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Extending the reach of the Fire Effects Planning Framework by taking a critical approach to science delivery and application

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Project Title: Extending the reach of the Fire Effects Planning Framework by taking a
critical approach to science delivery and application

Project Location: National Forests and National Parks in the western US including:
Sierra, Mendocino, and Southern California National Forests (Region 5), Dixie,
Boise, Manti-LaSal, Fishlake National Forests and Region 4 headquarters (Region 4),
Gila National Forest (Region 3), Rocky Mountain Geographic Area (Region 2),
Western Montana, Beaverhead-Deerlodge National Forests, Region 1 headquarters
(Region 1) and Northern Rockies Geographic Area, Greater Yellowstone
Coordinating Group, Yellowstone National Park, Boise National Incident
Management Organization.

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This final report briefly outlines the project, reviews proposed and accomplished
deliverables, and identifies lessons learned. Details on the study – background,
objectives, methods, and delivered products – are presented on our updated web page
(http://leopold.wilderness.net/research/fprojects/fepf/index.htm), which can be considered
an appendix to this final report.

Project Overview

Background
The Fire Effects Planning Framework (FEPF), developed under JFSP project (99-1-3-16)
"Wildland fuels management: evaluating and planning risks and benefits," was formally
completed in June 2004. FEPF is a logical framework that uses available data (e.g., local,
LANDFIRE data) and existing software (e.g., GIS, Farsite, FlamMap, expert knowledge)
to produce maps of probable fire effects during the pre-season or in advance of a fire
front. The initial project included significant technology transfer activities. As that
project concluded, however, we continued to receive requests for assistance from field
managers (District, Forest and Regional Forest Service offices), international
organizations (Interior West Fire Council), and national fire planning organizations (Fire

Program Analysis). These requests sought more information about the tool, assistance with using it for hazardous fuels planning, and guidance for incorporating FEPF into regional training courses.

To enable us to continue our outreach efforts, we initiated JFSP 05-4-1-20 "Extending the reach of the the Fire Effects Planning Framework by taking a critical approach to science delivery and application". This funding allowed us to meet requests for assistance and participation while allowing us to identify and concentrate on the most valuable transfer mechanisms. Our goal was to observe how field managers think about and use the tool, learn who they think the primary audience is, and then revise our materials and activities accordingly.

FEPF is the only analysis tool we know of that helps managers (land and fire) articulate probable *ecologic* effects of fire and integrate these into fire decision-making and assessment. The technology and data used by FEPF is widely available. The scientific basis for crosswalk determinations are grounded in best available science, transparent, and easily updated as new information becomes available. As the federal fire agencies move toward more comprehensive implementation of Appropriate Management Response, FEPF remains the only process that can quickly and consistently indicate areas and conditions where fire may be neutral, beneficial or harmful to natural resources of interest. Thus, it provides the only existing process to link emergency fire operations (from full suppression to wildland fire use) with land management plans, a requirement of federal oversight entities (e.g., OIG).

This project was designed to encourage diffusion of FEPF across the agencies. FEPF can be used for annual or multi-year planning activities to identify priorities for hazardous fuels treatments (including fire use), and during incident planning to determine whether fire is likely to produce resource benefits or detriments. Results of this project provided support to field units in the form of training and background materials. Tangible products include on-line examples, tutorials and testimonials to help users understand the process and initiate projects on their own. Intangible products include additional people with knowledge of and experience with FEPF (a critical facet of the diffusion of innovation process),and increased coordination and collaboration with developers of other fire decision support tools and integration of tools.

Objectives

The principal objectives were to:
- increase distribution and awareness of FEPF. We met this through on-site visits, web-based training and explanatory materials, trainings and workshops);
- develop a stand-alone training module for FEPF that can be integrated into existing and new fire risk and fuels management training programs. We met this by producing and posting on the website a video, template agenda, and a variety of Microsoft Powerpoint presentations and case study examples.
- increase the utility of existing technology transfer materials on FEPF. We accomplished this by revising our project website, updating and expanding upon our on-line materials.

- take advantage of innovative and new technologies to deliver FEPF materials to the field and encourage discussion, interaction and improvement of FEPF. We met this by exploring newer uses of web technology, but largely found that in-person visits provide the most effective delivery.
- track utilization and effectiveness of FEPF delivery mechanisms to guide future science delivery and application/technology transfer activities. We met this objective by hiring a subcontractor to develop a communications plan based on interviews with initial users. Based on this, we produced a training video, pursued additional on-site training and presentation opportunities, updating our website, and posting additional case study examples. We also evaluated web usage statistics, which indicate that project materials are among the most viewed on the ALWRI website.

Summary of Products and Outcomes to Date

The intent of this project was to encourage diffusion of the Fire Effects Planning Framework through additional outreach, significantly by seeking to understand and focus our efforts on effective outreach strategies. We gained clarity on 'effectiveness' through three mechanisms: conversations between project personnel and users; contracting with an external communications firm for a survey of users, development and implementation of a communications plan, and re-design of our website; and evaluating on-line materials via web-usage statistics.

> **Lesson Learned:** Face-to-face interactions are the most useful to our audience, especially when supported by passive documentation such as on-line tutorials, user guides, and examples.

As a result of this finding, we prioritized face-to-face opportunities to consult with field units, ultimately reaching over 500 individuals in 21 formal trainings, workshops, presentations and consultations across the western US, not counting numerous informal contacts.

Feedback from our consultant and from our own discussions, regarding the most appropriate communications/training plan compelled us to revise our approach to the project, as described in our 2006 Progress Report and 2007 letter requesting a no-cost extension. While these changes altered our timeframe and in some cases the form of product as well, they resulted in more powerful and effective transfer (see Table 1). For instance, we originally envisioned developing, conducting and video-taping a training of Resource Advisors in partnership with USFS Region 1. However, the research/management training team realized that while the Resource Advisors might be *consumers* of the FEPF products, they were not the appropriate audience for a workshop designed to train people to *develop* the data. Based on this, discussions with early adopters, and interviews of these users by an external consultant, we determined that a web-based introductory overview video was needed. We also determined that using peer field managers to describe the process would be more useful and effective than a researcher-based training video, particularly for building understanding among the ultimate user audience. The resulting video is part of a set of on-line and downloadable

training materials that also contains example agendas and Microsoft Powerpoint © presentations that can be used in both workshop and training settings.

> **Lesson Learned:** The audience most likely to use the FEPF output are not the same audience who will create the output. It is important to work with, and provide training materials to both audiences.

We originally envisioned evaluating 'effectiveness' by tracking frequency of access or number of visitors of materials posted on the project website to determine what type of material – video, publication, FAQs, case studies – were most useful. We still think this is a useful procedure. Unfortunately, the web-statistics program used by ALWRI's webhost only captures information on the top 50 webpages for any given period or client. Since ALWRI has over one thousand webpages on its site, with roughly half of those being publications and the other informational pages, this arbitrary 'top 50' criteria, captures usage on less than 10% of the informational and 10% of the publications available. This makes it difficult to understand detailed usage. For instance, on average for fiscal year 2007, these top 50 pages captured only 40% of total hits to ALWRI's website, with the top 3 pages (ALWRI home, publications home, featured projects home) accounting for fully one-third of total hits. The remaining 66% of hits are widely distributed across a myriad of subpages.

We do know that for 16 of the 17 months of web statistical records available over the course of our project, one or more of the FEPF webpages and/or downloads for this project *did* make it into the 50 most frequently visited pages (measured by number of visitors) on ALWRI's entire website. We can also say that the main project page and User's Guide are the most widely viewed; which seems typical of other project webpages on ALWRIs website.

> **Lesson learned:** The main project webpage is consistently among the most frequently visited on ALWRI's website.

> **Lesson learned:** The User's Guide is the most frequently downloaded document from the project website, and among the most frequently downloaded documents on ALWRI's website.

Unfortunately, with no information on sub-page usage, we cannot determine the extent to which people access or favor the case studies, the FAQs, or other interactive aspects of the website. Moreover, given the wide useage of dynamic IP addressing (DHCP), particularly in the federal land management agencies, it is not possible to anonymously survey users via the web. Since a peer-reviewed article was founded on our assumption of being able to conduct extensive quantification and evaluation, this situation also resulted in our inability to deliver a peer-reviewed article.

> **Lesson learned:** Understanding web-usage is more difficult than might be expected. While theoretically straight-forward, depending upon the software used and the IT expertise and budget available, tracking and

disentangling usage, or conducting an internet based automatic-reply survey may not be feasible.

For the past five years we have heard a consistent call for ways to calculate and capture information on the *benefits* of fire and to trace fire decisions from long-term plans to fire-line decisions and results. The FEPF provides this; yet incorporation of the concept into fire planning remains spotty. We believe this won't always be the case. Prior to this project we had worked exclusively with the lower tiers of management agencies – National Forests, National Parks and their district staffs. With this project we began fruitful discussions with Regional offices, which evolved as well into discussions with key large fire management organizations.

As described above, although our *initial* partnership concept with Region 1 (Resource Advisor training) did not pan out, our *mutual interest kept us talking*. These discussions - regarding the audience for and implementation of FEPF - resulted in new, previously unexplored collaborations with a National Incident Management Organization (NIMO), a GACC-level Decision Support Group, developers of the RAVAR (Rapid Assessment of Values at Risk) subunit of the Wildland Fire Decision Support System, and with members of NIFC. With this project the concepts embedded in FEPF have been introduced widely throughout the fire community - not only the prescribed fire and wildland fire use communities, but also suppression.

During the final year of this project, 2007, we worked closely with researchers (Calkin et al.) to describe the process for integrating non-monetary risks/benefits into the WFDSS process. This and our separate discussions with Region 1 resulted in a pilot process to develop and serve FEPF datasets to large fire management teams in Region 1 using the RAVAR and FSPro decision support tools. When fire season arrived, we had developed crosswalks for most of the regional priority vegetation communities, and were engaged in discussions about how to present this material appropriately on RAVAR maps. We expect this work to continue in 2008.

We are also continuing conversations with the Northern Rockies Coordination Group, USFS Region 1, National Park Service and other partners continue as to how to institutionalize the FEPF concepts - the calculation and capture of ecological effects of fire - in fire planning and reporting.

> **Lesson learned:** Keep talking. New ideas can take a long time to find their audience, venue and time. Keep exploring new partnerships, new ideas, new venues; keep pursuing old partnerships, existing ideas and emerging venues.

As of this final report, we admit to some frustration over the pace at which the FEPF concepts are being developed, but excited by the *continued interest* and *growing commitment* to pursuing the concept – among fire organizations (suppression and fire use) and levels (local and national). We will continue to support these efforts.

Table 1. Crosswalk between proposed outreach activities, as indicated in our project proposal (12/6/2004), actual Accomplishments and Status (including items listed as deliverables on the JFSP project website).

Proposed	Accomplishments	Status
Website Updated website - update existing website, fact sheets, publications (**deliverable Id 2005 and 2997**)	We met this objective by hiring an external contractor to interview early adopters, then develop and implement a new communications plan. This included: • we established http://leopold.wilderness.net/research/fprojects/F005.htm • then, revised and updated this with http://leopold.wilderness.net/research/fprojects/fepf/ • added a link on the FIREHouse website http://depts.washington.edu/nwfire/project.php?projectID=47 • added a link to the Leopold Institute website from LLC's Advances in Fire Practice, and • updated fact sheets, publications posted on Leopold.wilderness.net	Complete
Workshop module - Training guide and materials sufficient for a non-PI to run a 2-4 hour training course on the FEPF.	We met this objective by: • writing, filming and producing a **video** of peer-users explaining the FEPF and outlining the basic steps of the process; and • developing and posting example workshop materials – agendas and MSpowerpoint presentations used in training sessions – to supplement on-line examples and user's guides.	Complete
Interactive User's Guide - A web-based version of the User's Guide including links to specific examples and training exercises.	We produced one on-line interactive case study from examples in the User's Guide, and supplemented this with three more recent examples that illustrate and walk readers through the phases of crosswalk and dataset development. Case studies outline each phase of development and illustrate these with interim or output tables and maps. These are posted on the updated website.	Complete
Progress Reports - Written reports and presentations at PI workshop	PI conference cancelled 2005. Not selected for presentation in 2006 or in 2007. Attended PI conference in 2007 (Destin, FL). Progress report submitted in 2006.	Complete
LLC website - Interactive User's Guide, Web-based training module, Discussion forum	Creating and posting materials on LLC's website was not feasible. Creating a discussion forum on ALWRI's site also proved infeasible. We met this deliverable by: • designing and implementing an updated web presence on ALWRI's site; • revising the design of existing and creating additional case study examples useful for training; • posting MS powerpoint presentations, agendas and other materials used in workshops; and • providing a link to the Leopold Institute website from LLC's Advances in Fire Practice page.	Complete
Evaluation tools - Description and copies of tools to assess the utility of the various TT mechanisms, and the FEPF itself	We met this objective by: • hiring an external contractor to interviews of early adopters and subsequently develop and implement a new communications plan; and • evaluating web statistics captured by the host of ALWRI's website to ascertain patterns in access and use.	Complete

Peer-reviewed article - Submit article to peer-reviewed journal focusing on science delivery *JFSP Deliverable ID: 2008*	Since quantification of the science delivery effort proved elusive, we concentrated instead on other outreach venues. We met this objective by writing a book chapter. **Book chapter –** Peterson, David L.; Evers, Louisa; Gravenmier, Rebecca A.; Eberhardt, Ellen. 2007. **A consumer guide: tools to manage vegetation and fuels**. Gen. Tech. Rep. PNW-GTR-690. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 151 p.	Complete
Nonrefereed Publications - Submit article to Fire Management Today or Wildfire magazine *JFSP Deliverable ID 2990.*	**Nonrefereed publication –** Black, A.E. 2005. Fire Effects Planning Framework. International Journal of Wilderness. Science and Research Perspective. 11(1):19-20. Leopold Publication Number 540.	Complete
	The following fit *JFSP deliverable ID 2007* – Publication –General Audience article - **Nonrefereed publication -** Wildland Fire Lessons Learned Center. 2007. **Fire Effects Planning Framework.** *Advances in Fire Practice*	Complete
	Nonrefereed publication - Miller, C. 2005. **When to prescribe**. *Wildfire Magazine* July/August. Pages 16-21.	Complete
	Lay article - Fire Management Today (internal review).	Plan to submit 1/08
New items (not initially proposed) but accomplished through JFSP funding and meeting the intent of the proposal	**Workshop** – Manti-LaSal, Dixie, Fishlake National Forests, *Richland, UT*	12/8-9/06
	Workshop – R1 Watershed, Wildlife, Fisheries and Rare Plants, Forest wildlife, hydrologists, *Missoula, MT*	6/17/07
	* * *	
	Training session – Rocky Mountain Area Coordinating Group Fuels and Fire Use Burn Boss Workshop, *Grand Junction, CO*	2/3/05
	Training session– S580 Managing Wildland Fire for Resource Benefits, Northern Rockies Training Center. *Missoula, MT.* **JFSP Deliverable ID 2988**	2/16/05
	Training session - Rx510 Advanced Fire Effects, National Advanced Fire and Resource Institute (NAFRI), *Tucson, AZ.* **JFSP Deliverable ID 2989**	2/13-17/06
	* * *	
	Consultation/training - R1 Resource Advisors working group, *Missoula, MT*	2/24/05
	Consultation/training – Western Montana Planning Zone, *Missoula, MT*	3/15/05
	Consultation/training – Sierra National Forest**,** *Prather, CA*	4/15/05
	Consultation/training – Beaverhead-Deerlodge National Forest, *Butte, MT*	10/5/05
	Consultation/training – Northern Rockies Coordinating Group's Decision Support Group, *Missoula, MT*	8/23/07
	* * *	

	Field Demonstration/tour – Mendocino National Forest, - presentation and brief training on developing and using the Fire Effects Planning Framework, possible integration with Fireshed process *Willows, CA* ***JFSP Deliverable ID 2993***	3/18/05
	Field Demonstration/tour - USFS Region 1 Spring FMO meeting – presentation and brief training on developing and using the Fire Effects Planning Framework. *Coeur d'Alene, ID* ***JFSP Deliverable ID 2994***.	3/31/05
	Field Demonstration/tour - A.E. Black, M. Taber. 2005. Fire Effects Planning fRamework; mapping benefits and risks of fire to support wildland management. Presentation/training to Greater Yellowstone Coordinating Committee, Whitebark pine meeting, Yellowstone NP. ***JFSP Deliverable ID 2991.***	6/14/05
	Field Demonstration/tour – Gila National Forest, - presentation and brief training on developing and using the Fire Effects Planning Framework, *Silver City, NM,* ***JFSP Deliverable ID 2992***	8/26/05
	Field Demonstration/tour – San Bernardino Science Day, presentation and brief training on developing and using the Fire Effects Planning Framework, *Redlands, CA*	1/16/06
	* * *	
	Invited presentation –Rx510 Steering Committee, *Missoula, MT*	6/29/05
	Invited presentation – Black, A.E. "Translating and communicating fire research results in forms useful to managers" invited presentation to USGS Fire Science conference; *Tucson, AZ*	12/5-6/05
	Invited Paper/presentation – Black, A.E. 2005. Fire Effects Planning Framework. Mapping benefits and risks of fire to support wildland management. Invited presentation to the Interagency Wildland Fire Use conference, *Albuquerque, NM.* ***JFSP Deliverable ID 2995***.	1/31-2/2/06
	Invited Paper/presentation – Black, A.E. and B. Fay. Fire Effects Planning Framework: intergrating fire, fuels and resources for risk/benefit assessments. Invited presentation to USFS R4 Integrated Fire and Fuels Workshop, *Ogden, UT* ***JFSP Deliverable ID 2996***.	3/27 - 28/06
	Invited presentation - Boise NIMO team, *conference call*	3/29/07
	Invited presentation - R1 Fire Working Group, *Missoula, MT*	4/9/07
Final Report -	This report. JFSP deliverable 2009	Complete