

ORGANIZATIONAL LEARNING CONTRIBUTES TO GUIDANCE FOR MANAGING WILDLAND FIRES FOR MULTIPLE OBJECTIVES



Thomas Zimmerman and Tim Sexton

Since the inception of organized fire suppression in the early 1900s, wildland fire management has dramatically evolved in operational complexity; ecological significance; social, economic, and political magnitude; areas and timing of application; and recognition of potentially serious con-

Social pressures and organizational biases have created barriers to program development for wildland fire management.

sequences. Throughout the past 100 years, fire management has matured from a single-dimensional program focused solely on control and immediate extinguishment to a multidimensional program. Throughout this period, fire managers have adapted their responses to changing conditions, emerging knowledge, and increasing experience. Now, they can utilize the full spectrum of responses to wildland fire to achieve both protection and ecological benefits based on objec-

Tom Zimmerman is the program manager for the Wildland Fire Management Research, Development, and Application Program, Forest Service, Rocky Mountain Research Station, Boise, ID. Tim Sexton is the national fuels specialist for the Forest Service, National Interagency Fire Center, Boise, ID.

As organizational learning has affected the entire wildland fire management program, its influence on the management of wildland fires for resource benefits has accounted for significant advances, directly contributing to the program's evolution and growth, including:

- Expanded knowledge and understanding of fire ecology and the natural role of fire;
- Continual adjustments to the Federal wildland fire management policy;
- Focused planning, procedures, and precision;
- Advanced risk assessment of management knowledge and capabilities;
- Expanded and improved directions and magnitude of operational procedures;
- Increased management of fires as an ecological process, with implementation scales expanded beyond wilderness areas and into all fire regimes and vegetation types;
- Improved capability to manage fires for multiple objectives, and to redefine those objectives throughout the life of a fire;
- Improved capability to manage fires across a wider fire behavior range; and
- Implemented after-action reviews to observe, evaluate, and document accomplishments, successes, and failures.

tives described in the applicable land and resource management plans and fire management plans.

The expanded knowledge of fire's natural role has markedly facilitated the increased use of wildland fire to accomplish beneficial ecological effects. Management of naturally caused wildland fire to protect, maintain, and enhance resources and, as nearly as possible, to function in its natural ecological role, is one of many management

responses supported by the new "Guidance for Implementation of Federal Wildland Fire Management Policy" (USDA and USDI 2009).

What we know today about management of wildland fires to meet resource objectives evolved from decisions made nearly 40 years ago about the use of fire in wilderness areas, national parks, and other lands. This progressive thinking and the associated adaptive responses have extended fire man-

Table 1—Critical tasks important to organizational learning.

Task	Specific Activity	Outcome
Acquire new information.	<ul style="list-style-type: none"> • Collect information; • Consolidate program history and —current status; and • Develop shared vision. 	<ul style="list-style-type: none"> • Information and existing information from personal sources documented; • Information accuracy validated; • Current policies, procedures, and processes reviewed; and • Program goals and purposes better defined.
Analyze the best procedures.	<ul style="list-style-type: none"> • Analyze program development; • Examine past performance; • Establish standards and baselines; and • Analyze interdependency of all program elements. 	<ul style="list-style-type: none"> • Programmatic needs identified; • Past practices, both good and bad, both limiting and facilitating, evaluated; • Past experiences that need to be replicated or eliminated identified; and • Best practices that lead to superior performance and accomplishment identified.
Apply knowledge, processes, technology, and proven practices.	<ul style="list-style-type: none"> • Experiment with new knowledge applications; • Experiment with new technological applications; • Incorporate best knowledge and technology into business; • Address problem solving; and • Transfer knowledge. 	<ul style="list-style-type: none"> • Continual flow of new ideas, knowledge, and technology into application established; • Distinction between factual information, perceptions, and personal viewpoints recognized; • Knowledge, principles, guidelines, procedures, practices, etc., transferred through all available methods to practitioners; and • Application through the use of a dynamic learning environment improved.
Archive overall processes and results.	<ul style="list-style-type: none"> • Document program development, practices, and organizational growth; and • Ensure the retention of critical information. 	<ul style="list-style-type: none"> • Information transfer processes improved; • New practices, experiences, and knowledge, both positive and negative, documented; and • All information for future reference and application retained.

agers' knowledge and experience. We now think of management of naturally caused ignitions as an essential tool for achieving beneficial ecological effects.

Organizational Learning

Organizational learning has contributed to continuous and programmatic development of the guidance for management of wild-

land fires and has increased the ability of personnel to manage fires for multiple objectives by:

- Recognizing the importance of consolidating program examination;

- Acquiring new information;
- Analyzing the best procedures;
- Applying knowledge, processes, technology, and proven practices; and
- Archiving the overall processes and results and using the information to improve program effectiveness.

Fire managers recognize the importance of examining the results of management responses to wildland fire and applying the information to improve program effectiveness. However, organizations are sometimes controlled by social influences that hinder innovation and administrative mandates that limit response.

Barriers to Managing Wildland Fire as an Ecological Process

Social pressures and organizational biases have created barriers to program development for the management of wildland fires as a natural process. Such internal and external forces have led to divisiveness and a lack of clear and concise messages, direction, and goals. This situation has stifled overall organizational growth, restricted productivity, and has most certainly fueled negative public attention.

Public and governmental responses to specific fire situations have promoted agency reluctance to advance wildland fire management and resulted in procedural statements, operational guidance, and other circumstances intended to limit the magnitude and slow implementation of change in fire management. The conviction that

The conviction that all wildland fires can and should be suppressed is long standing, but mixed success in achieving this provides widespread support for defining multiple fire management objectives.

all wildland fires can and should be suppressed is long standing, but mixed success in achieving this provides widespread support for defining multiple fire management objectives. This belief has limited fire managers from full utilization of “emerging knowledge” of fire’s natural role, fire effects, and the ramifications of fire exclusion in the development of management responses.

Administrative barriers have existed throughout the history of wildland fire management. Use of wildland fires to support ecological processes has been viewed as an action that is distinctly separate from wildland fire management and with different operating standards. Internal policymaker resistance to changes that advocate expanded use of wildland fire have surfaced in every review and revision of wildland fire management policy.

Managing wildland fire to achieve land and resource management goals continues to be riddled with misperceptions and misinformation, which have limited both programmatic growth and overall effectiveness. As more credibility

has been placed on identifying best practices for wildland fire management, efficiency and accomplishment have improved; yet despite this development, resistance still affects resource agencies to some degree today.

Changing Perspectives

Today, organizational learning promotes a broader understanding and awareness that is beginning to change outdated thinking and reduce barriers. Organizational learning is spurring policy revisions, directing funding, and relaxing fiscal constraints for managing wildland fires for multiple objectives. The 2009 “Guidance for Implementation of Federal Wildland Fire Management Policy” allows wildland fires to be managed concurrently for many objectives and allows personnel to redefine those objectives as conditions change. Additionally, public perceptions and support have improved, workforce limitations have been reduced, and safety concerns have been addressed.

Finally, fire’s role in a healthy ecosystem is receiving positive recognition. Management of wildland fire for ecological benefits has grown from a wilderness-only application to one that spans all land-use situations with marked increases of land types considered suitable for application and expanded operational capabilities.

References

- USDA and USDI. 2009. Guidance for Implementation of Federal Wildland Fire Management Policy. Washington, DC: U.S. Department of Agriculture and U.S. Department of the Interior: 20 p. ■

Table 2—Specific examples of organizational learning benefits that support the management of wildland fire for resource benefits.

Changes and Advancements	Learned Outcome	Fire Management
Expanded knowledge of fire and its natural role	<ul style="list-style-type: none"> • Better understanding of wildland fire as a natural process and of its role in restoring and maintaining healthy ecosystems; and • Understanding that many ecosystems contain plants that depend upon periodic fire presence for their continued existence and that many of the effects of fire are positive. 	<ul style="list-style-type: none"> • Significant knowledge base of literature and reference materials established; The Fire Effects Information System Web site <http://www.fs.fed.us/database/feis> provides fire managers with an array of reference and support for land management and project planning; and the Wildland Fire Decision Support System <http://wfdss.usgs.gov/wfdss/WFDSS_Home.shtml> assists fire managers and analysts in making strategic and tactical decisions for fire incidents.
Continual adjustments of policy	<ul style="list-style-type: none"> • Understanding that wildland fire policy must provide flexible and responsive direction for wildland fire management—without unnecessary constraints, and readily adapting to emerging knowledge, technology, and science. 	<ul style="list-style-type: none"> • Accountability for long-term unplanned fire events managed for resource benefits that consider preparedness levels and fire management plan completion; • Prescribed natural fire eliminated as a strategy; • Wildland fire use eliminated as a defined and separate entity from other wildfires; • Approval of naturally caused ignitions to be managed as an ecological process, and to be managed for multiple objectives. • Fiscal procedures established that are conducive to greater use of wildland fire for resource benefits; • Standardized qualification of all fire management activities; and • Specific policy elements in the areas of science, planning, fire management, and ecosystem sustainability.

Changes and Advancements	Learned Outcome	Fire Management
Improved planning processes	<ul style="list-style-type: none"> • Successful application of fire to ecosystems depends upon detailed planning at all levels from the land management plan to the fire management plan and into specific fire implementation action planning. 	<ul style="list-style-type: none"> • Guidance to incorporate fire effects and the natural role of fire information into land management plans; • Land management processes that guide fire management planning and implementation; • Fire management plans that translate and support land management plans and on-the-ground action; • The Wildland Fire Decision Support System, providing the most detailed and comprehensive fire management planning and implementation information for fire use decision and tactical action to accomplish the strategic objectives of an unplanned ignition managed for resource benefits; and • A process developed with a focus on efficient long-term risk assessment, strategic planning, and tactical implementation instead of short-term, tactical operational implementation.
Risk assessment and decision support tools	<ul style="list-style-type: none"> • Acceptance of the importance of assessing risks associated with wildland fire management in terms of values, hazards, and probability in order to more adequately determine if the level of risk can be accepted and successfully mitigated or eliminated; and • Recognition of the importance of obtaining better information, reducing uncertainty, assessing potential fire outcomes, evaluating consequences of failure, determining probabilities of success, evaluating potential costs, and identifying values to be protected to better support decisionmaking. 	<ul style="list-style-type: none"> • Significant advances in predicting fire behavior spread and intensity, analyzing climatological and meteorological data, and assessing rare weather occurrences; • Advances in predicting fire effects, smoke production, and smoke dispersal; estimating fire-spread areas; identifying values at risk; and evaluating probabilities of the fire spatial extent; • Enhanced experience and knowledge in utilizing this kind of information in support of fire management decision-making, planning, and implementation; and • Improved decisionmaking processes.

Changes and Advancements	Learned Outcome	Fire Management
Increased management of wildland fires for ecological benefits	<ul style="list-style-type: none"> • Balanced fire management program with multiple management objectives; • Recognition of the value and importance of managing wildland fire for resource benefits; and • Recognition of the role wildfire can play in long-term restoration programs. 	<ul style="list-style-type: none"> • Improved understanding of wildfire and its primary and secondary benefits; and • Expanded fire management accomplishments, strengthened ecosystem maintenance and restoration, increased vegetation mosaics, decreased long-term wildfire potential, increased community protection, and advanced land management practices.
Development of operational procedures	<ul style="list-style-type: none"> • Better understanding that operational mitigation actions must include the full range of firefighting responses and tactics as appropriate to the specific situation; and • Understanding that successful wildland fire management requires detailed planning that defines threats, operational mitigation actions, constraints, number, and types of resources needed, and contingency actions. 	<ul style="list-style-type: none"> • Increased capability to respond to wildland fire under a wider range of jurisdictional situations and individual management areas; • Ability to acquire and utilize all firefighting resources as needed to respond to wildland fires, regardless of objectives; and • Established dedicated resources for use in managing wildland fire for resource benefits.
Expansion beyond wilderness	<ul style="list-style-type: none"> • Acceptance of the use of wildland fire to protect, maintain, and enhance resources and, as nearly as possible, to function in its natural ecological role as an effective management practice in wilderness and nonwilderness; and • Realization that successful management across all landscapes is dependent upon continued and proactive collaboration among Federal and State agencies, private organizations, and private landowners. 	<ul style="list-style-type: none"> • Increased vegetation mosaics, decreased long-term wildfire potential, and increased community protection capabilities resulting from the expansion of the use of wildland fire as an ecological process outside wilderness; and • Expanded fire management accomplishments, strengthened ecosystem maintenance and restoration, community protection strategies, and advanced land management practices achieved by managing naturally caused ignitions to accomplish resource benefits beyond wilderness to across all land-use situations, where applicable.

Changes and Advancements	Learned Outcome	Fire Management
Management across wider fire behavior ranges	<ul style="list-style-type: none"> • Understanding of the need to include wildland fire management across all fire regime classes and diverse situations, depending on land management direction and constraints; and • Understanding that the success of managing wildland fire for resource benefits is measured by fire effects and not solely by fire type and behavior. 	<ul style="list-style-type: none"> • Growing experience with managing fire in all fire regime classes and all fire behavior scenarios; and • Successful examples of management of high-intensity stand replacement wildland fires.
Use of After Action Reviews	<ul style="list-style-type: none"> • Immediate illumination of both successes and failures; • Awareness of the importance of timely and frank assessments of actions and presentation of outcomes regardless of success or failure; and • Understanding the importance of documenting both successes and failures in fire management planning and implementation. 	<ul style="list-style-type: none"> • Immediate feedback to program efficiency; • Facilitated progression toward a high-reliability organization; and • Established dynamic feedback mechanism supporting improved and advanced processes, procedures, and policy.
Documentation	<ul style="list-style-type: none"> • Understanding the importance of archiving both successes and failures in fire management planning and implementation; and • Understanding the value of saving examples and practical knowledge. 	<ul style="list-style-type: none"> • Markedly improved and advanced training; and • A substantial record of accomplishments, examples, case studies, etc., accessible to fire management practitioners.