

**Warm Fire After Action Review
North Kaibab Ranger District
Kaibab National Forest
October 11, 2006**

An After Action Review (AAR) of the Warm Wildland Fire Use Fire was conducted on the North Kaibab Ranger District on October 11, 2006. The purpose of the AAR was to review decision-making and actions taken during the Warm Wildland Fire Use Fire in order to identify lessons learned that will be incorporated into the Kaibab National Forest's wildland fire use program. Participants in the AAR included the following: Kaibab National Forest Supervisor, North Kaibab District Ranger, Fire Use Team Incident Commander, Incident Management Team Incident Commander, Kaibab National Forest Fire Staff Officer, Acting North Kaibab District Fire Management Officer (FMO), the initial Fire Use Manager for the incident, and Resource Advisors.

What did we set out to do?

The intent was to manage the Warm Fire for resource benefits.

The following Wildland Fire Use (WFU) objectives were established:

1. Provide for firefighter and public safety.
2. Protect developments at Jacob Lake.
3. Restore fire to the ecosystem.
4. Reduce fuel loadings.

The Warm Fire would continue to be managed as a WFU as long as those objectives continued to be met.

What actually happened?

Decision to Manage the Fire

Previous efforts at WFU on the North Kaibab Ranger District occurred after the arrival of the monsoon season and were not considered very successful. Typically, these WFU events remained extremely small, and fire behavior was so minimal that it did not produce desired effects.

The Warm Fire was started by lightning June 8. It was located on the west side of Highway 67 across from where the Jack Jolly Prescribed Fire was conducted in May. The fire was primarily a backing fire with southwest winds. It was burning at a relatively low level of intensity. Late winter snows and spring rains had moderated drought conditions. The Southwest Region was at Preparedness Level 3 (on a scale of 1-5). The District FMO understood that the fire danger indices would trend up but believed that the peak would be a relatively short number of days based on previous seasons.

The FMO made an initial determination to manage the fire as a WFU. The North Kaibab District Ranger was contacted and informed about the fire, current fire behavior, and the weather forecast. The District Ranger concurred with the decision to manage the fire as WFU. A Fire Use Manager Type 2 (FUM2) was assigned to the incident and a Stage I Wildland Fire Implementation Plan (WFIP) was drafted.

The Stage I WFIP, which establishes the information base for managing a WFU, took into account that there were two-to-three weeks of the peak fire season left. The fire location along the highway offered easy access and the opportunity for management actions, if necessary.

Initial Actions

On June 9, the Stage I WFIP was presented to the District Ranger, and it was approved. On June 10, resources were assigned to the fire. The primary concern was safety along Highway 67. Traffic control along Highway 67 was implemented, and a pilot car system was utilized when necessary.

For the first few days, the Warm WFU was a low-intensity backing/flanking fire with one-to-two foot flame lengths. On June 11, the decision was made to order a Fire Use Management Team (FUMT) because there were still two-to-three weeks left of the peak fire season and the WFU complexity was beginning to exceed the capabilities of the local organization.

The major workload continued to be highway safety and traffic management. The Arizona Department of Transportation (ADOT) was informed but not involved in traffic control. Some spot fires across Highway 67 occurred early on but were easily suppressed.

Public Contact

In the very early days of the WFU event, Grand Canyon National Park was informed on WFU activities, and prevention personnel visited Jacob Lake Inn, North Rim Country Store, Kaibab Camper Village, Jacob Lake Campground, Allen's Trailrides, and Kaibab Lodge. On June 10, the Kaibab National Forest issued the first news release about the Warm WFU. It was about 2 acres in size at the time. The news release was issued to virtually all media outlets in northern Arizona and to agency and organization personnel in the area. The forest continued issuing daily news releases until the FUMT information officers were able to take over that function. Besides issuing news releases, the forest also ordered an information officer to be assigned to the Warm WFU. The information officer used the information from the forest news releases to conduct traplines (personal visits) in local communities. When the FUMT arrived, they also took over this community relations function.

Initial Maximum Manageable Area (MMA) Development

The initial draft MMA was about 4,000 acres in size. The MMA delineates the geographic limits of the fire area as defined by the capability of management actions to meet resource objectives and mitigate risk for a given wildland fire managed for resource benefits. The rationale behind the 4,000-acre draft MMA was that it could be easily defended using district fire resources. There was some discussion that the draft MMA might not be large enough to allow for a wide range of tactical options.

There were some early discussions focused on preventing the WFU from spreading to the east side of Highway 67 due to potential changes in fire behavior. This did play a role in utilizing Highway 67 as part of the boundary of the initial draft MMA.

Transition to Fire Use Team

A briefing for the FUMT occurred on June 12. A Stage II WFIP, which represents a continuation of management for resource objectives, was not completed at that time. It apparently never was completed. The FUMT took command of the fire at 0800 on June 13.

Fire Use Team Management

The Incident Command Post (ICP) was established at the Jacob Lake Work Center. The Team was told by forest officials that the WFU could not move into the Mexican Spotted Owl (MSO) critical habitat that was located southeast of the fire. The District Ranger also had general concerns about managing fire in mixed conifer due to uncertainty about how fire would behave given the overly dense conditions.

On June 13, the fire spotted east of Highway 67, and the opportunity to allow the fire to grow to the east was evaluated. The FUMT called the District Ranger at home and discussed the possibility, and it was agreed to expand the draft MMA to the east.

This was a significant decision in the management of the Warm WFU. There was a very short timeframe for making the decision to either suppress the spot fire or allow it to grow. Although there had been some initial hesitation about allowing the fire to grow east of Highway 67, this concern was not raised in the making of this decision. In hindsight, there may have been insufficient time to fully analyze all of the implications of this decision.

Additional fire resources were ordered, but some orders went unfilled. The Warm WFU did not have a high priority when compared to other fires within the Southwest Region. On the evening of June 19, the fire crossed Forest Road 225 (one portion of the draft MMA at that time). In hindsight, the FUMT was probably inadequately staffed for the fire's complexity at that time due primarily to a lack of operational overhead and resources.

On June 20, the draft MMA was changed to Highway 89A and forest roads 224 and 217. The new strategy was to allow the fire to grow to the east into pinyon-juniper woodlands.

It was believed that the fire would go out on its own once it moved into those lighter fuels. On June 22, fire behavior moderated, and the FUMT, along with the District Ranger and Acting Forest Supervisor, felt more comfortable with the fire and its behavior.

The District Ranger received an update on the morning of June 24. The FUMT was going to focus on the north side of the fire, picking up spot fires and protecting the Jacob Lake area. The District Ranger wanted to ensure the north side was secure and wanted the south side of the fire to be held in place.

Based on the briefing on the morning of June 24, the District Ranger believed it would be prudent to order an Incident Management Team Type II (IMT2) to replace the FUMT instead of another FUMT. The rationale was that if it became necessary to shift to a suppression strategy, the IMT2 would be there and ready to go. The IMT2 was ordered. The District Ranger flew over the fire on June 24 and felt comfortable with what was seen on all sides of the fire at that time.

There was a potential for fire to curve back toward Jacob Lake from the east. The Incident Meteorologist was predicting NE winds to develop on June 24. There was also a need to get additional resources to staff the southeast side of the fire. The FUMT was trying to get additional resources with little success.

It is important to note that throughout the duration of the WFU event, there were periods of very active fire behavior and activity followed by relatively calm periods. When the fire would become very active, there was serious evaluation occurring as to further courses of action with the fire. Then, a period of less activity would take place and comfort levels would rise once again. The fact that this took place several times should have led to serious consideration as to whether or not to proceed with the WFU.

MMA Development

The FUMT thought having a good MMA boundary was vital to success. This was discussed with the district. The team thought that the original draft MMA was too small and wanted a larger area within which to work with Management Action Points (MAPs). MAPs are tactical decision points identified on a map, where an escalation or alteration of management actions is warranted due to fire activity, etc.

Stage III WFIP Development

Changes in the draft MMA throughout the WFU affected development of the Stage III WFIP, which represents completion of planning necessary to direct long-term implementation. Fire complexity and the involvement of key personnel in suppression activities delayed the completion of the Stage III WFIP.

The Long Term Analyst (LTAN) ran FARSITE (a fire growth simulation model) projections that showed the fire reaching Forest Road 225 on July 4. These projections

were based on the Energy Release Component (ERC) and fire growth observed at the time when the FUMT first arrived. After the completion of these projections, the weather changed significantly. This certainly impacted the reliability of the projections. Another factor may have been that the fuel model used in the projections was not representative of actual conditions within the fire area.

At some point during the WFU, it became apparent that the original projections were not very accurate. New projections should have been requested and then presented to district and forest personnel.

Definitions of Success

Was a good definition of success established at the beginning of the WFU? Meeting the established objectives is a good definition of success. That provides a benchmark for periodic assessments. In the AAR meeting, there were discussions on how important it is to clearly define success at the beginning of a WFU event.

The District Ranger said her definition of success was to have met the objectives on which the FUMT had been briefed – protect the Jacob Lake area and continue to get good fire effects depending on vegetation type. She said her definition of success did not include limits on flame lengths or the fire staying on the ground. There was a desire to see a mosaic. Stand replacement fire in the pinyon-juniper woodlands was considered appropriate from an ecological standpoint.

Why did it happen?

Fire Spread on June 18

Fire spread was due primarily to warm, dry, summer weather conditions. The ERC was continuing to go up.

Fire Spread on June 25

The significant fire growth on June 25 may be unparalleled on the Kaibab Plateau. Current fuel conditions are also unparalleled. It would appear that the significant growth was more terrain-driven than wind-driven. However, a thunder cell to the northwest of the district may have helped spread spot fires to the south. The climbing ERCs and the drought were certainly significant factors. Spot fires occurred at both the bottom and top of the hill along Forest Road 224.

What went well that we can use in the future?

- The Warm Fire was initially a good candidate for WFU. The location of the start of the fire was good. Highway 67 provided a good containment line for the east side of the fire. It was in ponderosa pine and the terrain was gentle. The initial

fire behavior and effects were also good. The fire was characterized by 2-3 foot flame lengths with moderate spread.

- The decision to order a FUMT early on in the management of the Warm Fire was a good one. The FUMT was ordered when the fire was not that complex. This allowed the FUMT to lay the groundwork for the future management of the fire. It also allowed the district to focus attention on other ongoing fire activity.

What are we going to do differently next time?

- Define the draft MMA early with careful consideration to its boundaries.
 - Describe the draft MMA based on the objectives for the WFU.
 - Have discussions with the Interdisciplinary Team (representatives from the various resource areas) on the draft MMA boundary very soon after the decision to manage as a WFU.
- Develop and provide clear objectives at the start of a WFU and eliminate the changing or adding of objectives during the fire.
- Assess the need to bring in assistance for the District Ranger to help with Agency Administrator duties associated with the WFU and other district activities.
- When available, District Rangers should attend S-580 (Advanced Fire Use Applications) training to improve their ability to be an Agency Administrator during a WFU event.
- The original relative risk assessment in the WFIP was used throughout the WFU portion of the fire. This should have been reviewed and updated based on changing conditions. The assessment frequency should be modified based on conditions. At the beginning of the WFU, the assessment frequency was daily. However, there were no changes to the relative risk assessment. The Agency Administrator must provide direction to the Incident Commander as to the frequency for updating the relative risk assessment.
- On June 15, it had been agreed that the District Ranger would revalidate the WFIP every third day unless significant fire activity occurred. This was likely not sufficient due to the changing conditions. The Agency Administrator needed to hear from the FUMT on a daily basis in order to make informed decisions on a very dynamic situation.
- Expanding the draft MMA is a significant decision.
 - The decision to change the draft MMA boundary needs to be based on objectives rather than what the fire is doing.
 - Think ahead to the anticipated duration of the event.
 - All of the key players need to be involved in a decision to change a draft MMA.

- Enlarging the draft MMA several times makes for a moving target. This played a role in the length of time it took to complete the Stage III WFIP.
- Stage II and Stage III of the WFIP are keys to success. They are the place to clearly define objectives and management actions.
- Ensure that we have sufficient personnel to complete both the Stage II and III of the WFIP in a timely manner. In those situations where fire complexity is ramping up, move into Stage III immediately with a plan for its timely completion.
- Carefully evaluate forecasted weather events, winds, relative humidity levels, red flag warnings, along with the current fire season conditions. The worst case scenario needs to be assessed.
- Establish a goal of developing draft MMAs that are place-based.
 - Draft MMAs should take the time of year into consideration.
 - Evaluate the benefit of putting them in the Fire Management Plan (FMP).
- Implement a public information campaign prior to the implementation of WFU activities. Increase public information activities during and after a WFU.
- Throughout a WFU incident that may involve archaeological resources, assign a technical specialist with an archaeology background as a resource advisor.
- The Line Officer must ensure that the Resource Advisor has a thorough understanding of the resources at risk and the areas approved for fire spread.
- Ensure that district and forest resource specialists are informed on fire plans and activities, that they are involved and know to whom they should bring their concerns (i.e. Resource Advisors, Line Officers, Fire Management personnel).
- Evaluate the need for emergency consultation with the U.S. Fish and Wildlife Service in order to include some MSO habitat within the MMA, if appropriate.
- Develop consensus on the definition of success at the beginning of a WFU incident. If it is in question that you are meeting that definition, it is time to seriously evaluate further operations.
 - Objectives that define success come from the Forest Plan.
 - Determine acceptable/desirable effects for WFUs in mixed conifer, where and when it is allowed.
 - Further define desired conditions where needed.
 - Circulate desired conditions among specialists for concurrence.
 - Share desired conditions with employees and the public as part of the public information effort.

- Develop agreements with district specialists about acceptable/desirable effects.
- When deciding whether or not to utilize WFU in pinion-juniper woodlands, which have the potential for stand replacement fire, we need to determine what effects are acceptable or desirable to archaeological resources and what resource data or preparation efforts are necessary to support that decision.
- Carefully analyze risk and potential consequences. Are the potential consequences within a given area worth the risk when balanced against the potential benefits?
- Community relations and public information are key in the development of a successful WFU program.
 - Start small in order to build success and trust with the public.
 - Information – show the full range of fire effects and possible outcomes.
 - Utilize district interpretive specialist to develop materials to share with forest visitors, schools, etc.
 - When appropriate, assign a liaison person with other government agencies to improve communications.
 - Make sure messages to the public and stakeholders are clear and coordinated.
- When managing a fairly complex WFU incident, consider utilizing an Incident Management Team with WFU capabilities rather than a FUMT. A FUMT may not have sufficient operational positions to manage a complex incident and may not be able to order those positions when resources become difficult to obtain.
- When requesting additional resources, clearly define the task for which they are needed along with the associated timeframe in which they are needed. Explain the consequences of not obtaining those resources.
- Interaction with and oversight of FUMTs and/or IMTs is critical. Everyone involved in the management of a WFU event needs to be monitoring the ability of the committed resources to manage the current and expected situation.
- Make individuals involved with the Warm Fire available to other WFU events to share the lessons learned.
- Complete future After Action Reviews immediately after the incident.

Watch Out Situations

Watch out situations have been developed for fire suppression and have proven to be very helpful. From our experience with the Warm Fire, we are suggesting the following WFU watch out situations. When one or more of these is occurring, it is a trigger point in evaluating further courses of action.

- Inadequate resources to meet current and expected objectives.
- Difficulty in obtaining additional resources.
- Heavy focus on one section of the fire.
- Unexpected events are occurring.
- Fire behavior and growth are exceeding initial projections.
- You are reacting to the fire on a daily basis. You are not successful in your planning of future actions. (Reactive vs. proactive stance.)