

PERSPECTIVES FROM THE  
ALDO LEOPOLD WILDERNESS RESEARCH INSTITUTE

# The Fire Effects Planning Framework

BY ANNE BLACK

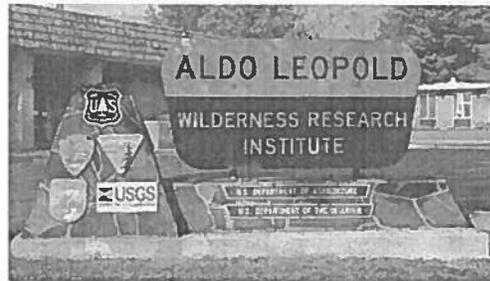
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The fire lookouts began calling in at 4:30 P.M. on Saturday July 20 2004. There were several fires on Green Ridge and in Scimitar Creek on the West Fork Ranger District of the Bitterroot National Forest (BRF). The area allows Wildland Fire Use (WFU) as a management option. As part of the Wildland Fire Implementation Plan (WFIP), the Stage I analysis must be completed within two hours to determine whether to allow the fire to burn or to suppress it. Dave Campbell, district ranger, and Bart Hoag, fire behavior analyst, turned to the BRF's Fire Effects Map Library to locate the fire in relation to lynx habitat and existing whitebark pine stands. Both lynx and whitebark pine are sensitive species in the forest. The area has substantial suitable habitat, although there are no known lynx in the forest and there is woefully little foraging habitat at present. Most of the whitebark pine stands have a significant component of spruce and fir growing in them, and recruitment of young trees is low. But instead of looking to see if they needed to keep fire out of these areas, Campbell and Hoag were using the maps to provide an indication of whether the fire might actually *benefit* these species. In this case, the fire was not in the appropriate habitat, but they turned back to the library once again, this time to the fire behavior maps, to quickly assess the 24-hour-size-up potential of the fire.

During the preseason, forest fire ecologist Tonja Opperman had built both fire behavior and fire effects map libraries for each of the four ranger districts. The Forestwide Geographic Information System datasets are housed on the BRF's computer server. District-specific hard-copy maps and associated descriptions were distributed to each ranger district. To create these maps, Opperman used the Fire Effects Planning Framework (FEPF). FEPF is an analytic framework conceived of at the Leopold Institute by the author, Carol Miller, and Peter Landres, and demonstrated by Tonja on the Bitterroot. FEPF's purpose is to help managers functionally link fire and resource management



by mapping out where fire under particular weather conditions meaningful to tactical and strategic fire management may be beneficial, neutral, or detrimental to species or other management objectives. In addition to assisting with incident planning, the maps are useful for fire management plan development and revision, as well as revision of long-range management plans.

## Why FEPF?

The idea arose after review of various fire and planning procedures revealed a stubborn disconnect between fire and other resource management planning. Despite a clear biophysical link, few agency planning efforts specifically detail how fire is likely to influence the systems under their management (see Yosemite National Park's Fire Management Plan for a notable exception). The resulting characterization of fire as either categorically good (WFU zones and wilderness areas) or bad (all other lands) provides little guidance for fire managers who must decide under what strategy to manage a fire (wildland fire use, aggressive suppression, containment), and where on the landscape they should use which strategies (where to hit the fire hard, where to herd it, where to play its natural role).

The map libraries provide fire managers with a quick, effective tool for functionally integrating their work into long-range management goals,

helping to answer the questions: should I try to influence this fire, and, if so, what areas should I attempt to keep fire away from and where should I try to encourage the fire to go? This information is integrated with knowledge of now classic "values at risk" (e.g., power lines, residences) to create a more complete picture of potential benefits and risks of fire. The map libraries provide resource staff with a means to quickly assess the impact of a fire, or a fire season, on progress toward and ability to meet management objectiveness.

#### **How Does FEPP Work?**

The logic behind FEPP is straightforward: identify and map where management objectives exist on the landscape (or where their important habitats exist); identify critical fire weather threshold conditions (such as 80th, 90th, 99th percentile Energy Release Component) and map fire behavior under each of these; identify how fire under each

threshold condition is likely to affect the management objective (or the habitat parameters on which it depends, such as large, early seral trees); and use this link between fire behavior and management objective to create a fire effects library. The choice of computer models to generate habitat and fire behavior is up to the user. Here in the United States, FireFamilyPlus (FF+) can be used to determine the typical fuel moisture and ambient weather conditions associated with each of the threshold conditions. FlamMap can be used to generate a wall-to-wall map of a number of fire behavior parameters (fireline intensity, crown fire potential, rate of spread, heat per unit area). Other countries may have different programs that generate similar information. Base vegetation and fuels conditions are derived from existing satellite imagery or modeled via a vegetation dynamics simulation model. The assessment of fire effects is based on species-habitat relationships and the known effects of fire on habitat

parameters documented in the scientific literature or developed through expert - knowledge systems.

#### **Where to Find More Information**

As part of our Research Applications Program, we have established a website for the FEPP (<http://leopold.wilderness.net/research/fprojects/F001.htm>) on which we have posted fact sheets, background information, and a draft User's Guide on the FEPP The User's Guide, which we hope to release in early 2005, provides both conceptual and detailed instructions for generating the necessary FF+ and FlamMap analysis, creating the linkages and using the output to address various planning questions. If you use FEPP, please let us know. We're interested in improving our science delivery techniques.

**IJW**

ANNE BLACK, postdoctoral ecologist,  
Aldo Leopold Wilderness Research  
Institute, P.O. Box 8089, Missoula, MT,  
59807, USA. E-mail: [aebblack@fs.fed.us](mailto:aebblack@fs.fed.us).