

## National Fire Plan Project Synopsis

# Fuel Reduction and Forest Restoration Strategies That Also Sustain Key Habitats, Species, and Ecological Processes in Fire-Prone Ecosystems in the Interior Northwest

Eastside Forest Health Restoration Team  
Wenatchee Forestry Sciences Laboratory  
USDA Forest Service, PNW Research Station

**Principal Investigators:** John F. Lehmkuhl and Research Forester (to be hired)

### Goals & Objectives

**Goal 1.** *Gain basic and applied research information on dry-forest forest ecology and associated species.* Gained knowledge will be used to design treatments, and to predict the effects of treatment alternatives, including no treatment, on key ecological processes and elements of biodiversity, particularly late-successional forests (LSF), keystone species such as woodpeckers, and T&E species.

**Objective 1A.** Study the stand and landscape dynamics (i.e., succession, disturbance, stand development) of dry forest LSF types to understand microhabitat development (e.g., large trees, snags, woody debris), and macrohabitat landscape dynamics.

**Objective 1B.** Study habitat relationships, population dynamics, and ecological function of LSF-associated species.

**Objective 1C.** Retrospective analyses of the effects of wildfire, prescribed burning, thinning, combined thinning and burning, and no treatment on biotic patterns and processes of vegetation and wildlife. Short-term retrospective studies will provide immediate information, especially for conditions or practices that cannot be manipulated experimentally (e.g., wildfire).

**Goal 2.** *Use research information to develop and test models and management strategies in a research/adaptive management environment.* This goal follows the scientific process of taking the best information available (i.e., from Goal 1 and from other sources), developing testable hypotheses (in this case management strategies), testing on the ground with operational projects, then feed back results to design new research or testable strategies/treatments. As such, results of Goal 2 feed back to Goal 1 and Goal 2 in a repeating cycle.

**Objective 2A.** Develop models for predicting locations of historical fire refugia of late-successional forest (i.e. where most sustainable) in the interior Northwest.

**Objective 2B.** Collaborate with NFS to develop fuel and stand treatment options that incorporate research knowledge.

**Objective 2C.** Conduct longer-term experimental studies of the above treatments in collaboration with NFS, other Stations (RMRS and PSW in particular), and universities. For example, the Lab currently is collaborating with the Wenatchee NF and the University of Washington in the Fire and Fire Surrogates Study (FFS; information at <http://ffs.fs.fed.us>). Other opportunities for collaborative adaptive management and research on similar Forest project areas are possible (e.g., Hungry Hunter project on the Okanogan NF).

**Objective 2D.** Develop research information into planning tools for risk and decision analysis of multi-scale (stand, watershed, Forest) management efforts.

Project work toward these broad goals will be designed to provide answers to several **central research questions**:

- a) What are the stand, landscape, and disturbance dynamics of dry forests?
- b) Where are LSF habitats most sustainable?
- c) What are the habitat needs and dynamics of wildlife?
- d) ) What management treatments are effective in maintaining or restoring stable and productive ecosystems and viable species at stand and landscape scales?

### **FY 2001 Research**

The following work will be done during FY 2001 to address the two broad goals of this project. Because continued funding is uncertain, this year's program is focused on leveraging existing studies that contribute to the project goals, or to begin longer-term cooperative studies with university partners for which long-term funding can be committed.

#### **Project Summaries**

<b>A. Fire ecology</b>	<u><b>Objective</b></u>	<u><b>Funding</b></u>
1. <i>Spotted owl neighborhood structure and characteristics.</i> Finish analysis and manuscripts of research initiated by Everett and Schellhaas et al.	1A, B	23,000
2. <i>Crown fire potential of spotted owl neighborhoods.</i> Finish analysis and manuscripts of research initiated by Everett and Schellhaas et al.	1A, B	2,000
3. <i>Climatic, topographic &amp; human influences on fire regimes.</i> Collaborative work with the USGS (David Peterson) and University of Washington (Jim Agee) that uses the extensive fire ecology dataset held by the Wenatchee FSL (Everett and Schellhaas et al's work) to model the climatic, topographic, and human influences on fire regimes at multiple scales.	1A	50,000
4. <i>Fire history of sub-alpine forest.</i> Finish analysis and manuscripts of research initiated by Everett and Schellhaas et al.	1A	5,000
5. <i>Douglas-fir fire regimes in the Tonasket area.</i> Fill a gap in our knowledge of fire history that extends from the Colville NF down the eastern WA Cascades. Ties in with #3 above.	1A	40,000
	<u>Subtotal</u>	<u>120,000</u>

**B. Vegetation & soil ecology**

1. <i>Dynamics of understory vegetation in relation to wildlife, prescribed fire, and vegetation management.</i> A 5-year cooperative study with Charles Halpern and Jim Agee (U of Washington).	1C	112,000
2. <i>Developing a soils fire risk model for the Okanogan-Wenatchee NFs.</i> Collaboration with the OWNF.	2D	26,000
3. <i>Fire &amp; Fire Surrogate &amp; Pendleton vegetation studies.</i> Supplement the FFS vegetation budget, and enable post-thinning resampling of similar sites in the nearby Pendleton adaptive management project.	2C	15,000
	<u>Subtotal</u>	<u>153,000</u>

**C. Wildlife ecology**

1. <i>Fire &amp; Fire Surrogate bird field work and data analysis.</i> Supplement the FFS budget.	1B, 2C	12,000
2. <i>Fire &amp; Fire Surrogate small mammal analysis.</i> Supplement the FFS budget.	1B, 2C	10,000
3. <i>Swauk arboreal rodent study.</i> Supplement completion of this study that focuses on the ecology of flying squirrels in old and young forests.	1B	15,000
4. <i>Pendleton adaptive management bird work.</i> Enable post-thinning resampling of sites in the Pendleton adaptive management project.	1B, 2C	20,000
5. <i>Pendleton adaptive management mammal work.</i> Enable post-thinning resampling of sites in the Pendleton adaptive management project.	1B, 2C	22,000
	<u>Subtotal</u>	<u>79,000</u>

**D. Treatment studies**

1. <i>Landscape-scale effects of prescribed fire on birds.</i> This study is being done by Vicki Saab in ponderosa pine forest on the Boise NF. Given future funding, we hope to replicate this study in the eastern Cascades to give a regional perspective on prescribed fire effects in dry-forest types.	1B, C	35,000
--	-------	--------

**E. Planning**

1. <i>Dry Forest Research and Management Workshop.</i> Workshop in May was attended by 200 managers and researchers. Objective was to discuss opportunities, issues, and concerns for implementing and monitoring (research) dry forest management treatments.	2B	2,000
2. <i>R6 silviculture and other workshops.</i> Lehmkuhl attend workshops.	2B	1,000
	<u>Subtotal</u>	<u>3,000</u>

Contingency	15,080
Station & Team Overhead	93,920
	<u><b>Total</b> \$499,000</u>

## Projects by Goal & Objective

Project	Goal & Objective						
	1A	1B	1C	2A	2B	2C	2D
<b>A. Fire ecology</b>							
1. Spotted owl neighborhood structure and characteristics.	X	X					
2. Crown fire potential of spotted owl neighborhoods.	X	X					
3. Climatic, topographic & human influences on fire regimes.	X						
4. Fire history of sub-alpine forest.	X						
5. Douglas-fir fire regimes in the Tonasket area.	X						
<b>B. Vegetation &amp; soil ecology</b>							
1. Dynamics of understory vegetation in relation to wildlife, prescribed fire, and vegetation management.			X				
2. Developing a soils fire risk model for the Okanogan-Wenatchee NFs.							X
3. Fire & Fire Surrogate & Pendleton vegetation studies.						X	
<b>C. Wildlife ecology</b>							
1. Fire & Fire Surrogate bird field work and data analysis.		X				X	
2. Fire & Fire Surrogate small mammal analysis.		X				X	
3. Swauk arboreal rodent study.		X					
4. Pendleton adaptive management bird work.		X				X	
5. Pendleton adaptive management mammal work.		X				X	
<b>D. Treatment studies</b>							
1. Landscape-scale effects of prescribed fire on birds.		X	X				
<b>E. Planning</b>							
1. Dry Forest Research and Management Workshop.						X	
2. R6 silviculture and other workshops.						X	

## Future Research & Development

### FY 2002:

(1) Develop study plan in conjunction with RMRS-Boise (V. Saab) for regional (WA, OR, ID, MT) retrospective study of wildfire, prescribed fire, and no-fire effects on vegetation and wildlife.

(2) Develop experimental study plans to validate currently planned adaptive management projects that are part of the Dry Forest Management Strategy of the Okanogan and

Wenatchee National Forests (OWNF). Attempt to extend that work to the Colville and other regional NFs. Continue Boise NF portion of study.

(3) Continue understory vegetation retrospective study and continue basic studies from first year (Halpern & Agee et al.)

(4) Develop and test late-successional forest prediction models.

(5) Publish leveraged wildlife studies (Pendleton, FFS pre-treatment data).

**FY 2003-2005:**

(1) Finish retrospective fire strategy (treatment) studies and publish short-term findings.

(2) Implement collaborative research & adaptive management studies with OWNF planned in 2<sup>nd</sup> year.

(3) Publish on late-successional forest disturbance ecology and predictive models, and integrate models in decision analysis models.

(4) Publish leveraged wildlife studies.