# Executive Summary for the Wildland Fire Workshops, March - April 2003: Bridging the Worlds of Fire Managers and Applied Fire Researchers

## Bridging the Gap

In March and April of 2003, over 250 managers, researchers, and other participants gathered and discussed lessons learned and opportunities presented from the previous fire season. The workshops were hosted by Oregon State University, University of Arizona, and Colorado State University, in close proximity to the record-breaking wildfires of 2002. Funding came from the Joint Fire Science Program, National Fire Plan, and USDA Forest Service Pacific Southwest and Pacific Northwest Research Stations.

The workshops were primarily a forum for eliciting management-driven research needs, but participants at all three locations emphasized that, as one person put it, "Fire is the current vehicle in which we are talking about sustainability." In addition to providing recommendations for future research, participants discussed essential partnerships for wildland fire managers and researchers, and the types of information, tools, and processes that were effective or could use improvement.

This summary report emphasizes common themes emerging from the three workshops, and is directed towards policy makers and those who make decisions about wildland fire research funding. A forthcoming general technical report (GTR) from the Pacific Northwest Research Station will provide additional detail and background information.

## Priorities for Future Research

The following questions are common research needs identified as high priority by participants from the Oregon, Arizona, and Colorado workshops in March and April of 2003—research needs that emerged from all three locations and whose utility spans the boundaries of the Pacific Northwest, Southwest, and Interior West regions:

- **Prediction of large fire behavior and occurrence:** How can we best modify existing tools or create new tools that better predict the occurrence and behavior of wildland fires?

- **Management potential of fuel treatments:** Taking into account climate patterns, which fuel treatment strategies are most likely to have the most impact on fire behavior, natural resources, and social values, and how should we allocate management resources across the landscape to achieve desired conditions?

- **Existing fuel conditions:** Across landscapes and in different ecosystems, what are the existing fuel conditions and rates of fuel accumulation in context of historic and current fire regimes?

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- **Post-fire fuel management activities:** After fires occur, what are the consequences of various restoration strategies related to fuel treatments?

- **Insects, disease, and other disturbance processes:** What are the interactions between insects, disease, fire, and drought conditions from stand to landscape scales?

- **Managing insects and disease:** What should be the scope of our vegetation/fuel management activities in order to mitigate the harmful effects and reap the beneficial effects of fire and other disturbance processes such as insects and disease?

- **Invasive species:** What are the interactions between invasive species and fire—how does fire spread or restrict invasive species, and how do invasive species spread or restrict fire?

- **Climate and invasive species:** How do drought conditions affect the propagation and spread of flammable invasive species?

- **Threatened & endangered species and fire:** What are the effects of wildland fire, hazardous fuels treatments, incident management tactics, and post-fire rehabilitation on threatened and endangered species; how can these activities be implemented to minimize the harmful effects and maximize the positive effects of fire?

- **The ecological role of fire in watershed processes:** How do fires, fuel treatments, and base conditions affect watershed processes such as the cycling of nutrients, sediment transport, and stream flow?

- **Watershed rehabilitation and fire:** How do post-fire watershed rehabilitation processes affect watersheds and other resources for short- and long-term time scales? How effective are current rehabilitation techniques for the short and long terms?

- **Modeling smoke emissions:** How can we improve models for predicting wildfire- and prescribed fire-generated smoke emissions, smoke movement, and impacts on human health and visibility?

- **Fire history and climate patterns:** In order to develop better prediction tools, what cab be determined about the historical natural variation in the distribution of fuel loadings, stand structure, insect and disease cycles, and the interaction between these characteristics and historical drought?

- **Fire hazard and climate:** At what point do climate patterns override the effects fuel treatments, and how does climate influence fire behavior?

- **Communication and partnership efforts:** How can we best improve communication and partnership efforts between the public, agencies, and other organizations in order to relay useful information, facilitate collaboration, and enhance the utility of scientific information for management application?

- **Optimizing decision making:** What social tools are needed by institutions (e.g., legislative branches, land management agencies, universities, stakeholder organizations, etc.) in order to improve decision making?

- **Wildland-urban interface issues:** How can we apply lessons from successful community fire planning efforts and social science to other communities in order to decrease the risk of fire to people, and what are the various policies that enhance or inhibit these efforts?

- **A cost-benefit analysis of fire:** What are the social, economic, and ecological costs, benefits, and risks of fire and fire management strategies, and how can we use these analyses to make better decisions?

- **A vision for the future:** How do we as a society decide upon the desired future conditions of the landscape? What methods are most appropriate for achieving those conditions?

- **An interdisciplinary perspective:** What are the effects of fires and post-fire management activities on ecosystems and biological communities? Addressing this question may include the use of adaptive management strategies, a critical assessment of existing models, and the development of a comprehensive fire occurrence database.

## Partnerships

Workshop participants identified several qualities that were common to effective partnerships. Partnerships are most effective when direct interaction occurs between all parties at multiple stages of research and management, including the development of a picture of desired landscape characteristics. For instance, what do we want the landscape to look like in 5, 10, 50, or 100 years? And how do wildfires and prescribed fires fit into the picture?

The existence of key individuals that are effective "bridge builders," and the need to cultivate those people, was a common theme in all locations. Participants recognized that although partnership processes should be institutionalized, the presence of these key people is necessary to build trust and maintain relationships.

Among the characteristics identified as essential for quality manager-researcher partnerships were:

- Direct interaction between partners
- Processes in place for compensation,
- Adequate time for partnership building
- Accountability for the role each partner plays

Participants also identified partnerships beyond the manager and researcher interface. Table 1 highlights some of those existing partnerships and characteristics that make them effective.

## Information, Tools, and Processes

Participants identified several qualities that were common to effective information, tools, and processes. They are typically well-funded, user friendly, involve input and direct interaction, and long-term commitment of people at multiple levels—from individual community members to decision makers in federal or tribal agencies. The existence of a "champion," someone willing to hang their hat on a project, was identified at each location as an essential component for effective and relevant research and management to occur.

Effective information, tools, and processes are typically:

- Adequately and consistently funded
- Multiple spatial and temporal scale
- User friendly
- Interactive between people at multiple levels
- Championed by a key, dedicated individual

With these elements in place, participants felt that several existing types of information, tools, and processes could be made more effective, and those already effective could be further improved. Table 2 lists key points identified by workshop participants.

## Concluding Remarks

According to workshop participants, future wildland fire research should consider a landscape perspective of fire ecology and be integrated across disciplines, most prominently with the social sciences. The highest priority recommendations for research from each location were related to the effects of fuel treatments—their efficiency, their effects on ecological and social values, their context in different ecosystems and weather regimes, or whether in some cases passive restoration techniques might be more appropriate.

Quality partnerships are often championed by key individuals, but will be further improved when partnerships are institutionalized and when direct interaction occurs between partners at all stages, when adequate time is allowed, and when rewards and accountability exist for partners. Effective information, tools, and processes for fire management and research are adequately and consistently funded, approached at multiple spatial and temporal scales, user friendly, and interactive. The need for technology transfer—namely the interpretation of science for managers and the communication of manager needs to researchers—was called for throughout the workshops as an essential need for bridging the worlds of fire managers and researchers.

Table 1. Examples of key partnerships for wildland fire research and management.

| Partnerships with… | Examples | Effective when… |
|---|---|---|
| Communities | Town hall meetings; cooperative extension services; community forestry; Firewise; demonstration areas; Gateway Community Program; soil and water conservation districts; watershed councils | Manager/researcher/extension agent is knowledgeable and respected locally; researchers are rewarded for interactions; public involved in fuels planning; public has input prior to management plan; extension agent knowledgeable in fire ecology |
| Resource specialists | Threatened and endangered species biologists; Burn Area Emergency Rehabilitation (BAER) teams | Input is solicited from researchers; knowledge from case studies is relayed to researchers |
| Schools and universities | Research; Student Career Experience Program (SCEP); Junior Fire Program | Fire science integrated into university curricula; students emerge with practical knowledge for on-the-ground application |
| Tribes | Direct partnerships with tribal councils and tribal fire managers; Bureau of Indian Affairs (BIA) | Tribal governments recognized as sovereign; each tribe recognized as unique; input solicited from tribal elders; electronic communication pathways are intact (i.e., BIA) |
| Policy makers and funding agencies | Intermediate organizations; Western Governors Association; other advisory councils; National Fire Plan; Joint Fire Science Program | Science is translated correctly; stakeholder goals are not contradictory; projects developed are applicable to managers; input occurs while writing forest plan; partnerships as a required element for grants |
| Technologists | Incident meteorologists (IMETs); Long-term fire analysts (LTANs); Fire Behavior Analysts (FBANs) | Adequate support is provided; users and managers have trust in products being developed; technology transfer is a key component |

Table 2. Examples of key information, tools, and processes identified by workshop participants.

| Information, Tools, and Processes | Examples | Effective when… |
|---|---|---|
| Models | First Order Fire Effects Model (FOFEM); Wildland Fire Situation Analysis (WFSA); BlueSky; Fire Area Simulator (FARSITE); Rare Event Risk Assessment Process (RERAP) | Driven by manager needs; accessible to all intended users; produces relevant results for clear decisions; interpreted correctly; uses up-to-date default values in addition to user input; landscape-scale; includes a spatial component; interacts with other models |
| Information clearinghouses | National Interagency Fire Center (NIFC) website; Fire Effects Information System (FEIS); National Fire Danger Rating System (NFDRS) | Regionally based; information is current; distilled; put into context of the "big picture;" local data available; central location for easy access |
| Funding | National Fire Plan (NFP) funding; Joint Fire Science Program (JFSP) announcement for proposal process | Managers are included in process; funding is consistent and long-term; cost sharing exists; local districts have input regarding how dollars are spent |
| Education | University curricula; training seminars; short courses; cooperative extension service; The Wildland Fire Primer | Integrated with other resources; adequate time for learning exists; learning is hands-on; fire science and NEPA training are integrated into university curriculum |
| Direct communication | Workshops; meetings; conferences; field trips; during fire events | Networking occurs; cultural barriers are removed (organizational, racial, and gender); incentives for communication are in place |
| Scientific publications | Scientific journals; general technical reports (GTRs) | Peer reviewed; provides synthesis of existing information; syntheses are given credit; abstracts are searchable; jargon is minimal |
| Research | Original, synthesis, meta-analysis: research on physical, ecological, and social processes related to fire | Collaboration with end user occurs at all phases (including hypothesis generation); design is statistically robust; results are reported with statement of uncertainty; researchers interact with one another and with managers; research is interdisciplinary |
| Monitoring and Reporting | Fire Effects Monitoring (FIREMON); National Fire Plan Operating and Reporting System (NFPORS); Data Ram Cache; Remote Automated Weather Stations (RAWS); Long Term Ecological Research (LTER) stations; adaptive management projects | Occurs long-term; consistent protocols across large spatial and temporal scales; maps of fire severity and fuel condition class are generated |
| Post-fire recovery efforts | Burn Area Emergency Rehabilitation (BAER); Emergency Stabilization and Rehabilitation (ESR) | Standard protocols exist; long-term effectiveness monitoring occurs; integrated with research; assembly of teams is evaluated |
| Demonstration areas and case studies | Blue Ridge Demonstration Project, AZ; Hayman Fire case study, CO; Blue Mountains Demonstration Project, OR | Comparative analysis is used; ran by a respected official |
| Mass media | Radio; newspapers; television broadcasts; community bulletins; web sites; flyers | Information is timely and has correct context |
| Incident management | Community evacuations; implementation of fire management plan (FMP) | Pre-planning occurs; wildland-urban interface communities have community fire plan in place (e.g., Firewise); standard safety protocols exist; other information, tools, and processes are effective and in place |