

# Pine Stub Prescribed Fire Review

Escaped Prescribed Fire on the

Prineville District BLM

Conducted

September 16, 2005

By

Central Oregon Fire Management Services

Oregon State Office BLM

## Review Team:

Team Leader: Maurice Evans, Fuels Management, COFMS

Team Members: Mark Rapp, Cascade Division FMO, COFMS  
Tim Rich, Fuels Management, ORO

## **I. Introduction and Background**

The Pine Stub prescribed fire escaped and became a wildfire on September 8, 2005. Central Oregon Fire Management Service (COFMS) assigned a review team to determine how the burn escaped and how this could be avoided in the future. Since suppression costs were expected to exceed \$50,000, the State Office participated in the review. The review team was briefed on September 12 at the Ochoco National Forest Headquarters. Review objectives were:

- To prevent future escapes from occurring.
- To establish accountability.
- To determine if the Prescribed Fire Plan was adequate for the project.
- To determine if the prescription, actions and procedures set forth in the Prescribed Fire Plan were followed.
- To determine the level of awareness and understanding of the personnel involved, with regard to procedures and guidance.
- To determine the extent of prescribed fire training and experience levels of personnel involved.
- To determine if overall policy, guidance and procedures relating to prescribed fire operations are adequate.

### **Summary of Events:**

The Pine Stub prescribed fire was a partnership burn between the Prineville District BLM and The Nature Conservancy (TNC). The project was a three-day, 1,686-acre burn that started on September 6<sup>th</sup>. The objectives were to reduce the abundance of young juniper trees and slow the succession of juniper woodland.

Pine Stub was one of several prescribed burns being conducted during the first week of September.

The Branson prescribed fire was initiated on the same day that Pine Stub prescribed fire was beginning and the Porcupine prescribed fire was starting on day two of the Pine Stub burn.

Pine Stub phase one, initiated September 6<sup>th</sup>, established a minimum of a 100-foot wide black-line along the eastside of the burn area (DP-3 to DP-1). Lighting was stopped because of winds exceeding prescription, but resumed later when the winds decreased. Phase two, initiated September 7<sup>th</sup>, created a minimum 100-foot black-line along the south boundary (DP-1 to DP-8). Later that evening, the east boundary was reinforced by increasing the width of the previously established black-line as much as 200 feet or more (DP-1 to DP-3). Phase three, initiated on September 8<sup>th</sup>, began firing operations in the northwest corner of the unit (DP-5). Burning operations moved east to DP-7 and south to DP-3 to tie-in previously established black-lines. At approximately 1420 hours a spot fire was reported east of the black-line by a designated lookout south of the burn unit.

The fire had escaped the containment line and was burning actively to the southeast. Crews from the north line (DP-3) moved to size-up and take action on the spot fire. At approximately 1502 hours Burn Boss requested a load of retardant and additional resources to contain the spreading fire. The incident was declared a wildfire at 1915 hours.

In all, 721 acres burned beyond the burn perimeter. Three to five acres of private land was burned. The burn did not escape the Maximum Management Area (MMA). One old homestead cabin burned on TNC land. See Figure 1.

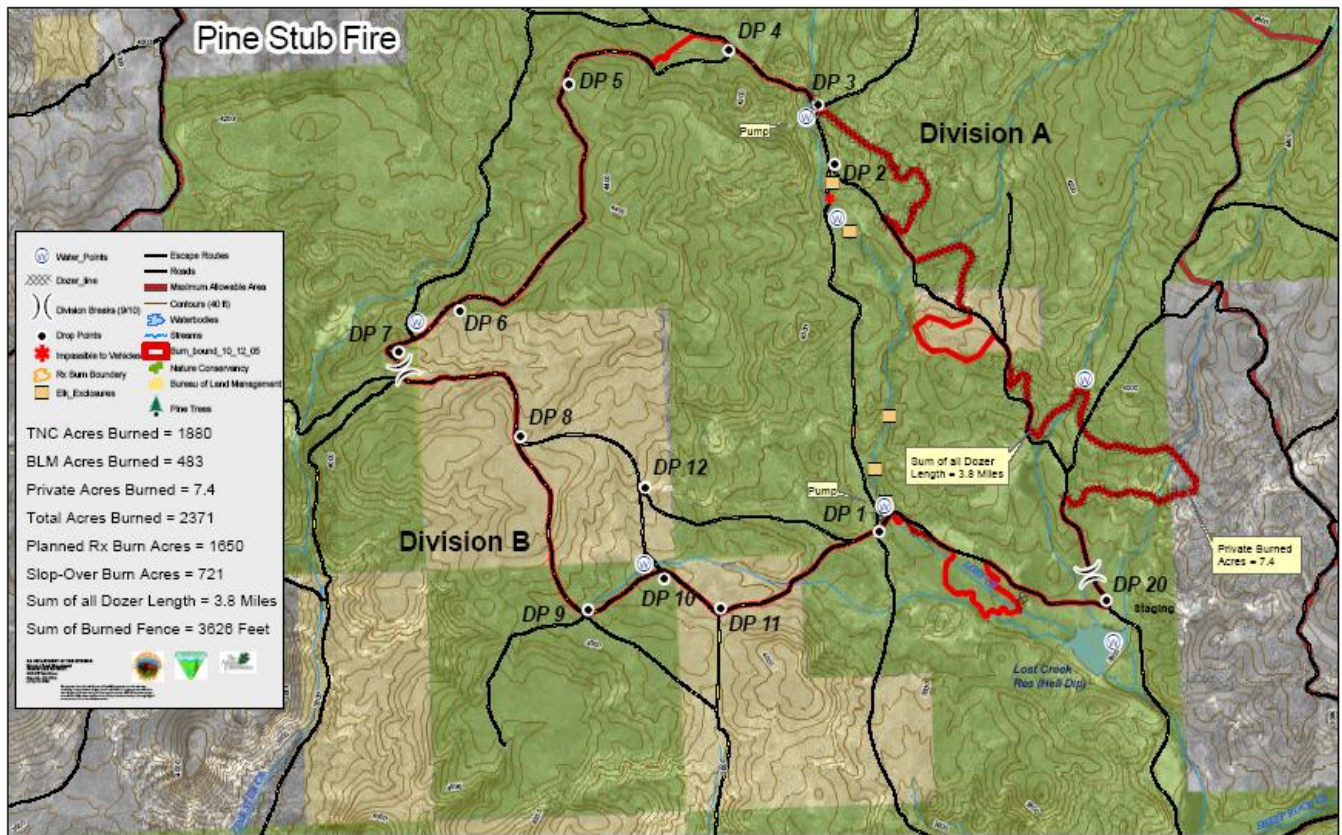


Figure 1. Pine Stub prescribed fire and wildfire perimeters

Table 1. Summary of Prescribed Fire Sequence.

Date	Event
August 29	Pre-burn planning meeting.
September 6	Pine Stub and Branson black-lining
September 7	Pine Stub, Branson and Porcupine black-lining.
September 8	Pine Stub and Branson burns conducted. Porcupine black-lining conducted. Pine Stub escapes and wildfire declared at 1915.

**Weather and Seasonality:** Central Oregon has had an average to below average fire season this year. The unusually wet spring resulted in a greater amount of grass and herbaceous growth than normal. When the burn was conducted, live herbaceous fuels were entirely cured. In the days leading up to and including the burn days, daytime temperatures were increasing, relative humidity was decreasing, and nighttime relative humidity recovery was decreasing. Dry and stable conditions were forecasted to continue over the burn area through September 8<sup>th</sup>, followed by a cold front on Friday, bringing much cooler weather with increasing winds.

The spot weather forecast on September 8th call for 87 degrees, winds northwest 3-5 mph in the afternoon, minimum relative humidity 15 percent.

## **II. Commendations**

- The burn boss had many discussions with Pendleton Fire Weather forecasters before and during the phases of the burn.
- Line Officer Tina Welch has done an outstanding job of prescribed fire program oversight.
- Prairie Division has an aggressive fuels program that includes large acres of prescribed fire.
- Review Team wishes to thank all interviewees for their candid and forthright response to the review.

## **III. Causal Factors of Escape**

The prescribed fire was conducted on the “Hot End” of the prescription as documented in the burn plan. Objectives could be most optimally achieved at this end of the prescription. The first two days of black-lining were successful even though minor spot fires did occur but were picked up easily. During black-lining operation on Wednesday a crew was sent to reinforce the east line that had been black-lined the previous day. This action re-introduced more fire to an area that may have been considered secure.

During Phase III implementation on September 8<sup>th</sup>, the designated lookout reported a juniper torching out along the east line perimeter south of the ongoing ignition in the vicinity of drop point 2 and 3. An ATV and operator was sent to the area to investigate and determine if there were any potential problems, none were observed and ATV operator was called back to the north line where ignition operations were continuing and resources were working on 3-5 acre spot fire. Approximately 15 minutes later lookout reports a smoke east of unit perimeter where juniper had previously torched. Personnel on the unit noted that the wind had increased simultaneously when this spot was detected. The Burn Boss dispatched resources to this area. The responding units were delayed because there was an impassable section of road along the east line and they had to take an alternate route.

Residual torching juniper from black-line operations on September 6<sup>th</sup> or 7<sup>th</sup> appears to have caused spot fire across line on September 8<sup>th</sup>. The east line was patrolled on September 7 but it appears that insufficient resources during September 8 operations to adequately cover all perimeters may have caused the spot fire to get established and eventually escape.

Records show that more wind was observed on the unit than was predicted on the spot weather forecast.

## VI. Statement of Findings

**Finding 1. Although all the elements of the Prescribed Fire Plan were addressed, there were several inconsistencies found between some of the elements.**

- The Complexity Analysis was not consistent with the burn plan.
  - Ten engines were identified under potential for escape, but the burn plan identified six engines as adequate at the “Hot End” of the prescription.
  - Fire Behavior (#5) was not consistent with fire behavior forecasted in the burn plan at “Hot End” of prescription. It indicated that direct attack was feasible. The burn plan indicated spotting would be a problem, and flame lengths of up to 8 feet and rates of spread up to 121 ch/hr. were predicted.
- The burn plan was unclear whether the prescription was based on weather parameters or fire behavior predictions. There were many BEHAVE runs in the burn plan, but it was unclear which one was used to predict fire behavior, and which fuel model was used. The Burn Boss stated she based her decision to Go/No-Go on weather parameters and not predicted fire behavior. If the weather parameters were used to determine the prescription for Go/No-Go, then 90 degrees, RH 10%, wind 10 mph in a fuel model 2 predicts a ROS of over 200 ch/hr.
- There needs to be clear links between predicted fire behavior and required holding forces. If assigning enough resources to suppress potential slop over is not feasible, as is often true in these fuel types, then other mitigation measures should be identified in the burn plan. This can include reducing the spot fire potential, or spacing resources to provide early detection and attack.
- The escape fire plan was inconsistent with predicted fire behavior. Fire behavior in the burn plan indicated indirect or parallel attack, but the escaped fire plan stated that direct attack would be used.

### Recommendation

1. COFMS will assure that all unaccomplished burn plans are reviewed and amended regarding above inadequacies.
2. Once this is completed, COFMS will send an updated burn plan to the State Office for review.

**Finding 2. The resources assigned to the burn were inadequate for holding given the expected fire behavior, and the holding plan was not followed.**

The initial plan was to conduct two burns, Branson and Pine Stub, and then initiate the third planned burn (Porcupine). This decision resulted in two contingency engines that were assigned to Pine Stub to be re-assigned to the Porcupine burn. Even though the resources assigned to the burn were within the plan, two engines broke down during burning operations, and the remaining engines were not

sufficient to detect and contain spot fires. According to Dispatch records, the Burn Boss did order another engine after the first one broke down.

Based on the burn plan, the prescription at the “Hot End” indicates rates of spread (ROS) of 120 chains per hour or less are in prescription. Resources assigned to the burn were primarily engines. A type 6 engine has an initial attack production rate of approximately 7-12 chains per hour with two personnel.

On site weather observations at 1430 was 86 degrees, RH 13%, wind 3-7 mph (see Appendix 2). This is consistent with weather at Badger RAWS. Modeled fire behavior estimates under these weather conditions show a ROS in the range of 165 chains per hour. Experience has shown that BEHAVE tends to over-predict this fuel type (FM 2) and fire managers sometimes reduce this by as much as 50%. Even with this reduction ROS would be in the range of 94 chains per hour, well beyond the production capabilities of the resources assigned to the burn.

The burn was conducted within prescription as defined by the weather parameters in the burn plan.

Other significant operational factors that likely contributed to the escape are:

- Holding plan was not followed. The plan indicated that two engines would be positioned south of the impassible crossing, but this did not happen. This is where the spot fire occurred. Spotting from juniper torching was noted in burn plan as a concern, but actions were not taken to mitigate this concern. Cold trailing under junipers or cutting juniper close to the fireline might have prevented spot fires. Although a lookout was designated on the days of ignition to detect spot fires, rates of spread were too rapid to prevent an escape without sufficient resources close by.
- Contingency resources were available but too far away to be effective. The contingency forces identified in the prescribed fire report had resources as far away as Crescent, Sisters, and Bend, with potential travel time in excess of three hours.
- Even though heavier than normal fuel loadings as result of wet spring was recognized as a potential problem, no adjustments in prescriptions or operations were made as a result. (See BLM Prescribed Fire Handbook). In the Go/No-Go Checklist, the first item (A) “Has the burn unit experienced unusual drought conditions or contain above normal fuel loading which were not considered in the prescription development” was checked “No”. The BLM Prescribed Fire Handbook has highlighted this as a common reason for escaped prescribed fires, and this was the reason this first checkbox was added to the Go/No-Go checklist in 2003. The “X” in the “No” column was actually a typo, was made known to each Line Officer and discussed verbally each day as the Go/No Go was being conducted.

## Recommendation

1. Prior to conducting the first prescribed fire of the season, conduct a briefing for line officers and burn bosses of planned burns of the season.
2. Implement the Pacific Northwest Contingency Plan developed in 2001. (See Appendix 3.)
3. Follow your holding plan.



### **Finding 3 – Leadership oversight and communications among key leadership positions needs to be improved.**

There were several leadership shortcomings or, at a minimum, miscommunications that may have contributed to the escape. This happened at several levels of the organization, and between key players in leadership. Those leadership lapses or miscommunications we identified included:

- The job as prescribed fire manager was not filled. While the FMO was acting as burn boss on the Branson Prescribed Fire, no one was explicitly designated as acting FMO and fulfilled responsibilities of a prescribed fire manager. Had this happened, more coordination between burns would likely have occurred, the resource shortage on Pine Stub may have been anticipated, and the transition to wildfire may have gone more smoothly.
- Several key players had concerns about how the burn was to be conducted; yet several of these issues were not openly discussed and acted on. The Area Manager had refused to sign the burn plan a year earlier because of several “red flags”, including one element in the Complexity Analysis that was rated “High”, inadequate contingency plan, an appearance of haste, and a lack of thorough review of the burn plan. This triggered a review of the burn plan and complexity analysis, and delaying the burn until 2005. The Burn Boss expressed that she had concerns about accomplishing the burn when several resources were reassigned to the Porcupine prescribed burn on the day of escape. She also assumed she had all the resources that were available to her for the burn on Thursday, so did not order additional. The Burn Boss also understood that contract resources could not be used for prescribed fire.
- There were differences in the understanding of the outcome of a key meeting among the players. This meeting on August 29<sup>th</sup> of prescribed fire leadership and line officers resulted a decision to implement multiple burns, but some thought the burns would be done in sequence, while others thought they would be conducted at the same time. The result was that resources and key overhead were pulled from Pine Stub to work on Porcupine without advance notice.

### **Recommendations**

1. When conducting multiple burns on a single unit, management needs to insure that either a prescribed fire manager is assigned, or the FMO or acting fills that role.
2. To foster a culture of open, frank communications, management should take such actions as implementing standard daily debriefings, after action reviews, or pre-season prescribed fire meetings. Major decisions should be documented.
3. Clarify what resources may or may not be used for prescribed fire operations (ie. Contract resources).

### **V. Observations**

1. The agreement with TNC specifically, and all agreements with private landowners who are involved with prescribed fire needs to be reviewed. One issue that needs to be addressed is an agreement of cost apportionment in the event that additional resources are needed, and who has liability in the event of an escaped prescribed fire.



2. Seems there was confusing direction to the Burn Boss regarding the direction to declare a wildfire. FMO, Division FMO, and Designated Line Officer provided differing guidance.
3. When the prescribed fire was declared an escape, there was confusion as to who was in charge on the fire initially, and key people did not receive this information. The burn plan and BLM direction says that the Burn Boss will determine that an escape has occurred. This is commonly a mutual decision between the Burn Boss and superiors. Dispatch called Burn Boss to tell her that the burn was now a wildfire and the Suppression AFMO was the IC, however, this was not communicated to the AFMO. The responsible Agency Administrator did not know a wildfire had been declared until the following day.
4. MMA is not part of BLM accepted prescribed fire terminology. Allowable Area is currently the expectable term and concept. Conceptually, Allowable Areas are areas outside the planned perimeter where fire is acceptable, but does not have to be declared a wildfire.

## **VI. Action Plan**

To be written by District

### **Appendix I. List of people interviewed:**

Central Oregon Resource Area, Prineville District  
Fuels Specialist, Prineville District  
Fire Management Officer, Prairie Division, COFMS  
The Nature Conservancy  
Interagency Fire Management Officer, COFMS  
Assistant Fire Management Officer, Prairie Division, COFMS  
Fire Ecologist, COFMS