BLM lands.

The HFRA requires authorized projects to be planned and conducted consistent with resource management plans and other relevant administrative policies and decisions that apply to the Federal lands covered by the project (Section 102(b)). The HFRA also prohibits authorized projects in wilderness areas, formal wilderness study areas, and Federal lands where an act of Congress or Presidential proclamation prohibits or restricts removal of vegetation (Section 102(d)).

Wildland-Urban Interfaces Within or Adjacent to At-Risk Communities

The HFRA provides improved administrative procedures for hazardous-fuel-reduction projects on NFS and BLM lands in the WUIs of at-risk communities. The act encourages the development of Community Wildfire Protection Plans under which communities will designate their WUIs, where HFRA projects may take place. The HFRA will greatly accelerate the interest of listed at-risk communities (FR 66 160 Aug. 17, 2001; *http://www.fireplan.gov/content/reports*) in preparing wildland fire protection plans and designating their WUIs, as well as the interest of other communities in becoming listed as at-risk communities. Federal agencies and their State and local cooperators must be prepared to provide information and services to support these communities (figure 5).

This *Field Guide* includes information on planning and setting priorities for work in and around at-risk communities in the section on *Setting Priorities and Collaborating*.

At-Risk Municipal Watersheds

The HFRA authorizes projects that reduce the risk wildland fires pose to the quality of a municipal water supply or to its maintenance (figure 6). Specifically, in Sections 102(a)(2) and (3), the HFRA provides for expedited vegetation treatments on NFS and BLM lands in Condition Class 3 in all fire regimes and in Condition Class 2 in Fire Regimes I, II, or III that are:

> "…in such proximity to a municipal water supply system or a stream feeding such a system within a municipal watershed that a significant risk exists that a fire disturbance event would have adverse effects on the water quality of the municipal water supply or the maintenance of the system, including a risk to water quality posed by erosion following such a fire disturbance event."

At-risk watersheds do not have to be directly associated with at-risk communities or their WUIs under Section 102(a)(1) of the act. However, when managers work with communities to assess the risk of wildland fire, they should include the risk of wildland fire to municipal watersheds in the Community Wildfire Protection Plans described in Section 101(3).

Figure 5—High-intensity wildland fire on the Pueblo de Taos Indian Reservation near Taos, NM, shows the need for projects to reduce the risk of wildland fire to at-risk communities.

Determination of Significant Risk

The HFRA requires an evaluation that a significant risk exists that a wildland fire would have adverse effects on the quality of the municipal water supply or on maintenance of the system. Many NFS and BLM units have completed watershed analyses that should be utilized to the maximum extent possible to assess the potential adverse effects of a wildland fire event on the quality of municipal water supplies and system maintenance. This determination of adverse effects is the responsibility of the land-management agency and should be based on an examination of the relevant information. However, resource managers must seek to collaborate with and actively involve community leaders and citizens in providing information relevant to such determinations.

This determination of adverse effects of wildland fire should be made after an assessment that:

- Identifies and maps the municipal watersheds
- Identifies and maps the fire regimes and fire regime condition classes in and adjacent to the watershed
- Assesses the likely effects on water quality, sediment delivery, and water supply system infrastructure if a wildland fire occurs in or adjacent to the watershed

Protocols for assessing fire regimes and fire regime condition classes have been developed by the USDA Forest Service and

Figure 6—Within 48 hours after the Myrtle Creek fire burned in the municipal watershed for Bonners Ferry, ID, sediment from the watershed was degrading water taste and clarity.

the DOI for field use. These assessments should be conducted at the appropriate scale for determining the risk that a wildland fire event may pose to the quality of the municipal water supply or to maintenance of the system. More information on identifying fire regimes or fire regime condition classes is available at: *http://www.frcc.gov*.

In most cases, the evaluation of the adverse effects of a wildland-fire event in, or adjacent to, a municipal watershed should be relatively straightforward. This evaluation should include:

- Changes in peak streamflow frequency or magnitude

- Sediment flows in municipal watersheds that could degrade water quality, reduce its quantity, and increase treatment costs

- Other relevant effects, such as the release of heavy metals

The effects of wildland fire on municipal water supplies include: changes in erosion hazard and erosion rates, debris and mud-flow hazards, the ability of channels to handle sediment, and the formation of water-repellent soil layers. In some watersheds, wildland fire may also mobilize substances toxic to human health, such as mercury, lead, arsenic, cadmium, and other metals. These materials may have entered the watershed from natural sources, abandoned or active mines, or through atmospheric deposition. After a fire, these materials may be dissolved in water or adsorbed (attached) to inorganic and organic particles, making the materials more mobile than they were before the fire. In watersheds where mobilization of these toxic materials is a concern, they may be identified and the risk of their mobilization could be included in estimates of risk from wildland fires (figure 7).

The condition of the watershed and other factors that may place the water quality or quantity at risk, such as landslide-prone areas, excessive roading, or the effects of past wildland fires, may be included in the watershed risk assessment.

Risks to municipal water supply infrastructure also may be influenced by the capacity of the municipal water system and the proximity of the municipal watershed system infrastructure to flammable vegetation.

Some other factors that could be considered in evaluating the risks associated with wildland fires include the:

- Vegetation type

- Predicted fire severity

- Soil texture

- Stream gradient

- Precipitation intensity

- Surface soil erodibility estimates (using the Revised Universal Soil Loss Equation) and mass failure risks

Figure 7—Soil damaged by fire is susceptible to extreme erosion if heavy rains occur shortly after the fire.

- Potential for increases in instantaneous peak streamflows
- Portion of the water system infrastructure that is within the 100-year floodplain
- Lands close to the watershed where conditions pose a significant risk from fire
- Number of people served by the community water system
- Percent of the municipal watershed area administered by the DOI BLM and USDA Forest Service
- Probability that the community water system would be disrupted

These evaluations should be performed at the local level, in an open forum including all interested parties as part of the normal NEPA process, before treatment areas are selected.

The HFRA does not require setting priorities among various at-risk municipal watersheds based on the relative risk of damage in the event of wildland fire. Some municipal watersheds are at more risk of fire than others, based on the likelihood of a wildland fire occurring, its potential damaging effects, the amount of Federal land in a condition class that increases the risk from wildland fire, and other factors. Resource managers should consider such factors when allocating funds.

The determination of "significant risk" referred to in HFRA Sections 102(a)(2) and (3) should not be confused with NEPA requirements to determine whether a Federal action will create a "significant impact" on the environment. A determination of significant risk under the HFRA does not dictate whether an agency should use an EA to document an action's effects.

The HFRA and the Safe Drinking Water Act have specific definitions for the terms *municipal watershed* and *municipal water supply system*:

- A *municipal watershed* is a community water system "that serves at least 15 service connections used by year-round residents of the area served by the system; or regularly serves at least 25 year-round residents" (Safe Drinking Water Act, Section 1401, 42 U.S.C.A. 300f.(15)).
- Under the HFRA, a *municipal water supply system* is "the reservoirs, canals, ditches, flumes, laterals, pipes, pipelines, and other surface facilities and systems constructed or installed for the collection, impoundment, storage, transportation, or distribution of drinking water" (Section 101).

For the purposes of this *Field Guide* "**… in such proximity to a municipal water supply system**" (HFRA Sections 102(a)(2) and (3)) would include:

—Those Federal lands in the municipal watershed drainage area.

—All Federal lands adjacent to the infrastructure of a municipal water system.

—A locally determined zone of protection around the perimeter of the municipal watershed that extends into the adjacent drainages. This zone could be delineated during development of a Community Wildfire Protection Plan or through discussions with managers of local municipal water systems. The degree that the zone extends into adjacent drainages, and the width of these extensions should take into account geographic features, the condition of the vegetation, and other characteristics of the adjacent lands.

Documentation

The analysis and documentation for threats of wildland fire to municipal water supplies and infrastructure under Sections 102(a)(2) and (3) of the HFRA are intended to be integrated with the analysis and documentation done under current NEPA guidance and other relevant guidance. This documentation should be included in the NEPA documents normally prepared during project planning, the Decision Records or Records of Decision prepared before project implementation, or in the project file itself.

This analysis and documentation for the threat of wildland fire referenced above should document the factors considered in determining that a wildland fire likely would have adverse effects on the quality of the municipal water supply or on system maintenance. If possible, when making the case for adverse effects, the hazards and risks should be quantified. The short- and long-term effects of proposed treatments and the effects of taking no action should be described as provided for in the *Judicial Review* section.

Because of homeland security concerns, and as required by Title IV of the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (P.L. 107-188), personnel must avoid providing exact locations of water supply systems and associated infrastructure. All maps, information, and data related to these community water supply systems that are used to assess risk and set priorities for fuel treatments are to be exempt from Freedom of Information Act (FOIA) requests and must be stored in secure locations—**they are not public documents**. For further assistance regarding FOIA questions, contact your local FOIA coordinator.

Threats to Ecosystem Components or Forest or Rangeland Resources

Section 102(a)(4) of the HFRA authorizes expedited vegetation management projects on NFS and BLM lands where any one of three specified conditions is present that poses "…a significant threat to an ecosystem component, or forest or rangeland resource, on the Federal land or adjacent non-Federal land."

Those conditions are:

- Wind throw, blowdown, or ice-storm damage on NFS or BLM land
- The existence of an insect or disease epidemic on NFS or BLM land
- The presence of an insect or disease epidemic on immediately adjacent land (which may be non-Federal land) and the imminent risk that the epidemic will spread

The presence of one or more of these conditions does not trigger use of HFRA procedures. There must be a determination that the condition or conditions pose a significant threat to an ecosystem component or a forest or rangeland resource. For example, a stand where conditions rate a high hazard of loss or damage to an ecosystem component or forest resource would not qualify for HFRA procedures unless there was an actual insect or disease epidemic or other condition listed above. Such stands certainly could be treated to reduce risk using other authorities. In addition, significant threats caused by conditions other than the three conditions listed above do not qualify a project for HFRA authorization.

Note: Projects authorized under Section 102(a)(4) are exempt from the old-growth and large-tree retention provisions in Sections 102(e) and 102(f) of the HFRA. They do not constitute "covered" projects as defined in Section 102(e)(1)(B).

Determination of Significant Threat to an Ecosystem Component or Forest or Rangeland Resource

Examples of important forest or rangeland resources that can be harmed by wind throw, ice-storm damage, or insect and disease epidemics include: water quality and quantity, forest products, critical wildlife habitat, and threatened and endangered species. In addition to directly affecting these resources, epidemics and wind throw also can increase fuel buildups and the risk of destructive wildland fire.

Examples of ecosystem components that can be harmed include: increasingly rare environments such as whitebark pine ecosystems, riparian forests, sky islands, single-storied old forests, critical fish and wildlife habitat, and threatened and endangered species.

Resource managers are responsible for identifying important ecosystem components and resource values that may be threatened by wind throw, ice-storm damage, or insect or disease epidemics, and deciding the management actions that will be taken to address them. Forest health and other specialists, working together with resource managers, should provide expert advice whether a significant threat exists to ecosystem components or forest or rangeland resources.

The determination of "significant threat" referred to in Section 102(a)(4) should not be confused with NEPA requirements in the National Environmental Policy Act of 1969 to determine whether a Federal action may significantly affect the quality of the human environment. A determination of "significant threat" under the HFRA does not dictate whether an environmental analysis or environmental impact statement should be prepared. Rather, that determination should be made after developing alternative treatments and assessing their environmental effects.

Determining Whether Blowdown or Ice-Storm Damage Increases Risk to an Ecosystem Component or Forest Resources

The HFRA provides for expedited processes when wind throw, blowdown (figure 8), or ice-storm damage on NFS or BLM land poses a significant threat to an ecosystem component, or to a forest or rangeland resource, on the Federal land or adjacent non-Federal land.

Disturbance events such as ice storms (figure 9), wind events, blowdown, fires, or large-scale droughts, may affect population growth of insects or disease agents. Such events can be a factor triggering massive insect outbreaks. Large areas of blowdown provide a supply of stressed and dying trees where insects may feed and breed. They also can increase the risk of destructive wildland fire.

Ice storms or wind events knock down or damage trees that increase wildfire risk and often are colonized by insects, leading to rapidly increasing insect populations that can attack surrounding trees, if they are susceptible. Areas of scattered blowdown can result in insect epidemics in areas with moderate- to high-hazard conditions.

Assessing whether a particular wind throw or ice-storm event poses a significant threat to an ecosystem component or forest or rangeland resource is complex and depends on the specific ecological conditions and the context in which they occur. Some of these factors are discussed in the following sections. Assessments of significant threat should be made by specialists who

Figure 8—Blowdown on the Superior National Forest increased fuel loadings and the forest's susceptibility to insect infestations.

Figure 9—A December 2000 ice storm inflicted moderate to heavy damage across 340,000 acres of Ouachita National Forest and private lands in Arkansas. Damaged trees were more susceptible to insect and disease infestations, and fuel loads increased the risk of catastrophic wildland fire.

have professional knowledge of the behavior of insect and disease populations and other factors that are likely to be affected by blowdown events or ice storms, such increased threat of wildland fire.

Determining the Existence of an Insect or Disease Epidemic

Except for cases of wind throw, blowdown, or ice-storm damage, HFRA Section 102(a)(4) requires the existence of an epidemic on, or adjacent to, NFS or BLM land and the imminent risk that the epidemic will spread. Resource managers need to understand the potential for such insect and disease epidemics to develop and spread.

What Is an Insect or Disease Epidemic? *Epidemic* refers to populations of damaging insects and pathogens that build up, often rapidly, to injuriously high levels (figure 10). *Epidemic* is synonymous with *outbreak*. Ecologically, an outbreak is often an explosive increase in the abundance of a particular species over a relatively short period. For example, Douglas-fir tussock moth populations can increase to tree-killing levels and then subside over a 3- or 4-year period. Other outbreaks, such as dwarf-mistletoe, may take years to increase to damaging levels and can persist for decades.

Some factors that could be considered when determining whether an epidemic exists include:

- Current population levels relative to endemic levels
- Observed rates and extent of population increase and/or spread
- Species composition of the stand
- The age and size of the trees in the stand
- Stand densities or stocking levels
- Climate and seasonal weather patterns
- Disturbance events such as wind, snow, and ice storms

Insect or disease epidemics result from vulnerable stand conditions (*hazard*, see the *Glossary*) and increasing pest populations (*risk*, see the *Glossary*). An understanding of implications of a particular outbreak will come from an evaluation of the interaction of species, forest conditions, and weather-related phenomena, such as extended periods of drought and high winds.

The Field Manager (DOI BLM) or Forest Supervisor (USDA Forest Service) will determine whether an epidemic exists under Section 102(a)(4) of the HFRA after consulting with forest health specialists (entomologists and pathologists) who know the factors that are relevant to such a determination.

Figure 10—Epidemic levels of insects or diseases, such as this southern pine beetle outbreak on the Daniel Boone National Forest in Kentucky, produce forest conditions that have all the ingredients leading to a fast-moving, high-intensity catastrophic wildland fire.

Evaluating the Threats Posed to Ecosystem Components or Forest or Rangeland Resources

Factors to consider when evaluating the threat that insect or disease epidemics pose to ecosystem components or forest or rangeland resources include:

- Forest and stand conditions
- Pest populations and their rate of increase or decrease
- Weather-related conditions such as drought
- Fire
- Tree damage from a variety of causes

Forest and stand conditions determine the effects of insects or disease. For example, the greatest biological factor affecting bark beetle populations is the availability of food, which is determined by the conditions of their host species within a forest. Attributes of a given stand that influence bark beetle activity include: species composition, the age and size of the trees, and the density of the trees.

Drought stress is caused by prolonged periods of extremely low precipitation that reduce soil moisture below the requirements for trees. Drought stress can predispose trees to insect and disease epidemics by compromising or inhibiting their defense mechanisms. Prolonged periods of drought are associated with mortality caused by root diseases, bark beetles, and woodborers. Increased moisture also can increase the likelihood of infection by pathogens, such as the exotic white pine blister rust, and other pathogens that affect a tree's foliage.

Fire often kills trees or severely stresses them by injuring their foliage, stem, or root systems. Many species of insects are attracted to trees injured by fires. Bark beetle populations that are active in stands before a fire, combined with susceptible stand conditions, could increase the likelihood of additional tree mortality after a fire. Fire can also indirectly affect the hazard when fire cycles are interrupted, leading to changes in the species composition, density, and structure of a stand, which can affect the incidence and likelihood of spread of many pathogens, such as dwarf mistletoe and root diseases, and increase the hazard to damage by many species of insects, such as the western spruce budworm and Douglas-fir tussock moth.

It is important to identify the potential short- and long-term effects of these events on ecosystem components or forest and rangeland resources so treatments can be developed to reduce harmful effects. Coordination among fuel specialists, ecologists, silviculturists and forest health specialists is important.

Computerized hazard- and risk-rating models are available for several forest insect and disease pests. These models are linked to forest stand development models, such as the *Forest Vegetation Simulator* and should be used whenever possible to help increase reliability when assessing the spread of insect or disease epidemics. Such assessments should be made by forest health specialists who have professional knowledge of the behavior of insect and disease populations, the factors that contribute to the outbreak, development, and spread of epidemics, and the potential effects of epidemics on ecosystem components.

Forest health specialists should provide expert advice to resource managers on the actions that are available to reduce threats to ecosystem components or forest and rangeland resources.

Effective management strategies for direct and indirect control of insect or disease outbreaks include prevention, suppression, and restoration. Prevention strategies are designed to change the conditions that render forests susceptible to epidemics. Suppression strategies are designed to suppress or control existing populations of insects and pathogens. Restoration strategies reestablish an ecosystem's ecological integrity so that the ecosystem's components are functioning and capable of self-renewal.

Documentation

The analysis and documentation for threats from insects and disease under Section 102(a)(4) of the HFRA are intended to be integrated with the analysis and documentation done under current NEPA guidance and other relevant guidance. This documentation should be included in the NEPA documents normally prepared during project planning, the Decision Records or Records of Decision prepared before project implementation, or in the project file itself.

Insect or disease risk-reduction projects carried out under the HFRA should document the factors considered and the methods used in making determinations. Where possible, the hazards and risks supporting any determination that a "significant threat" exists should be quantified. The short- and long-term effects of proposed treatments and the effects of taking no action should be described as provided for in the *Judicial Review* section.

Threatened and Endangered Species

Section 102(a)(5) of the HFRA authorizes projects that will enhance protection from catastrophic wildland fire for threatened and endangered species or their habitats and that maintain and

restore such habitats. Projects are authorized on NFS and BLM lands containing threatened and endangered species habitat where:

A—Natural fire regimes are identified as being important for, or wildland fire is identified as a threat to, a threatened or endangered species, or the habitat of a threatened or endangered species, in a:

- Species recovery plan prepared under Section 4 of the ESA (16 U.S.C. 1533), or a
- Notice published in the Federal Register determining a species to be endangered or threatened, or designating critical habitat.

AND

B—The authorized hazardous-fuel reduction project will provide enhanced protection from catastrophic wildland fire for the endangered species, threatened species, or the habitat of the threatened or endangered species

AND

C—The Secretary complies with any applicable guidelines specified in any management or recovery plan described in A.

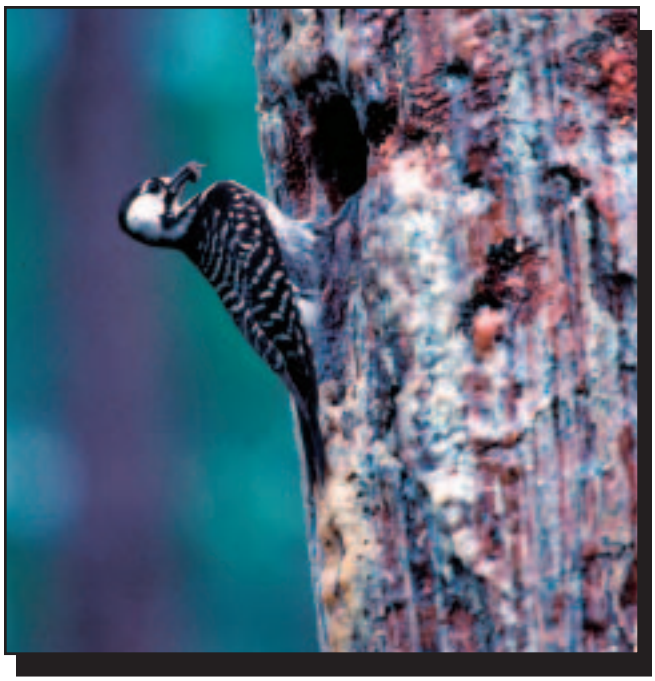


Figure 11—The red-cockaded woodpecker is an example of an endangered species that depends on frequent fires to maintain its habitat.

Determining the Threat of Fire and the Need for Enhanced Protection

Many threatened and endangered species require fire to maintain their habitat. Disturbances, such as fire, provide the ecological basis for conservation management in many forest ecosystems. The endangered red-cockaded woodpecker (figure 11) and Kirtland's warbler are two examples. Projects that return fire to the ecosystem in a manner that improves or maintains habitat effectiveness should be considered important for such species. If such projects also provide enhanced protection from catastrophic wildland fire for threatened and endangered species or their habitat, they may be authorized under the HFRA.

Some threatened and endangered species can be adversely affected by wildland fire. Whether a potential wildland fire may pose a risk to a species, and the degree of risk, depend on many factors, including the likelihood that a fire may occur; the fire's size, intensity, and severity; fire frequency; the time of year of the fire; the availability of needed replacement habitat; and the species' habitat requirements. These factors should be considered when determining the threat of wildland fire to species and habitats (figure 12). Fire regime condition class assessments also should be considered when determining whether a treatment or series of treatments would reduce the likelihood of an uncharacteristically severe wildland fire and benefit the species overall.

Figure 12—Rangeland resources often occur within a wildland-urban interface. Rangeland treatment can help reduce fuel and improve habitat management for species such as the sage grouse, which has been petitioned for listing under the ESA.

Threatened and endangered species recovery plans, final listing rules, the Fire Effects Information System, the NatureServe Explorer, USDA Forest Service and DOI BLM resource management plans, and the scientific literature are important sources of information when determining whether hazardous-fuel treatment will benefit threatened and endangered species or their habitat (see *References*). The expected effects of wildland fire on species limiting factors and the threats to a species are key considerations.

Many threatened and endangered species have approved recovery plans that identify specific tasks needed to recover species and ecosystems and the significance of fire (natural and prescribed) to the species. All final rules to list species under the ESA identify the factors that contributed to a need to list the species. These rules may include information on fire's ecological importance for the species.

The potential beneficial and adverse effects to the species, over the short and long term, need to be identified when determining whether a project will produce a net positive benefit. Resource managers should refer to the 2002 HFI *Net Benefits Guidance* (see *References*) issued by the USFWS and NOAA Fisheries for a more thorough discussion.

Coordination among fuel and fire specialists, ecologists, biologists, and researchers—internal and external—is especially important. The design and evaluation of fuel treatments at project and landscape scales should be appropriate for the geographic ranges of any relevant threatened and endangered species.

Projects based on Section 102(a)(5) of the HFRA must comply with guidelines in approved threatened and endangered species recovery plans or final listing rules and with the management requirements they include. If such rules or plans do not identify the need to reduce the risk of wildland fire, resource managers should weigh the positive and adverse effects that fuel-reduction activities would have on the species, using the best available information (see *References*).

Documentation

The analysis and documentation for projects under Section 102(a)(4) of the HFRA are intended to be integrated with the analysis and documentation done under current NEPA guidance and other relevant guidance. This documentation should be included in the NEPA documents normally prepared during project planning, the Decision Records or Records of Decision prepared before project implementation, or in the project file itself.

All projects implemented under this section of the HFRA should include documentation in the administrative record on the factors that were analyzed and the assumptions that were made when determining the net benefit to threatened and endangered species as provided for in the *Judicial Review* section.

Old-Growth and Large-Tree Retention

The old-growth and large-tree retention provisions of the HFRA only apply to "covered" projects. Covered projects, as defined in Section 102(e)(1)(B), include all projects authorized under the HFRA on NFS and BLM lands, except those carried out under Section 102(a)(4).

Old Growth

Section 102(e)(2) provides that the USDA Forest Service and DOI BLM, when carrying out covered projects using HFRA authority, are to "fully maintain, or contribute toward the restoration of, the structure and composition of old-growth stands according to the pre-fire suppression old-growth conditions characteristic of the forest type, taking into account the contribution of the stand to landscape fire adaptation and watershed health, and retaining the large trees contributing to old-growth structure."

Section 102(e)(3) provides that old-growth direction in resource management plans established on or after December 15, 1993, (so-called "newer plan direction") is sufficient to meet the requirements of Section 102(e)(2) and will be used by agencies carrying out projects under the HFRA. December 15, 1993, refers to the date old-growth direction was adopted into the plan, which may have been after the date the current plan was originally adopted (if the plan was amended to include updated old-growth direction). For example, old-growth direction would not need to be revised in plans encompassed by the *Northwest Forest Plan Record of Decision,* because these plans contain old-growth standards adopted after December 15, 1993.

Any amendments or revisions to management direction for old growth made after December 3, 2003, must be consistent with Section 102(e)(2) for the purpose of carrying out "covered" projects in old-growth stands.

Resource management plan direction governing old-growth resources can take a variety of forms. For example, plans may refer to old growth or may use related terms that refer to late-successional forest conditions. In addition to the term *old growth*, plans may use terms such as *ecological old growth*, *old forests*, *late-successional forests* or *reserves*, *late-successional habitat* or *vegetation*, *climax forest* or *vegetation*, *overmature forests*, or a *mature* and *overmature timber inventory stratum* or *habitat*

class. For the purposes of implementing the HFRA, the use of terms that are equivalent to *old growth,* such as those above, should be considered to be the same as *old growth* as used in the HFRA. In this *Field Guide*, the term *old growth* is intended to refer to the various terms that are equivalent to *old growth* in resource management plans.

The direction for old-growth stands contained in newer resource management plans (those issued after December 15, 1993) should guide the development of projects carried out under the HFRA within these stands. When the resource management plan is revised or amended, the direction for old-growth stands in the parent plan should be reviewed with regard to covered projects if resource managers want to continue using HFRA authorities.

To comply with Section 102(e), field units must have a process in place to identify old-growth stands or their equivalent before they use HFRA authorities. The HFRA does not mandate particular definitions of old growth or the specific process to identify old-growth stands, nor does the HFRA require that old-growth stands be mapped.

The HFRA does not require revisions or amendments to resource management plans, nor does the HFRA require a review of management direction for old-growth stands adopted before December 15, 1993, unless a unit elects to use HFRA authority. However, if units are amending or revising their resource management plans, or contemplate doing so, they should consider the benefits of being able to use the HFRA authority.

Under Section 102(e)(4), for plans containing old-growth management direction adopted before December 15, 1993, resource managers expecting to use HFRA authorities have up to 2 years or, if the plan was in the revision process as of December 3, 2003, up to 3 years, to review existing management direction for old growth. Existing old-growth management direction in the plan applies during the review period. When reviewing the older management direction, the unit should:

- Take into account any relevant scientific information that has become available since adoption of the older management direction.

- Determine whether the older management direction provides for maintaining and restoring old-growth stands to a pre-fire suppression condition, as provided by Section 102(e)(2).

Based on this review, the agencies will determine whether additional plan direction is needed for covered projects within old-growth stands.

If a review of older management direction is not completed within the 2- or 3-year timeframes described above, forest stands must be dropped from any HFRA project proposal if someone provides “substantial supporting evidence” during scoping that the stands are old-growth stands (Section 102(e)(4)(C)). Managers may examine whether these areas can be treated using standard legal authorities, rather than those provided in the HFRA.

Substantial supporting evidence may include maps or records identifying old-growth stands, accompanied by plot data showing that the stands meet old-growth stand attributes or criteria established by the applicable resource management plan.

The *References* section contains USDA Forest Service ecological old-growth definitions that may be a useful starting point for reviewing management direction in older plans (those adopted before December 15, 2003). These definitions were not necessarily developed for determining the “pre-fire suppression old-growth condition” as directed by the HFRA. Resource managers should evaluate these definitions closely to determine whether they need to be modified for identifying, maintaining, and restoring old-growth stands under the HFRA.

In making this evaluation, resource managers should consider the appropriate reference condition for old growth. While the HFRA refers to a “pre-fire suppression old-growth condition,” fire behavior patterns had been modified substantially in many areas 50 years or more before the era of active fire suppression. Such changes in fire behavior commonly were associated with the elimination of burning by native peoples and a dramatic increase in livestock numbers, which modified grasses and other fine fuels. In selected forest types where such changes occurred, it may be desirable to establish reference conditions that existed before the era of active fire suppression. The HFRA does not prohibit this. The *References* section provides examples of regional planning direction and assessment-level old-growth information that may be useful when evaluating resource management plan direction to maintain and restore old-growth stands to a pre-fire suppression condition.

Various approaches to amending old-growth direction in resource management plans are possible (if such amendments are deemed necessary). These include:

- Amendments for each resource management plan

- Project-specific amendments

- Development of multiforest old-growth management guidelines based on specific forest types, followed by resource management plan amendments to meet those new guidelines

In situations where the plan does not contain old-growth management direction, if resource managers want to carry out a hazardous-fuel-reduction project (figure 13) under the HFRA, the large-tree retention requirements in Section 102(f) should be used until the plan is amended to incorporate direction in conformity with Section 102(e)(2). In these situations, if plans are not amended or revised to include old-growth management direction consistent with Section 102(e)(2) within 2 years of the HFRA's enactment, or within 3 years if the plan was being revised at the time of the HFRA's enactment (December 3, 2003), forest stands must be dropped from a HFRA project proposal if someone provides "substantial supporting evidence" during scoping that these stands are old growth.

Research studies, such as the study by Kauffman and others in dry ponderosa pine and Douglas-fir landscapes in the southern Rocky Mountains (2003, see *References, Old-Growth and Large-Tree Retention, Project-Level Guidance*), may provide useful insights when developing treatment strategies for maintaining or restoring old growth to pre-fire suppression conditions. Tools, such as the *Vegetation Dynamics Development Tool* and the *Forest Vegetation Simulator*, coupled with the *Fire and Fuels Extension* (see *References, Old-Growth and Large-Tree Retention, Project-Level Guidance*), may also be useful when modeling prescriptions to restore or maintain pre-fire suppression old-growth conditions in particular forest types. Regional or State offices can help units accomplish these aims by hosting workshops or providing guidance for the major forest types within their region or State.

Large-Tree Retention

Section 102(f) governs vegetation treatments in covered projects outside of old growth, and where the resource management plan does not contain old-growth management direction. The section requires such treatments to be carried out in a manner that:

- Will "modify fire behavior, as measured by the projected reduction of uncharacteristically severe wildland fire effects for the forest type (such as adverse soil impacts, tree mortality, or other impacts)." In achieving this objective, vegetation treatments are to focus "largely" on small-diameter trees, thinning, strategic fuel breaks, and prescribed fire (figures 14 and 15).

Figure 13—Hazardous-fuel treatments authorized by the HFRA in old-growth stands are intended to retain the "large trees contributing to old-growth structure." This old-growth ponderosa pine stand in the Lassen National Forest (California) was thinned, leaving large trees. Some of the trees that were removed were large enough to cut for lumber at a sawmill. Smaller trees were chipped and used as fuel to produce electricity.

Figure 14—After decades of wildland fire exclusion, some ecosystems, such as this ponderosa pine forest in southern Oregon, have become overgrown and unhealthy, leaving them unsuitable for wildlife and hazardous to communities nearby.

Figure 15—Ecosystem health has been restored and the risk of high-intensity wildland fire has been reduced after mechanical treatments, followed by low-intensity burning, in the ponderosa pine forest shown above.

- Maximize "the retention of large trees, as appropriate for the forest type, to the extent that the large trees promote fire-resilient stands."

The HFRA also states that the large-tree retention requirements of Section 102(f) must not prevent agencies from reducing wildland fire risk to communities, municipal water supplies, and at-risk Federal land.

In areas where large-tree retention requirements apply, resource managers should design projects that retain large trees to the extent possible, while they also:

- Are appropriate for the forest type
- Will reduce uncharacteristically severe wildland fire effects within the treated area
- Will meet the objective of reducing wildland fire risk to communities, municipal water supplies, and at-risk Federal land

Specific vegetation treatment methods to be applied within these areas should be guided by the key objectives described above.

Silviculture prescriptions should be designed for forest vegetation treatments that integrate fuel and other resource objectives to meet the resource management plan direction. The silviculture prescription should prescribe for retention of large, fire-resilient trees (generally intolerant tree species adapted to fire processes) and retain large trees to the degree this practice is consistent with the objective of maintaining or restoring fire-resilient stands. However, large trees of selected species that are not adapted to fire processes may need to be removed to promote greater fire resiliency. Similarly, the removal of small- to mid-sized trees will generally be needed to reduce fuel ladders within the treatment area, curtailing uncharacteristically severe wildland fire effects and enabling use of prescribed fire. Trees in a variety of size classes may need to be removed in these areas to reduce wildland fire risk to communities, municipal water supplies, and at-risk Federal land. These practices are allowed under the HFRA.

In determining characteristic large-tree sizes appropriate for the forest type, resource managers may explore using the ecological definition of old growth developed for the forest type as one means of identifying diameter ranges for the tree species covered by the definition. USDA Forest Service ecological definitions for forest types are listed in the *References* section.

Resource managers should consider using growth models and other simulation tools when developing treatment strategies for areas where large-tree retention provisions apply. Models, such as the *Forest Vegetation Simulator* coupled with the *Fire and Fuels Extension* (see *References, Old-Growth and Large-Tree Retention, Project-Level Guidance),* allow treatment scenarios to be analyzed through time to determine their effects on fire behavior at the stand level and to help predict fire effects. Through using this kind of model, practitioners can determine the optimal treatment or set of treatments within a particular forest type that will help achieve the objective of retaining large trees, to the extent that is consistent with the objective of promoting fire-resilient stands.

Administrative Review

The DOI BLM administrative review process was not modified by the HFRA.

Section 105(a) of the HFRA replaces the USDA Forest Service's administrative appeals process with an objection process that occurs before the decision approving authorized fuel-reduction projects under the act. The Secretary of Agriculture has established interim final regulations for a predecisional administrative review process for authorized hazardous-fuel reduction projects on NFS lands. The interim final rules were published January 9, 2004 (69 FR 1529, *http://www.regulations.gov/fredpdfs/04-00473.pdf*).

Only authorized hazardous-fuel reduction projects, as defined by the HFRA (Section 101(2)), on NFS lands that have been analyzed in an EA or EIS are subject to these special procedures.

Participation in the predecisional review process is limited to individuals and organizations who have submitted specific written comments related to the proposed authorized hazardous-fuel-reduction project during the opportunity for public comment provided when an EA or EIS is being prepared for the project (Section 105(a)(3), 36 CFR 218.6).

Written objections, including any attachments, must be filed with the reviewing officer within 30 days after the publication date of the legal notice of the EA or final EIS in the newspaper of record (Section 218.4(b)). It is the responsibility of objectors to ensure that their objection is received in a timely manner.

Before the issuance of the reviewing officer's written response, either the reviewing officer or the objector may request to meet to discuss issues raised in the objection and their potential resolution. The reviewing officer has the discretion to determine whether or not adequate time remains in the review period to make a meeting with the objector practical. All meetings are open to the public.

The reviewing officer will issue a written response, but is not required to provide a point-by-point review, and may include instructions to the responsible official, if necessary. In cases

involving more than one objection to a proposed authorized hazardous-fuel-reduction project, the reviewing officer may consolidate objections and issue one or more responses.

The responsible official may not issue a record of decision or decision notice concerning an authorized hazardous-fuel-reduction project until the reviewing officer has responded to all pending objections.

Judicial Review

Persons may bring a civil action challenging an authorized hazardous-fuel-reduction project in a Federal District Court only if they raised the issue during the administrative review process and they have exhausted the administrative review process established by the Secretary of Agriculture or the Secretary of the Interior.

Section 106 of the HFRA establishes direction governing judicial review of lawsuits challenging hazardous-fuel-reduction projects authorized under the act. The section:

- Requires lawsuits to be filed in the U.S. District Court where the project is located (Section 106(a)).
- Encourages expeditious judicial review of authorized fuel-treatment projects (Section 106(b)).
- Limits preliminary injunctions and stays to 60 days, subject to renewal. At each renewal, parties to the action shall provide the court with updated information on the project (Sections 106(c)(1) and (2)).
- Directs courts to balance the impact of the short- and long-term effects of undertaking or not undertaking the project when weighing the equities of any request for an injunction of an authorized hazardous-fuel-reduction project (Section 106(c)(3)).

Documentation

The agencies' analyses and documentation of the short- and long-term effects of action or taking no action (figures 16 and 17) will be important to the court's evaluation of any request for injunctive relief.

Although a no-action alternative does not always have to be considered for HFRA-authorized projects, it is important that the specialists' report retained in the project files document the anticipated short- and long-term effects of proposed HFRA treatments.

The analysis and documentation for the short- and long-term effects of action or taking no action are intended to be integrated with the analysis and documentation done under current NEPA guidance and other relevant guidance.

Documentation from the long list that follows would include only information directly relevant to evaluating the short- and long-term effects of implementing or not implementing the proposed project:

Fuel Conditions and Fire Behavior

- Describe the area based on the type of fire and fire behavior expected in foreseeable fire scenarios.
- Address the short- and long-term effects of proposed treatments and of taking no action.
- Describe the desired condition from a fire-behavior perspective. What target fuel conditions will provide a change in unwanted fire behavior to meet the description of purpose and need in the EA or EIS? Include a description of the results of taking no action. What is likely to happen if the fuel conditions are not treated?
- Provide maps of recent fires and photos of present conditions. Describe in words, computer simulations, photographs, or some combination of the three, what the area will look like with and without treatment.
- Gather and document pertinent scientific information.

Threatened and Endangered Species

- Document the presence of threatened or endangered species, or of any threatened or endangered species that potentially could be affected, either by wildland fires (with or without fuel reduction) or by the fuel-reduction action itself.
- Document the importance of fire (wildland or prescribed) to any threatened or endangered species or to the ecosystem on which they depend.
- Document the risk of future wildland fires, including fires of different intensity.
- For any threatened or endangered species involved:
  - —Document the threats or benefits that are possible or likely from future wildland fires if hazardous fuel is not reduced.

Figure 16—The Bucktail fire burned through this treated stand on the Uncompahgre National Forest in western Colorado. Burning within the stand was low intensity and patchy, despite the dead trees and branches on the forest floor.

Figure 17—This stand (adjacent to the stand shown in figure 16) burned much more intensely the same day. Because this stand had not been treated, environmental damage was significantly greater.

—Document which habitat components would be improved by hazardous-fuel reduction, even if wildland fires never occur.

—Document which habitat components would be protected from the adverse effects of future wildland fires by hazardous-fuel reduction.

—Document which habitat components would be improved by wildland fires because hazardous-fuel reduction will change the fire regime or condition.

- For the above evaluations, document both the short- and long-term (or any other relevant timeframe) situations regarding such risks, threats, benefits, components, and effects.

Insects and Disease

- Describe the hazard- or risk-assessment procedures used (such as published risk assessments, local guidelines, or field visits by consulting entomologists or pathologists).
- Describe procedures used (such as field survey, inventory data, or aerial photo interpretation) to establish vegetative conditions when assessing the hazard or risk (see *Glossary*) associated with insects and diseases within the stand or landscape.
- Include maps of recent or current disturbances, such as insect or disease activity, wind throw, ice damage, and so forth, including estimates of the disturbances' effects.
- Provide treatment alternatives with supporting literature describing how they address the description of purpose and need in the EA or EIS.
- Address the short- and long-term effects of proposed treatments and of taking no action.
- Discuss treatment methods that are not appropriate—for example, the limited scope of the proposed treatment may not effectively address the disturbance.
- Document any consultation with entomologists or pathologists.

Municipal Watersheds and Water Supplies

- Describe the expected effects of the worst-case fire scenario on water supply, water quality, contaminants, and water supply facilities, including the immediate and long-term effects on watershed functions and human uses.
- Provide a similar analysis of the expected effects if no fuel-reduction measures are implemented within the municipal watershed or close to the water system infrastructure, over the short and long terms.
- Evaluate the list of factors included in the *At-Risk Municipal Watersheds* section of this *Field Guide* to inform the decision-maker of the short- and long-term consequences of taking no action and of implementing the proposed fuel-reduction projects.
- Include copies (or references to them) in the files of available published and unpublished reports, data, and any other information about the municipal watershed and the community water supply system. Maps or descriptions of the water intake locations, pipelines, and treatment facilities are considered to be sensitive data and must be kept in locked, secure cabinets or computers, or as otherwise required by the U.S. Environmental Protection Agency and the U.S. Department of Homeland Security.

General information on the scientific basis for modifying wildland fire behavior and severity by changing forest structure can be found in the Rocky Mountain Research Station's report RMRS–GTR–120 (see *References*).

Setting Priorities and Collaborating

The HFRA provides expedited NEPA procedures for authorized fuel-reduction projects on NFS and BLM lands in the WUIs of at-risk communities. Under HFRA Section 101(1), an at-risk community is one that:

- Is an interface community as defined in the Federal Register notice of January 4, 2001 (66 FR 753), or a group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) in or adjacent to Federal land
- Has conditions conducive to a large-scale wildland fire

- Faces a significant threat to human life or property as a result of a wildland fire

The HFRA is intended to build on work carrying out fuel treatments in and around communities under the *National Fire Plan* (*http://www.fireplan.gov*) and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan* (May 2002, *http://www.fireplan.gov/reports/11-23-en.pdf*).

The HFRA encourages the development of Community Wildfire Protection Plans (figure 18). Section 101(3) describes a Community Wildlfire Protection Plan as one that:

- Is developed in the context of the collaborative agreements and guidance established by the Wildland Fire Leadership Council and agreed to by the local government, local fire department, and State agency responsible for forest management, in consultation with interested parties and the Federal land-management agencies that manage land in the vicinity of an at-risk community.

- Identifies and sets priorities for areas needing hazardous-fuel-reduction treatments and recommends the types and methods of treatment on Federal and non-Federal lands that will protect one or more at-risk communities and their essential infrastructure.

- Recommends measures to reduce the chance that a fire will ignite structures (figure 19) throughout an at-risk community.

For at-risk communities that have not yet designated their WUIs as part of a Community Wildfire Protection Plan, the HFRA has a default definition of WUI (Section 101(16)(B (ii)). It is an area:

- Extending ½ mile from the boundary of an at-risk community.
  OR

- Extending 1½ miles from the boundary when other criteria are met—for example, a sustained steep slope, a geographic feature that could help when creating an effective firebreak, or Condition Class 3 land.
  OR

Figure 18—Effective collaboration at the community level is a cornerstone of all HFRA activities. This meeting took place at the Croatan National Forest in North Carolina.

Figure 19—One of the keys to effective fire management is treating fuels adjacent to structures and on private and Federal land throughout the wildland-urban interface.

- Adjacent to an evacuation route. There is no distance limitation for evacuation routes.

The HFRA directs the USDA Forest Service and DOI BLM, in accordance with *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan* (May 2002), to "develop an annual program of work for Federal land that gives priority to authorized hazardous fuel reduction projects that provide for protecting at-risk communities or watersheds or that implement Community Wildfire Protection Plans" (Section 103(a)). The USDA Forest Service and DOI BLM will consider recommendations made in such plans (Section 103(b)(1)).

Additionally, Section 103(d)(2) requires that when providing financial assistance for authorized hazardous-fuel-reduction projects on non-Federal land, Federal agencies will consider recommendations made by at-risk communities that have developed Community Wildland Fire Protection Plans and give priority in allocating funding to communities that have adopted such plans or that have taken measures to encourage willing property owners to reduce fire risk on private property.

Federal involvement in planning and developing Community Wildfire Protection Plans under Section 103(b) is exempt from the Federal Advisory Committee Act and NEPA. Except as otherwise provided in Section 104 of the HFRA, NEPA requirements continue to apply when Federal actions are implemented in the WUI and elsewhere.

Identifying At-Risk Communities

Communities may identify themselves as *at risk* based on an analysis following the *National Association of State Foresters Field Guidance on Identifying and Prioritizing Communities At Risk* (June 27, 2003), or during development of their Community Wildfire Protection Plans. The State Foresters' guide and the Federal Register notice with the current list of at-risk communities are available at: *http://www.fireplan.gov/reports.*

As communities identify themselves as *at risk* and approach Federal agencies to work collaboratively, joint development of plans and projects will ensure that investments in hazardous-fuel reduction are the most economical and effective ways to reduce risk (see the *Interagency Memorandum of Understanding for Fuel Treatment Collaboration* at: *http://www.fireplan.gov/*).

Developing Community Wildfire Protection Plans

Communities may, at their option, develop Community Wildfire Protection Plans. The HFRA encourages the development of Community Wildfire Protection Plans and outlines their contents (see above). A Community Wildfire Protection Plan identifying WUIs need not be limited to the default definitions. It is under such plans that at-risk communities will recommend the WUIs within which HFRA-authorized projects may take place on NFS and BLM land. For at-risk communities that have not yet designated their WUIs as part of Community Wildfire Protection

Plans, the default definition of WUI (described above) establishes the maximum distance a WUI can extend from the boundary of an at-risk community (figure 20).

Under Section 103(d)(1)(C) projects that are already well into the NEPA planning process can use existing definitions of WUI for up to 1 year from the date of the act's passage (the project's decision notice must be issued by December 3, 2004).

Federal agencies should be partners in the preparation of Community Wildfire Protection Plans to the extent that a community desires, within budgetary constraints. In the WUI, these plans will provide a seamless guide for fuel reduction across ownerships, identifying those treatments to be completed by public agencies and those to be completed by private landowners. Implementing a Community Wildfire Protection Plan will fulfill the requirements for a collaboration in the *Implementation Plan*.

On February 27, 2003, the DOI BLM directed field offices to work with communities to complete Community Assessment and Mitigation Plans (OFA IM-2003-020). These plans are intended to meet the same requirements as the HFRA Community Wildfire Protection Plans. Communities meeting the DOI BLM guidance should not have to revise their plans unless the plans are missing a component of the HFRA requirements. To avoid any confusion in maintaining two names for plans that are intended to serve the same purpose, DOI BLM field offices should recommend that communities refer to their assessment and mitigation plans as Community Wildfire Protection Plans.

The National Association of State Foresters is working with the Western Governors Association, the National Association of Counties, and the Society of American Foresters to develop a user-friendly guide to help communities get started in developing, or finalizing, their Community Wildfire Protection Plans (see *http://www.fireplan.gov/content/reports*. Regional, State, local, Tribal, or area administrators, or other Federal officials, Tribal leaders, and governors will collaborate on setting priorities and coordinating planning across jurisdictions to facili-tate accomplishments at the local level. Ongoing communication should facilitate the exchange of technical information for fully informed decisions.

Figure 20—This complex wildland-urban interface illustrates the need for a Community Wildfire Protection Plan. Protecting such homes scattered throughout the forest can be a serious challenge for wildland firefighters.

Setting Priorities Collaboratively

At the local level, successful implementation of fuel treatments must include decisionmakers collaborating with Federal, State, and local governments, Tribes, community-based groups, landowners, and other interested persons. Collaboration will be used to establish priorities, cooperate on activities, and increase public awareness and participation to reduce the risks to communities and surrounding lands. While land-management agencies make the decisions on matters affecting public lands, these collaborative efforts will produce programs that can be supported broadly and implemented successfully.

Direction for collaborating and setting annual fuel-treatment funding priorities for projects on Federal land is documented in a memorandum from the Chief of the USDA Forest Service and the Assistant Secretary for Policy, Management, and Budget, DOI (fuel collaboration letter, *http://www.fireplan.gov/*).

The *Development of a Collaborative Fuels Treatment Program* memorandum of understanding signed in January 2003 provides a general framework of collaboration for hazardous-fuel treatments (*http://www.fireplan.gov/content/reports*). The memorandum provides that, working in partnership, the Federal agencies, State and local governments, and Tribes will ensure that projects are strategically located and implemented across the landscape and ownerships. Five Federal agencies (the DOI BLM, USDA FS, BIA, NPS, and USFWS), the National Association of State Foresters, the National Association of Counties, and the Intertribal Timber Council signed this memorandum.

Providing Financial Assistance for Projects on Non-Federal Lands

Federal financial assistance for hazardous-fuel-reduction projects on non-Federal lands is available through State foresters. Other cooperative assistance programs that provide funds for addressing hazardous-fuel conditions on non-Federal land include *State Fire Assistance*, a USDA Forest Service program, and *Community Assistance*, a wildland-urban interface DOI BLM program.

New Mexico has established the *Collaborative Forest Restoration Program* based on the Community Forest Restoration Act of 2000 (Title VI, P.L. 106-393). This program provides grants for collaborative forest-restoration and small-diameter tree utilization projects on Federal, State, Tribal, county, and municipal lands. In 2005, the USDA Forest Service will report to Congress on how well the program has met its objectives and on the potential that such programs could be expanded to other States in the Intermountain West (figures 21 and 22).

Under the authority of the Wyden Amendment, managers of Federal lands may spend funds to conduct treatments on adjacent non-Federal lands to treat private lands where treatments are designed to improve the viability of, and otherwise benefit, fish, wildlife, and other biotic resources. Some USDA Forest Service appropriations are available for managers to assist their non-Federal neighbors with hazardous-fuel treatments if projects proposed on USDA Forest Service lands pose a threat to the neighbors. Federal resource managers may also spend National Fire Plan funds on non-Federal land projects under certain circumstances. Direction for the use of Federal funds is subject to annual change in appropriations law.

In all cases where Federal funds are proposed for use on non-Federal lands, resource managers must work closely with their grants and agreements specialists. Appropriate options and procedures may vary by region, State, forest, or field office.

Grants and agreements specialists will provide advice regarding the most appropriate authority and legal instrument for implementing such projects or transferring funds and will help ensure that all applicable requirements are met. In addition, resource managers must work closely with their agency NEPA, ESA, and National Historic Preservation Act coordinators to ensure that the appropriate procedures and consultation requirements of these acts are met, specifically those regarding the use of Federal funds on non-Federal lands.

The Secure Rural Schools and Community Self-Determination Act

Commonly called *Payments to States*, the Secure Rural Schools and Community Self-Determination Act (P.L. 106-393) can provide resources for collaboration and community planning, as well as funds for fuel-reduction and ecosystem-restoration projects.

The act is intended to stabilize payments that help counties support roads and schools, provide projects that enhance forest ecosystem health, provide employment, and improve cooperative relationships among Federal land-management agencies and those who use and care about Federal lands.

In Title II of the Secure Rural Schools Act, counties have the option to set aside funds to be used for ecological restoration projects on Federal lands. The communities are represented by a resource advisory committee that recommends projects and funding levels to the local Federal land-management agency. Counties can set aside funds under Title III of the act for other activities, including community forestry projects on non-Federal land and community fire planning and education.

More information on *Payments to States* can be found at: *http://wwwnotes.fs.fed.us:81/r4/payments_to_states.nsf.*

Figure 21—The Rio Grande bosque in New Mexico had high fuel loadings before fuel-reduction treatments.

Figure 22—Fuel loading was significantly reduced by a combination of thinning and prescribed-fire treatments in the Rio Grande bosque. Wildland fire is less of a threat when stands are in this condition than when they are in the condition shown in figure 21 (the same stand before treatment).

Monitoring

The HFRA contains provisions requiring that the USDA Forest Service and DOI BLM monitor the results of a representative sample of authorized hazardous-fuel-reduction projects and submit a report every 5 years that includes an evaluation of the progress toward project goals and recommendations for project modifications.

Fire sciences research funded by the National Fire Plan is assessing monitoring schedules and protocols to meet the requirements of the HFRA, as well as those of the National Fire Plan. Recommendations for implementation will be made to the Wildland Fire Leadership Council.

Multiparty Monitoring

Section 102(g)(5) of the HFRA instructs the USDA Forest Service and DOI BLM to establish a collaborative multiparty monitoring, evaluation, and accountability process when significant interest is expressed in such an approach. The process will be used to assess the positive or negative ecological and social effects of authorized fuel-reduction projects, as well as those undertaken under Section 404 (applied silvicultural assessments) of the HFRA.

Diverse stakeholders, including interested citizens and Tribes, should be included in the monitoring and evaluation process. The requirement for multiparty monitoring is not directly connected to the requirements for monitoring a representative sample of projects, but shall be used where "significant interest is expressed," in the judgment of the field unit involved. The USDA Forest Service and DOI BLM both have experience with multiparty monitoring, which can be an effective way to build trust and collaborate with local communities and diverse stakeholders, including interested citizens and Tribes. Multiparty monitoring will be subject to available funding and the ability of stakeholders to contribute funds or in-kind services.

An excellent publication on protocols and guidelines for multiparty monitoring of community-based forest restoration projects is available at the Collaborative Forest Restoration Program Web site: *http://www.fs.fed.us/r3/spf/cfrp/monitoring/.*

Additional information on multiparty monitoring is available online at: *http://www.fs.fed.us/forestmanagement/index.shtml* (click on the *Stewardship Contracting Success Stories* link there) and *http://www.pinchot.org/community.html*.

Monitoring Maintenance of Treated Areas

Section 102(g)(8) of the HFRA requires the USDA Forest Service and DOI BLM to develop a process for monitoring the need to maintain treated areas over time. For example, areas requiring treatment to move from Condition Classes 2 or 3 to Condition Class 1 also will require periodic treatments. Proposed actions and alternative descriptions should include an estimated maintenance treatment schedule and cost. As field units accomplish their projects, they will need to plan for future maintenance and monitor completed projects to ensure that the proposed maintenance treatment schedule is accurate. Maintenance treatments are to be scheduled into the annual program of work. Field units should consider the maintenance workload when assessing their ability to implement fuel treatments (figures 23 and 24).

Reporting Accomplishments

Accomplishments for all projects using HFRA authority must be tracked and reported by fire regime and condition class. The National Fire Plan Operations and Reporting System (NFPORS) is the interdepartmental system for reporting National Fire Plan accomplishments, including those involving hazardous-fuel reduction. The interdepartmental functionality of NFPORS is critical because the HFRA applies to both the DOI BLM and the USDA Forest Service. Data consistency between agencies is important.

The NFPORS database has been updated for reporting HFRA accomplishments. Field units will need to report fire regime and condition class determinations before and after treatments for all projects using the HFRA and HFI authorities, as well as for those funded by the National Fire Plan. Field units reporting accomplishments using the HFRA and HFI authorities will follow their agency's NFPORS reporting schedules and data-quality standards.

Procedures for determining fire regime and condition class at the project scale can be found at: *http://www.frcc.gov/.* Information on NFPORS can be found at: *http://www.fireplan.gov/.*

Tracking Acres Burned

Section 102(g)(7) of the HFRA requires tracking the acres burned and the degree of severity for large wildland fires (as defined by the Secretary). Details on the reporting requirements for this section are under discussion.

Figure 23—Maintaining stand and fuel conditions is a continuous requirement. This stand in Florida was burned in July 2001.

Figure 24—Vegetation recovery and regrowth 2 years after the photo in figure 23 suggests that this stand will need retreatment soon.

Title II—Biomass

This title provides the authority to obtain information that will help overcome barriers to the production and use of biomass and help communities and businesses create economic opportunity through sustainable use of the Nation's forest resources. Three programs will help achieve those goals.

Research to Improve Biomass Use

In HFRA Section 201, the Biomass Research and Development Act of 2000 was amended to focus research on overcoming barriers hindering the use of biomass. Emphasis areas are:

- Integration of silviculture, harvesting, product processing, and economic factors
- Decision support for production and management alternatives
- Tools for cost and stumpage analysis
- Development of light-on-the-land, cost-effective mechanical treatment systems
- Development of training materials

Funding authorization was increased by $5 million for the new research emphasis.

The Fiscal Year 2004 solicitation for the Biomass and Development Initiative was modified to include competitive funding opportunities for feedstock development, new products, and forest management training, as identified in the HFRA. Other research activities will continue as part of the Biobased Products and Bioenergy program within the USDA and in collaboration with the U.S. Department of Energy, including some of the focus areas under this section. Depending on funding levels, additional research will be accelerated, expanded, or developed to implement the HFRA fully. USDA Forest Service Research and Development has a comprehensive research program that includes forest biomass assessment, management, harvesting and recovery, utilization, processing, and marketing.

Rural Revitalization Through Forestry

Section 202 of the HFRA amended Section 2371 of the Food, Agriculture, Conservation, and Trade Act of 1990 (7 U.S.C. 6601). This section essentially replaces the USDA Forest

Service State and Private Forestry Cooperative National Forest Products Marketing Program eliminated in 1990. The HFRA provides new authority, but in many ways, the policy and budget direction of the USDA Forest Service is in place and similar work is underway through a combination of different authorities. The efforts of State and Private Forestry Forest Product Conservation and Recycling utilization and marketing specialists, including the Technology Marketing Unit of the Forest Products Lab, USDA Forest Service Research and Development employees, and partnership coordinators in the NFS have had varying levels of success in assisting community-based enterprises over the years.

The HFRA provides direction to accelerate assistance to community-based enterprises and encourages the adoption of technologies that use biomass and small-diameter material. Success depends on the participation of State foresters' utilization and marketing specialists, Federal and State economic development assistance agencies, local nonprofit organizations, and businesses involved in collective efforts to build community-based forest enterprises. Some promising areas include:

- New emphasis to work with universities and the USDA Cooperative State Research, Education, and Extension Service
- Formalized procedures to access, select, fund, and monitor pilot or demonstration projects in targeted parts of the country
- Greater emphasis on adding value to small-diameter and underutilized forest material, particularly biomass removed during fuel-reduction and restoration projects

Funding authorization is $5 million for each fiscal year from 2004 through 2008.

Biomass Commercial Utilization Grant Program

Section 203 of the HFRA contains the following language:

> (a) IN GENERAL.—In addition to any other authority of the Secretary of Agriculture to make grants to a person that owns or operates a facility that uses biomass as a raw material to produce electric energy, sensible heat, transportation fuel, or substitutes for petroleum-based products, the Secretary may make grants to a person that owns or operates a facility that uses biomass for wood-based products or other commercial purposes to offset the costs incurred to purchase biomass.
>
> (b) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section $5,000,000 for each of fiscal years 2004 through 2008.

If funds for this program are requested and appropriated, further guidance on implementation will be developed.

Title III—Watershed Forestry Assistance

This title provides assistance to expand forest stewardship capacities and activities through forestry best management practices and other means to address watershed issues on non-Federal forested and potentially forested land (Section 302), including lands under Tribal jurisdiction (Section 303). The title's overall purposes include:

- Improving public understanding of the connection between forest management and watershed health
- Encouraging property owners to maintain tree cover and use tree plantings and vegetative treatments as creative solutions to watershed problems
- Enhancing forest management and riparian buffer use in watersheds, with an emphasis on community watersheds
- Establishing partnerships and collaborative watershed approaches to forest management, stewardship, and conservation

Watershed Forestry Assistance

This program, which is to be administered by the USDA Forest Service and implemented by the State foresters or equivalent State officials, authorizes an appropriation of $15 million each fiscal year from 2004 through 2008. This section directs the USDA Forest Service, in cooperation with participating State foresters, to:

- Engage interested members of the public, including nonprofit organizations and local watershed councils, to develop a program of technical assistance to protect water quality
- Establish a watershed forestry cost-share program that provides for:
  - —Awards to communities, nonprofit groups, and nonindustrial forest landowners for watershed forestry projects
  - —Selection of priority watersheds by State forest stewardship committees or their equivalents to target funding for projects
  - —Creation of State watershed forester positions

Tribal Watershed Forestry Assistance

This program, which is to be administered by the USDA Forest Service and implemented by participating Tribes, authorizes appropriations of $2,500,000 each fiscal year from 2004 through 2008. This section directs the USDA Forest Service, in cooperation with participating Tribes, to:

- Develop a program to provide technical assistance to protect water quality
- Establish a watershed forestry program that provides for:
  - —Annual awards to Tribes for watershed forestry projects
  - —Selection of priority watersheds to target funding for projects
  - —Opportunities to create Tribal watershed forester positions

Developing Program Guidelines

The guidelines for implementing Sections 302 and 303 will highlight the link between healthy forests, healthy watersheds, and clean water; encourage the use of forests and forestry practices in protecting and restoring watersheds; and promote partnerships and collaborative approaches through community-based, watershed-scale planning and management of forested landscapes. The guidelines will provide information on the technical and financial assistance available; outline eligibility requirements for Tribes, landowners, and other entities; and discuss criteria for allocation of funds. Tables 1 and 2 provide timelines for developing the guidelines.

Table 1—The timeline for developing Section 302 guidelines during 2004 (Watershed Forestry Assistance Program).

Month	Task
January	Form a workgroup including representatives of State forestry agencies, the USDA Forest Service, and USDA Cooperative State Research Education and Extension Service.
February to September	Develop and implement a communication plan for public outreach.
March	Publish the *Federal Register* notice of intent to develop guidelines. A 30-day comment period will be provided.
March to September	Develop and refine drafts of the guidelines based on comments from the public, other agencies, and interested stakeholders.
October	Issue the final guidelines and publish the *Federal Register* notice of availability of the guidelines.

Table 2—The timeline for developing Section 303 guidelines during 2004 (Tribal Watershed Forestry Assistance Program).

Month	Task
January	Begin coordination with Tribes and Tribal organizations.
February to March	Request input from Tribes through a *Federal Register* notice and other means on Tribes' preferences for Tribal coordination, their need for technical assistance, and an overall approach for implementing Section 303.
March to September	Form a workgroup of USDA Forest Service and Tribal representatives to develop and refine drafts of the guidelines.
October	Publish the *Federal Register* notice of availability of the guidelines and distribute the final guidelines to the Tribes.

Title IV—Insect Infestations and Related Diseases

This title focuses primarily on developing an accelerated program of basic and applied research, development, and technology transfer to combat infestations by forest-damaging insects and associated diseases. The act notes the need for cooperation with colleges and universities, State agencies, and private landowners to carry out the program. Although healthier forests should be less susceptible to wildland fire, this title emphasizes methods to prevent and suppress infestations of insects and related diseases, utilization options for infested trees, and restoration of forest ecosystems.

In Section 402 of the HFRA, *applied silvicultural assessment* means "any vegetative or other treatment carried out for information gathering and research purposes." *Applied silvicultural assessment* includes timber harvesting, thinning, prescribed burning, pruning, and any combination of those activities. Although applied treatments—including new insect attractants—are not specifically listed, they also will be of interest. Eight specific forest-damaging insects are listed, including: southern pine beetle, mountain pine beetle, spruce bark beetle, gypsy moth, hemlock wooly adelgid, emerald ash borer, red oak borer, and white oak borer. To address other species that might become serious forest pests, the title includes the language "and such other insects as may be identified by the Secretary." The term *Secretary* refers to the USDA and DOI. Both departments are covered by Title IV.

Accelerated Information Gathering

Section 403 of the HFRA establishes an accelerated program to:

- Plan, conduct, and promote comprehensive and systematic information gathering on forest-damaging insects and associated diseases, including an evaluation of several factors:

  —Infestation prevention and suppression methods

  —Effects of infestations and associated disease interactions on forest ecosystems

  —Efforts to restore forest ecosystems

  —Utilization options for infested trees

  —Models to predict the occurrence, distribution, and impact of outbreaks of forest-damaging insects and associated diseases

- Help resource managers develop treatments and strategies to improve forest health and reduce the susceptibility of forest ecosystems to severe infestations of forest-damaging insects and associated diseases on Federal, State, and private land

- Disseminate the results of the information gathering, treatments, and strategies

These activities will be conducted under the auspices of both the Secretary of Agriculture, acting through the USDA Forest Service for NFS land, and the Secretary of the Interior, acting through appropriate offices of the U.S. Geological Survey for Federal land administered by the DOI, in cooperation with colleges; universities; Federal, State, and local agencies; and private and industrial landowners.

Applied Silvicultural Assessments

Section 404 provides for information gathering and research. The language provides for field studies, or *applied silvicultural assessments,* on Federal land that is "at risk of infestation by, or is infested with, forest-damaging insects." Within the USDA Forest Service, the applied silvicultural assessments may be conducted under the category of administrative studies (FSM 1991), research studies (FSM 4072.3), or special pest management projects (FSM 3440; FSH 3409.11, chapter 50). All three options provide the opportunity for collaboration among USDA Forest Service Research and Development, National Forest System, and State and Private Forestry. Within the U.S. Geological Survey, the applied silvicultural assessments occur under the auspices of research studies.

Each applied silvicultural assessment should be covered by a study plan, whether the assessment is a research study, administrative study, or special pest management project. Research personnel should be involved in study plan development, in any case. Table 3 includes the references for further information on the specific types of studies.

Table 3—References for research study plans, administrative studies, and special pest management plans.

Agency	Research study plans	Administrative studies	Special pest-management projects
USDA FS	FSM 4072.3	FSM 1991.05	FSH 3409.11, chapter 50
USGS	Department Manual, part 305, chapter 4		

Each silvicultural assessment authorized under this title must be peer reviewed by "scientific experts," including non-Federal experts. Existing peer review processes may be used. Peer review is not specified under FSM 1991 for administrative studies. However, peer review is required to use HFRA authorities. Table 4 includes references for peer review of study plans for research studies.

Table 4—References for peer review of study plans for research studies.

Agency	Peer review references
USDA FS	FSM 4072.3
USGS	Draft (9/17/03) Department Manual, part 305, chapter 4 (Scientific Review) Peer Review Guidelines: *http://biology.usgs.gov/intranet/science/science.html*

Section 404 carries a requirement for public notice and comment and, "where significant interest is expressed," for multiparty monitoring under Section 102(g)(5) of the HFRA. Persons using this authority must provide public notice of each proposed applied silvicultural assessment. For guidance on public notice and comment within the USDA Forest Service, refer to FSH 1909.15—*Environmental Policy and Procedures Handbook*, chapter 11: *Conduct Scoping*.

This section includes a provision for a categorical exclusion for certain applied silvicultural assessment and research treatments, with a limit of 1,000 acres for an assessment or treatment. This provision is the title's major new authority. The assessment or research treatments may be categorically excluded from documentation in an EIS or EA under NEPA with the provisions that:

- The assessments or research treatments shall not be in an area that is adjacent to another area that is categorically excluded and is being treated with similar methods
- The assessments or research treatments shall be subject to the extraordinary circumstances procedures (40 CFR 1508.4)
- The total number of acres categorically excluded under Section 104(d) shall not exceed 250,000
- No additional findings are required to determine whether an assessment project, either individually or cumulatively, has a significant effect on the environment

Tracking acres under this title will be a joint effort for USDA Forest Service Research and Development and the U.S. Geological Survey.

Title V—Healthy Forests Reserve Program

Title V directs the USDA to establish a *Healthy Forests Reserve Program* to acquire short- and long-term agreements and easements on private land to promote the recovery of endangered species, improve biodiversity, and enhance carbon sequestration. It:

- Directs the Secretary of Agriculture, in consultation with the Secretaries of the Interior and Commerce, to designate rare forest ecosystems that are eligible for the reserve program
- Specifies lands eligible for enrollment and lists eligibility and enrollment requirements for program participants, including enrollment priorities for land with threatened and endangered species
- Allows lands to be enrolled based on a 10-year cost-share agreement, a 30-year easement, or an easement of not more than 99 years
- Specifies a maximum enrollment of 2 million acres
- Requires the Secretary to consider the cost effectiveness of each agreement and its restoration plans to maximize the environmental benefits per dollar expended

Title V does not designate an implementing agency. The USDA is conducting a detailed assessment to determine the capacities that are needed to deliver the *Healthy Forests Reserves Program*. Once the assessment is complete, the USDA will proceed with our ongoing assessment of the agency or agencies that would best be positioned to deliver this program.

Title VI—Miscellaneous

This title establishes a Forest Stands Inventory and Monitoring Program to improve the detection of environmental threats and the responses to them.

Section 601(a) instructs the Secretary of Agriculture to carry out a program to monitor forest stands on NFS lands and private lands (with landowner consent), authorizing $5 million for each fiscal year from 2004 through 2008 to implement the program. Section 601(b) describes the issues to be addressed by this program:

- Early detection, identification, and assessment of environmental threats (including insects, disease, invasive species, fire, weather-related risks, and other episodic events)
- Loss or degradation of forests
- Degradation of the quality of forest stands caused by inadequate forest-regeneration practices
- Quantification of carbon-uptake rates
- Management practices that focus on preventing further forest degradation

As part of the program, Section 601(9)(c) requires the Secretary of Agriculture to develop a comprehensive "early warning system" that will enable resource managers to better:

- Isolate and treat a threat before the threat gets out of control
- Prevent epidemics, such as the American chestnut blight in the first half of the 20th Century, that could be environmentally and economically devastating to forests

Several existing USDA Forest Service programs are already addressing the issues in Section 601(b). These programs will be reviewed to determine the degree to which they meet the requirements of Title VI. Some of these programs are described below.

North American Exotic Forest Pest Information System

Forest insect and disease organisms introduced from other continents (exotic forest pests) pose an increasing threat to the forests of North America. Information on management of these pests often is not available readily to pest management specialists, regulatory officers, research scientists, and the general public. The Exotic Forest Pest Information System for North America (EXFOR) collects hard-to-find information assessing an exotic forest insect or pathogen's risk of establishment and spread and on its management. EXFOR is a scientifically based Internet database including information on more than 100 exotic insect pests and disease pathogens. This information, which enables resource managers to design rapid detection systems for specific exotic organisms, is available at: *http:/ www.fs.fed. us/foresthealth/briefs/EXFOR_database%20.htm*.

Forest Health Protection

The Forest Health Protection (FHP) staff works to protect America's forest and tree resources from damaging outbreaks of forest insects, pathogens, and invasive plants. FHP does this by providing survey and monitoring information, and technical and financial assistance to prevent, suppress, and control outbreaks of forest pests to Federal, State, and private resource managers. FHP also helps to maintain, enhance, and restore healthy forest conditions. FHP works in partnership with the USDA Animal and Plant Health Inspection Service and State agencies to detect and eradicate newly introduced exotic organisms. Information on FHP is available at: *http:// www.fs.fed.us/foresthealth/briefs/What_we_do_8_03.pdf* and *http://www.fs.fed.us/foresthealth.*

Rapid Pest Detection Program

This program is designed to develop the framework for and implement a national interagency detection, monitoring, and response system for nonnative invasive species. Since 2001, the Exotic Pest Rapid Detection Team has coordinated pilot tests for the detection of nonnative bark beetles and nun moths throughout the United States. The team's objective is to develop and test a prototype national survey, identify potential exotic pests and likely pathways of introduction and spread, identify detection and management guidelines, detect and monitor new introductions at selected high-risk sites, develop recommendations to address gaps in detection protocols and taxonomic resources, and use the information collected to set agency protocols and priorities (*http://www. fs.fed.us/foresthealth/briefs/ Rapid_dect_response_prg.htm*).

Pest Suppression

The Pest Suppression Program of the FHP focuses on implementing efficient and effective treatments to reduce the impacts of forest pests. Forest health management specialists evaluate the risk for tree mortality and determine prevention, suppression, maintenance, and restoration treatments based on results of risk evaluations and surveys. Aerial and ground surveys for insects and diseases are conducted in areas of risk. The program also supports the agency initiative and focus items addressing invasive species on Federal and Tribal lands (*http://www.fs.fed.us/foresthealth/forest_health_management.shtml*).

Forest Health Monitoring

Forest Health Monitoring is a National program designed to determine the status, changes, and trends annually in indicators of forest condition. The monitoring program uses data from ground plots and surveys, aerial surveys, and other biotic and abiotic data sources and develops analytical approaches to address forest health issues that affect the sustainability of forest ecosystems. Forest Health Monitoring covers all forested lands through a partnership involving USDA Forest Service, State foresters, and other State and Federal agencies and academic groups. Major activities include:

- Detection Monitoring—Nationally standardized aerial and ground surveys to evaluate status and change in the condition of forest ecosystems
- Evaluation Monitoring—Projects to determine the extent, severity, and causes of undesirable changes in forest health identified through detection monitoring
- Intensive Site Monitoring—To enhance understanding of cause-and-effect relationships
- Research on Monitoring Techniques—To develop or improve indicators, monitoring systems, and analytical techniques
- Analysis and Reporting—Synthesis of information from various data sources to produce reports on status and change in forest health at National, regional, and State levels *(http://www.na.fs.fed.us/spfo/fhm/*).

Forest Inventory and Analysis

Forest Inventory and Analysis is the Nation's forest census. Forest Inventory and Analysis collects, analyzes, and reports information on status and trends, including:

- Forest areas and locations
- Species composition, size distribution, and health of forests
- Growth, mortality, and removals by harvesting
- Wood production and utilization rates, by various products
- Forest land ownership
- Various measures of forest health and sustainability

The program includes information relating to tree crown condition, lichen community composition, soils, ozone indicator plants, vegetative diversity, and coarse woody debris. The program is managed by USDA Forest Service Research and Development in cooperation with State and Private Forestry, the National Forest System, and the National Association of State Foresters. The program covers all public and private forest lands in the United States. The program is implemented in cooperation with a variety of partners, including State forestry agencies and private landowners who grant access to their lands for data collection (*http://fia.fs.fed.us*).

Glossary

At-Risk Community—In Title I of the HFRA, this term means an area comprised of:

- An interface community as defined in the notice *Wildland Urban Interface Communities Within the Vicinity of Federal Lands That Are at High Risk From Wildfire* issued by the Secretary of Agriculture and the Secretary of the Interior in accordance with Title IV of the U.S. Department of the Interior and Related Agencies Appropriations Act, 2001 (114 Stat. 1009) (66 FR 753, January 4, 2001)
  OR

- A group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) within or adjacent to Federal land
  AND

- In which conditions are conducive to a large-scale wildland fire disturbance event
  AND

- For which a significant threat to human life or property exists as a result of a wildland fire disturbance event

Authorized Hazardous-Fuel-Reduction Project—In Title I of the HFRA, this term means projects carried out on the specific types of BLM and NFS lands authorized under HFRA Section 102 using various methods to reduce hazardous fuel, including: prescribed fire, wildland fire use, and various mechanical methods, such as crushing, tractor and hand piling, thinning (to produce commercial or precommercial products), and pruning.

Community Wildfire Protection Plan—In Title I of the HFRA, this term means a plan for an at-risk community that:

- Is developed in the context of the collaborative agreements and the guidance established by the Wildland Fire Leadership Council and agreed to by the applicable local government, local fire department, and State agency responsible for forest management, in consultation with interested parties and the Federal land-management agencies managing land in the vicinity of the at-risk community

- Identifies areas for hazardous-fuel-reduction treatments, sets priorities for treating them, and recommends the types and methods of treatment on Federal and non-Federal land that will protect one or more at-risk communities and their essential infrastructure
  AND

- Recommends measures to reduce structural ignitability throughout the at-risk community

Condition Class 2—This term means the condition class description developed by the USDA Forest Service Rocky Mountain Research Station in the *Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management* (RMRS-GTR-87, *http://www.fs.fed.us/rm/pubs/rmrs_gtr87.html*), dated April 2000 (including any subsequent revisions), under which:

- Fire regimes on the land have been moderately altered from historical ranges.

- A moderate risk exists of losing key ecosystem components from fire.

- Fire frequencies have increased or decreased from historical frequencies by one or more return intervals, resulting in moderate changes to:

  —The size, frequency, intensity, or severity of fires.
  OR

  —Landscape patterns.
  AND

  —Vegetation attributes have been moderately altered from their historical ranges.

Condition Class 3—This term means the condition class description developed by the Rocky Mountain Research Station in RMRS-GTR-87 (see above) under which:

- Fire regimes on land have been significantly altered from historical ranges.

- A high risk exists of losing key ecosystem components from fire.

- Fire frequencies have departed from historical frequencies by multiple return intervals, resulting in dramatic changes to:

  —The size, frequency, intensity, or severity of fires.
  OR

  —Landscape patterns.
  AND

- Values of vegetation attributes have been significantly altered from their historical ranges.

Covered Project—This term means authorized hazardous-fuel reduction projects carried out on land described in Section 102(a) of the HFRA, except projects designed to reduce significant insect and disease threats (Section 102(a)(4)).

Decision Document—In Title I of the HFRA, this term means:

- A decision notice (as that term is used in the USDA *Forest Service Handbook*)
- A decision record (as that term is used in the *Bureau of Land Management Handbook*)
- A record of decision (as that term is used in applicable regulations of the Council on Environmental Quality)

Fire Regime I—This term means an area:

- That historically has had low-severity fires every 0 to 35 years
  AND
- That is located primarily in low-elevation forests of pine, oak, and pinyon-juniper

Fire Regime II—This term means an area:

- That historically has had stand-replacement-severity fires every 0 to 35 years
  AND
- That is located primarily in low- to mid-elevation rangeland, grassland, or shrubland

Fire Regime III—This term means an area:

- That historically has had mixed-severity fires every 35 to 100 years
  AND
- That is located primarily in forests of mixed conifer, dry Douglas-fir, or wet ponderosa pine

Hazard—This term means a set of conditions that make a forest stand vulnerable to significant damage (usually tree mortality) as a result of an insect or disease epidemic. Often, this term is used with an assessment of pest populations (see *Risk*).

Implementation Plan—This term means *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan* (May 2002 and subsequent revisions, *http://www.fireplan.gov/reports/11-23-en.pdf*), developed pursuant to the conference report that accompanied the U.S. Department of the Interior and Related Agencies Appropriations Act, 2001 (House Report 106-64).

Interface Community—As defined in the Federal Register notice of January 4, 2001, an *interface community* is a community where structures directly abut wildland fuels. A clear line of demarcation generally exists between the wildland fuels and residential, business, and public structures. Wildland fuels generally do not extend into the developed area. The development density for an interface community is usually three or more structures per acre, with shared municipal services. Fire protection is generally provided by a local government fire department, which has the responsibility to protect structures from interior fires and from wildland fires. An alternative definition of the interface community emphasizes a population density of 250 or more people per square mile (66 FR 753).

Municipal Watershed—A community water system "that serves at least 15 service connections used by year-round residents of the area served by the system; or regularly serves at least 25 year-round residents" (Safe Drinking Water Act, Section 1401, 42 U.S.C.A. 300f.(15)).

Municipal Water Supply System—This term means the:

- Reservoirs, canals, ditches, flumes, laterals, pipes, pipelines, and other surface facilities
AND

- Systems constructed or installed for the collection, impoundment, storage, transportation, or distribution of drinking water

Old-Growth Management Direction—This term means definitions, designations, standards, guidelines, goals, or objectives established for an old-growth stand under a resource management plan developed in accordance with applicable law.

Resource Management Plan—This term means:

- A land and resource management plan prepared for one or more units of land of the National Forest System described in Section 3(1)(A) under Section 6 of the Forest and Rangeland Renewable Resources Planning Act of 1974 (16 U.S.C. 1604)
  OR

- A land-use plan prepared for one or more units of the public land described in Section 3(1)(B) under Section 202 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1712).

Risk—This term expresses the likelihood that an insect or disease outbreak will cause significant economic or environmental damage to a stand or forest. Often, this term is used with an assessment of hazard (see *Hazard*).

Threatened and Endangered Species Habitat—In Title I of the HFRA, this term means Federal land identified in a:

- Determination that a species is an endangered species or a threatened species under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 et seq.)

- Designation of critical habitat of the species under the ESA
  OR

- Recovery plan prepared for the species under the ESA

Wildland-Urban Interface—In applying Title I of the HFRA, this term means:

- An area within or adjacent to an at-risk community identified in recommendations to the Secretary in a Community Wildfire Protection Plan
  OR

- In the case of any area for which a Community Wildfire Protection Plan is not in effect:

  —An area extending ½ mile from the boundary of an at-risk community

  —An area within 1½ miles of the boundary of an at-risk community, including any land that:

  - Has a sustained steep slope that creates the potential for wildland fire behavior endangering the at-risk community

  - Has a geographic feature that aids in creating an effective firebreak, such as a road or ridgetop
    OR

  - Is in Condition Class 3, as documented by the Secretary in the project-specific environmental analysis
    AND

  —An area that is adjacent to an evacuation route for an at-risk community that the Secretary determines—in cooperation with the at-risk community—requires hazardous-fuel reduction to provide safer evacuation.

When you are not using Title I of the HFRA, use the definition of wildland-urban interface community from the *Federal Register,* January 4, 2001, pages 752 to 753.

References

At-Risk Municipal Watersheds

A number of methods, protocols, or tools can be used to assess risks after a fire has burned in a municipal watershed. Some methods apply to a wider set of conditions or a broader geographical area than others. One method for assessing the risks is described in chapter 4 of *Mapping Wildfire Hazards and Risks* (Sampson, Atkinson, and Lewis 2000, see below). Field personnel should employ methods for which they have reliable data and confidence. Some local applications may provide the best estimates.

The erosion potential after a fire can be estimated by entering information on vegetation, soils, slope length and steepness, and fire severity in the *Disturbed WEPP* model, available online at: *http://forest.moscowfsl.wsu.edu/engr/erodesw.html*

Slope stability can be estimated using the LISA model (assuming that 5 years after a severe fire, root strength and tree surcharge will be 0). This model is available at: *http://forest.moscowfsl.wsu.edu/engr/slopesw.html*

Source Water Assessments, created at the State level, may be an additional source of data and information. About 40 States have completed their assessments (*http://www.epa.gov/safewater/protect/assessment.html*).

Information on abandoned mines on DOI BLM lands is available at: *http://www.blm.gov/aml*

Publications

Dissmeyer, George E., ed. 2000. Drinking water from forests and grasslands: a synthesis of the scientific literature. U.S. Department of Agriculture, Forest Service, Southern Research Station. Gen. Tech. Rep. SRS-39. Chapter 12—Fire Management. Chapter 18—Hardrock Mining. Available online at: *http://www.srs.fs.usda.gov/pubs/viewpub.jsp?index=1866*

Robichaud, Peter R.; Beyers, Jan L.; Neary, Daniel G. 2000. Evaluating the effectiveness of post fire rehabilitation treatments. Gen. Tech. Rep. RMRS-GTR-63. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 85 p. Available online at: *http://www.fs.fed.us/rm/pubs/rmrs_gtr63.html*

Sampson, Neil R.; Atkinson, Dwight R.; Lewis, Joe W., eds. 2000. Mapping wildfire hazards and risks. Binghamton, NY: Haworth Press, Inc. ISBN 1-56022-071-6. Chapter 4—Predicting Post-Fire Erosion and Sedimentation Risk on a Landscape Scale: A Case Study from Colorado.

Seaber, P. R.; Kapinos, F. P.; Knapp, G. L. 1987. Water-Supply Paper 2294. Hydrologic unit maps: U.S. Department of the Interior, U.S. Geological Survey. 63 p.

Threats of Insect or Disease Epidemics

A variety of risk- and hazard-rating systems and models have been developed for some of the most important insects and diseases that affect forests. Because of regional differences in forest types and associated insect and disease activity, the tasks of selecting an appropriate hazard rating system, choosing data collection methods, analyzing data, and interpreting the results will require consulting with professional pathologists and entomologists.

Outbreak factors, impacts, and management strategies for the West are described in *Assessment and Response to Bark Beetle Outbreaks in the Rocky Mountain Area* (RMRS-GTR-62, *http://www.fs.fed.us/rm/pubs/rmrs_gtr62.html*).

A listing of local forest health specialists is available at: *http://www.fs.fed.us/foresthealth/regional_offices.html*

The Forest Health Technology Enterprise Team supports a variety of forest pest extensions for the *Forest Vegetation Simulator* at: *http://www.fs.fed.us/foresthealth/technology/products.shtml*

Additional information on forest insects and diseases is available online at: *http://www.fs.fed.us/foresthealth/pubsindex.shtml*
and *http://www.forestpests.org/*

Threatened and Endangered Species

Web Sites

Birds and Burns Network (fire effects on wildlife in ponderosa pine)
http://www.rmrs.nau.edu/lab/4251/birdsnburns/

Endangered Species Act net benefits and alternative approaches guidance
http://www.fs.fed.us/projects/hfi/tools.shtml

Endangered Species Consultation Handbook
http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm

Endangered Species Consultation with Federal agencies
http://endangered.fws.gov/consultations/consultations.pdf

Fire Effects Information System (threatened and endangered species habitat and fire information)
http://www.fs.fed.us/database/feis/index.html

National Fire Plan Project Design and Consultation
http://www.or.blm.gov/fcp/

National Oceanic and Atmospheric Administration Fisheries (threatened and endangered species programs and information)
http://www.nmfs.noaa.gov/prot_res/overview/es. html)

NatureServe Explorer (threatened and endangered species habitat and fire information)
http://www.natureserve.org/explorer/servlet/NatureServe?init=Species

Science Synthesis and Integration for Fuels Planning: Ecological Consequences
http://www.fs.fed.us/fire/tech_transfer/synthesis/synthesis_index

The Nature Conservancy Fire Initiative
http://nature.org/initiatives/fire/

The Nature Conservancy Conserve Online
http://www.conserveonline.org/

Threatened and endangered species habitat and fire profiles, listing rules, and recovery plans
http://endangered.fws.gov/wildlife.html

USDA Forest Service research publications
http://216.48.37.142/

U.S. Fish and Wildlife Service (threatened and endangered species recovery and recovery plans)
http://endangered.fws.gov/recovery/index.html

U.S. Fish and Wildlife Service (threatened and endangered species programs, information, and species searches)
http://endangered.fws.gov/

Wildfire, the Endangered Species Act, and human safety
http://news.fws.gov/fire.html

Wildland fire in ecosystems: effects of fire on fauna
http://www.fs.fed.us/rm/pubs/rmrs_gtr42_1.html

Wildland fire in ecosystems: effects of fire on flora
http://www.fs.fed.us/rm/pubs/rmrs_gtr42_2.html

Publications

Attiwill, P. M. 1994. The disturbance of forest ecosystems: the ecological basis for conservation management. Forest Ecology and Management. 63: 247–300.

Battles, J. J.; Shlisky, A. J.; Barrett, R. H.; Heald, R. C.; Allen-Diaz, B. H. 2001. The effects of forest management on plant species diversity in a Sierran conifer forest. Forest Ecology and Management. 146: 211–222.

Berger, John J., ed. 1990. Environmental restoration: science and strategies for restoring the earth. Washington, DC: Island Press. 398 p.

Brosofske, K. D.; Chen, J.; Crow, T. R. 2001. Understory vegetation and site factors: implications for a managed Wisconsin landscape. Forest Ecology and Management. 146: 75–87.

Conner, R. N.; Rudolph, D. C.; Walters, J. R. 2001. The red-cockaded woodpecker: surviving in a fire-maintained ecosystem. Austin, TX: University of Texas Press. 363 p.

Falk, D. A.; [and others]. 1996. Restoring diversity: strategies for reintroduction of endangered plants. Island Press. 505 p.

Gilliam, F. S. 2002. Effects of harvesting on herbaceous layer diversity of a central Appalachian hardwood forest in West Virginia, USA. Forest Ecology and Management. 55: 33–43.

Kotliar, N. B.; Hejl, S.; Hutto, R. L.; Saab, V.; Melcher, C. P.; McFadzen, M. E. 2002. Effects of wildfire and post-fire salvage logging on avian communities in conifer-dominated forests of the Western United States. Studies in Avian Biology. 25: 49–64.

Kulhavy, David L.; Conner, Richard N., eds. 1986. Wilderness and natural areas in the eastern United States: a management challenge. Nagadoches, TX: Stephen F. Austin State University, School of Forestry, Center for Applied Studies. 416 p.

Lyon, L. J.; [and others]. 1978. Effects of fire on fauna: a state-of-knowledge review. Gen. Tech. Rep. WO-6. Washington, DC: U.S. Department of Agriculture, Forest Service. 41 p.

Pickett, S. T. A.; White, P. S. 1985. The ecology of natural disturbance and patch dynamics. Orlando, FL: Academic Press.

Saab, V. A. 1997. Cavity-nesting bird responses to stand-replacement fire and post-fire salvage logging. Blue Mountains Natural Resources Institute. 7: 8–9.

Saab, V.; Powell, H., eds. [In review]. Fire and avian ecology in North America. Studies in Avian Biology.

Scheller, R. M.; Mladenoff, D. J. 2002. Understory species patterns and diversity in old-growth and managed northern hardwood forests. Ecological Applications. 12: 1329–1343.

Wood, G. W. 1981. Prescribed fire and wildlife in southern forests. Georgetown, SC: Clemson University, Belle W. Baruch Forest Science Institute. 170 p.

Old-Growth and Large-Tree Retention

General Information

Frequently Asked Questions About HFRA's Old Growth and Large Tree Retention Provisions. Washington, DC: U.S. Department of Agriculture, Forest Service, HFRA Implementation Team.

Ecological Definitions of Old Growth

Borchert, Mark. 1991. Interim guidelines defining old-growth stands: coast redwood, southern Monterey County, California. Vallejo, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Region. 3 p.

Boughton, Jerry; [and others]. 1992. Definitions for old-growth forest types in southcentral Alaska. Juneau, AK: U.S. Department of Agriculture, Forest Service, Alaska Region, Old-Growth Definition Task Group. 33 p.

Capp, Jack; Van Zee, Bruce; [and others]. 1992. Final report: ecological definitions for old-growth forest types in the Alaska Region. Juneau, AK: U.S. Department of Agriculture, Forest Service, Alaska Region, Ecology Steering Committee. 56 p.

Fites, Jo Ann; [and others]. 1992. Preliminary ecological old-growth definitions for mixed conifer in California. Vallejo, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Region, Old-Growth Definitions Team 2. 22 p.

Fites, Jo Ann; [and others]. 1991. Preliminary ecological old-growth definitions for white fir. Placerville, CA: U.S. Department of Agriculture, Forest Service, Eldorado National Forest. 23 p.

Gaines, Glen; [and others]. 1997. Guidance for conserving and restoring old-growth forest communities on national forests in the Southern Region. Atlanta, GA: U.S. Department of Agriculture, Forest Service, Southern Region, Old-Growth Team. 121 p.

Green; [and others]. 1992. Old-growth forest types of the Northern Region. Missoula, MT: U.S. Department of Agriculture, Forest Service, Northern Region. 58 p.

Hamilton, Ronald G. 1993. Characteristics of old-growth forests in the Intermountain Region. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Region. 86 p.

Jimerson, Tom; [and others]. 1991. Ecological definition for old-growth Douglas-fir/tanoak/madrone. Vallejo, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Region, Old-Growth Definition Team 1. 22 p.

Jimerson, Tom; [and others]. 1991. Ecological definition for old-growth Pacific Douglas-fir. Vallejo, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Region, Old-Growth Definition Team 1. 22 p.

Mehl, M. S. 1992. Old-growth descriptions for the major forest cover types in the Rocky Mountain Region. In: Old growth forests in the Southwest and Rocky Mountain Regions. Gen. Tech. Rep. RM-213. Fort Collins, CO: U.S. Department of Agriculture, Forest Service. Rocky Mountain Forest and Range Experiment Station.

Potter, Don; [and others]. 1992. Ecological characteristics of old growth in California mixed subalpine forests. Sonora, CA: U.S. Department of Agriculture, Forest Service, Stanislaus National Forest. 17 p.

Potter, Don; [and others]. 1992. Ecological characteristics of old growth Jeffrey pine in California. Sonora, CA: U.S. Department of Agriculture, Forest Service, Stanislaus National Forest. 17 p.

Potter, Don; [and others]. 1992. Ecological characteristics of old growth lodgepole pine in California. Sonora, CA: U.S. Department of Agriculture, Forest Service, Stanislaus National Forest. 17 p.

Potter, Don; [and others]. 1992. Ecological characteristics of old growth red fir in California. Sonora, CA: U.S. Department of Agriculture, Forest Service, Stanislaus National Forest. 18 p.

Smith, Sydney. 1991. Revised interim old growth definitions for interior ponderosa pine in northeast California. Vallejo, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Region. 10 p.

Smith, Sydney; [and others]. 1991. Interim guidelines defining old growth stands: Pacific ponderosa pine. Vallejo, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Region, Old Growth Definition Team 4. 11 p.

Tyrell, Lucy E.; [and others]. 1998. Information about old growth for selected forest type groups in the Eastern United States. Gen. Tech. Rep. NC-197. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Experiment Station. 507 p.

U.S. Department of Agriculture, Forest Service. 1992. Recommended old-growth definitions and old-growth allocation procedure. Albuquerque, NM: U.S. Department of Agriculture, Forest Service, Southwestern Region, Old-Growth Core Team. 53 p.

Various authors. 1993. Interim old growth definitions for Douglas-fir, grand fir/white fir, interior Douglas-fir, lodgepole pine, Pacific silver fir, ponderosa pine, Port Orford-cedar and tanoak, subalpine fir, and western hemlock series. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 124 p.

Publications

Acker, Steven A.; Harmon, Mark E.; Spies, Thomas A.; [and others]. 1996. Spatial patterns of tree mortality in an old-growth *Abies procera-Pseudotsuga menziesii* stand. American Midland Naturalist.

Bingham, B. B.; Sawyer, J. O. 1991. Distinctive features and definitions of young, mature, and old-growth Douglas-fir/hardwood forest. In: Wildlife and vegetation of unmanaged Douglas-fir forests. Gen. Tech. Rep. PNW-GTR-285. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 363–378. (*http://www.fs.fed.us/pnw/pubs/gtr285*)

Bolsinger, C. L.; Waddell, K. L. 1993. Area of old-growth forests in California, Oregon, and Washington. U.S. Department of Agriculture, Forest Service.

Carey, A. B.; Johnson, M. L. 1995. Small mammals in managed, young and old-growth forests. Ecological Applications. 5: 336–352.

Chen, J. (1991). *Edge effects: microclimatic pattern and biological response in old-growth Douglas-fir forests*. (Doctoral dissertation, University of Washington, Seattle, WA).

Chen, Jiquan; Franklin, Jerry F.; Spies, Thomas A. 1990. Microclimatic pattern and basic biological responses at the clearcut edges of old-growth Douglas-fir stands. Northwest Environmental Journal. 6.

Chen, Jiquan; Franklin, Jerry F.; Spies, Thomas A. 1992. Vegetation responses to edge environments in old-growth Douglas-fir forests. Ecological Applications. 2(4).

Crow, T. R. 1990. Old-growth and biological diversity: a basis for sustainable forestry. In: Old Growth Forests. Toronto, Canada: Canadian Scholar's Press, Inc.: 49–62.

DeBell, Dean S.; Franklin, Jerry F. 1987. Old-growth Douglas-fir and western hemlock: a 36-year record of growth and mortality. Western Journal of Applied Forestry. 2(4).

Franklin, J. F.; Cromack, K., Jr.; Denison, W.; [and others]. 1981. Ecological characteristics of old-growth Douglas-fir forests. Gen. Tech. Rep. PNW-GTR-118. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. (*http://216.48.37.142/pubs/viewpub.jsp?index=5546*).

Franklin, J. F.; McKee, A.; Swanson, F. J.; [and others]. 1979. Age structure analysis of old-growth Douglas-fir stands: data versus conventional wisdom. Bulletin of the Ecological Society of America. 60.

Franklin, Jerry F. 1986. The ecology of old-growth Douglas-fir forests. Oregon Birds. 12(2).

Franklin, Jerry F.; DeBell, Dean S. 1988. Thirty-six years of tree population change in an old-growth *Pseudotsuga-Tsuga* forest. Canadian Journal of Forest Research. 18.

Franklin, Jerry F.; Spies, Thomas A. 1991. Composition, function, and structure of old-growth Douglas-fir forests. In: Wildlife and vegetation of unmanaged Douglas-fir forests. Gen. Tech. Rep. PNW-GTR-285. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 71–82. (*http://www.fs.fed.us/pnw/pubs/gtr285*)

Franklin, Jerry F.; Van Pelt, Robert. 1990. Old-growth reference stand network in the Pacific Northwest: recording long-term ecosystem dynamics. Northwest Environmental Journal. 6.

Gholz, H. L.; Fitz, K.; Waring, R. H. 1976. Leaf area differences associated with old-growth forest communities in the western Oregon Cascades. Canadian Journal of Forest Research. 6(1).

Harmon, M. E.; Chen, H. 1991. Coarse woody debris dynamics in two old-growth ecosystems. BioScience. 41(9).

Harris, Larry D.; Maser, Chris; McKee, Arthur. 1982. Patterns of old-growth harvest and implications for Cascades wildlife. Transactions of the North American Wildlife and Natural Resources Conference. 47.

Hunter, M. L., Jr. 1989. What constitutes an old-growth stand? Journal of Forestry. 87(8).

Isaac, L. A. 1956. Place of partial cutting in old-growth stands of the Douglas-fir region. U.S. Department of Agriculture, Forest Service.

Juday, G. P. (1976). *The location, composition, and structure of old-growth forests of the Oregon Coast Range*. (Doctoral dissertation, Oregon State University, Corvallis, OR).

Lang, F. J. 1980. Old-growth forests of the Douglas-fir region of western Oregon and western Washington: characteristics and management. Sacramento, CA: Jones and Stokes Associates, Inc. 62 p.

Lattin, John D.; Moldenke, Andrew R. 1992. Ecologically sensitive invertebrate taxa of Pacific Northwest old-growth conifer forests. Washington, DC.

Lertzman, K. P.; Krebs, C. J. 1991. Gap-phase structure of a subalpine old-growth forest. Canadian Journal of Forest Research. 21.

Lienkaemper, G. W.; Swanson, F. J. 1987. Dynamics of large woody debris in streams in old-growth Douglas-fir forests. Canadian Journal of Forest Research. 17(2).

MacMillan, Paul C.; Means, Joseph; Hawk, Glenn M.; [and others]. 1977. Log decomposition in an old-growth Douglas-fir forest. Northwest Scientific Association abstract of papers presented at the 50th annual meeting. Pullman, WA: Washington State University Press.

Marcot, Bruce G.; Holthausen, Richard S.; Tepley, John; Carrier, W. Dean. 1991. Old-growth inventories: status, definitions, and visions of the future. In: Wildlife and vegetation of unmanaged Douglas-fir forests. Gen. Tech. Rep. PNW-GTR-285. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 47–59. (*http://www.fs.fed.us/pnw/pubs/gtr285*)

McComb, W. C.; Muller, R. N. 1983. Snag densities in old-growth and second-growth Appalachian forests. Journal of Wildlife Management. 47.

Moldenke, A. R.; Lattin, J. D. 1990. Dispersal characteristics of old growth soil arthropods: the potential for loss of diversity and biological function. Northwest Environmental Journal. 6.

Morrison, Peter H. 1988. Old growth in the Pacific Northwest: a status report. Washington, DC: The Wilderness Society. 46 p.

Morrow, R. J. (1985). *Age structure and spatial pattern of old-growth ponderosa pine in Pringle Falls Experimental Forest, Central Oregon*. (Master's thesis, Oregon State University, Corvallis, OR).

Murphy, M. L. (1979). *Predator assemblages in old growth and logged sections of small Cascade streams*. (Master's thesis, Oregon State University, Corvallis, OR).

Nowacki, G. J.; Trianosky, P. A. 1993. Literature on old-growth forests of Eastern North America. Natural Areas Journal. 13: 87–107.

Old-Growth Definition Task Group. 1986. Interim definitions for old-growth Douglas-fir and mixed-conifer forests in the Pacific Northwest and California. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Poage, N. J. (2000). *Structure and development of old-growth Douglas-fir in central western Oregon*. (Doctoral dissertation, Oregon State University, Corvallis, OR).

Ripple, William J.; Johnson, David H.; Hershey, K. T.; [and others]. 1991. Old-growth and mature forests near spotted owl nests in western Oregon. Journal of Wildlife Management. 55(2).

Ruggiero, Leonard F.; Aubry, Keith B.; Carey, Andrew B.; [and others], tech. eds. 1991. Wildlife and vegetation of unmanaged Douglas-fir forests. Gen. Tech. Rep. PNW-GTR-285. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 533 p. (*http://www.fs.fed.us/pnw/pubs/gtr285*)

Schowalter, T. D. 1990. Invertebrate diversity in old-growth versus regenerating forest canopies. Northwest Environmental Journal. 6.

Spies, Thomas A. 1991. Plant species diversity and occurrence in young, mature and old-growth Douglas-fir stands in western Oregon and Washington. In: Wildlife and vegetation of unmanaged Douglas-fir forests. Gen. Tech. Rep. PNW-GTR-285. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 111–121. (*http://www.fs.fed.us/pnw/pubs/gtr285*)

Spies, Thomas A.; Franklin, Jerry F. 1991. The structure of natural young, mature, and old-growth Douglas-fir forests in Oregon and Washington. In: Wildlife and vegetation of unmanaged Douglas-fir forests. Gen. Tech. Rep. PNW-GTR-285. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 91–109. (*http://www.fs.fed.us/pnw/pubs/gtr285*)

Stewart, G. H. 1986. Forest development in canopy openings in old-growth *Pseudotsuga* forests of the western Cascade Range, Oregon. Canadian Journal of Forest Research. 16.

Swanson, Frederick J.; McKee, Arthur. 1990. Old-growth research at the H. J. Andrews Experimental Forest. Northwest Environmental Journal. 6.

Tappeiner, J. C.; Huffman, D.; Marshall, D.; [and others]. 1997. Density, ages, and growth rates in old-growth and young-growth forests in coastal Oregon. Canadian Journal of Forest Research. 27.

Thomas, Jack W.; Raphael, Martin G.; Anthony, R. G.; [and others]. 1993. Viability assessments and management considerations for species associated with late-successional and old-growth forests of the Pacific Northwest. Washington, DC: U.S. Government Printing Office.

Van Pelt, Robert; Spies, Thomas A.; Franklin, Jerry F. 1992. Disturbance succession and species interactions around canopy gaps in old-growth Douglas-fir forests. Northwest Environmental Journal. 8(1).

Assessment-Level Information

U.S. Department of Agriculture, Forest Service; U.S. Department of the Interior, Fish and Wildlife Service; U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service; [and others]. 1993. Forest ecosystem management: an ecological, economic, and social assessment, report of the Forest Ecosystem Management Assessment Team [generally called the FEMAT report]. Portland, OR: U.S. Department of Agriculture, Forest Service and U.S. Department of the Interior, Bureau of Land Management. 1039 p.

Executive Summary (7.6 MB Acrobat file) *http://www.or.blm.gov/nwfpnepa/FEMAT-1993/1993_FEMAT-ExecSum.pdf*

FEMAT Report (46.1 MB Acrobat file) *http://www.or.blm.gov/nwfpnepa/FEMAT-1993/1993_%20FEMAT_Report.pdf*

U.S. Department of Agriculture, Forest Service. 2000. Old growth management prescriptions for the Southern Appalachian Forests. Atlanta, GA: U.S. Department of Agriculture, Forest Service, Southern Region.

Regional Planning Direction

U.S. Department of Agriculture, Forest Service. 1997. Guidance for conserving and restoring old-growth forest communities on national forests in the Southern Region: report of the Southern Region Old-Growth Team. Atlanta, GA: U.S. Department of Agriculture, Forest Service, Southern Region.

Examples of management direction can be found in the *Northwest Forest Plan Standards and Guidelines*, available at: *http://www.reo.gov/library/reports/newsandga.pdf*

Review the sections on ecological principles (Pages B–1 through B–9), riparian reserves (B–12 through B–17 and C–31 through C–32), and late-successional reserves (C–9 through C–20).

Planners should consider the three-part *Arapaho-Roosevelt Land Management Plan Prototype* (*http://maps.fs.fed.us/fp/r2/arnf/*) as an example for addressing provisions of the HFRA.

Planners should consider the forest health language that applies in the USDA Forest Service Strategic Plan (2000 revision, *http://fsweb.wo.fs.fed.us/rpa/stratplan.pdf)* specifically, Goal 1, objective 1.c, and related strategies, measures, and milestones.

Project-Level Guidance

Brown, P. M.; Kaufmann, M. R.; Shepperd, W. D. 1999. Long-term landscape patterns of past fire events in a ponderosa pine forest of central Colorado. Landscape Ecology. 14: 513–532.

Forest Vegetation Simulator (FVS) and the *Fire and Fuels Extension* (FFE) are key tools for modeling the effects of proposed treatments to reduce the risk of wildland fire while achieving large-tree retention and old-growth stand conditions resembling those before fire suppression. More information is available at: *http://www.fs.fed.us/fmsc/fvs/index.php*

Kaufmann, M. R.; Huckaby, L. S.; Fornwalt, P. J.; Stoker. J. M.; Romme, W. H. 2003. Using tree recruitment patterns and fire history to guide restoration of an unlogged ponderosa pine/Douglas-fir landscape in the southern Rocky Mountains after a century of fire suppression. Forestry (UK). 76: 231–241.

General

Graham, Russell T.; McCaffrey, Sarah; Jain, Theresa B., tech. eds. 2004. Scientific basis for changing forest structure to modify wildfire behavior and severity. Gen. Tech. Rep. RMRS–GTR–120. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 43 p. (See *http://www.fs.fed.us/rm/main/fire_plan/index.html*)

Library Card

U.S. Department of Agriculture, Forest Service; U.S. Department of the Interior, Bureau of Land Management. 2004. The Healthy Forests Initiative and Healthy Forests Restoration Act: Interim Field Guide. FS–799. Washington, DC: U.S. Department of Agriculture, Forest Service. 58 p.

Provides general guidance on implementing the Healthy Forests Initiative and Healthy Forests Restoration Act for field managers and line officers in the U.S. Department of Agriculture, Forest Service and U.S. Department of the Interior Bureau of Land Management. The field guide addresses the administrative and legal issues field managers should consider when preparing fuel-reduction and forest-restoration projects. It includes three decision diagrams that are intended to help field managers and includes references to Web sites and publications.

Keywords: collaboration, epidemics, fire management, fire suppression, forest health protection, old growth, planning, threatened and endangered species, Indian Tribes, watersheds, wildfire, wildland fire, wildland-urban interface

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