



Knowledge management is getting the right information to the right people at the right time.

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**Lesson Learned –**  
 An innovative approach or work practice that is captured and shared to promote repeat application. A lesson learned may also be an adverse work practice or experience that is captured or shared to avoid recurrence.

**Best Practice –** A process, technique, or innovative use of resources, technology, or equipment that has a proven record of success in providing significant improvement to an organization.

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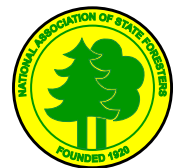
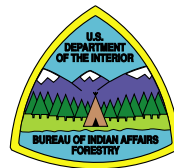
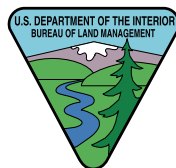
# Prescribed Fire and Fire Use Lessons Learned



Photo: Clear Trap Prescribed Burn September 2004 Tom Fuller

*In conjunction with the “Achieving the Learning Organization – Interagency After Action Review Workshop” of November 2003, seven fire management officers shared some of their cumulative experiences and lessons learned from their several decades of combined experience managing prescribed burns and fire use events. Special thanks to Brett Fay, Kim Soper, Rod Dykehouse, Lary Floyd, Greg Vergari, Lisa Elenz and Larry McCoy for sharing their knowledge with the wildland fire community.*

These fire management officers (FMO) have served as Burn Bosses and Fire Use Managers. They all agreed that they had learned some of their most valuable lessons from colleagues and mentors early in their fire careers. In addition, all said they had “lost” at least one prescribed burn during the past 20 years. Their discussion included whether they had learned more from escaped burns or from their successes. Most agreed that, while they learn from every burn, they remember lessons learned from escaped fires more vividly. They shared the following lessons learned.



## The Value of Public Education and Information

Public education and information plays a vital role in prescribed burning and wildland fire use. This role continues to grow and become more critical as more of the general public is exposed to these management tools. Fire managers must therefore address public education and information, in part, because as prescribed burns and fire use events continue to increase in complexity,

## Managing Multiple Events

When multiple burns are being planned, executed, or monitored; an FMO with experience as a Type 1 Burn Boss can be invaluable. The FMO must coordinate smoke management, plan for contingencies, and provide various notifications to individuals and agencies. All these tasks consume a significant amount of time. One FMO serving as a Type 1 Burn Boss learned this lesson, at the cost of a significant escaped burn. During burning operations spanning multiple

### KEY DEFINITIONS

#### Prescribed Fire

Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

#### Prescribed Fire Plan (Burn Plan)

This document provides the prescribed fire burn boss information needed to implement an individual prescribed fire project.

#### Wildland Fire Use

The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in Fire Management Plans.

#### Wildland Fire Implementation Plan (WFIP)

A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.

Source: National Park Service Fire and Aviation Management Web site. ★

the public understanding must also evolve. The stakes are high because the public has not yet accepted prescribed burns or fire use events of extended duration. Consequently, fire managers must incorporate public education and information measures during prescribed fire and wildland fire use planning, and execute a positive public relations plan during implementation.

Some agencies have hired dedicated staff specialists to handle the public tasks associated with prescribed burn or fire use events. Units operating in an interagency environment have found a fire education specialist or information officer position to be invaluable. However, many fire organizations increasingly find that their public efforts fall, not to an information officer, burn boss or fire manager, but to the unit FMO. The FMOs believe there is a need to analyze the complexity of the information function for a given project, and staff accordingly for successful implementation.

operational periods, the FMO must make certain that someone is assigned to tracking these components on their behalf and advise them of situational changes in a timely manner.

As agencies increasingly employ wildland fire use as a tool, FMOs find that they also face the challenge of managing multiple, simultaneous fire use events. Cited as an example during 2003, a National Park and two adjacent National Forests had six fire use events burning at the same time. The three FMOs involved constantly found themselves on a steep learning curve coordinating their operations. However, it was felt that the complexity of the situation provided an excellent experience, which they can now share with others and will draw from for themselves in the future.

For example, during these events one FMO brought in a Fire Use Management Team (FUMT) that prepared and implemented the third stage of Wildland Fire Implementation Plans (WFIP) for two of the fires on the Forest.

The FMOs agreed that ordering a FUMT to manage a wildland fire use event, particularly during Preparedness Levels 4 and 5, offers the fire manager and agency administrator many benefits due to their level of expertise. However, just as when a unit hosts a Type 1 or Type 2 Incident Management Team, the unit

**These experienced FMOs have found that the support of their neighboring agencies is essential to success.**

FMO will still find themselves coordinating the many responsibilities that are necessary to assure the success of a FUMT and unit partnership. Keeping the agency administrator informed represents just one of many vital tasks for the FMO. Even if a unit does not order a FUMT to manage their wildland fire use event, the unit must document the event history, and should note their lessons learned, with the goal of sharing that new knowledge through the Wildland Fire Lessons Learned Center.

These experienced FMOs have found that the support of their neighboring agencies is essential to success. In addition, they believe that the agency administrator tends to have an increased level of confidence knowing that nearby cooperators are involved and prepared to assist. Additionally, good documentation provided by the FMO that illustrates the unit's fire history can reinforce the agency administrator's confidence by enabling them to see how management goals and objectives are accomplished through wildland fire use.

### The Value of Communicating Objectives and the After Action Review (AAR)

One FMO reflected back on an escaped prescribed burn of several years ago. Five weeks after the District had conducted a helitorch burn, fire rekindled in a punky log on the primary unit's edge. The original burn had been only marginally successful, and had not consumed enough fuels. Recognizing an opportunity, the FMO, who was also Burn Boss, assembled a team to manage the rekindled fire. The resulting effort required a 24-hour operation; with the Burn Boss and an ignition team igniting at night, and the holding group working during the day.

In one part of this burn unit, the fire moved cross-slope against strong down-drainage winds during the

night, a very unusual event in this fire particular environment. This positioned the fire for an upslope run when daytime heating began. The day holding personnel and the night ignition personnel, including the Burn Boss, debriefed at transition meetings held at the end of each daytime operational period.

However, no similar meetings were occurring as the night ignition personnel came off shift and the day holding personnel came on shift. Consequently, important communication connections were not made and the Burn Boss's intent for holding was not clearly communicated. This lack of communication resulted in the holding specialist not checking on a problem area the following morning. Dispatch woke the Burn Boss at about 11:00 a.m. to inform him that the burn had escaped. Looking back on this event, the Burn Boss believes that they could have prevented the escape if they had taken the time to conduct After Action Reviews (AAR) after each day and night operational period.



Photo: Prescribed Burn Briefing September 2004 David Eaker

Other FMOs also stressed the value of conducting daily AARs during multi-day prescribed burns or fire use events. During these extended operations, the AAR provides an effective tool to enable discussion and agreement on what the organization needs to sustain and what it needs to improve for the next operational period. Regular and immediate AARs help ensure that significant operational details are communicated and do not slip through the cracks.



Photo: Clear Trap Prescribed Burn September 2004 Zion National Park, Utah Ron Mitchell

## Interagency Wildland Fire Key Messages

Key messages are general concepts that agencies are encouraged to incorporate into their discussions, print materials and other resources used in communication, education, information, and prevention efforts. Key messages are umbrella statements that require additional supporting points and examples for context.

- 1) Wildland fire is an essential, natural process.
- 2) Society's influence has altered historic fire cycles, leading to a dangerous and difficult build up of vegetation in our wildlands.
- 3) Land management agencies are committed to a balanced fire program that will reduce risks and realize benefits of fire.
- 4) Public education is necessary to the success of fire management programs.

Though the communication of fire issues is extensive throughout the wildland fire community, our messages have not been consistent. This appears to be especially true in prescribed fire and wildland fire use. For our own agency personnel and the public to truly understand the role of wildland fire, we must communicate clearly and consistently across all agencies.

For more information on the Interagency Wildland Fire Key Messages developed by the NWCG Wildland Fire Education Working Team go to: [http://www.nwcg.gov/teams/wfewt/key\\_message\\_announce.htm](http://www.nwcg.gov/teams/wfewt/key_message_announce.htm) and click on Attachment 1. ★

### Capturing Fuels and Fire Behavior Knowledge

One of the FMOs is both a Burn Boss and a Fire Behavior Analyst. He suggested that the Wildland Fire Lessons Learned Center could provide a valuable service disseminating lessons learned on how fuels react under various prescribed burning conditions. This Burn Boss believes that there should be no real surprises in how fuels react. However, fire personnel find it difficult to maintain strong knowledge of potential fire behavior in the numerous fuel types in which they might work. Consequently, the more Burn Bosses are able to share their experiences, the better prepared both Burn Bosses and fire personnel will be about fire behavior.

### Contingency Planning in Extreme Drought Conditions

Many units have only minimal experience conducting large, landscape-scale, multi-day prescribed burns often because this is a relatively new concept. Fire managers struggle to plan for a worst case contingency. In addition to current conditions, contingency plans must take into account long-term indicators of fire behavior potential including drought, weather trends and fire danger rating indices. Specifically, the planning unit must institute mitigating measures that address preventing escaped fires when fire danger rating indices reach the 97<sup>th</sup> percentile.

### Lessons In Complexity

The FMOs discussed whether agencies should classify all multi-day prescribed burns as "complex." Too often, Burn Bosses will ignite within prescription, only to find themselves trying to hold a unit that two or three days later goes out of prescription, with a lot of fire on the ground.

Conditions associated with the current extended western drought, and resulting extreme fire behavior conditions, have complicated planning for both prescribed fire and wildland fire use. One unit has chosen to assign a Type 1 Burn Boss to mentor a Type 2 Burn Boss, even when prescribed burn projects are not classified as complex.



Photo: Rattlesnake Peak Wildland Fire Use  
August 2004 Wenatchee NF WA

## Situational Awareness and Human Factors

The FMOs agreed on the critical need to monitor their staff and maintain situational awareness during prescribed burns and fire use events. They continually observe how people are interacting with one another and pay particular attention for any signs of “target fixation.” They also remind themselves to step back and keep their own perspective on the big picture. This is the main reason why Burn Bosses cannot have the drip torch in their hand.

While attention to human factors has permeated the fire suppression community, people’s perceptions and attitudes are still evolving in prescribed fire. Consequently, fire management personnel must ask themselves whether they are maintaining the same quality of situational awareness in prescribed fire as they do during a fire suppression event. Do people cut corners and de-emphasize situational awareness because prescribed fires are planned events or because the agencies do not consider prescribed fires as hazardous duty? To elevate situational awareness on prescribed burns several FMOs agreed that Burn Bosses must prepare, brief and distribute a daily incident action plan. The plan must include objectives, an organization chart, and a communication plan.



Photo: Fire Use Module Spike Camp WA

- ★ The involvement and support of neighboring agencies is essential to successful management of prescribed burns and fire use events.
- ★ The FMO can reinforce the agency administrator’s level of confidence via the utilization of good documentation illustrating the unit’s fire history. This approach enables the agency administrator to see how management goals and objectives can be achieved through the wildland fire use process.

. . . fire management personnel must ask themselves whether they are maintaining the same quality of situational awareness in prescribed fire as they do during a fire suppression event.



Photo: Mammoth Creek Prescribed Burn Dixie NF Utah 2002

## Summary of Lessons Learned

- ★ Management of public information represents an important function when planning and implementing prescribed fire projects and wildland fire use events. Analyzing the complexity of the information function for a given project and staffing the function accordingly is critical to success.
- ★ Success requires that someone must be dedicated to coordinating and monitoring the numerous tasks that must be given attention when multiple burns are being planned and executed. An FMO experienced as a Type 1 Burn Boss proves invaluable.
- ★ Ordering a FUMT to manage multiple wildland fire use events, particularly during Preparedness Levels 4 and 5, offers the program manager and agency administrator many benefits.

- ★ Conduct daily end-of-shift AARs during multi-day prescribed burns or fire use events. During these extended operations, the AAR process provides an effective tool to enable discussion and agreement on what the organization needs to sustain and what it needs to improve in the next operational period. AARs also help ensure that significant operational details do not slip through the cracks.
- ★ Contingency plans must take into account long-term indicators of fire behavior potential, including drought, weather trends and fire danger rating indices.
- ★ Assure that personnel are maintaining the same quality of situational awareness in prescribed fire as they do during fire suppression. Elevate situational awareness on prescribed burns by preparing, briefing, and distributing a daily incident action plan that includes objectives, an organization chart, and a communication plan. ★

## After Action Review (AAR) Tips



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### **Tips for Conducting AARs**

Schedule shortly after the activity is completed.

Remember the 25, 25, 50 suggested time allotment.

Focus on WHAT not WHO.

Establish clear ground rules: encourage candor and openness, this is dialog – not lecture or debate, focus on items that can be fixed, keep all discussions confidential.

Skilled facilitation is recommended (an individual with less at stake like a staff member outside of the chain of command. Also see AAR Facilitation Techniques)

#### **1. What did we set out to do?** *(Spend about 25% of total time on this question and the next)*

Establish the facts.

Purpose of the mission and definition of success

- Key tasks involve
- Conditions under which each task may need to be performed
- Acceptable standards for success

#### **2. What actually happened?**

Continue to establish the facts

If available, it is best to pool information from three diverse/objective sources:

- Observer-controller
- Instrumentation (voice records from dispatch, RAWs data, etc)
- Video taping

Participants should come to agreement on what actually happened.

Pool multiple perspectives in a process that resembles “majority rules”.

#### **3. Why did it happen?** *(Spend about 25% of total time on this question)*

Analysis of cause and effect

Focus on WHAT not WHO.

Provide progressive refinement for teasing out explanations of what occurred. This will lead into developing possible solutions.

#### **4. What are we going to do next time?** *(Spend about 50% of total time on this question)*

Solutions will arise naturally once problems are identified and understood.

Focus on items you can fix, rather than external forces outside of your control.

Identify areas where groups are performing well and should sustain. This will help repeat success and create a balanced approach to the AAR.

Sustain/Maintain:

Improve:

***Did lessons learned, trends, concerns, processes or ideas come up that you want to share immediately with other units horizontally & vertically? Highlight them on the ICS 214 Unit Log. Submit them to the Lessons Learned Center as a Spark that others can learn from.***

There are several formats that you might use. Two possibilities are suggested below:

- Issue, Discussion, Recommendation
- Concept of the Operation, Results, Trends, Recommendation

#### ***Is an After Action Review Rollup Recommended at this point or end of the project?***

Submit completed AAR Rollups to the Lessons Learned Center:

- What was the most notable success at the incident that others may learn from? Please explain.
- What were some of the most difficult challenges face and how were they overcome? Please explain.
- What changes, additions or deletions are recommended to wildland fire training?
- What issues were not resolved to your satisfaction and need further review?

Notes: